



**The Influence of Management Practices on Employee Commitment  
and Food Safety Performance in Food Manufacturing Firms**

تأثير الممارسات الإدارية على التزام الموظفين وأداء سلامة الأغذية  
لدى شركات الصناعات الغذائية

by

**SADI MOHAMMAD SADI TAHA**

**A thesis submitted in fulfilment of the requirements for the  
degree of  
DOCTOR OF PHILOSOPHY IN BUSINESS MANAGEMENT**

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**The British University in Dubai**

**Supervisor's Name: Professor Stephen Wilkins**

**September 2018**



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**18<sup>th</sup> September 2018**

## **ABSTRACT**

Traditional training, food testing, inspections, and adopting various food safety management systems are commonly used solutions to improve food manufacturing safety. Despite the implementation of these interventions, food borne illnesses, food product recalls, and food safety violations persist. With the purpose of improving food safety practices and performance, it is argued that food manufacturing firms focus on the behavioural issues of their food handlers. Previous studies have focussed on behaviour and researchers have used different theories to investigate how knowledge and training may affect food handlers' behaviour. The theories used include social norms theory, reasoned action theory, and the theory of planned behaviour.

The existing literature emphasises the need for researchers to investigate the organisational factors that could influence the behavioural intentions of food handlers. However, no studies have been conducted that have investigated the impact of different management practices on food handlers' behaviour with regard to the implementation of safe food procedures and organisational food safety performance. Thus, this study expands the literature and uses commitment theory to assess how a range of management practices influences food handlers' commitment and organisational food safety performance.

The objectives of this research are to critically investigate the impacts of several management practices – specifically, management support, communication, training, and employee involvement – on food handlers' commitment towards food safety performance in food manufacturing firms based in the United Arab Emirates (UAE). The study examines the mediation effect of the food handlers' commitment on the relationship between the management practices and the food safety performance of the firms. The sample comprised 189 food manufacturing firms operating in the Emirate of Dubai.

This research adopted a positivist philosophy, and a quantitative deductive approach. Two focus groups were conducted to support the literature analysis and to gain more information from the participants to support the research aims, which validated the draft survey instrument that had been based on the literature. Data were collected by using a self-administered hard copy survey questionnaire that was completed by five food handlers in each of the 189 firms. The data analysis was accomplished using the Statistical Package for the Social Sciences (SPSS) and structural equation modelling (AMOS) by means of multiple regression, path and mediation analysis. It was found that all of the studied management practices have a direct significant positive impact on the food handlers' commitment to implementing safe food procedures. Furthermore, the food handlers' commitment has a significant positive impact on organisational food safety performance.

The results also indicate that the food handlers' commitment fully mediates the relationship between the training and food safety performance of food manufacturing firms. Similarly, the food handlers' commitment fully mediates the relationship between employee involvement and the food safety performance of food manufacturing firms. The food handlers' commitment was found to partially mediate the relationship between organisational management support and the food safety performance, and similarly the food handlers' commitment was found to partially mediate the relationship between communication and the food safety performance. These results indicate that food handlers' commitment is a mediator in the relationship between all of the studied management practices and the food safety performance of food manufacturing firms.

Based on the mediation results, the association between employee involvement and training was examined and found significantly associated. This suggests that employee involvement can be an important factor in boosting training effectiveness, such as the food handlers' skills levels and their work performance when they are involved in decision making, or their problem solving in daily work activities. This indicates that learning is not a product with an identifiable outcome endorsed with a completion or attendance certificate. Rather, it is a process in which learners enhance their work performance when they are involved and able to translate the knowledge obtained through training into practice during daily work activities.

To the knowledge of the researcher, this is the first empirical study that uses commitment theory to investigate the antecedents of food handlers' commitment to implement safe food procedures, and the influence of management practices and food handlers' commitment on organisational food safety performance. Most of the previous studies have used behavioural theories focusing on explaining the behaviour itself, which considered the normative influences without accounting for the environmental or economic factors that may affect an employee's intention to perform a particular behaviour.

This study contributes to knowledge by presenting a conceptual model, which builds upon and improves the existing models of food safety management, by introducing commitment theory to the present behavioural theories. It succeeded in explaining the management practices that influence food handlers' commitment to implementing safe food procedures, and how both these practices and the food handlers' commitment may impact upon organisational food safety performance. It is concluded that food handlers with strong commitment are more likely to implement safe food procedures, thus contributing to the organisation's food safety performance. The findings suggest that the managers of food manufacturing firms should analyse the impacts of their management practices and create policies that motivate and improve employee commitment and performance. Further implications of the results and future research directions are also presented.

## الملخص

أصبح مألوفاً استخدام التدريب التقليدي، والفحص المخبري للأغذية، والتفتيش الغذائي وتطبيق أنظمة السلامة الغذائية لتحسين أداء سلامة الأغذية لدى شركات الصناعات الغذائية. على الرغم من ذلك، تستمر التسممات الغذائية، وعمليات سحب المنتجات الغذائية، ومخالفات سلامة الأغذية. ولغرض تحسين ممارسات وأداء سلامة الأغذية، تم النقاش بضرورة التركيز على القضايا السلوكية للعاملين في مجال الأغذية. حيث ركزت الدراسات السابقة على السلوك نفسه، واستخدم الباحثون نظريات مختلفة للتحقيق في كيفية تأثير المعرفة والتدريب على سلوك العاملين. وتشمل النظريات المستخدمة نظرية الفعل المنطقي، ونظرية السلوك المخطط، ونظرية العوامل البيئية أو الفيزيائية.

تؤكد المؤلفات الحالية على ضرورة قيام الباحثين بالتحقيق في العوامل التنظيمية التي يمكن أن تؤثر على النوايا السلوكية للعاملين. ومع ذلك لم تجر أية دراسات تبحث في تأثير الممارسات الإدارية المختلفة على سلوك العاملين فيما يخص تنفيذ إجراءات السلامة الغذائية وأداء سلامة الأغذية لدى شركات الصناعات الغذائية. وبالتالي، فإن هذه الدراسة تثير الأدبيات باستخدامها نظرية الالتزام لتقييم مدى تأثير مجموعة من الممارسات الإدارية على التزام العاملين وأداء سلامة الأغذية لدى شركات الصناعات الغذائية.

تتمثل أهداف هذا البحث في إجراء تحقيق نقدي حول عدد من الممارسات الإدارية - تحديداً دعم الإدارة، والتواصل، والتدريب، ومشاركة الموظفين - بشأن التزام العاملين بأداء سلامة الأغذية في شركات الصناعات الغذائية التي تتخذ من دولة الإمارات العربية المتحدة مقراً لها. تبحث الدراسة في التأثير الواسطي للالتزام بالعاملين على العلاقة بين الممارسات الإدارية وأداء سلامة الأغذية في الشركات. شملت العينة 189 شركة لتصنيع الأغذية تعمل في إمارة دبي. اعتمد هذا البحث على الفلسفة الوضعية، والنهج الاستدلالي الكمي. تم تكوين مجموعتين من مجموعات التركيز كتمرين للحصول على معلومات من المشاركين، والتي بدورها أكدت صحة مسودة أداة المسح التي أقيمت من الأدبيات السابقة. تم جمع البيانات باستخدام إستبيان (نسخة مطبوعة) تم تعبئته من قبل خمسة من العاملين في مجال التصنيع الغذائي في كل شركة من عينة البحث (189 شركة تصنيع غذائي).

تم إنجاز تحليل البيانات باستخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS) ونموذج المعادلة الهيكلية (AMOS) عن طريق تحليل الإنحدار المتعدد والمسارات والوساطة. وقد تبين أن جميع الممارسات الإدارية المدروسة لها تأثير إيجابي مباشر على التزام العاملين بتنفيذ إجراءات السلامة الغذائية. علاوة على ذلك، فإن التزام العاملين له تأثير إيجابي كبير على أداء سلامة الأغذية في شركات التصنيع الغذائي.

وأشارت النتائج إلى أن التزام العاملين يتوسط العلاقة بشكل كلي بين التدريب، وأداء سلامة الأغذية في شركات التصنيع الغذائي. وبالمثل، فإن أن التزام العاملين يتوسط العلاقة بشكل كلي بين مشاركة الموظفين، وأداء سلامة الأغذية في شركات التصنيع الغذائي. لقد وجد أن التزام العاملين يتوسط جزئياً العلاقة بين دعم الإدارة التنظيمية، وأداء سلامة الأغذية، وبالمثل أن التزام العاملين يتوسط جزئياً العلاقة بين التواصل، وأداء سلامة الأغذية. تشير هذه النتائج إلى أن التزام العاملين هو وسيط في العلاقة بين جميع الممارسات الإدارية المدروسة، وأداء سلامة الأغذية لدى شركات التصنيع الغذائي.

واستناداً إلى نتائج الوساطة، تم فحص الارتباط بين مشاركة العاملين والتدريب، ووجد أنه مرتبط بشكل كبير. هذا يشير إلى أن مشاركة العاملين يمكن أن يكون عاملاً مهماً في تعزيز فعالية التدريب، مثل مستويات مهارات العاملين وأداء عملهم عندما يشاركون في صنع القرار أو حل الصعوبات في أنشطة العمل اليومية. ويشير هذا إلى أن التعلم ليس منتجاً له نتائج محددة تختصر بالحصول على شهادة اجتياز دورة التدريب أو شهادة حضور. بل هي عملية يقوم فيها المتعلمون بتعزيز أداء أعمالهم عندما يكونون معنيين، وقادرين على ترجمة المعرفة المتحصلة عليها من خلال التدريب إلى ممارسة فعلية على الواقع أثناء أنشطة العمل اليومية.

في حدود معرفة الباحث، فإن هذه هي أول دراسة تجريبية تستخدم نظرية الالتزام للتحقيق في العوامل المؤثرة لالتزام العاملين بتنفيذ إجراءات السلامة الغذائية، وتأثير الممارسات الإدارية والتزام العاملين على أداء السلامة الغذائية لدى شركات التصنيع الغذائي. وقد استخدمت معظم الدراسات السابقة النظريات السلوكية التي تركز على شرح السلوك نفسه، وإعتبار التأثيرات المعيارية دون حساب للعوامل البيئية أو مسببات السلوك، والتي قد تؤثر على نية الموظف في أداء سلوك معين.

تساهم هذه الدراسة في المعرفة من خلال تقديم نموذج مفاهيمي، والذي يقوم على تحسين النماذج الحالية لإدارة سلامة الأغذية، من خلال إدخال نظرية الالتزام إلى النظريات السلوكية الحالية. حيث نجحت في شرح الممارسات الإدارية التي تؤثر على التزام العاملين بتنفيذ إجراءات السلامة الغذائية، وكيف يمكن أن تؤثر هذه الممارسات والتزام العاملين على أداء سلامة الأغذية في شركات التصنيع الغذائي. أصبح من المرجح أن يقوم العاملين ذوي الالتزام القوي بتنفيذ إجراءات السلامة الغذائية، وبالتالي المساهمة في أداء سلامة الأغذية في شركات التصنيع الغذائي. تشير النتائج إلى أن مديري شركات تصنيع الأغذية يجب أن يحلوا نتائج ممارساتهم الإدارية، وأن يضعوا سياسات بدورها تحفز وتحسن التزام العاملين وأدائهم. لقد تم تقديم المزيد من الآثار المترتبة على النتائج والاتجاهات البحثية المستقبلية في جنبات هذا البحث.

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## **Acknowledgements**

In the name of Allah, Most Gracious, Most Merciful. Praise be to Allah, the Cherisher and Sustainer of the worlds for assisting me and award me the power to accomplish my PhD thesis on time. This research would not have been possible without the help and support of my director of studies, Dr. Stephen Wilkins who has assisted me to have this work come out true. My sincerest appreciation to my director of studies, Dr. Stephen Wilkins for his marvelous advice, invaluable support and friendship have been invaluable on both an academic and a personal level, for which I am extremely grateful. His attention, moral support and timely suggestions were useful during the PhD journey. His emotional support and encouragement increase my self-reliance during the difficult times were really respected.

I would like to extend my gratitude to my second supervisor Dr. Katariina Juusola for her continues support and full cooperation. My sincerest thanks to the staff at the British University in Dubai (BUiD) for their valuable efforts during the taught courses and research times. Sincerest thanks to Prof. Ashly H. Pinnington and Prof. Haleem Boussabaine for their continuous great advice, support and encouragement. I also feel so honoured to have this opportunity to thank my friend Omar Ali who encourage me always to strive harder to complete the PhD journey. These acknowledgments would not be complete without thanking my family for their constant support and care. Today I feel that my parent's hard work and dreams have been flowered. My sincerest thanks and gratitude to my father Mohammad, my mother Fatema may God have mercy on them, brothers, sisters my wife Raeda and sons Mohammad, Omar, and Ali for their kind support and I am grateful to all my teachers from school to university education.



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## **List of Abbreviations**

HACCP	Hazard Analysis Critical Control point
TPB	Theory of Planned Behaviour
KAP	Knowledge Attitude Practice
LMX	Leader-Member Exchange
QMS	Quality Management Systems
FSMS	Food Safety Management System
EXR	Extra Role Behaviours
INB	In-Role Behaviours
SEM	Structural Equation Modeling
AMOS	Analysis of Moment Structures
KMO	Kaiser-Mayrt-Olkin
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
MP	Management Practices
AVE	Average Variance Extracted
SV	Shared Variance

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# **Chapter One: Introduction**

## **1.1 Introduction to the Chapter**

The first part of this chapter introduces the management of food safety and performance with a focus on food safety and food poisoning, the role of food handlers, and food safety intervention programmes. The second part of this chapter presents the research problem and questions, the aim and objectives, and the significance of the research.

### **Food Safety**

Food safety is a promise that food has been prepared for its intended use in such a way that does not deliver harm to the consumers (Codex Alimentarius 1969). It involves conducting hygienic procedures relating to food preparation, handling, and storage to ensure the produced food is safe and to prevent consumers from experiencing food poisoning (World Health Organisation 1984).

Managing food businesses and performing regulatory food inspections have become a more difficult task, especially in light of the current global environment and trade competition. In addition, the right for people to consume safe and hygienic food has toughened the management of the food business and regulatory inspections. The increasing number of food poisoning cases is becoming a critical concern of the public and governments worldwide due to the negative effects on public health, economy, and trade (Kaferstein 1997; Taylor et al. 2015). Morbidity and mortality cases caused by food poisoning outbreaks have increased, thus creating a universal anxiety. The most common causes of such outbreaks are cross-contamination and temperature abuse, which are simple to avoid.

Not adhering to safe food handling practices and procedures not only affects the organisational performance but also leads to negative effects on public health, trade, and tourism (Taylor et al. 2015).

While the food business management and health authorities have applied several interventions, such as food testing, food safety management system certifications, training, and inspections, the number of food poisoning cases have continued to rise (Kaferstein 1997), and product recalls are becoming a global concern within the circles of food manufacturing firms, health authorities and the public. Unsafe food products cause about 32,000 deaths and 35 million illnesses each year in the United States (Muralidharan, Bapuji & Laplume 2015). However, food handlers are still failing to adopt the food safety procedures they have been taught to follow (Clayton & Griffith 2008), and the results of the intervention strategies applied to improve employees' behaviour intention concerning the adoption of safe food handling procedures remain inadequate.

While it is often considered only a microbiological issue, food safety is also a behavioural issue (Griffith & Redmond 2009). As most food poisoning cases are caused by food handling errors or malpractices, food handlers have a key role in preventing cases of food poisoning (Hedberg et al. 1994; Howes et al. 1996). Many researchers have called for studies to examine the influences of food handlers' behaviours in food businesses field like the ones conducted on the influences of safety behaviours of employees working in the field of occupational safety (Griffith, Livesey, & Clayton 2010; Yiannas, 2009). Clayton and Griffith (2008) claimed that it was not enough to examine only employee behaviour concerning safe food handling procedures and that the related organisational factors must also be investigated.

Considerable research in the private and public sectors has found that organisational commitment is linked to behaviour, performance, and achievement. Commitment theory has been used to measure the impact of the organisation life on the behaviour and performance of the employees successfully (Cohen 2007; Lawrence et al. 2012). However, understanding the impact of management practices on food handlers' behaviour to implement safe food handling procedures and enhance the organisation's food safety performance has not yet been studied in food manufacturing firms in the United Arab Emirates (UAE) through commitment theory.

Currently, health authorities use diverse intervention strategies such as inspections, food safety management systems, and training to integrate strategies that will increase their effectiveness and efficiency to decrease the risks of potential foodborne hazards (Lee 2013). Foodborne diseases have become a global issue and, although accurate statistics of foodborne diseases are unavailable for many reasons, it is estimated that more than 1.4 million people die from foodborne diseases, thus highlighting the need for improved food safety management. Health authorities are thus developing strategies to ensure compliance with the international standards of food safety within food businesses (Al Yousuf, Taylor & Taylor 2015). In addition to the government's role, food businesses have a strong responsibility to implement food safety procedures and therefore set an example for their food handlers to follow and to ensure that the organisation adheres to the food safety regulations set by the government (Taylor et al. 2015).

In light of international trade and health results, food safety has become a global issue (WHO 2006). The concerns of food safety issues are on the rise in developing countries because of mass food production aimed at meeting the population increase in these countries (Kaferstein & Abdussalam 1999).

As food poisoning can occur at any time and in any place, say, in a restaurant, at home, or in hospital, food safety procedures must be implemented to prevent cases of food poisoning. Without promoting food safety measures, consumers are always at risk.

### **1.3 Food Illnesses and Food Poisoning**

Food illnesses or food poisoning are caused by infections or toxins that enter people's bodies through consuming toxic food. Estimating the global number of food poisoning cases may be a daunting task because food safety problems differ from one country to another (WHO 2007). However, the WHO estimated that the number of foodborne illnesses in 2010 was 582 million, of which 351,000 resulted in deaths. The WHO also estimated that in 2013, the number of deaths worldwide caused by foodborne illnesses exceeded 1.4 million, despite the recent advent of technology (Al Yousuf, Taylor & Taylor 2015). Eating food contaminated with microorganisms due to the unhygienic practices of food handlers who carry microorganisms in their body or on their skin will cause food poisoning (Jay et al.1999).

According to the Center for Disease Control and Prevention (CDC), there were 818 food poisoning outbreaks, 13,360 reported food illnesses, 1,062 admitted to hospitals, 16 deaths, and 14 food recalls in the United States in 2013. In 2014, there were 864 food poisoning outbreaks, 13,246 food illnesses, 712 admitted to hospitals, 21 deaths, and 21 food recalls (CDC 2015; CDC 2016).

## **1.4 Food Safety in UAE**

Many interventions have been called for to enhance food safety performance and minimise the risks of foodborne diseases. These interventions include testing food items, training food handlers, and carrying out governmental inspections; however, food safety remains an important concern among researchers, health authorities, food businesses, and the public worldwide. Despite moving from a reactive to a proactive approach and applying quality standards in food firms such as Hazards Analysis Critical Control Points (HACCP), the food safety performance still fails to reach an acceptable level. Furthermore, despite health authorities' regular inspections and providing thousands of training for food handlers, the performance of food safety has not been enhanced significantly over time (FDA National Retail Food Team 2004). This lack of progress indicates that other factors might have a major role in influencing the food handlers' ability or desire to implement safe food handling procedures and enhance their organisation's food safety performance (Yiannas 2009). Statistics specific to UAE indicate that 336 Salmonella and 245 other food poisoning cases were recorded in 1999, and foodborne diseases in Abu Dhabi for 2010, 2011 and 2012 were 561, 667 and 1,147, respectively, reaching 1,663 in the first nine months of 2011 in Dubai (Ministry of Health 2000; Abu Dhabi Health Authority 2012; Dubai Health Authority 2011). Because of these incessant food poisoning cases, health authorities (Food Control Departments in UAE Municipalities) are expending their efforts toward improving food safety measures, and the health regulatory authorities in UAE are attempting to establish an efficient system that ensures all imported food products and all locally produced products are safe for consumers.

Samples are sent regularly to the labs for analysis, and food safety professionals are employed to inspect food businesses in order to ensure compliance with food safety regulations and to promote health education and awareness among food handlers. Food safety training given by third party consultants has become mandatory for food handlers.

According to engineer Khalid Al-Sharif, the assistant director general for health, safety, and environment control in Dubai Municipality, most health authorities have started a new training programme, which is designed to make the food supervisor, manager, or person in charge responsible and accountable for matters related to food safety. This setup would make the communication between the food inspector and the person in charge more efficient (Dubai Municipality 2010).

Sharjah Municipality devised an innovative food safety training programme known as Good Hygiene Practices aimed at educating business managers in food services establishments in the Emirate of Sharjah. The training material has been designed considering international best practices, the site's environment, and practical violations that occur during operations. Mr. Basem M. Azzam, technical quality manager of the Health Education Office, explained that Sharjah Municipality food inspectors contributed to the training materials following their observations of work practices during inspections. Thus, by following the trainees on their sites, the inspectors provide the necessary guidelines to food handlers to help them translate the knowledge gained into hygienic food handling practices.



## **1.5 The Role of Food Handlers in Food Safety**

In 2010, US regulations controlling the hygiene standards of food businesses defined a food handler as any person (employee, employer, or other natural person) working in or operating a food facility, dealing with stores and transport, or having contact with anything in the food facility such as equipment, tools, or materials used in the handling, preparation, manufacture, service, or sale of food.

Research findings show that food service establishments are the riskiest places for reported food poisoning cases and that the risk of experiencing food poisoning increases when eating food prepared outside (Olsen et al. 2000). Research on foodborne diseases and observation studies show that most outbreaks occur due to the unhygienic food handling practices in food service establishments (Clayton & Griffith 2008) and ignoring the basic standards in food handling practices. For example, using contaminated raw food materials, abusing temperatures and time and allowing infected food handlers to participate in food preparation are general faults that have occurred in the food business sector (WHO 1999).

When they are ill, food handlers can be a source of pathogens because they can spread the pathogens from their skin to the food. Thus, food handlers that are sick should not be allowed to handle food until they have recovered fully. Even when they are not ill, food handlers can spread pathogens from raw food to cooked food during food preparation. Thus, good personal hygiene standards and food handling practices are essential to avoid spreading pathogens to other people via the food (Evans et al. 1998).

## **1.6 Food Safety Intervention Programmes**

Since food poisoning is caused by unhygienic food handling practices during food preparation in food service establishments, food handlers' practices need to be improved to prevent food poisoning outbreaks. However, to attain this objective, the problems with existing practices need to be comprehended to determine what influences such practices and what can be done to alter those behaviours (Yiannas 2009).

The negative consequences of food poisoning cases have motivated the need to improve food handling practices and communicate the significance of hygiene among food handlers. As long as the food handlers' behaviours are monitored, the food will be safe (McCabe-Sellers & Beattie 2004).

As most cases of food poisoning occur due to food handlers' errors, providing food handlers with training is important to ensure sustainable benefits to the food business (Smith 1994). The food handlers' role in food poisoning cases has led to the understanding that providing training for food handlers would help reduce occurrences of food poisoning (Clayton & Griffith 2008). Therefore, training is one of the main strategies currently sought by food businesses to enhance the levels of food safety. However, existing training programmes focus heavily on science-based facts related to principles of hygiene and tend to ignore the organisational factors that aid food handlers to translate the knowledge gained from training into hygienic practices (Mitchell et al. 2007; Ehiri & Morris 1996). Additionally, current epidemiological evidence reveals that food poisoning is not a result of the food handlers' lack of knowledge related to hygiene but rather their inability to translate the gained knowledge into practice in the field (Ehiri & Morris 1994).

Food handlers, thus, continue to implement unsafe food handling procedures even after receiving food safety training (Henroid & Sneed 2004), which indicates that food safety training alone is not sufficient for motivating food handlers to implement the safe food handling procedures (Arendt & Sneed 2008). Researchers have therefore attributed the failure of executing safe food handling practices to organisational factors (Pragle et al. 2007).

## **1.7 Research Problem**

Although a great deal of effort has been expended to enhance food safety performance, the potential risk of food poisoning, product recalls, and low food safety inspection scores continue to increase among food manufacturing firms. In addition, food handlers continue to exhibit unhygienic behaviours in food preparation (Clayton & Griffith 2008).

Despite intervention strategies such as inspections, food safety management certifications (HACCP), innovations in technology, improvements in the organisational performance of food firms related to food poisoning, inspection scores and product safety remain modest. It has become clear that food safety management involves not only knowledge and technical skills but also the consideration of factors related to human aspects such as employee commitment and food handlers' behaviours issues (Taylor et al. 2011). Many academics and professionals have recently proposed that food safety requires a deeper comprehension of how organisations carry out food safety. Measuring how organisations conduct food safety could be determined by examining the employees' perceptions of management practices such as management support, communication, employee involvement, accountability, leadership, training, and work environment (Griffith et al. 2010a; Powell et al. 2011; Taylor 2011; Yiannas 2009).

Human capital has become the most important asset of an organisation and several researchers have investigated the influence of human resource practices on organisational performance and proposed the potential of many HRM practices to enhance and maintain the organisational performance (Sendogdu, Kocabacak & Guven 2013). Furthermore, many studies have found that most foodborne disease outbreaks are related to food handlers' failure to execute safe food handling procedures. Thus, studying the subjective behavioural factors would help to understand how best to improve the organisational food safety performance (da Cunha et al. 2015).

Managers can influence the employee performance by implementing management practices, which contributes to the greater organisational performance (Almatrooshi, Singh & Farouk 2016). Managers can influence the employee performance by creating a motivational workplace environment that affects the attitudes and behaviours of employees and motivates them to execute the standard procedures (Mastrangelo et al. 2014).

Improper cooking & cooling, poor cleanliness, and cross-contamination, as some traditional common, contributing factors for foodborne outbreaks (Yiannas 2009). The results of many outbreaks investigations have revealed that food handlers behaviors in food industry is a critical risk factor for the outbreaks. The organisational factors have been linked during foodborne outbreaks and recall investigations as an underlying cause for food-safety management-system failures. Supportive management practices within the food-manufacturing firms' culture is needed to improve the food safety management system effectiveness toward the performance in the firms such reduce the food poisoning outbreaks and food products recall (Ungku Fatimah, Strohbehn & Arendt 2014; Vashisht 2018).

Such food products recall and food poisoning outbreaks influence the firms negatively like firm's brand identity; financial losses; and bankruptcy. Therefore, the organisational factors were proposed to be considered during the investigation of the outbreaks in addition to the traditional risk factors (Griffith et al. 2010b).

Food safety plays an important role to human's health. Studies proved that improper practices and lack of knowledge are contributing factors of foodborne diseases. Results accentuate the need of food safety training of food handlers strongly. Some features of food handlers' safety behaviour need to be emphasized. Food borne diseases are still common issues worldwide. Research showed that lack of knowledge and unhygienic behavioural of food handling were identified as cause of food poisoning. Food handlers have key role in prevention of food borne diseases. Poor food hygienic practices of food handlers could contribute food borne diseases in their work area (Lestantyo et al. 2017).

Food handler behaviour is important for producing safe food. Food handler's error is a factor in many outbreaks (Griffith 2013). Furthermore, Foodborne viral outbreaks are often associated with ill food handlers on the food business and in early outbreak reports; evidence was mainly based on epidemiological data (Boxman2013). Food handlers' behaviour is the only utmost significant factor affecting the control of food hazards and in managing risk (Griffith and Redmond 2009).

Many studies conducted and showed that food handlers are associated directly with food contamination resulting from poor hygiene habits and from inappropriate behaviours adopted in food handling. The food handlers are the main responsible for contamination during the time of food processing, mainly due to lack of guidelines and training.

Enabling food handlers to develop adequate hygienic behaviours to be implemented regularly is vital to enhance the products safety and quality (Pagotto et al.2018).

Food poisoning could results in huge financial losses and public confidence. Food hygiene training is needed to increase food handlers' knowledge, even though this does not always change employee's behaviour. Management should build food safety behaviour amongst their food handlers to ensure the food safety. Food safety needs special attention to definite preventive action regarding minimise the biological and chemical hazards contaminations (Lestantyo et al. 2017).

To confirm the safe food handling procedures are in place, the food manufacturers firms should have adequate safety protocols. Otherwise could have severe and potential terrible costs in terms of contamination. Thus, it is important the manufacturers and food handlers to adopt safe hygiene policies and procedures to enhance the food safety and protect their company reputation and its brands. Utmost significantly, the health of consumers. Change management is a key business process for all firms but, in the context of food safety, it is a principally critical one that should be managed in a systematic way.

'Two Sisters' food chicken factory in UK, shown unsatisfactory hygiene standards. The product recalls, such as the eggs imported to the UK between March and June from Dutch farmers in 2017 were contaminated with a high level of chemical substance in eggs. Such chemical contamination affect people's kidneys, liver and thyroid glands (Pandi & Watson 2018).

The Maple Leaf Foods' Listeria Outbreak happened in Canada in August 2008 due to the contamination of meat products led to 57 illnesses and 23 loss their lives. Before the recall, Maple Leaf Foods was perceived to be a company with a strong commitment to food safety; having a high governmental inspection score, effective HACCP system, and conducted third-party audits.

However, the contamination issues evolved reflect the ineffective management, gaps of good manufacturing practices and the root cause to be a mixture of technical and behavioral issues.

After the outbreak, the management has committed to stop such an event. They promise to change their strategy to emphasis on people behaviour equally with the systems and communicate their vision “always produce safe products to the food handlers. The food handlers’ behaviours become the common denominator that frame the success and failure during the journey of food poisoning outbreaks elimination (Jespersen & Huffman 2014).

The largest incidence of E. coli O157 Outbreak happened in South Wales (England) in September 2005 due to the critical violations of the food-safety regulations and practices at John Tudor & Sons affecting more than 150 people (mostly children) (Pennington 2009). The cross contamination happened at a packaging machine which was both raw and cooked meats was identified as root cause of the outbreak. The management of this business not supported the food safety and failed to implement the safe food handling procedures such as cleaning, sanitation and cross-contamination prevention (Powell, Jacob & Chapman 2011).

Furthermore, poorly trained food handlers, maintenance and ineffective HACCP system were the factors contributed to the outbreak (Griffith 2010; Pennington 2009). Besides to these technical factors, the food safety culture in the company was not enough to prevent the cross contamination risks. They failed to implement the safe food handling procedures, personal-hygiene practices, effective cleaning, and adequate separation of raw and cooked meats. Food handlers paid low salaries, which generated low commitment and accordingly high turnover among the food handlers (Pennington 2009).

The recall at XL Foods was the largest meat recall in Canadian history happened between September and October 2012. This confirmed 18 cases of E. coli O157:H7 and a recall from Canadian, U.S., and other international markets for 4,000 metric tons of products with financial losses between \$16 million and \$27 million.

The investigation results showed that for food-safety programs was not practiced by the food handlers, as the aim was to maximise the production and profits rather enhancing the food safety. Furthermore, lack of periodic sanitation programs and turnover among the staff (30%) that reflect the low commitment among the food handlers and weak food safety culture in the company (Lewis, Andre, & Usborne 2013).

Blue Bell Creameries' Listeria Outbreak happened on April 20, 2015 and products made in Blue Bell's production facilities like ice cream, frozen yogurt, sherbet, and frozen snacks were voluntarily recalled. The investigation showed that 10 people were hospitalized; resulting in 3 reported deaths in Kansas. The inspection findings point out the absence of proper infrastructure, risk awareness by management of the company that reflects the low management commitment in treating critical pathogen-contamination issues, gaps of good manufacturing practices were the main factors contributed to the outbreak (CDC 2015).

Jensen Farms' Cantaloupe Listeria Outbreak happened in 2001 that linked to cantaloupes distributed by Jensen Farms led to hospitalize 147 people and 33 deaths through 28 states. The investigation showed that the safe food handling procedures were not implemented and the general cleanliness of the facilities were unsatisfactory including inappropriate facility and equipment design; and an insufficient infrastructure.



The best science in the world is not adequate to stop the people from being sickened and improve the performance of companies alone but implanting a positive culture among the food handlers is required to be as a guidepost in the food business management (Bailin 2013).

The Salmonella Typhimurium outbreak associated with the Peanut Corporation of America is a famous example of deficiency in the system of a third-party audit, which occurred in January 2009.

A few days after being awarded a high score by a third-party audit, an outbreak occurred which resulted in 691 illnesses and 9 deaths in 46 states of the US and Canada, leading to the recall of peanut butter and peanut-containing products from over 3,900 companies (Powell et al. 2013).

The facilities suffered of lack of safe procedures such as cleaning, sanitation, pest-control and procedures to prevent the contamination. The management supported the maximising of production and ignoring food safety rules. This reflect the negligent management of serious foodborne hazards of the company and negative food safety culture prevailed at the organisation (Powell, Jacob & Chapman 2011).

Successful food safety interventions must be based on firm theories and a consideration of all relevant variables (Husain 2016). As the food handlers often engage in unsafe food handling behaviours, the previous studies have investigated the ability of behavior-change theories to explain and predict these behaviours. The most commonly applied theory was the Theory of Planned Behavior (Young et al. 2017).

After examining the relevant literature, it appears that research on the association between these management practices and organisational food safety performance has not yet been done. Moreover, the impact of employee commitment as a mediating factor in the association between management practices and the food safety organisational performance of food manufacturing firms in UAE is also an area that has not yet been explored.

## **1.8 Research Questions**

Based on the questions raised by previous studies in the field of food safety and the problem statement of this study, the present research addresses the following three questions:

1. To what extent do management practices influence the employee commitment of food handlers to implement safe food handling procedures?
2. To what extent does employee commitment affect organisational food safety performance?
3. Is employee commitment a mediator in the association between management practices and organisational food safety performance?

## **1.9 Aim of the Research**

This study aims to develop a rigorous understanding of the employees' perceptions of management practices that influence the food handlers' commitment behaviours to comply with safe food handling procedures. This study also explores which management practices could influence the food handlers' commitment and investigate the relationship between management practices and organisational food safety performance in food manufacturing firms.

This research seeks to enhance the present body of knowledge on the relationship between management practices and food-manufacturing firms' food safety performance by exploring the mediating role of employee commitment in the implementation of safe food handling procedures.

### **1.10 Research Objectives**

The objective of this research is

1. to introduce and classify participative management practices that might enable food manufacturing firms to have highly committed employees that implement safe food handling procedures and to explain the relationship between these management practices and the food manufacturing firms' food safety performance;
2. to investigate the indirect relationship between management practices and organisational food safety performance; and
3. to investigate the impact of employee commitment on the association between management practices and food safety performance in food manufacturing firms.

The research seeks to investigate the association between management practices and employees' commitment to implement safe food handling procedures followed by the association between employee commitment and food safety performance. Then, it will investigate whether employee commitment mediates the association between management practices and organisational food safety performance.

## **1.11 Research Significance**

To reduce the potential risk of food poisoning, product recalls, and low food safety inspection scores, a great deal of effort has been exerted to enhance the organisational food safety performance, such as inspections, training, and food testing, with modest results. For this reason, researchers are shifting the focus towards behavioural factors related to human aspects. Therefore, the present study aims to develop an understanding of the management practices that have not yet been explored to respond to the need to examine the organisational factors that could affect organisational food safety performance (Ungku Fatimah, Strohbehn & Arendt 2014). This research aims to develop a rigorous understanding of the employees' perceptions of management practices that influence the food handlers' commitment behaviours to comply with safe food handling procedures.

The findings could help the management of food manufacturing firms to (1) identify which management practices have a significant effect on food handlers' commitment to implement safe food handling procedures, (2) discover possibilities for enhancements, and (3) create policies that motivate and improve employees' commitment and performance. The results of this research are also expected to help the food manufacturing firms' management, health authorities, and training consultants improve food safety performance, update auditing protocol, and improve the training materials. Previous research into organisational factors related to safety show improved safety performance after a change in employees' behaviours toward safety practices.

This positive achievement encouraged researchers in health fields to call for investigations into food handlers' behaviours and attitudes towards implementing safe food handling practices in food manufacturing firms (Yiannas 2009). Such research would help in structuring important management practices designed towards improving organisational performance (process, people and products).

Using the commitment theory will provide an insight into how food handlers conduct food safety as the result of management practices effect and also into the commitment effect that direct the positive behaviour toward actual standard performance.

## **1.12 Summary**

This chapter introduces the main issues of food safety related to food illnesses and food poisoning and discusses the role of food handlers in food safety handling practices. This chapter also outlines the research problem, questions, aim, objectives, and significance that will be discussed in the following chapters.

## **Chapter Two: Literature Review**

### **2.1 Introduction to the Chapter**

This chapter presents an extensive literature review of food safety issues and the difficulties involved in managing food manufacturing firms. This chapter presents examples of the traditional interventions applied to treat food safety issues, the prominent results of these treatments and the benefits of treating such issues to improve the performance of food firms. In addition, the chapter discusses the theories applied in previous food safety research, such as TPB, to find out why food handlers still fail to execute safe food handling practices. The chapter ends by defining four management practices addressed in this study (organisational management support, communication, training and employee involvement) and sheds light on employee commitment and organisational performance to investigate the relationships between the three concepts in the next chapter.

### **2.2 Comprehensive Literature Review**

Food safety has become a critical concern due to the negative impact of the increasing amount of food poisoning cases on health, trade and the economy (Kaferstein 1997). This concern places increased responsibility on the management of food manufacturing firms and health authorities. Despite applying different strategies, the level of food safety performance remains low because food handlers continue to practice unhygienic behaviours when handling food (Clayton & Griffith 2008). The Food Safety and Hygiene Working Group (1997, p. 9) defined a food handler as any individual irrespective of his position who participates in handling or preparing food at any stage from the raw materials to the finished food product.

Despite modern technological advancements, the production of safe food remains a worldwide public health problem. Although statistical estimates are not available in all countries, the World Health Organisation estimates that 1.4 million deaths annually are the result of food poisoning (WHO 2013). Additionally, it is estimated that, annually, foodborne toxins cause more than 600 million people illnesses worldwide and 420,000 deaths, with the highest estimated illnesses (91 million) and deaths (137,000) occurring in Africa. Governments, the food industry and the public have a shared responsibility to ensure food safety and prevent avoidable foodborne illnesses (WHO 2015).

While existing epidemiological research has not examined the food hygiene malpractices and the reasons behind them, the CDC in the United States estimates that 97% of foodborne illnesses are caused by food handler error. Therefore, developing a deeper understanding of the food handlers' practices will help to determine ways to decrease foodborne diseases (Clayton & Griffith 2004).

Many interventions have been designed to promote safe food handling practices including food safety training, end product testing, regulatory enforcement approaches (command and control), regular governmental inspections and self-regulation (HACCP), with varied results. However, the results of knowledge-oriented food safety training showed that the training lacked effectiveness because food handlers were unable to translate the food safety knowledge into positive behaviours or practices in the workplace (Pilling et al. 2008). Thus, it seems that many factors (e.g. management practices and support, behavioural issues) affect food handlers' abilities to practice standard food safety procedures beyond the knowledge of food safety (Howells et al. 2008).

Studies of onsite food service facilities have also shown that despite having adequate food safety knowledge, the food handlers failed to comply with safe food handling procedures (Strohbehn et al. 2011).

The current training provided to food handlers focuses on scientific communication and does not address the food handlers' behaviours and practices (Park, Kwak, & Chang 2012). Therefore, although such training increases the food handlers' food safety knowledge, it does not guarantee that the trainees will put those modifications into practice (Miles, Braxton, & Frewer 1999). McIntyre, Vallaster, Wilcott, Henderson and Kosatsky (2013) showed that using diverse strategies beyond using lectures and training could be more transformative because when employees are motivated, the food safety knowledge enables them to incorporate the safe food handling practices. Food handlers should therefore be informed of the reasons for and the importance of the food safety requirements (Griffith, Jackson & Lues 2017).

Previous research has considered food safety training an effective intervention to guarantee the execution of safe food handling practices. Nevertheless, the results of the research findings concerning transforming the knowledge into behaviour were inconsistent, and some studies using self-report questionnaires showed that training is an effective tool for enhancing the inspection scores for overall sanitation, food microbiological quality and changes in food safety practices (McElroy & Cutter 2004).

Most food poisoning cases are due to the unhygienic behaviours of food handlers, which suggests that enhancing the food safety performance can be achieved through understanding the food handlers' behaviours because the causes of most food poisoning cases are simple and avoidable (Hedberg et al., 2006; Taylor et al., 2011; Taylor et al., 2015; Yiannas, 2009).



To make an effective food safety training programme, the content should focus on changing the behaviours that most readily cause foodborne diseases. Most food safety training is heavily knowledge-based because of the belief that knowledge can change behaviours, based on the Knowledge, Attitudes and Practices (KAP) model. Nevertheless, this model has been criticized due to its limitations (Griffith 2000); it is recognised that knowledge alone is insufficient to activate preventive practices and that tools are necessary to stimulate action and promote positive attitudes (Tones & Tilford, 1994).

Egan et al. (2007) investigated the impact of inspection frequency and food handlers' education on inspection violations and found that food facilities that provided food handler training obtained better overall inspection scores than facilities that did not provide food handler training. These results indicate that the organisation's growth and survival relies on employee training because the goals of the employees and organisation are influenced by the training.

To motivate employees to execute safe food-handling practices, Ellis et al. (2010) proposed that managers should communicate with employees and offer the proper resources and support. Because of a lack of proper training, food handlers might not comply with hygiene standards. It is acknowledged that providing training for food handlers increases the level of food safety knowledge. As a result, food handlers with more food safety knowledge will improve the facility's inspection grade, leading to more promising and positive food safety attitudes compared to food handlers that receive poor inspection grades. Nevertheless, it is difficult to confirm the effectiveness of food safety training because the results of many studies show conflicting outcomes of its success related to enhancing behaviours (York et al. 2009).

As food handlers with food safety knowledge and technical skills continue to practice unhygienic behaviours, researchers have acknowledged that potential factors beyond the traditional interventions in the organisations might have an influence on the food handlers' behaviour (Ungku Fatimah, Strohbehn & Arendt 2014; Yiannas 2009).

Microbiological food safety management is based on the effective design of processes, products and procedures. End product testing is used as a control measure at the end of the production process. However, such testing provides limited information on the condition of the safety of food products because biological tests are only performed on a few samples and do not therefore provide assurance of the safety of the whole batch produced. As this approach is also reactive, it is too late to take preventative action. The aim is to take a proactive approach to prevent and control the hazards to ensure acceptable levels of safety are maintained throughout the food safety management system (Zwietering et al. 2016).

In the early 1920s, strategic changes were made to move away from testing end products as a reactive approach toward taking a preventative approach to food safety management. Although these strategies in the beginning were mainly ineffective, they were re-emphasised in 1930 and adopted in the form of HACCP in the 1970s. Food firms that adopted HACCP achieved high microbiological standards and food quality performance (Little et al. 2003). The documented food systems detail how things should be done by food handlers; however, food handlers only really reflect the values and culture of the workplace environment, which integrates the knowledge, attitudes and practices of individual food handlers within the workplace environment and aligns with standards put in place by the management (Griffith 2000).

The actual benefits of food safety management systems rely on whether these systems are effectively implemented by the certified food firms or not. Therefore, several researchers have confirmed that the success or failure of the standards lie in the organisations readiness and commitment to effectively implement them and not on the nature or requirements of the standards themselves. Several studies have found that implementing food safety management systems improves a firm's competitive performance (Kafetzopoulos, Gotzamani & Psomas 2014).

The behaviour of humans is important and it is not easy to control; therefore, dealing with people requires situational management. While engineering control cannot reduce the hazards, employees need to recognise the hazards to lessen their impacts (Jevsnik, Hlebec & Raspor 2008). Effective HACCP implementation leads to improved food safety performance, and HACCP can be used as a tool for auditing by food safety authorities and food firms. Hence, effective HACCP implementation could enhance food safety and decrease foodborne illnesses, improve the efficiency of procedures and processing, decrease recalls and costs, ensure compliance with regulatory requirements, improve the company's reputation and image, and reduce customer complaints (Milios et al. 2013).

Effective implementation of a food safety management system combined with a positive workplace environment assists in decreasing the potential food safety issues and accomplishing a better food safety performance. As part of the organisation's quality system, the food safety management system controls critical points in the production to confirm the food safety and comply with the health authorities' requirements. However, implementing a food safety management system does not always ensure a better food safety performance as other factors also affect the performance.

Evolving, installing, maintaining and verifying a successful food safety management system relies on overcoming a combination of managerial, organisational and technical difficulties (Al Yousuf, Taylor & Taylor 2015). The workplace environment refers to the conditions, actual employee behaviour and managerial environments (Nyarugwe et al. 2016).

The goal of food safety inspection programmes is to offer the public safe food for consumption. Usually the programme's success relies on the employees' behaviours in food handling and their capability to accept the programme's protocol. Recent studies have shown differing levels of improvement in food handling behaviours and actions of compliance (Harris et al. 2017).

Internal and external food safety audits and inspections of the production steps, manufacturing practices and general cleanliness of premises and personal hygiene of food handlers can be performed to assess food safety. While some food firms use employees from different departments to conduct internal audits and inspections, external auditors often come from a second party such as a purchaser or from a third party such as an auditing agency. However, despite obtaining high scores from third party inspections, several manufacturers have still experienced foodborne disease outbreaks, which questions the effectiveness of these audits and inspections. The Salmonella Typhimurium outbreak associated with the Peanut Corporation of America is a famous example of deficiency in the system of a third-party audit, which occurred in January 2009. A few days after being awarded a high score by a third-party audit, an outbreak occurred which resulted in 691 illnesses and nine deaths in 46 states of the US and Canada, leading to the recall of peanut butter and peanut-containing products from over 3,900 companies (Powell et al. 2013).

Nevertheless, external audits and inspections are still considered a respected approach to evaluating food safety, even though they only reflect the hygiene situation during the limited time of inspection (Powell et al. 2013).

In light of the current global environment and strong competition, food safety has become a critical concern for the food businesses, health authorities and the global public (Taylor et al. 2011). Managing food manufacturing firms and conducting regulatory food inspections have become more difficult. Several interventions have been applied to improve the food safety standards, such as training, food testing, inspections and food safety management systems, but the results of these interventions remain modest (Yiannas 2009). It suggested that the food manufacturing firms should focus on the behavioural issues related to their food safety management to enhance the food safety standards (Taylor et al. 2011; Yiannas 2009).

Recent studies have recommended examining the organisational factors that could affect the organisational food safety performance (Ungku Fatimah, Strohbehn & Arendt 2014). The potential impact of organisational factors on food safety behaviours and practices have piqued the interest of food safety researchers. Better attention to organisational factors might help to create more effective food safety interventions to apply in the workplace environment because most food safety problems are caused by organisational factors associated with the workplace environment (Yiannas 2009). Recent studies have investigated the influence of organisational factors on food handlers' food safety practices and revealed that room of behavioural factors assisting to translate the food safety training into food safety performance in the food facilities.

In addition to insufficient food safety and technical skills, the organisational factors associated with the workplace environment, such as a lack of organisational management support and accountability create barriers to executing the safe food procedures. According to Howells et al. (2008), preventing foodborne illness requires more than just food safety training. Several studies have shown that the success of executing safe food handling practices lies in accommodating diverse environmental, organisational and human factors into the food firms (Ungku Fatimah, Strohbehn & Arendt 2014).

The behaviour of food handlers might be influenced by different factors in the organisation that encourage or discourage the food handlers to implement the safe food handling practices (Mitchell et al. 2007). Researchers have recently suggested that an understanding of “how the organisation does food safety” would help to comprehend the food handlers’ behaviour and thus enhance the food safety performance (Griffith et al. 2010b; Taylor 2011; Yiannas 2009). Strohbehn et al. (2013) found that a deficiency of resources such as supplies, time, money, employee training, motivation and turnover created critical barriers to executing safe food handling practices, which confirmed that a number of organisational factors contribute to the accomplishment of food safety performance in the organisation. Managers of food firms also have an important role in setting a positive environment and implementing proper policies and standards that inspire the food handlers to execute the food safety practices. Managers should provide support, ensure effective training and communication, and control rewards and punishment (Arendt & Sneed 2008). The role of the organisation has been raised by many researchers as significant in affecting the food handlers’ concerns toward safe food handling practices.

It has been proposed that safe food handling practices are usually deeply embedded in the workplace environment, making them difficult to amend. Taking the organisational context into consideration will thus help to make the food safety interventions more effective. In occupational and health fields, organisational factors were found to enhance the safety behaviours of workers. Thus, to ensure food safety in food firms, similar could be followed to those conducted in occupational and health fields (Yiannas 2009).

A positive food safety environment has been described as one in which all food handlers have the same sense and determination to execute the safe food handling procedures and retain high standards of food safety. Several recent studies have confirmed the relationship between food safety training and the food safety behaviours of food handlers (Nayak & Waterson 2017). Griffith, Jackson and Lues (2017) found that several factors are essential to excellent food safety management, such as the existence of a proper food safety policy and keeping a positive workplace environment. However, despite the presence of formal internal hygiene auditing and training of food safety, they were not integrated in the inclusive food safety management approach. A lack of food safety leadership, management support and communication were found to reduce the execution of the safe food handling practices. Many foodborne illness outbreaks were the result of management failures such as insufficient planning, organising, leading and controlling (Griffith 2000).

Despite increased acknowledgment by managements of the importance of food safety training (Brown et al. 2014), the training has traditionally focused on the technical side of the food management system rather than on the food handlers' behaviour.

Managers therefore need to know how to inspire and motivate the food handlers to execute and maintain the safe food handling practices and procedures. In addition to the training and work environment, many tangible and non-tangible variables impact food handlers' abilities to execute safe food handling practices such as food safety management systems, consistency of rules and risk perception. Yiannas (2009) found that swift and direct consequences for non-compliance help to enhance food handlers' compliance with safety procedures, while Griffith et al. (2010a) proposed offering monetary and social rewards.

## **2.3 Theories and Food Safety Behaviours**

Many theories have been used in food safety studies to understand how food handlers behave toward good hygiene practices and why they might fail to execute safe food handling procedures. Academics and professionals have used theories such as TRA, TPB to clarify the factors, particularly those related to knowledge and training, that they believed affect the food handlers' behaviour. These studies showed that factors other than knowledge and training affect food handlers' behaviours concerning the implementation of safe food handling procedures (Brannon et al. 2009; Clayton & Griffith 2008).

Yiannas (2009) asserted the significance of utilising behavioural theories to study the different factors that could influence food handlers' behaviour in the organisation. However, Clayton and Griffith (2008) proposed that investigations should not be restricted to examining the employees' behaviour concerning the implementation of safe food handling procedures and that related organisational factors should also be considered. The three theories used in previous food safety studies are discussed in the following three sections.



### **2.3.1 Social Norms Theory**

Once food safety training is completed, the trainers tend to think that the trainees will translate the correct knowledge into positive food hygiene attitudes and good hygiene practices; however, this has been found to be inaccurate (Taylor 2011). In the 1970s, psychologists Fishbein and Ajzen (1975) suggested that “social norms” have a major role in translating knowledge into practice. Trainers should thus be aware that the trainees will be influenced by “social norms” and cultural norms in the businesses where they work. Therefore, despite completing the food safety training course, the food handlers will not be inclined to wash their hands if the company fails to enforce this practice (Yiannas 2009).

### **2.3.2 Reasoned Action Theory**

This theory, which was developed by Fishbein and Ajzen in 1967, is used to predict how an individual will behave based on their pre-existing attitudes and behavioural intentions. The theory suggests that the food handler’s intention to execute one behaviour depends on their intention (Montano & Kasprzyk 2002). A person’s intentions and beliefs are impacted by two main things: a positive attitude regarding the behaviour and a need to conform to a social norm (Yiannas 2009).

### **2.3.3 Theory of Planned Behaviour**

Ajzen created this theory when he presented his theories with Fishbein and Bandura in 1985. This theory stipulates that a positive attitude with self-efficacy and encouraging social norms would direct the individual’s intention to implement a particular behaviour (Taylor 2011). Factors other than attitude influence an individual’s behaviour, such as a person’s attitude, subjective norms and perceived control determine behavioural intention (Ajzen 1988, 1991).

This theory is better at predicting behaviour than TRA because it introduces the element of perceived control (Ajzen 1988, 1991). The attitudes toward particular behaviours and according to TPB depend on expectations concerning the possibility of different outcomes of the behaviour or behavioural beliefs. Therefore, an individual with a negative belief of a particular behaviour would be more likely to avoid doing that behaviour whereas an individual with a positive belief of that particular behaviour would perform that behaviour (Ajzen & Fishbein 1980).

A person's intentions are also affected by other people's attitudes to the behaviour. Therefore, even if a food handler builds up a positive attitude to wash their hands correctly during training, they might still avoid washing their hands when they return to their work environment if other food handlers do not comply with this behaviour.

The actual resources or ability to achieve the hygiene food safety practices is also important because these will also affect the food handlers' compliance with hygienic practices. For example, a food handler may plan to check the temperature for cooked meat but finds upon trying to do so that the thermometers are damaged, leaving him unable to check it (Ajzen 1991).

TPB is the most broadly applied theory in health behaviour research that uses psychological models to study the factors affecting behaviour. According to this theory, the greatest predictor of an individual's behaviour in any situation is the individual's intention to execute the behaviour. To change the attitudes and behaviours of food handlers, food safety training clarifies the association between food handling practices and foodborne diseases. Nevertheless, the behaviour of an individual is affected by many factors besides their attitude toward the behaviour (Brannon et al. 2009).

Previous behaviour change theories or models were used to explain the behaviour itself and did not focus on the significant impact of environmental or physical factors of a behaviour or connect particular behaviours with the overall system. These theories considered the normative influences without considering the environmental or economic factors that may affect an employee's intention to perform a behaviour.

In the case of the food handlers, it is usual to assume that they would wash their hands after visiting the toilet, especially if they have good knowledge of the significance of handwashing and access to a hand sink. However, if they are particularly busy and have little time to complete their work orders, the probability of performing handwashing practices might decrease. Therefore, the environmental or physical issues such as a good design of the facility or equipment is not always the key to explaining the behaviour. The reason behind that food handlers selecting not to wash their hands is not because the inappropriately designed facility but to other reason that be beyond physical issues (Yiannas 2009).

In contrast to previous works, this research aims to explore the cause of the behaviour (management practices that influence the food handlers' commitment behaviours to comply with safe food handling procedures) and explain its impact on the organisational food safety performance using commitment theory. While many researchers have investigated the organisational commitment of employees, no studies have measured the food handlers' commitment or examined the antecedents to their behaviour and consequences. In addition, this study examines the relationship between the management practices and organisational food safety performance through the food handlers' commitment as a mediator, which has not yet been studied yet in the UAE context.

## **2.4. Management Practices**

Four management practices were presented in this research as follows: organisational management support, communication, training and employee involvement.

### **2.4.1 Organisational Management Support**

The success of management practices begins with commitment from the top management. Thus, to increase employees understanding, the management should use diverse approaches to communicate with their employees regularly and effectively. The management should check whether the employees identify the support from their top management (To, Martin & Yu 2015).

However, providing employees with regular training is not enough because they would likely continue with practicing the procedures that prevail in the workplace culture unless they receive sufficient support and direction from the management to implement the new procedures. By focusing solely on generating profit and keeping a distance from the employees, the management will not be able to set a positive model of safety among the employees (Nayak & Waterson 2017). The role of leadership is therefore important in setting a hygiene strategy setting and ensuring the food handlers behave hygienically.

Creating and maintaining a positive food safety culture requires the management's commitment and support; the achievement of any changes in the culture can be predicted by organisational management support and their personal commitment. Food safety managers should adopt a proactive approach to protect the organisation's products and enhance the food safety performance.

The management's commitment can be communicated in different forms to the food handlers and supervisors to show how much time, interest and money the management has spent on food safety (Griffith, Jackson & Lues 2017).

A serious barrier to executing safe food handling procedures effectively is the limited time food handlers' have to complete their work. Food handlers thus tend to prioritise their work depending on their perceptions of importance. The manager plays a key role in the success of a total quality programme and in inspiring every food handler to execute safe food handling procedures (Faour-Klingbeil et al. 2015). Management should therefore ensure that the food handlers' processes incorporate the time needed to execute the food handling procedures safely.

Researchers consider the commitment of the top management a vital element in achieving any management system. Measuring the top management's commitment to food safety could be done by determining the level of time and resources the management spends or commits to solving the problems. Despite existing internal food safety auditing processes and providing training to food handlers, these methods are not incorporated into a complete approach to food safety management. Several factors are considered essential for an effective food safety management system including food safety leadership, communication and support. However, these factors are scarce in the food business and little incentive is made for food handlers to execute safe food handling procedures (Griffith, Jackson & Lues 2017).

The management's competence in executing safe food handling procedures and to create and implement an effective food safety management system can be seen through concrete or physical factors.

For example, an effective food safety management system should provide easy access to handwashing facilities, materials such as disinfectants, calibrated thermometers and an adequate number of food handlers to execute the food procedures safely. Furthermore, the provision of a qualified food safety supervisor would help to improve food safety procedures and inspection scores and lead to the successful implementation of the food safety management system (Eves & Dervisi 2005).

Several previous studies have examined the effect of management support in diverse fields such as quality management, safety management, food safety management on employee attitudes and behaviours and on organisational performance. The overall findings show that management should support the employees (internal marketing) before supporting the customers (external marketing). Additionally, to deliver external marketing with a quality service or product, the internal customers (employees) need to be supported and motivated by the management. A positive relationship has been found between management practices – such as organisational management support and commitment and effective internal communication – and employees' pro social behaviours. Additionally, a significant association is also evident between organisational management support and commitment to service quality and organisational performance. Further, clarity of the employee's role has been influenced directly by management commitment to service quality, while employee job satisfaction and employees' commitment influenced indirectly by management's commitment to service quality (To, Martin & Yu 2015).

Cascio et al. (2010) found that the perception of management commitment by employees has a strongly significant influence on the work behaviours of employees, suggesting that the management should ensure regular, effective communication with its employees.

Additionally, Shanock and Eisenberger (2006) revealed that a close relationship between supervisors and employees has a significant effect on the employees' perceptions and performance. However, Cascio et al. (2010) showed that employee perceptions of commitment from the top management has a superior influence on the work behaviours of employees than does commitment of their immediate supervisors.

To implement and build internal marketing practices, management should assess whether the employees recognise the top management's support using management commitment as an internal marketing measure. The management should adopt regular and effective communication with employees through diverse modes to increase the employee comprehension; posters and pictures can be used as visual aids (Madera et al. 2013).

The employees should feel supported and well cared for by their organisations (Chen & Eldridge 2011). Perceived organisational support (POS) is the employees' perception of care that the organisation provides concerning the employees' socio-emotional needs. POS builds on the supposition that the organisation and employees enjoy an exchange relationship. Such a relationship is built once the organisation creates a supportive environment and the employees respond with positive job behaviours. The support that employees receive from the organisation and their leader (supervisor) is of great significance because it is out of the employees' control. Although employees can affect their social relations with peers, POS and leader (supervisor) and member (employee) exchange are significantly influenced by the organisation.

The supervisor is a representative of the organisation who can affect decision-making and create a bridge between the management and employees. As a result, employees tend to accept the supervisor's support as that of the organisation, and a stronger leader–member exchange (LMX) will improve the POS. Job-related outcomes such as increased job involvement are positively influenced by POS and LMX (Ahmed, Khairuzzaman Wan Ismail & Mohamad Amin 2014). Employees that perceive the positive support from the management will reciprocate with positive behavioural and job outcomes such as job involvement, which is important for improving in-role performance (Ahmed et al. 2013).

Employees build perceptions about the level at which they are cared for and respected by their organisation, and concerning the level that their supervisors and colleagues value their contributions and care about their well-being. Employees understand this organisational support as evidence of the management's commitment to them, and they adjust their responses to the required and appropriate attitudes and behaviours. POS is a precursor to the sequence of employees' attitudinal and behavioural forms and the employees respond to POS with affective and normative commitment (Eisenberger et al. 2001).

When employees feel that their socio-emotional needs such as attachment and emotional support are met by the organisation or its agents (supervisors, colleagues), affective commitment is produced, meaning that employees will respond with respect for their organisation and participate in improving the organisation's performance (Simosi 2012).



Simosi (2010) examined the socialisation practice of receiving positive social support from experienced organisational members and found that positive social support leads to a better fit of the employees' values with those of the organisation, thus leading to an emotional attachment to the organisation and improved organisational commitment.

Perceived supervisor support and perceived colleague support are likely to meet a newcomer's needs for emotional support and generate a feeling of obligation and attachment to the company. As a result, newcomers to the organisation are likely to be more enthusiastic to reciprocate through their attitudinal and behavioural manifestations by accommodating and making more efforts to achieve the organisations' goals and applying the skills obtained in their training to their real work. Therefore, organisational support is a predictor of organisational affective and normative commitment (Simosi 2012).

Nazir and Islam (2017) showed that POS positively affects an employee's performance and affective commitment, and employee engagement was mediated by these relationships. POS is therefore a precursor to employee engagement, suggesting that employee engagement results in affective commitment and employee performance. Their study recognises that organisational support determines employee commitment and performance, which become more efficient when organisational support motivates employee engagement. Therefore, employees that perceive higher organisational support will have higher engagement in their organisation (Gupta et al. 2015) and have greater achievements because they complete the required tasks with a higher commitment level.

The employees are encouraged to repay the kindness given by the organisation to balance the association. Affective commitment and organisational trust are forms of kindness that employees repay to their organisation (Lee & OK 2016). This proposes that employees with high engagement resulting from organisational support respond with higher affective commitment and performance. Management commitment and leadership is the critical element of success in the implementation of a total quality management system. At least 94% of difficulties that occur in an organisation are the responsibility of the top management because the management assigns the resources control, establishes and executes the work procedures, affects the working environment and promotes adherence to organisational systems. Therefore, the top management of food firms have to know the effects of their leadership and responsibilities, create a positive food safety environment and furnish their managers with the essential tools to generate and motivate all employees to perform food safety procedures (Griffith, Jackson & Lues 2017). Therefore, the success of food handlers executing safe food handling procedures lies in the support and motivation from their manager (Faour-Klingbeil et al. 2015).

### **2.4.2 Communication**

Employee commitment is considered important for enhancing organisational performance. The high level of stress in most organisations reduces employee satisfaction, leading to low organisational commitment (Elangovan 2001). However, better communication within the organisation will strengthen employees' commitment to enhance the performance (Chen, Silverthorne & Hung 2006).

Chen, Silverthorne and Hung (2006) examined the association between organisational commitment, communication and job performance and found a positive association. They recommended improving the communication channels in the organisation to enhance the commitment towards job performance.

The communication of food safety is significantly perceived as regular communication that enhances the food safety behaviour among the food handlers (De Boeck et al. 2016). Top-down communication from management to food handlers is needed to clarify the food safety goals and the required safe food handling practices and procedures; however, the food safety communication concerning the food safety documentation needs to be two way.

As part of the communication process for enhancing the food safety performance, managers should make regular site visits to meet with the food handlers and listen to their concerns about food safety issues (Griffith 2014). Such regular meetings will enable the management to confirm the extent of the food handlers' compliance with safe food handling procedures and responsibilities. However, conflicting responsibilities and deficiency of management support and involvement will lead to possible communication barriers to implementing successful food safety management systems in food firms. Through communication, the management can ensure that the documentation, training and corrective action is being done. Further, the management can discuss the inspection scores and audit results with the food handlers, and display negative and positive comments on the noticeboard as feedback (Griffith, Jackson & Lues 2017).

Communication has been recognised and has a supreme significant role in enhancing the food handlers understanding of the messages related to food safety. Therefore, the management in food business have to create the positive work environment and define the clear strategy of food safety communication. To achieve effective food safety communication, the management should ask the food handlers for their feedback related to food safety and confirm that all messages are received (Griffith 2014). Better communication among the hierarchies in the organisation will lead to better coordination, cooperation and compliance with food safety procedures.

Open communication will also encourage employees to suggest new ideas for job improvement and facilitate their participation in decision-making to help reduce their stress and improve their level of emotional attachment to the organisation. The support of the workplace environment offers chances for participation and helps employees to develop their skills, which further improves the employees' motivation level (Sharma & Dhar 2016). Communication from the management also assists the employees to understand the importance of their roles in achieving the goals and objectives of the organisation. Managers should exhibit their commitment through communicating with employees about their roles in achieving the organisation's mission.

Several management practices such as management commitment, communication and organisational support are positively associated with employee behaviour and organisational performance. The perceived commitment of top management by employees has a strong and positive influence on employee behaviour in the workplace and the organisation should use active communication between management and employees to engage its employees. Such active communication is described as internal marketing; it has a strong and significant association with job satisfaction and customer satisfaction.

As a main element of internal marketing, which is recommended for managers to show extra care towards their employees, communication can be formal or informal. Formal internal communication is periodical communication used by management team to share fundamental information. By contrast, informal internal communication is more unprompted, unplanned and personalised, and it complements the formal internal communication between management and employees through personal networks and casual contacts. Managers can benefit from informal internal communication by using it to obtain the most relevant information and enhance their decision-making (Fay 2011). To build credibility and obtain trust among employees, the formal communication should come prior to the informal communication.

Yu and To (2013) found a positive association between the various communication practices and employees' work attitude and job performance. The findings showed that employee work attitude is influenced positively by effective communication, especially information distribution.

Further, many communication characteristics such as openness, consistency, a bottom-up approach and clarity affect the execution of safe food handling procedures. Open communication among the food handlers encourages them to speak up when a food safety issue arises, and clear feedback from a manager and bottom-up communication from employees to managers encourages food handlers to execute safe food handling procedures (Ungku Fatimah, Strohbehn, & Arendt 2014).

Investing in specific practices such as training and internal communication will increase the employee's job satisfaction and encourage them to be more cooperative and helpful to colleagues and customers. These positive behaviours thus have a positive effect on the organisational performance (Kanyurhi & Bugandwa Mungu Akonkwa 2016).

A significant organisational feature that affects the commitment of employees involves decentralisation, thus enabling employees to participate in decision-making. In a flat organisation, employee commitment is enhanced because the employees are motivated to participate, and shared goals form the basis for the coordination. The employees also have more control over the rules and procedures. The relationship was found between the leader social support and employee commitment particularly within the high involvement environment, wherein cooperation in the form of open communication and participate with decision-making between the managers and the employees is important for eliciting novel ideas and suggestions from the employees (Nijhof, de Jong & Beukhof 1998).

Despite the expanding amount of communication options inside organisations, each method has the same purpose of transferring information from one individual to another and this might include one or a number of steps. As food handlers in the organisation need internal communication to complete the interaction, they become more familiar with their responsibilities and organisational beliefs about how to perform safe food handling procedures and enhance the organisation's performance. Communication plays a vital part in any organisation and is characterised as a business procedure that clarifies the way in which individuals, groups and organisations convey the information to others inside and outside of the business.

The quality of the social exchange is measured by LMX. According to reciprocal influences, employees with a high LMX have greater involvement in food safety communications and tend to be more committed to food safety. An important point in the communication is to ensure the communicated message that is sent is the right message (Griffith, Livesey & Clayton 2010).

The information is processed in a circle between the sender and receivers of each message. The communication channels differ depending on the level of the formality, the workplace environment and the level of technology adopted by the organisation. Organisations adopting a proactive communication system face fewer errors compared with those adopting a system of reactive communication. Various communication channels can be used including face-to-face or print-based discussions or electronic networking (Vredenburg 2002).

Conversations on the worksite that are informal communications concerning food safety might have a stronger effect on the employees' behaviour than sending a formal email to all employees. Nevertheless, the most effective method is by sharing a communication policy document containing written standards and procedures using an equiponderant mix of various communication forms such as formal, semi-formal and informal to communicate the issues of food safety. Nonetheless, employees will feel supported by effective communication from the management, making them more likely to become more involved and empowered toward enhancing their motivation, commitment and performance (Griffith, Livesey & Clayton 2010).

Under-communication could be a public business issue. A positive relationship between employees tends to construct reciprocity which leads to information transfer that is not mentioned clearly in training schemes. The social unity of employees is reflected in cooperative behavioural standards that would facilitate the appropriate information transfer among the employees (Argote et al. 2003).

When food safety attitudes align between the top management and employees, employees are more likely to adopt a positive behavioural attitude toward executing the safe food handling procedures, which is good for enhancing the organisation's food safety performance.

The approach intention explains the level of confidence employees feel about speaking to a colleague who has engaged in unsafe food behaviour. This readiness, or lack of, to speak out is associated with unsafe food behaviour levels and can indicate the type of workplace environment surrounding food safety in an organisation. An employee's readiness to speak is mediated by a blame environment wherein the employee that made the errors is named and shamed. Such an environment weakens the positive food safety environment because the employee becomes a victim and the faulty management system continues without correction. Such kind of communication demotivates the employees to recognise or acknowledge any mistakes due to the potentially adverse outcomes (Reason et al. 2001).

Despite considerable investments being made to train food handlers, the impacts of food safety training are inconsistent and assessments of the training are seldom achieved. This difficulty in battling foodborne diseases might be because the present food safety training depends heavily on generic prescriptive content and delivery methods that resemble those used in lectures. New strategies were suggested to be effective teaching for food handlers about food safety, which claimed that the food safety messages should be directed and specific to the targeted audience. Accordingly, an effective change in behaviours could be achieved when specific targeted messages that focus on individual are used instead of generic messages. To construct a campaign for effective communication with the goal of changing behaviour, comprehending the target audiences' specific needs and perceptions is vital (Chapman, MacLaurin & Powell 2011). Through an effective process of organisational communication, employees will build a fruitful environment for problem solving, decision-making and interacting on common ground. The structure of communication has an impact on employees' empowerment, which leads to job commitment.



The way in which the organisation communicates its goals to its employees and their role in accomplishing them has a strong effect on employees' job commitment. Further, the mechanisms of communication nourish employees' trust and affect their commitment. Communication is a process in which the employees interact through many methods and within diverse areas to perform the goals related to the organisation. Several organisational communication dimensions can influence the success of the organisation. Furthermore, the effectiveness of the organisational communication processes has an impact on the identity and organisational climate and thus influences the organisational performance (Brunetto & Farr-Wharton 2004).

Researchers have used many instruments to measure employee satisfaction with the communication process. Several researchers have claimed that measuring employees' level of satisfaction with their relationship with their managers is important as a main indicator for organisational success and performance. The relationship between managers and employees has an impact on the employees' capability to process information sufficiently, decrease uncertainty and improve harmony in the organisation. The quality of process of communication between management and employees is related to the employee motivation and performance level. Thus, the communication feedback processes management is essential to accomplish perceived and real organisational communication success (Robbins 2001).

The attitude of management to the communication process influences the employees' outcomes because it regulates the environment where the communication processes take place and the degree to which these processes accomplish both the organisational and personal goals.

For instance, a clear written formal communication by means of a policy documentation could be supported by a meeting to provide additional information that facilitates and supports the employees to perform the job. The way that managers communicate work instructions to the employees influences the way in which the employees perceive and receive the information. Further, because the employees understand the work environment by means of many dimensions that form the organisational workplace construct, the quality of the process of organisational communication is an important element in accomplishing organisational performance (Mills 2000).

A positive feedback environment both vertically, between superiors and employees, and horizontally, between employees, relates with increased employee job satisfaction and commitment. Therefore, affective commitment, job satisfaction and communication have a significant positive relationship (Brunetto & Farr-Wharton 2004).

Communication is a vital aspect of an organisation because the organisational presence depends on communication. Through communication, the organisation can continue to perform in difficult situations and determine the opportunities and threats. Managers listening to employees' issues and giving feedback are the most significant aspects of the communication. Managers play a key role in organisational communication because they provide a larger picture of the organisation, the environment, competing values and procedures to employees in the organisation, and the employees translate these messages (van Vuuren, de Jong & Seydel 2007).

As the central attitude in organisational research, organisational commitment relates to communication in many ways, and the variables of communication explain a high percentage of the variance in organisational commitment. Communicating task-related information is an essential antecedent to organisational commitment (De Ridder 2004).

Supervisors who practice effective, accurate and timely communication create a positive workplace environment which enhances the employees' feeling of attachment and level of commitment to their organisation. The climate of communication contribution found that the openness and adequacy of information predictor to commitment. Similarly, employees' satisfaction with communication with their supervisor was found to generate an appropriate environment for (affective) commitment (van Vuuren, de Jong & Seydel 2007).

### **2.4.3 Training**

Employee training is carried out to improve employees' knowledge and skills and to encourage positive behaviour through a learning experience that improves their personal and organisational performance. A review of the literature showed that employee commitment could be influenced by training. Improved knowledge, skills and abilities, becoming an efficient member of the team and enhanced career progression are examples of the many benefits employees gain from training (Hanaysha 2016). When asked how to accomplish a set of preferred behaviours among food handlers and organisational food safety performance, the management of food organisations and health authorities point to training as the answer.

To reduce the risks of foodborne illnesses, organisations typically implement food testing and inspections, and they provide training in an attempt to encourage food handlers to follow food handling procedures. However, training focusing on technical aspects is not enough to guarantee behavioural changes. Employees need to learn the food safety information (education) explaining the importance and effects of food safety. Nevertheless, existing training programmes focus on how to perform food safety rather than explain why food safety is important.

Food handlers with a strong knowledge of food safety are more likely to act in line with the management's expectations. Thus, to follow safe food handling procedures, food handlers need to possess the correct skills and a positive attitude toward the importance of food safety because a positive attitude raises the chance that food handlers will act accordingly. Therefore, it is considered that education affects the food handlers' attitudes, whereas training affects the food handlers' behaviour (Yiannas 2009).

The employee commitment level can be recognised through employees' loyalty and productivity in the organisation; committed employees identify more closely with the organisation's values and goals. Several behavioural outcomes, including important achievements, work quality and employee sacrifice to enhance the organisation's performance, relate to commitment. Highly committed employees offer superior support to their organisation's global achievement. Managers that create a pleasant workplace environment and offer support to their employees help to increase employee retention. It is the management's responsibility to provide training courses through the suitable channels to improve the personality characteristics and skills of employees (Danish et al. 2013).

In the highly competitive and technologically advancing environment, organisations are working hard to survive and to find suitable solutions to produce sustainable competitive advantages. Developing the employees' knowledge, skills and capabilities is thus essential in achieving the organisational performance and supporting all the employees in the organisation to execute their jobs well. Providing valuable training and development courses is one approach to building and enhancing the quality of the employees (Elnaga & Imran 2013).

In the global marketplace, the capabilities, knowledge and skills of talented employees, known as human capital, are important determinants of competitive advantage.

Ensuring employees receive meaningful inputs depends on relevant theories, considering the characteristics of effectiveness, efficiency and differences between employees, and continuous development is the main training principle (Diab & Ajlouni 2015). The aim of training programmes is to give employees the essential knowledge and novel skills they require to develop their professional abilities (Elnaga & Imran 2013) and to accomplish the goals and objectives of the organisation where they work. Investing in employees' training enhances the organisation's productivity, effectiveness and performance (Singh & Mohanty 2012).

Previous research has shown that training has a key role in influencing employee job satisfaction, leading to organisational commitment and increased employee retention. Accomplishing the goals and objectives of the organisation through attracting, retaining and managing the employees effectively can be achieved by developing training strategies (Hanaysha 2016).

Training is an important practice that has a big influence on competitive power. When an organisation invests in employee training, it improves employee and organisational performance and enhances employees' commitment to their organisation.

Therefore, when employees begin to expect that they will receive training, their organisational commitment is motivated as a consequence of the trust that a verbal psychological agreement has been made between the organisation and the employee (Pasaoglu 2015).

Different variables of training have a positive relationship with the affective and normative commitment such as training availability, learning motivation, co-worker support, supervisor support and benefits of training. However, no relationship has been found between these variables and continuance commitment. Improving employee competence, performance and growth are the central objectives of providing employee training in organisations that need to develop forthcoming human resource requirements (Armstrong 2001).

Several previous studies have shown that a relationship exists between the two variables of training and organisational commitment. These variables are of primary significance to organisations that need to enhance their performance, improve their competitive advantage and decrease turnover intentions. Newman et al. (2011) investigated the influence of employee perceptions of training on employees' commitment and turnover intentions. The findings showed the perceptions of training benefits and learning motivation are not related to continuance commitment, which contradicted the findings of Al-Emadi and Marquardt (2007). However, considerable research has shown with certainty that the attitudes of employees and job-related behaviour are influenced by management practices which enhance their performance in the organisation.

This relationship is fundamentally positive because the employees perceive that the organisation appreciates and respects the employees' contributions toward the organisation. Social exchange theory (Blau 1964) supports this positive relationship because the employees' attitudes are mostly affected by the psychological agreement between the employees and the organisation.

When an organisation shows interest in its employees, the social exchange will result in a reciprocity in the form of positive employee attitudes and job-related behaviours, which aim toward enhancing organisational performance. Employee training thus has a key role in enhancing organisational commitment because the employees are inclined to perceive the delivery of training by the organisation as a mark of care and appreciation to the employees' contributions. Such action produces a social exchange as a result, generating a solid bond through a psychological state. Lowry et al. (2002) investigated the influence of work aspects of management practices, such as training, on employees' job satisfaction and commitment and found that employees who received training have greater job satisfaction and commitment to their jobs than those who were not trained. Additionally, Bartlett (2001) explored the relationship between the perceptions of training and employees' commitment toward their organisation and found that the perceived access to training among the training variables had a strong association with organisational commitment because the affective commitment among the other organisational components had the most powerful association with training.

Ahmad and Bakar (2003) studied the association between training and employee commitment toward the organisation and found that the five variables related to training have a positive association with all organisational commitment components.

Nevertheless, a significant association was found between training availability and affective and normative commitment, while a less significant association was evident between training availability and continuance commitment.

Newman et al. (2011) found a strong relationship between the perceptions of training availability and continuance commitment, while Ahmad and Bakar (2003) and Bartlett (2001) reported a weaker relationship between training perception and continuance commitment. The perceived support from co-workers regarding training has a positive influence on employees' commitment toward their organisation. Once emotional ties among co-workers and employees become vigorous, employees offer full encouragement towards and cooperation with colleagues to accomplish all allocated tasks.

The role of cooperation with responsibility to co-workers enhances the level of responsibility employees feel toward their organisation, which accordingly influences employees' normative commitment (Wang 2008). Employees and the organisation both benefit from the training because the training can enhance the job satisfaction and job performance of employees; accordingly, these benefits have a positive influence on the organisational performance (Bashir & Long 2015).

Al-Emadi and Marquardt (2007) found a positive association between the beliefs of benefits of training, such as personal, career and job-related benefits, and employee commitment toward their organisation. Thus, the more organisations spend on practices such as employee training and communication, the greater job satisfaction the employees will experience, and the greater will be their compliance and support towards the organisation. These behaviours indirectly and positively influence the organisational performance (Kanyurhi & Bugandwa Mungu Akonkwa 2016).

Internal marketing indicates the organisation's interest in training employees and treats employees as internal customers, motivating them to provide a better service, which in turn affects the organisational effectiveness.



Previous research has proposed that a relationship exists between internal marketing, job satisfaction and organisational performance, claiming that internal marketing influences the employees' commitment towards their organisation (Stoffers & Heijden 2009). Adopting internal marketing practices raises morale among the employees, reduces staff turnover and produces preferred behavioural responses, productivity and organisational performance (Kanyurhi & Bugandwa Mungu Akonkwa 2016). Thus, improving the employees' motivation, knowledge and skills can motivate them to make more effort than usual in their work. Using an employees' incentive system also has a positive effect on the operations' quality, efficiency and effectiveness.

By executing internal marketing practices and procedures, the organisations construct a work environment that frames the work and performance of employees. Such practices boost the interactions within the organisation, inspire the vision sharing among employees and generate an emotional attachment that makes employees continue their employment (Awwad & Agti 2011).

The management can improve employee performance and maximise the work outcomes by enhancing employees' skills through providing training and managing positive guidance and ethics. Several organisations in UAE operate with a vision of increasing the level of performance and motivation among their employees, which is a main element of maximising performance. Most organisations that perform well in UAE provide training programmes that help their employees achieve the best possible outcomes (Almatrooshi, Singh & Farouk 2016).

Cognitive intelligence is a key factor to an organisation's success. Cognitive intelligence is not only improved through studying textbooks and passing a test or by obtaining academic skills, but rather constitutes a broader capability of understanding one's atmosphere toward getting meaning how to do things.

Accentuating cognitive intelligence in the training programme contents and the training delivery will enhance the employees' decision-making and problem-solving abilities, which will further enhance the level of coordination, cooperation and compliance among employees (Gilson et al. 2011).

Offering fair chances for training and work improvement and providing justifiable rewards and positive appreciation for employees' contributions are important for improving the employees' performance as well as the organisational performance.

Many organisations work hard to create a positive work environment to maintain employees commitment to the organisation through management practices such as training, performance appraisal and rewards (Al-hussami et al. 2011). Employee commitment is identified by many organisations as a strategic advantage and valuable tool for retaining knowledge and expertise within the company, which accordingly assists the organisation to obtain competitive advantage (Aladwan et al. 2013).

In UAE, employees with various types of knowledge and skills have produced competent managements and outstanding employee performance in most organisations. Organisational knowledge has become an asset that is perceived in the UAE as the main foundation for success in the globalised competitive environment. Therefore, the association between leadership competence and employee performance in the UAE is significant (Siddique 2012). By improving employees' skills through training, managements can develop and enhance employee performance (Macleod & Clarke 2011).

To ensure organisational effectiveness, it is important to promote organisational commitment among employees. Employees with high commitment levels lead to promising organisational performance. Hanaysha (2016) found that training employees has a significant positive impact on employee commitment. The swift snowballing competition pushes organisations to concentrate on their employees and make sure the employees maintain a high level of commitment. Organisational commitment is an important goal for an organisation to continue its presence and development (Hanaysha 2016).

#### **2.4.4 Employee Involvement**

Employee involvement in the strategic planning process leads to unity among the employees and enhances their joint identification with the overall strategy of their organisation (Liedtka 2000). Involving the employees in planning the strategy helps the management to reach a consensus concerning the organisation's strategy, as the idea of a participative planning process is useful in strategy implementation (Judge et al. 1997). Employees can become involved in the organisation's continuous improvement by offering their efforts to solve problems and improve the goals of continuous quality. Employees can also assess the organisations performance by providing feedback. Additionally, they can execute the standard procedures as required to avoid making repeated mistakes and to help the organisation in its journey toward continuous improvement.

Previous studies have asserted that employee involvement has a direct association with continuous improvement because employees have a key role in making quality decisions. Employees with high levels of satisfaction and motivation will participate in improving quality and produce novel suggestions concerning product and process improvements (Kafetzopoulos, Gotzamani & Psomas 2014).

To adopt modern quality practices and to improve the quality and safety of food, food firms have implemented many systems related to food safety and quality such as the HACCP and quality management systems (QMS). To ensure the successful implementation and management of these systems, a set of employee attributes such as employee involvement and commitment need to be considered (Lin & Jang 2008). However, few research studies have found a positive association between employee attributes and operational performance (process output or productivity). Furthermore, there is no widespread empirical proof of the influence of these employee attributes on product quality (Olsen et al. 2008).

According to Luning and Marcelis (2006), the notion of human resource is a key factor that affects the food quality and an investigation into the relationship between the employee attributes and product quality is needed. Furthermore, an explanation is needed about whether a direct relationship exists between employee attributes and product quality or whether other constructs are the main precursors of food product quality.

Kafetzopoulos, Gotzamani and Psomas (2014) examined the impact of employees' attributes, including employee involvement, on operational performance, continuous improvement and food product quality. The results showed that employees' attributes do not directly affect the product quality, while continuous improvement and operational performance were both found to have a direct impact on food product quality (Kafetzopoulos, Gotzamani & Psomas 2014).

When employees cooperate and participate in programmes concerning novel process improvements, they become involved in these novel processes and in turn give themselves a greater intellectual and affective contribution.

A higher level of employee involvement is required to make employees commit to product quality or any form of process improvement continually (Crause O'Brien 1995). Managers should thus create a workplace environment that allows employees to use quality practices smoothly by encouraging employees' enthusiastic involvement and enabling them to contribute to improving the organisational quality performance (Baird et al. 2011).

Employees' cooperation and personal commitment are essential for the firm to implement a quality system. When the workplace environment encourages employee involvement in decision-making, the process is rewarded because the employees are motivated to work more towards enhancing the organisational performance and improving the quality of the process or product. The result is to create satisfied, motivated and committed employees that produce innovative ideas for enhancing operating performances and firm competitiveness (Kafetzopoulos, Gotzamani & Psomas 2014).

Employees that are committed to their organisation conduct their works efficiently, with little or no supervision, for the worth of the organisation. Associated collective behaviours and group membership also have an important role in organisational performance. Organisations with traits of high involvement strongly motivate employee participation and generate a feeling of ownership and responsibility. This feeling creates a superior commitment to the organisation and enhances employees' self-sufficiency. Employee involvement also benefits the organisation because the input received from employees helps to enhance the quality of decision-making and contributes to implementation success (Denison 1990). The main problem in modern organisations originates from the approach to managing employees (Luthans 1985).

For various reasons, managers focus more on technical matters and inattention the management people concept which these conditions become treated only after knowing of organisational behaviour that deal with people behaviours within their organisations. Managing the organisation by focusing on technical matters through rules, systems and procedures and ignoring the human dimensions leads to the setting of impractical targets and unethical procedures that negatively influence the moral climate and overall organisational performance.

Thus, employee involvement is recognised as a significant element in the organisation culture that has a strong effect on organisational performance (Amah 2006).

Employee involvement is the extent to which employees participate in the process of decision-making in the organisation, and a feeling of responsibility and commitment as a result of engagement. Also called participative management, employee involvement refers to the level of information, knowledge, rewards and power the employees share in the organisation that are vital to establishing well-knit vision, values and purpose. Involving employees in the workplace processes not only gives employees a sense of control of one's own job but also empowers them to participate in decision-making. Raising the level of employee involvement further increases the influence they have on the decisions in the organisation work unit, process and outcomes (McShane & Von Glinow 2003).

There are diverse forms of employee involvement within an organisation. Formal participation, for instance, occurs when structures and formal expectations are established in the organisation, whereas informal participation happens when unplanned, episodic or unrecorded activities take place at the management's appreciation.

Other forms of involvement are voluntary or statutory; employees participate in voluntary involvement that is not required by force or law, while statutory involvement occurs when the government legislates its activities (Strauss 1998). When the employee is involved in a decision-making process, direct participation occurs, and when the employees are represented by peers, representative participation takes place (McShane & Von Glinow 2003).

There are also diverse of employee involvement levels which represent the power level over the decision and the decision steps required to use the power. When the employee is consulted for a particular opinion or selected for a consultation individually regarding one or two decision aspects, the involvement will be at the lowest level. At this level, the employee is not furnished with many details surrounding the problem, is not informed of the purpose for which his opinion will be used and is not asked for solutions. When consulted individually or in a group for an opinion, the employee involvement level is moderate, meaning that the employee is informed of the problem and asked for recommended solutions, but the final decision is out of the employee's hands. When employees have full power over the final decision at the highest involvement level, they are able to outline the problem, select the best solution and monitor their decision outcome (McShane and Von Glinow 2003). Employee involvement enables managers to gain highly committed employees that have a feeling of ownership and responsibility towards their organisations.

Employees that have a high level of involvement and commitment work seriously to confirm and accomplish the organisational performance by enhancing the productivity, profitability and market share and achieving the organisation's goals. The employee involved in the process of decision-making will be committed to the decision and affect the work behaviours and organisational commitment.

When the employees are involved, they will be happier in their work and will be more likely continue working at the organisation. Employees that are committed to an organisation also make the managers work easier because they carry out their jobs without supervision. Trained employees with high involvement in decision-making are more productive. Team orientation and employee empowerment in the organisations are likely to generate a superior of feeling of ownership and commitment among involved employees.

Appreciating and rewarding the employees for their valuable contribution by the management also increases the employees' commitment to their organisation (Amah & Ahiauzu 2013). Organisational commitment is described as a certain limit up to which an employee builds a sense of belongingness towards the organisation. This developed sense of commitment is formed through continuous involvement in various activities in the organisation. Such constant involvement can be achieved by obtaining suggestions from employees, communicating their issues and involving them in decision-making processes. This involvement also makes the employee feel valued and respected (Hanaysha 2016).

Performance management is an important management tool for sustaining harmony and implementing organisational development. Employee involvement improves the performance of employees. The effective management of employee performance is essential for improving the effectiveness and performance of the organisation. The involved employees present many productive behaviours that improve collaborative team energies and subsequently improve the employees' performance and achieve the goals of organisation.



The ability of involved employees through their organisation is the key factor of producing such energies and performance as the enhancement of employees' productivity is because of employees' reaction to goals as a group. The cognitive abilities and emotions of highly involved employees play a key role in encouraging them to follow their role-related objectives.

Additionally, involved employees work with colleagues cooperatively, conduct the tasks with responsibility, work hard to accomplish the goals and objectives of the organisation and have a solid influence on job performance (Nazir & Islam 2017).

Employee involvement enhances the employees' attitudes organisational performance. Employee involvement gives the employees a chance to actively share their views and participate in organisational decision-making processes. Therefore, employee involvement is a strong predictor of various outcomes. Employee involvement as employees' shared perceptions of to which level that management motivates and gives a chance for employees to share their views and participate in decision-making processes (Bosak et al. 2017).

When employees perceive management practices such as employee involvement, they are more enthusiastic about sharing their knowledge and engaging in the decision-making process collectively. They therefore replace negative norms with positive feedback and treat the problems of performance and nonconformity to conform with the required standards and procedures (Ramanujam & Rousseau 2006).

Employee involvement aims to authorise employees to make decisions and find suitable solutions to problems that arise. The logic of employee involvement is to give employees more control in the process of improvement, bring them closer to the problems and give them opportunities to make decisions for enhancement.

The level of employee involvement and employee attitudes, such as job satisfaction, relate positively with organisational commitment and organisational performance (Bosak et al. 2017).

## **2.5 Employee Commitment**

Employee commitment occurs when the employee has a positive job attitude, which generates a propensity to favourite inputs contributions into one's work role. Positive job-related attitudes can affect the performance of employees positively and minimise the negative behaviours. The right attitude assists the employee by directing his behaviours towards performance that are pertinent to the goals of the organisation and that are under the individual employees' control. Failure to accept and believe in the organisation's goals, missions and objectives by employees would threatened the organisation's performance. Sharma et al. (2016) made a distinction between employee behaviours which are straight observable actions of an individual and the performance results of employees influenced by causes out of the employee's control.

Research has revealed the positive influence of employee commitment on employee behaviour, productivity and performance (Mowday et al. 2013). Employees that are highly committed to their job and organisation make more effort in their work compared with employees that lack commitment. Employee commitment occurs when employees have shared beliefs and values which create a state of positive emotion. Most organisations have difficulty obtaining competent and committed employees who are willing to maximise their skills and abilities to achieve the organisation's objectives. As a result, organisations strive to involve such employees toward accomplishing their goals and objectives. Indicators of employee commitment include having no interest in obtaining other job offers, accepting the responsibility of their role and having job satisfaction countenance and readiness to contribute usefully (Iqra & Yahya 2013).

Each of the three components of organisation commitment (affective, continuance and normative) has a different effect on employees' behaviours in the workplace and these behaviours are considered by most managers to influence the organisational performance. As employees form the concrete base of any organisation, the organisational performance is technically considered the sum of all employees' performance working in the organisation. However, organisations can only survive in today's competitive world with the assistance of committed employees; those committed to the organisation's objective through working effectively to accomplish superior performance. Organisational commitment can be described as the state in which employees have a psychological link with their organisation and identify with it, making them more willing to participate in achieving the objectives and goals of the organisation. Good interactions between outstanding employees and organisations through organisational commitment and organisational connection lead to superior outcomes (Abu Amodu & Aka Ama 2016).

Yu (2007) found a positive association between organisational commitment and organisational performance, and Abu Amodu and Aka Ama (2016) showed that organisational commitment has a significant impact on financial performances, although differences exist in the measurements of organisational commitment and organisational performance.

Many research studies have examined organisational commitment in private and public sectors and found that organisational commitment is connected to behaviour, performance and achievement. It has been used successfully to measure the impact of organisational life on the behaviour and performance of the employees (Cohen 2007; Lawrence et al. 2012).

As the impact of management practices on food handlers' behaviour to implement safe food handling procedures has not previously been studied in food manufacturing firms in UAE using commitment theory, this study measures the food handlers' commitment in food manufacturing firms to determine whether the food handlers' commitment act as a mediator between the variables in this study.

### **2.5.1 Definition, Types and Perspectives of Commitment**

Improving human competences and stimulating commitment towards an organisation are the main factors to an organisation's success. Competent employees with strong commitment are important for the organisation's ability to compete strongly by improving product quality and to implement changes such as novel technologies and automation (Wim et al. 1998). The researchers have paid special attention to defining organisational commitment and operationalising the concept to determine what affects employee commitment.

Employee commitment is important in the workplace as many researchers found important evidence of organisational commitment and attitudes in the workplace, which encouraged researchers to study the antecedents and outcomes of employee commitment (Porter et al. 1974).

While no consensus on a definition of commitment exists (Morris et al. 1993), Mowday et al. (1982) defined commitment as the strength of an employee's identification and involvement with a certain organisation. This definition presents three features: (1) a belief in the organisational values and acceptance of these values, (2) employee readiness to offer exertion and (3) a willingness to continue with the organisation. These features indicate that the commitment is attitude and behaviour as well (Nishat Faisal & Al-Esmael 2014).

Scholl (1981) defined commitment as a constant, strong power that ensures the direction of the behaviour remain compliant with and loyal to the organisation's standards, values, procedures and norms.

The different definitions of commitment over the years have led to a multidimensional construct of organisational commitment (Meyer & Allen 1991). Because the role of employee commitment links the employees with their organisation, this might have a strong effect on their performance, which makes employee commitment a prevalent topic in management research (Rubin & Brody 2011).

According to Allen and Meyer (1997), employee commitment is a psychological state which indicates the strength of the relationship between the employees and their organisation and the employees' willingness to keep this relationship. Caught (2000) defined organisational commitment as the state of an employee being committed to the organisation to help in the organisation's goal accomplishment, and it includes identification, involvement and loyalty.

Organisational commitment is an emotional response through which beliefs, attitudes and behaviours of employees can be measured. It is a psychological promise of employees towards the organisation with regard to a sense of job involvement, positive belief and loyal of organisations' values (O'Reilly, Chatman & Caldwell 1991).

Meyer and Allen (1991) proposed the construct of organisational commitment with three-dimensions. The first dimension is affective commitment, which portrays the emotional status of the employee's attachment, identification and involvement in the organisation. Employees will keep their employment with the organisation when they have a strong affective commitment; they want to do so.

The second dimension is continuance commitment which portrays the links between the costs associated with leaving the organisation; the employees will continue their employment with the organisation because they need to do so (Meyer & Allen, 1991, p. 67). The third dimension is normative commitment, which portrays the employee's obligation towards the organisation; employees will continue their employment with the organisation because they feel they ought to. Each dimension of commitment links to a specific work outcome because each dimension has different behavioural outcomes and thus influences the employee's performance and the organisation's performance (Cohen & Golan 2007; Malhotra & Mukherjee 2004).

Previous studies have highlighted two aspects of employee commitment: attitudinal commitment, which centres on employees' thinking of the relationship between themselves and their organisation, and behavioural commitment, which centres on how employees may come to be tied into a specific organisation (Mowday et al. 1979).

Generally, continuance commitment is not or it relating with affective commitment, and with the outcome of work-related such as organisational citizenship behaviours and job performance, while normative commitment strongly relates to affective commitment (Meyer et al. 2002).

Lee and Chulguen (2005) suggested that separating normative commitment from affective commitment is empirically difficult. Some of normative commitment antecedent correlate with affective commitment (Ko et al. 1997). Ko et al. (1997) agreed with Mowday et al.'s (1982) suggestion that organisational commitment is treated as an affective attachment only.

A significant association is found between normative or continuance commitment with variables of behavioural outcome, but not with affective commitment (Allen & Meyer 1996).

According to Somers (1995), concentrating on affective commitment in several previous researches was not wholly misplaced. Therefore, many researchers considered affective commitment as central to organisational commitment and applied it as a single indicator of organisational commitment (Kuvaas 2006).

Existing literature shows a predominant covenant that organisational commitment is an attitude. Some researchers described organisational commitment as a psychological state of involvement in and identification with the organisation, or attaching the employee to the organisation, and others described it as a readiness to act (Solinger, van Olffen & Roe 2008). These definitions present the common understanding of attitude: the internal state of an individual prior to and directing action including feelings, beliefs and behavioural tendency (Ajzen 2001).

The definition of affective commitment embodies the attitude as emotional attachment to the target (the organisation) not to the behavioural act of ending or staying with the organisation. By comparison, continuance commitment, which is based on utilitarian outcomes, follows from engaging in the behaviour. Continuance commitment considers the utilitarian outcomes and embodies the attitude toward behaviour and not toward the target, as in the case of affective commitment (Solinger, van Olffen & Roe 2008). Affective commitment embodies and focuses on the attitude toward the organisation (target), whereas continuance and normative commitment both embody and focus on the outcomes of a behaviour, explicitly the act of stopping work with the organisation.

Employee commitment can be described using the three-commitment model, which is a multiple concept combining attitude toward the organisation with attitude toward a behaviour. The model comprises affective commitment, continuance commitment, and normative commitment.

This three-commitment model is a multiple concept combining attitude toward the organisation with attitude toward a behaviour. Randall et al. (1990) used normative commitment to explain the employees' concern for quality in the organisation and found low correlations with the behaviour of remaining with the organisation. Likewise, Meyer et al. (2002) found that the association between continuance commitment and organisational citizenship behaviours is not significant because continuance commitment perceives the cost to discontinue working with the organisation.

When using normative commitment to predict actual quality concerns toward quality enhancing behaviour or organisational citizenship behaviours (not the specific behaviour of remaining in the organisation), considerable higher relations are expected (Solinger, van Olffen & Roe 2008).

Integrating attitudinal (affective) commitment and behavioural commitment can be achieved in a constant reciprocal influence process. Employees with ability to achieve and execute a high proficiency level of work would be behaviourally committed to that performance level and would accordingly build a more affective commitment toward the target (organisation). A continued high level of performance is insured as a result of building of such an attitude (Meyer & Allen 1991).

Although the three-commitment model is inconsistent in its focus, the reciprocal influence between attitudes and behaviours is consistent over time. The distinction between attitude and behaviour is associated more with the process of being engaged in the commitment development and not on the focus of commitment. Thus, the focus of affective commitment is the target (organisation), whereas the focus of continuance and normative commitment is the behaviour. Based on the motivational viewpoint, affective commitment passes a general inclination to do a room of behaviours for the benefit of the organization (Eagly & Chaiken 1993).



Continuance and normative commitment are considered antecedents of attitudes to a particular behaviour (Eagly & Chaiken 1993). Normative commitment occurs once the employee has a sense of responsibility to the organisation; the employee works hard for the organisation because they are indebted to the organisation and thus present a suitable job performance. Building strong levels of normative commitment benefits the managers who need to influence their organisation's performance (Albrecht 1999, p.173). Normative commitment occurs when employees continue working with their organisation according to the expected standards of behaviour or social norms. Employees with high commitment put particular behaviours into practice because of a belief that it is right morally and not for personal gain (Best 2000).

Employees with normative commitment are considered to continue working in the organisation because it is morally right, irrespective of what enhancements they might receive or their satisfaction with the company (Iverson & Buttigieg 1999). The power of normative organisational commitment is affected by recognised rules about reciprocal obligation between the employees and their organisation. Employees with strong normative organisational commitment frequently sense an obligation to return to the organisation in response to their care of them, such as the provision of training courses (McDonald & Makin 2000).

### **2.5.2 Role of Commitment**

Most previous studies have treated commitment as an independent variable affecting the organisation's performance or as a dependent variable influenced by demographic or other antecedent variables.

However, commitment has a significant mediating role in organisations (Morgan & Hunt 1994), which is confirmed by Iverson et al. (1996, p. 36): as the commitment significance comes from its influence as a fundamental mediating variable in organisational outcomes.

Organisational commitment has a key role in encouraging employees to execute in role behaviour and encouraging them to follow and execute extra role performance (Coffman & Gonzalez-Molina 2002; Snape & Redman 2007). Executing more than what is assigned to their role officially relies on a level of commitment and readiness to execute additional tasks. In addition to supporting the extra role performance, organisational commitment acts as a mediation variable between different individual and organisational variables such as exchange leader member (LMX), human resources management (HRM) practices and psychological empowerment (Srivastava et al. 2014; Srivastava et al. 2016).

Organisational commitment motivates employees to not only do the best for the organisation, but to also achieve superior relations with subordinates, management and supervisors and assist them sense secure and authorised (Garg & Dhar 2014; Jaiswal & Dhar 2016). Such employees tend to be more successful in their role performance, without experiencing any type of anxiety or concern that might arise from a negative perception of human resource practices (Dhar 2012). Perceiving the organisational practices by committed employees works positively towards the advancement of the organisation. Such employees are extra committed toward the organisation and thus present extra role behaviour (Jaiswal & Dhar 2016).

Despite the extensive theoretical acceptance of the significance of the commitment role as a mediator, no studies have attempted to discover commitment role reality, particularly as normative commitment in food manufacturing firms.

Furthermore, the nature of the associations between the commitment and its antecedents, such as organisational management support, communication, training, employee involvement and organisational outcomes, such food safety performance, remain vague.

### **2.5.3 Employee Commitment, Behaviour and Job Performance**

Two different concerns the organisations face in the competitive business world are to survive and to achieve a fruitful performance in the war with their competitors. To be a strong a competitor, the organisation needs to be innovative and to have committed employees willing to continue with their organisation and contribute a suitable performance and innovativeness in the achieved works (Srivastava & Dhar 2016).

Performance is described as how well the employee executes what the organisation assigns him to do (Campbell et al. 1993). Considering the antecedents of performance is vital for the organisation to survive and to face the competitors in the challenging business world. Employee attitudes and behaviour are important influencers that can lead to a positive performance in organisations (Sharma et al. 2016).

Meyer and Allen (1991) extended the commitment aspects into a three-group construct including affective, continuance and normative commitment, which affect the organisational performance. Employees with a higher commitment level will form a strong belief to accept the goals and values of the organisation. Furthermore, such employees will apply greater exertion for the organisation's benefit and exhibit a willingness to be a member of the organisation (Meyer et al. 2004).

Employee commitment is a predictor of overall organisational performance (Bergmann et al. 2011). Previous studies have found a link between affective commitment and a range of behavioural or attitudinal outcomes, such as performance (Meyer et al. 2002). The extent to which the planned objectives are accomplished efficiently is known as effective performance (Sumanth 1994). Therefore, when employees give their efforts and energy to comply with standard procedures and pre-determined goals, the performance is considered effective (Neely et al. 1995). Employees with high affective commitment feel emotionally attached to their organisations and have a strong enthusiasm to execute and accomplish the planned goals (Bakker et al. 2012).

A strong relationship was found between the commitment and the performance of employees (Chang and Chen, 2011); employees with a strong commitment have a strong feeling to provide efforts beyond the expectations of the organisation (Leong et al. 1994). Existing literature found commitment to be a strong antecedent to employee performance (Jaros 1997; Sharma & Dhar 2016).

Lee and Olshfski (2002) revealed that organisational commitment leads to a significant potential to engage in positive behaviours. Further, after accepting a new job, the employee will identify with the role belonging to the job and develop their commitment. Once committed, the employee will execute the job according to the standard procedures and in line with the expectations of the role attached to that job. Suliman and Lles (2000) examined organisational commitment and job performance and found that all three organisational commitment dimensions have a positive association with job performance. Clarke (2006) studied the relationship between commitment and performance and revealed that commitment has a key role precisely with performance results.

Both affective and normative forms of commitment have influence on performance, whereas the relationship between the continuance commitment and performance was negative. Rashid, Sambasvani and Joari (2003) found that the workplace environment in the organisation relates to commitment, and both have an influence on performance. The literature also showed that commitment has a positive influence on employees' job performance.

Employee behaviour that goes above the expectation of the official role requirements is known as extra role behaviour (EXR) (Burney et al. 2009). By contrast, employee behaviour that meets the requirements of the assigned work roles that are officially enforced by the organisation are known as in-role behaviours (INB) (Bonias et al. 2010).

EXR are described as unplanned, creative and innovative behaviour that leads to a healthy work environment and enhances organisational performance (Eisenberger et al. 2010). Usually such behaviours are described as discretionary and voluntary behaviours because if the employee does not achieve these, he will be neither rewarded nor penalised (Tremblay et al. 2010). Better communication paves the way for better coordination, cooperation and compliance. Considering the importance of the 5 Ts – talk, train, teamwork, trust and thanks – with the employees would also increase their performance.

Examples of EXR include speaking freely, listening to colleagues' work issues and assisting them to treat the problems with suitable corrective action, decreasing the workload caused by absent employees or during peak time to ensure the standard procedures are executed, and providing new ideas and suggestions (Organ 1997). Chen et al. (2009) stated that EXR originates from an intrinsic motivation to execute the work and is an additional resource for organisations that does not incur more effort or money.

EXR support employees to have a wider view of the work because of the strong emotional connection to the organisation and assists the employees to think further away from their own interests (Morrison 2005). Using social exchange theory, studies have presented an association between organisational factors and EXR (Anitha 2014). Akoto (2014) claimed that organisational factors affect the association between organisational commitment and extra role performance EXR. Organisational factors and employees' characteristics affect employee commitment, and employee commitment influences EXR (Sharma & Dhar 2015).

Employees that are committed to their organisation usually demonstrate extra role behaviour as a sign of their commitment toward the organisation (Dhar 2015). Srivastava and Dhar (2016) showed that leader member exchange, psychological empowerment and human resources management practices have a positive impact on organisational commitment, and organisational commitment affects extra role performance. Furthermore, leader member exchange affects extra role performance through organisational commitment while human resources management practices and psychological empowerment only partially affect extra role performance.

#### **2.5.4 Variables Influencing Employee Commitment**

Although previous research has focused on the effects of commitment on employees, such as turnover, Allen and Meyer (1990) suggested that the nature of the job the employee performs is more important than whether the employee continues with the organisation. Obtaining empirical evidence on the influence of commitment is difficult and involves measuring the direct association between as there be more of intervening factors when measure the relationship between profit of the organisation and commitment for instance (Wim et al. 1998).

Variables related to personal, job and organisational characteristics and work experiences influence employee commitment (Mowday et al. 1982), and demographic variables such as age have been found to be positive predictors of employee commitment. According to Mathieu and Zajac 1990), older employees have fewer employment options and thus present a high commitment towards their current organisations, and Dunham et al. (1994) claimed that older employees that tend to have a vast investment and long history with their organisation are more committed than younger employees.

While some studies examined the effects of employees' personal characteristics found that they did not have a key role in determining commitment. However, the findings suggested that the commitment of younger employees was higher than that of older employees because younger employees are more encouraged to commence a career and are more adaptable to change than older employees in the organisation (Boerlijst et al. 1995) while older employees have less commitment as they tend to be more frustrated (Morris et al. 1993).

In terms of gender, women were found to be more committed than men because they have to overcome barriers to get to their position in the organisation. Owing to the financial and family responsibilities, married employees typically present more commitment (Mathieu & Zajac 1990).

These results relate to continuance commitment, which concerns the cost associated with leaving the organisation and increases employees' commitment to the organisation, but they do not necessarily relate to enhanced performance. When employees' expectations from the organisation are met, their commitment will be greater.

Al-Qarioti and Al-Enezi (2004) found no association between the type of organisation (public institutions, non-government organisations and private companies) and organisational commitment, and a negative association between age, educational levels and length of service and organisational commitment.

Mignerey et al. (1995) presented a relationship between the early job experiences and commitment. New recruits become more accustomed to the organisation's procedures after receiving an induction programme from the organisation. Gaertner and Nollen (1989) found that commitment was related to employees' perceptions of organisational support, which could be perceived through an induction programme.

Many researchers showed a significant positive association between a good relationship between the employees and their managers and the development of higher commitment development (Green et al. 1996), and Schwarzwald et al. (1992) found that commitment was higher among employees who were awarded a promotion. Green et al. (1996) found a positive association between employees' happiness level based on job satisfaction and commitment.

Nevertheless, older employees with long years of service to the organisation tended to have a solid attachment to the organisation, and Mowday et al. (1982) found a small negative correlation between education level and commitment. Several studies concluded that job characteristics are significant predictors of commitment.

Job characteristics that create a challenge and elevate employees' responsibility and create a mix of thinking and practice are highly associated with commitment (Walton 1985). Organisational characteristics such as employee involvement and decentralised decision-making also influence employees' commitment (Mowday et al. 1982).



Further, Walton (1985) asserted that practices that offer employees co-ordination and control and that are based more on shared goals will enhance employees' commitment to the organisation. Additionally, the social support of management for employees and managers to cooperate in decision-making correlates with commitment (Nijhof, de Jong & Beukhof 1998).

Open communication between management and employees encourages employees to talk freely and share novel ideas and suggestions, and training was also found to relate with commitment (Morris et al. 1993).

However, findings related to the relationship between salary level and commitment were inconsistent among researchers. Gallie and White (1993) found that salary is unrelated with commitment, while Morris et al. (1993) found a small positive influence of a high salary on commitment. Managers reported that the central influences of commitment are product quality improvement, organisational communication improvement, good client relationships and employees' readiness to change. Commitment relates to the employees and the management style, and this relation could be considered a significant asset in the organisation (Wim et al. 1998).

Providing positive work experiences will increase employees' affective commitment because it promotes an environment where the employees feel comfortable and wish to remain with the organisation. Thompson and Heron (2006) showed that when employees have affective commitment, they share knowledge and are more innovative, and Chughtai (2013) showed that commitment to a supervisor raises the potential to enhance employees' learning, engagement and innovativeness.

In addition, Liu et al. (2011) showed that a positive environment encourages knowledge exchange between employees, which thus produces a feeling of commitment. Such technical knowledge sharing among the staff leads to innovative outputs and a greater organisational performance. Several earlier studies showed that various organisational factors are significant in instilling a sense of commitment among the employees toward the organisation.

Meyer et al. (2002) classified the elements that influence affective commitment into personal characteristics, work experiences and organisational factors. This research study examines four organisational management practices (organisational management support, communication, training and employee involvement).

This study also determines the predictors of normative commitment (concentrate on executing safe food handling procedures) and investigates the mediating role of normative commitment between the management practices and food safety performance.

### **2.5.5 Importance of Organisational Commitment**

The strong competitive environment has forced organisations to rely on their employees as human capital for its survival and performance successes. Both creativity and innovation are important elements for an organisation's performance success. Consequently, managers need to promote innovative behaviours within their organisation; but to do so, organisations need committed employees. Employee commitment needs to be viewed by managers as a fundamental factor that is necessary to the success of organisational performance. Managers of organisations have to work hard to create or promote commitment among the employees because an organisation with committed employees can achieve better performance and higher productivity (Jafri 2010).

Many researchers that focused on organisational commitment (Jaiswal & Dhar 2016; Meyer & Allen 1997; Srivastava & Jaiswal 2015) found that employee dedication and devotion to the organisation leads to a compliance with the objectives, practices, procedures and values of the organisation (Tangen 2005). Organisational commitment concentrates on the employees' internal willingness to be a member and offer their best work to the organisation (Mowday et al. 1982). In addition to supporting organisational progress, organisational commitment results in employee satisfaction (Sharma & Dhar 2015). With organisational commitment, the employees can identify and direct their individual desires, aims and readiness to continue their membership within an organisation and achieve the organisation's goals (Dhar 2015; Jaussi 2007).

Employees with higher organisational commitment build a psychological association with the organisation during their years of service (Jaiswal & Dhar 2016). Employees' commitment level can be deduced by measuring the loyalty and dedication towards the organisation and through their perceptions of whether their organisation is loyal, fair and committed to them (Vakola & Nikolaou 2005). This perception drives organisational success (Srivastava et al. 2014), well-organised role behaviour (Tremblay et al. 2010) and involvement in the organisation (Van Vuuren & Elving 2008). It facilitates the track for innovation through employee involvement and generates positive attitudes and behaviours among the employees (Gilliland & Bello 2002). Powell (2011) claimed that the organisational workplace environment is a key influencer in motivating performance and enhancing the commitment levels of employees.

### **2.5.6 Organisational Commitment and Contributions**

The behavioural approach to organisational commitment is driven by the employees' commitment to the entire organisation rather than a specific department of the organisation. Agreeing with this approach and engaging in the required behaviours might result in the employees reaching a psychological state of commitment (Meyer et al. 1993). The employees' commitment typically relates to an emotional and functional attachment to the organisation.

However, not all commitment dimensions relate to improved performance. For instance, employees who have a high continuance commitment and low affective and normative commitment are unlikely to generate advantages for the organisation (Meyer & Allen, 1997). Such employees will only remain in the organisation because the cost of leaving is too high.

A significant association is evident between affective and normative commitment and employees' innovative behaviour because employees with a strong affective commitment are likely to continue working for the organisation. Employees with such a commitment typically pay greater attention to the goals of organisation, perform additional work and show a positive performance; they also motivate other employees to demonstrate innovative behaviour. Affective commitment enables employees to observe and analyse the work issues in a positive way, which motivates them to create novel methods to address the issues and produce extra innovative behaviour. While normative commitment helps employees to implement their duties, which can thus produce novel ideas and innovation, continuance commitment has no influence on employees' innovative behaviour. Thus, overall, employees require a strong affective and normative commitment to do their best to achieve and to show innovative behaviour. Organisations therefore need to work hard to support affective and normative commitment among employees.

For producing innovative behaviour among employees, the organisation required to implant the affective and normative commitment among the employees, identify, and amend the continuance commitment into other two commitment type (Hakimian et al. 2016).

Employee satisfaction derives from their colleagues, managers and the workplace environment. Allen and Meyer (1991) proposed that affective commitment has the greatest potential advantages for organisations compared with the other two commitment dimensions. Affective commitment has been measured most in recent literature in line with 'engagement'. Employees with high affective commitment tend to comply more with the organisation's requirements than those that lack affective commitment.

Employees with strong continuance commitment often remain with the organisation because they feel they need to, which generates a feeling of frustration and leads to unsuitable behaviours. Such employees may not want to contribute to the organisation (Meyer & Allen 1997). Employees with strong normative commitment will remain with the organisation due to the feeling that they ought to; however, this feeling is not generated because of education, pay or age but due to mutual trust. The associated literature presented a positive relationship between normative commitment and work behaviours and performance (Munene & Dul 1989).

In addition to training and employee involvement, hard practices (related to process management) such as continuous improvement and the soft practices (related to human management) such as organisational management support have a significant and positive influence on organisational performance (Gadenne & Sharma 2009). Therefore, the hard practices should be managed through effective management of the soft practices to psychologise the behaviour (understand and explain the employee behaviour).

Therefore, the hard practices are to be managed through an effective management of the soft practices and psychologise the behaviour (understanding and explaining the employee behaviour).

The current study investigates the behavioural commitment of food handlers, and it is expected that management practices influence the food handlers' proficiency to follow food safety procedures. Consequently, efficient management practices will encourage the food handlers to become behaviourally committed to the performance of executing safe food handling procedures (to repay the debts). The food handlers' commitment was measured by focusing on normative commitment as a single construct because this component relates to a wider range of outcome behaviour variables.

Continuing the performance of executing safe food handling procedures as a habit (repetition of behaviour reasonably is automatic) will build attitudinal (affective) commitment to the organisation. Subsequently, the developed commitment will influence and improve the food safety performance in the organisation.

## **2.6 Organisational Food Safety Performance**

Organisational performance refers to matching the performance of the organisation with its fixed goals and objectives, or comparing the measured real results of organisation with its planned outputs (Tomal & Jones 2015). Price (2001) defined employee performance as an effective orientation to the work, and Sempene et al. (2002) defined it as an employee's overall perception and evaluation of the work environment or positive emotional status. These definitions portray the employee performance as the result of how employees feel about the work environment.

The organisational performance, including the business effectiveness, efficiency and outcomes, is a key determinant of potential business success, which is the business's ability to execute strategies effectively to accomplish objectives.

Organisational performance relies on the leaders' skills and the relationship between the managers and employees to accommodate change for executing strategies. The employees as part of the organisation play an important role in organisational performance as they achieve the goals of the organisation. Leaders and employees require cognitive competencies to accomplish the organisational performance effectively (Almatrooshi, Singh & Farouk 2016).

Organisations are a key factor in people's lives because successful organisations exemplify an important factor in the development of a nation. Economists describe organisations as the engine for assessing the country's economic, social and political growth. Though the concept of organisational performance is used widely in the literature as one of the most significant variables in the management research, defining organisational performance is still tough due to its numerous meanings. In the 1950s, organisational performance was defined as the degree to which organisations are seen as the social system that achieves its purposes (Georgopoulos & Tannenbaum 1957, p. 535), and in the 1960s and 1970s, organisational performance was described as the ability of an organisation to deal with its environment and use the restricted sources efficiently (Yuchtman & Seashore 1967, p. 379).

Performance assessments were initially used to assess the work, people and the organisational structure; however, in the 1980s and 1990s, identifying the organisational objectives became excessively difficult and managers thus considered an organisation successful when achieved its goals in an efficient and effective way.

Lebans and Euske (2006) described performance as a group of indicators, such as financial and nonfinancial, business performance and operational performance indicators, which provide information about the achievement of objectives and results.

The dynamic nature of performance requires judgment and interpretation. Performance can thus be demonstrated using a causal model, which defines how existing actions might influence future results. The understanding of organisational performance might differ depending on the individual; for example, an individual within the organisation might evaluate the performance against different parameters compared to individuals from outside of the organisation.

Knowing the elements that are characteristic of each area responsible for the performance is vital for defining the performance concept, and an ability to quantify the results is required to determine the performance level of the organisation (Lebans & Euske 2006). Enhancing the operational performance increases the attractiveness and quality of the products and decreases product wastage, which reduces customers' complaints and increases profits.

Human resources play a key role in contributing to food quality in food firms because the human resources regulate the level of inconsistency in peoples' decisions through stipulating their actions, consequently the employees are forced to work under particular a management system, which includes complete managerial activities and practices. Employees with high satisfaction and motivation contribute to the enhancement of products and processes. Effective teamwork practices enhance employees' knowledge related to their tasks, the stability of their efforts and organisational food quality performance.



By contrast, negative behaviour of employees, failing to understand the food quality system, lack of training, safety risk misconceptions and inadequate organisational management support contribute to poor food quality (Kafetzopoulos, Gotzamani & Psomas 2014).

Researchers have used various indicators, such as operational performance and product quality, to measure organisational performance related to employees, processes and products. Food safety is used as an indicator of quality because it is an important factor of food products (Soliman 2000). Building affective commitment enables leaders of an organisation to have a positive influence on organisational performance. Top managers cannot achieve success even with the most creative plans and programmes without organisational commitment (Albrecht 1999, p.173).

To obtain a deep understanding of the effects of interventions in the food industry, it is important that food companies and the government can measure food safety performance quantitatively, without relying microbiological analysis. Opportunities employees have for development influences their commitment towards the organisation; the organisation can influence the employees through showing appreciation and rewarding employees for their efforts and through communication. Committed employees are essential to the success of the organisation. Without committed employees, the organisation will be unable to maximise the effect of strategic initiatives, which includes successful acceptance of organisational changes and ensuring competitive advantage (Nishat Faisal & A. Al-Esmal 2014).

The management of the organisation should show a strong commitment to food safety and have the ability to direct food handlers to follow safer practices to ensure the food safety management systems are in place. It is essential that the organisation ensures that all food handlers understand the expectations of their job and are held accountable for following food safety procedures.

Accountability can be enforced by performing daily HACCP checks and ensuring that required outcomes are being accomplished. Organisations should carry out the HACCP checks, observe the food safety behaviours of the food handlers and provide feedback to the food handlers on the findings. The organisation should also make their commitment to food safety clear to the food handlers to encourage them to execute safe food handling procedures. This will encouraged food handlers to execute safe food handling procedures because they know it is right thing to do, not because they are being watched (Griffith et al. 2010b; Seamana & Evesb 2006; Yiannas 2009).

Before the risk of foodborne diseases can be reduced by enhancing food safety performance, the organisation's food safety levels need to be determined so that the organisation knows whether its food safety performance is getting worse, better or remaining stable. Food safety measurements can be used to recognise the areas of opportunity for improvement and determine the root cause of the issues. For instance, if the measurements show that food handlers repeatedly follow unsafe food handling procedures, the solution might not be to retrain the workforce but rather to amend the workflow procedure at the workstation. The food safety measurements used towards innovation as innovation and change lead to improvement (Taylor et al. 2015; Yiannas 2009).

Food safety measurements include examining the physical conditions of the organisation by performing inspections, conducting audits and checking the physical attributes of food to highlight any food safety risks. However, Jones et al. (2004) and Mullen et al. (2002) proposed that no association exists between food inspection scores and the probability of an outbreak occurring in the food firm, which suggests that it is insufficient to measure only the end state of a physical condition and that the food manufacturing process needs to be tested.

While measuring the food product temperature in its end state is acceptable, the results do not offer a complete picture of whether the achieved results were achieved by chance or because of proper production process; thus, it is unclear whether the results are achievable constantly. An alternative method would involve measuring the food handlers' food safety knowledge by making it mandatory to have a licensed food safety person in charge that is required to pass recognised exams set by a governmental training agency.

Having such a licensed food safety person in charge is not the only technique that can be used for measuring knowledge. A mix of leading and lagging indicators would offer greater success in food safety performance measuring (Hopkins 2007; McCarty 2015; Yiannas 2009). Evaluating food safety performance goes beyond measuring the physical condition of the food firm and the food, as measuring processes, knowledge, and behaviour are most significant.

The absence of qualified employees might pose a significant risk for foodborne illness, particularly in the case of working with high-risk food, which leads to the production of food products with poor microbiological performance. Thus, executing a food safety management system in small-sized food establishments is a challenge because of a shortage of competencies and resources (Dora et al. 2013). Nevertheless, Luning et al. (2015) revealed that some small and medium establishments succeed in executing advanced food safety management systems and produce highly safe food products because the management of these smaller companies are owners or family businesses who have a higher level of commitment toward quality and safety issues (Berlin, Lockeretz, & Bell 2009).

The interaction between the food handlers' perceptions of management practices, such as the organisational management support, communication in the existing work environment and the way the organisation runs the operation will lead to a certain microbiological output. In other words, the interaction between the human route and assuring the efficient execution of the food safety management system (techno-managerial route) will lead to a microbiological performance of products, and performance of food handlers and processing environment (De Boeck et al. 2016).

Microbiological testing, which is considered to be a reactive approach, is one of many techniques used to test the performance of the food safety management system. However, it is not the most effective technique to evaluate the food safety because it is specific to one aspect of food safety and when the results of the microbiological testing are outside the limits of the microbiological criteria, corrective action to withdraw or recall the products is costly. Thus, additional techniques that can be used to verify the food safety performance include reviewing the HACCP documents and conducting field inspections and auditing, and measuring quantitative and qualitative indicators, lagging and leading indicators, and process indicators.

The microbiological testing is not the best technique to evaluate the food safety performance, which is applicable to one particular point. It is a reactive approach and cost more when the testing covers many points in processing line like raw materials, ingredients, to finished products (Heggum et al. 2015). Evaluation of food safety performance can be achieved by using sub categories like quantitative and qualitative indicators, lagging and leading indicators, process indicators.

In light of the complex business life, traditional competitive mechanisms have become ineffective and organisations need novel sources of competitive advantage. Human capital has become the most important asset of an organisation, which HRM directs toward creating competitive advantage for the organisation. In human resources literature, several researchers have investigated the influence of human resource practices on organisational performance and proposed the potential of many HRM practices to enhance and maintain the organisational performance (Sendogdu, Kocabacak & Guven 2013).

Food safety is most commonly assessed by conducting a microbiological assessment of the food and field inspections. However, microbiological assessments can be misleading. Many studies have found that most foodborne disease outbreaks are related to food handlers' failure to execute safe food handling procedures. Thus, studying the subjective behavioural factors would help to understand how best to improve the organisational food safety performance (da Cunha et al. 2015).

Organisation effectiveness involves every employee working in the organisation, as the employee performance is the output of the leadership function. Managers can influence employee performance by implementing management practices, which contributes to the greater organisational performance (Almatrooshi, Singh & Farouk 2016). Leaders in the organisations have the main role of accomplishing organisational goals and objectives by creating a motivational workplace environment which affects the attitudes and behaviours of employees and motivates them to execute the standard procedures (Mastrangelo et al. 2014). Furthermore, the leaders motivate the employees to become more involved in the organisation and thus enhance their performance. Competent leadership outlines and identifies organisational successes.

Leaders should utilise models of competencies that include monitoring, leading, communicating, listening, problem solving and motivating (Tomal & Jones 2015). Enhancing employee performance will improve organisational performance because competent leadership and employee performance are the main elements that contribute to organisational performance (Babcock-Roberson & Strickland 2010).

The food safety culture is the chemistry between the human route and the techno-managerial route that leads to certain food safety results. In other words, food safety culture is the interaction between the employees' and the managers' perceptions of the food safety climate in their firm (behaviour focused) and the way the firm operates and executes food safety management procedures (process focused). The food safety climate refers to the current shared perception among employees of their firm's communication, commitment and leadership relating to food safety. Faour-Klingbeil et al. (2015) emphasised the management type relates to food safety attitudes and practices, and Griffith (2000) claimed that management failures, such as inappropriate planning, organising and control, are contributory influences of various outbreaks of foodborne diseases. Therefore, the management of food safety training is essential (Brown et al. 2014). However, traditional food safety training tends to focus more on the technical features of food management systems than the effects of the human behaviour.

Managers need to understand the food safety management system and know how to direct the employees' behaviour to implement the procedures efficiently and effectively. Thus, when implementing food safety management procedures, the food manufacturing firms should consider the behaviour of the employees and establish a system that focuses on food safety management based on behaviour.

Focusing on technological solutions that analyse the processing steps and product formulations and managerial solutions, such as having a food safety management system, are not sufficient for enhancing the food safety performance. De Boeck et al. (2015) claimed that having a food safety management system would not ensure food safety and constant system performance.

Thus, it is important that firms focus on improving employee behaviours to enhance the food safety performance because the actual implementation of the procedures is influenced by employees' perceptions of the firm's food safety climate in the firm (Yiannas 2009).

Human capital has become the most important asset of an organisation and several researchers have investigated the influence of human resource practices on organisational performance and proposed the potential of many HRM practices to enhance and maintain the organisational performance (Sendogdu, Kocabacak & Guven 2013). Furthermore, many studies have found that most foodborne disease outbreaks are related to food handlers' failure to execute safe food handling procedures. Thus, studying the subjective behavioural factors would help to understand how best to improve the organisational food safety performance (da Cunha et al. 2015).

Managers can influence the employee performance by implementing management practices (more details in the next chapter), which contributes to the greater organisational performance (Almatrooshi, Singh & Farouk 2016). Managers can influence the employee performance creating a motivational workplace environment that affects the attitudes and behaviours of employees and motivates them to execute the standard procedures (Mastrangelo et al. 2014). In this study, the impact of management practices was critically investigated—specifically, management support, communication, training, and employee involvement—on food handlers' commitment towards food safety performance in food manufacturing firms based in the United Arab Emirates (UAE).

The study examines the mediation effect of the food handlers' commitment on the relationship between the management practices and the food safety performance of the firms. In this research, measuring the food safety performance was achieved through involving both lagging and leading indicators that cover the product, process, and people. The aim of using both reactive and proactive is to measure the performance from the behaviour based food safety management system point of view. The lagging and leading indicators included handlers food safety knowledge, food handlers personal hygiene, food handlers behaviours, food safety management system (HACCP) measures, results and scores of internal, external, and regulatory food safety audit, trend of recall cases, expired, and returned of finished food products, and finished food products comply with specification and standards.

## **2.7 Summary**

This chapter presented a comprehensive literature review and defined the four management practices that form the focus of this study: organisational management support, communication, training and employee involvement. This chapter also presented the prominent theories applied in food safety to explain the food handlers' behaviour toward safe food handling procedures and organisational food safety performance. In this chapter, the organisational commitment was highlighted as a key factor that directs the food handlers' behaviour and its contributions to food safety performance. The following chapter explains the relationships between the research constructs mentioned above.



## **Chapter Three: Conceptual Framework and Hypothesis Development**

### **3.1 Introduction to Chapter**

This chapter discusses the research theoretical framework and associations between research variables dependent, mediator, and independent. According to the research theoretical framework, the hypotheses developed seek to answer the research questions in the coming chapters. In this chapter, the researcher concludes that management practices (organisational management support, communication, training, and employee involvement) have a positive impact on employee (food handler) vis-à-vis the implementation of safe food procedures toward organisational food safety performance. This chapter also highlights the role of employee commitment as a mediator.

### **3.2 Review of Relevant Literature**

#### **3.2.1 Management Practices**

Whiting and Bennett (2003) recognised many best practices related to occupational health and safety concerns in organization which are appropriate for food safety. These practices include employee involvement, food handlers' participation in professional committees, and establishing trusting relationship among food handlers. Moreover, communication is one of the best practices that create open discussions in staff meetings. Providing enough resources and recognising safe food performance are a vital form of organisational management support practice, along with specific professional training.

Karia and Asaari (2006) stated that training and empowerment are linked to significant and positive association with organisational commitment. Furthermore, organisational communication is correlated with affective commitment, since communication is perceived as the most important and most powerful tool of total management practices correlated with affective commitment (Boon, Safa, & Arumugam 2006). A study conducted by Daily and Bishop's (2003) show that employee involvement has a significant relationship with organisational commitment.

Although many strategies have been devised, food safety performance is still modest as food handlers are still using unhygienic practices (Clayton & Griffith 2008). Researchers have found that food handlers' food safety knowledge and technical skills do not often result in implementing hygienic practices. According to research, there are other influences related to organisational factors that affect the food handlers' behaviour (Yiannas 2009).

Understanding organisational factors such as management practices might be a key factor to assist food manufacturing firms in food safety performance evaluation that direct behaviour toward safe food procedures accordingly. Researchers agree that food handlers' behaviour could be influenced by organisational factors in their workplace, which may motivate or demotivate the food handler's intention to implement hygienic procedures.

To understand the food handlers' behaviour towards executing safe food procedures, researchers studied many theories such as the theory of social norms, reasoned action theory, and the theory of planned behaviour (Yiannas 2009).

Research confirms that food handlers are the key factor in improving food safety inside food-manufacturing firms, and it becomes clear that the management of food safety is not just a technical matter. Rather, behaviour has been noted as an important component (Taylor et al. 2011).

### **3.2.2 Employee Commitment**

According to recent research, organisational commitment is a multidimensional construct. The employee commitment is a constant power that directs the behaviour to comply with the organisation's norms or values (Scholl 1981). Building this construct is a result of works done by Allen and Meyer (1990). This construct consists of the following three elements: emotional attachment (affective), perceived cost (continuance), and obligation (normative). Many researchers adopted this construct in their studies, and it was the basis for them as it is extensively used in organisational commitment measuring (Klein et al. 2009).

Many researchers such as Cohen (2007), Lawrence et al. (2012) conducted their studies using organisational commitment in the private and public sectors (non-food organisations) and have found that organisational commitment is related to the employee's behaviour, performance, and achievement. Employee commitment has been used successfully to measure the influence of management practices and organisational life on employees' behaviour and performance. For instance, committed employees are most probably to stay with their present organisations and maximise their efforts towards the organisational performance more than their own personal interests. By contrast, non-committed employees are most likely to leave the organisation, and their contribution to their organisational performance will be less (Lim 2014).

Organisational commitment among food handlers is an area that has not been explored yet to reveal the influence of management practices on food handlers' behaviour towards implementing safe food procedures. It is also important to note that there is an association between management practices and organisational food safety performance through committed food handlers in food manufacturing firms.

Coming to grips with the way management practices in food manufacturing firms influences food handlers' commitment to the firm can offer important contributions to organisational research and can be helpful to food firms management.

Unlike previous food safety research, this research addresses organisational commitment adopted in understanding the food handler's behaviour in food manufacturing firms. In addition, this research attempts to examine whether or not employee commitment is a mediate factor between management practices and organisational food safety performance.

Many organisations are expending considerable efforts to create positive working environment and climate to retain committed employees through management practices such as training, and professional development, and reward incentives (Al-hussami et al. 2011).

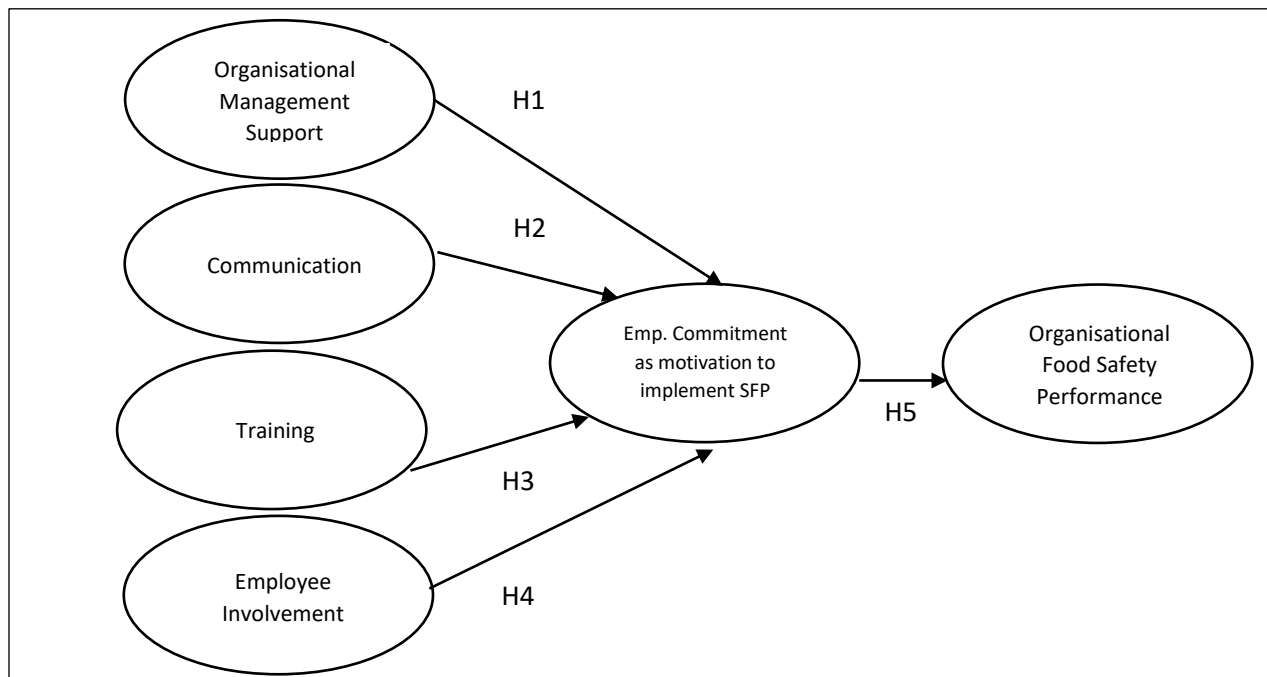
### **3.3 Conceptual Framework**

After a review of the relevant literature, it appears that organisational commitment has not been adopted to understand the food handlers' behaviour towards implementing safe procedures in food manufacturing firms and its influence on organisational performance. In this research, organisational commitment is used to study and explore if employee commitment acts as a mediate factor between the relationship between management practices and food safety performance.

The model below (Fig. 3.1) suggests that management practices (organisational management support, communication, training, and employee involvement) as independent variables influence the food handlers' commitment to implement safe food procedures and employee commitment affects organisational food safety performance.

The model also indicates employee commitment as a mediator in the association between management practices and organisational food safety performance. Through reviewing the literature of management practices, commitment and performance, the following conceptual framework has been proposed for examination:

The impacts of management practices – specifically, management support, communication, training, and employee involvement – to be investigated on food handlers’ commitment towards food safety performance in food manufacturing firms based in the United Arab Emirates (UAE). The mediation effect of the food handlers’ commitment on the relationship between the management practices and the food safety performance of the firms to be examined. The sample comprised 189 food-manufacturing firms operating in the Emirate of Dubai.



**Fig. 3.1** Proposed conceptual model

### **3.4 Hypotheses Development**

The hypotheses have been developed in the following sequence:

#### **3.4.1 Organisational Management Support**

Perceived organisational management support is described as the employees' perception toward the employer's appreciation to them. It refers to the degree of an employer's appreciation of and care about employees' participation (Eisenberger et al. 1986). The reciprocal exchange relationship is the basic factor in outlining the relative needs and extending the official contract (Eisenberger et al. 2001).

Perceived organisational management support presents the notion that employees have views concerning the organisation's commitment to them (Erdogan & Enders 2007). Previous literature, on the other hand, focused only on the employee's commitment to the organisation. This view is vital in organisational research since both employees and their firms are engaged in a mutual association. Assessing the organisations' support to their employees is significant; whereas, assessing just one part of the association is not adequate (Chen & Mau 2009).

Employee commitment and organisational support were examined, and a significant connection between them was found (Malhotra et al. 2007; Williamson et al. 2009). Furthermore, satisfaction and career development as elements of support produce a strong commitment manager who will take care of other employees' developments (Tansky & Cohen 2001). Evidence reveals that organisations are able to enhance employees' commitment through utilising the reward support (Miao et al. 2013). The rewards support approach has a key role in developing and nourishing an employee's commitment with a greater level of loyalty and performance (Malhotra et al. 2007).

Employees are the main asset in an organisation; they are considered as a pure and unique source of competitive advantages and enhance the organisation efficiency and effectiveness. From this stand point, employee commitment plays an important role in organisation's achievement because a highly committed employee will maximise the organisation's endeavours towards attaining its main goals (Mosadeghrad 2003).

The employee who receive commitment from his company; he will appreciate this and reflect his commitment positively to the company. An employee with strong obligation toward their organisations is an important consequence of perceived organisational support.

An employee appreciates their company's commitment toward them, and this will positively impact their commitment towards the company. An employee with a strong obligation toward their organisations is an important consequence of perceived organisational support. In fact, the employees who feel an obligation toward their organisation will exhibit positive attitude and behaviour. As a result, this commitment becomes conducive toward the attainment of the organisation's goals (Eisenberger et al. 1986). The findings indicate that the relationship between the perceived organisational support and continued commitment is negative. However in a study conducted by Ucar and Otken (2010), the relationship between perceived organisational support, affective commitment, and normative commitment is positive.

The Perceived organisational support enhances affective commitment through satisfying the employees' socio-emotional needs such as respect, appreciation, authorisation, and attachment (Fuller et al. 2003). In fact, such satisfaction will give the employee a sense of belonging to the organisation and, thus, increase the employee's social identity that generates a strong commitment.

Several studies reveal that a host of organisational factors play an important role in implanting a sense of affective commitment among employees. Therefore, there is a strong association between perceived organisational support and affective commitment (Sharma & Dhar 2016).

Perceived organisational support shows that appreciation of employees' efforts improves their organisational commitment and affects their behaviour and affective commitment (Whitener 2001). Perceived organisational support is an organisational approach that has a major influence in involving the employee, enhancing their commitment toward the organisation, and affecting their performance (Lam & Zhang 2003).

Previous research shows that the employee's perceptions of fair management and procedures motivate their organisational affective commitment. Therefore, procedural justice is said to be an important key in employee's commitment toward the organisation (Colquitt et al. 2001).

Organisations can use fairness in political procedures, supervisory support, rewards, and satisfactory work conditions to promote and enhance the individuals' perceptions of organisational support (Cropanzano et al. 1997).

Employees will perceive practices such as social acceptance behaviours by the organisation as supportive and will translate that supportive behaviour into better affective commitment to and job performance in the organisation (Armeli et al. 1998). Therefore, the next hypothesis is framed as follows:

*H1: Organisational management support is positively related to employee commitment to implement safe food procedures*



### **3.4.2 Communication**

Feedback and response from both employees and management are forms of communication and have an association with organisational commitment (Varona 2002). Furthermore, the employees' commitment lead to greater organisational outcomes and performance (Mitchell et al. 2001).

A well-established and effective communication has a significant impact on knowledge sharing and spreads across the organisation, thus positively shaping affective commitment (van den Hooff & de Ridder, 2004). The significance of communication lies in its being a key strategy in motivating employees' involvement, and it is this involvement that creates the feeling of organisational commitment (Thornhill et al. 1996). In fact, research carried out by Varona (1996) reveals a positive association between organisational communication and employee commitment.

The supervisor's communication skills, the manager's listening capability, and the accuracy of the message have been identified as strong factors that affect and boost the employee's commitment (Bambacas & Patrickson 2008). The process in which individuals or groups perform in a range of methods in diverse areas to achieve organisational goals is based on organisational communication (Boon & Arumugam 2006).

Communication is a strong predictor of employee commitment and leads to greater organisational performance. In fact, the findings of several studies conducted to this end reveal that the association between communication and employee commitment is positive (Goris et al. 2000). Several previous studies have found that vertical communication concerning the organisation's work improves organisational commitment.

By contrast, this improvement in organisational commitment seems to be lacking because it is significantly influenced by horizontal communication concerning social and emotional subjects.

The employee's perception of communication directions between organisational management communication and employees including superior-subordinate communication, and communication quality are found key factors in employees' commitment.

Employees with low organisational commitment have low-perceived autonomy of speech and communication in the organisation (Gorden & Infante 1991). Previous research indicates that there is an association between the quality of communication and the entire organisational performance, and a lack of successful communication is regarded as the crucial factor that impedes performance in the organisation (Tubbs & Moss 2008). Successful communication allows employees to talk freely and discuss work-related issues.

This kind of freedom in communication will assist employees in sharing information and generating ideas. Furthermore, participating in the decision-making process may lead to problem solving and suggestions for further improvements. Trombetta and Rogers (1988) conducted a study to measure the impact of communication on improving the employees' commitment. This has been done through an evaluation of sufficiency of information, contribution to the decision making process, and communication openness. The findings indicate that contribution to the decision making process has weak association with employee commitment; whereas, sufficiency of information and communication openness have direct and indirect association with employee commitment, respectively. Therefore, the next hypothesis is framed as follows:

*H2: Communication is positively related to employee commitment to implement safe food procedures.*

### **3.4.3 Training**

As employees constitute the main source of accomplishing competitive advantages and enhancing the organisation's performance, the organisation ought to invest in this capital and provide employees with focused learning opportunities.

For instance, the organisation should strive to steer the employees' knowledge, attitude, and experience towards achieving its goals and objectives successfully (Bashir & Long 2015). Both employee training and employee commitment are crucial in achieving the organisation's goals, enhancing performance, gaining competitive advantage, and increasing employees' loyalty.

Several studies that have been carried out to investigate the different training-related variables and employees' commitment reveal an association between the two (Al-Emadi & Marquardt 2007). Another study by Felstead et al. (2010) indicates that there is a strong link between training and employee involvement. The significant influence of Human Resources Management (HRM) practices on employees' attitude and behaviour in the workplace and high organisational performance have been clarified by earlier studies that investigated the association between employees training and commitment. The reason behind such a positive association is the employees' perception of the degree of the organisation's appreciation of their work, its recognition of their worth, and its care about the employees' prosperity (Newman et al. 2011).

Newman et al. (2011) further clarifies this positive association by using social exchange theory proposed by Back (1965). This theory emphasises that the existence of psychological treaty between the organisation and the employees generates positive attitudes and behaviours. These are known as reciprocity practices that take place between the organisation and its staff.

For example, when the employees' prosperity is being taken care of by the organisation, the employees will exhibit positive attitude and behaviour that will eventually improve the organisation's performance. Therefore, training has a key role in improving the organisational commitment level, as the employees who have received enough training will display more organisational commitment (Lambooi et al. 2007).

Some studies have not found any strong evidence to support this association (Davies, Taylor & Savery 2001). However, the findings of a study conducted by Ahmad and Bakar (2003) indicate a positive association between all the three types of organisational commitments and training variables. Bashir and Long (2015) conducted a study on the association between the different training related variables such as the availability of training, the motivation to learn, the co-worker's support for training, the supervisor's support for training, the benefits of training, and employees' commitment. The results of this study show no significant association between the training variables and employees' continuous commitment, but (the results) indicate a positive association between the affective and normative commitment. Similar results in studies carried out by Bulut and Culha (2010), Ooi and Arumugam (2006) reveal that access to training is positively associated with organisational commitment. Also, Lam and Zhang (2003) found that learning opportunities and organisational commitment are positively connected.

In investigating the association between employees' commitment and perception of training, the findings of a research conducted by Alhassan (2011) indicate that employees with greater perception of training exhibit more affective commitment compared with employees with little perceived training. Therefore, the next hypothesis is framed as follows:

*H3: Training is positively related to employee commitment to implement safe food procedures.*

### **3.4.4 Employees Involvement**

Employee involvement is a process in which employees are given the chance to participate with a certain authority that will enable them to maximise their energy to deliver individual as well as organisational performance. Involving employees in decision-making, problem solving, and increased autonomy in work processes will make them more motivated, committed, productive, and satisfied in the workplace (Sofijanovska & Zabijakin-Chatleska 2013).

Employee involvement is a management and a leadership philosophy which explains that employees should be given the chance to participate toward the continuous improvement and constant achievement of their organisation's work. An employee should not be regarded as a goal or a tool, as it is believed by and practiced in numerous organisations (Sofijanovska & Zabijakin-Chatleska 2013).

The employees' use of their own notions, expertise, and energy to solve problems and make decisions are examples of their straight contributions to assist in accomplishing the organisation's mission and in attaining its objectives. Employees are the most important pillar of an organisation's valuable assets and significantly contribute to its success.

According to Price (2004), employees' involvement means assisting them in maximising their energies to participate more effectively and efficiently rather than merely motivating them. Price further regards the employee's involvement as a process that includes participation, communication, and decision-making, which are all conducive toward democracy and enhancement of the employee's motivation.

Employee involvement is creating an atmosphere in which employees are encouraged to have a constant influence concerning the decisions and actions that influence their jobs. In addition to motivating employees and increasing their job satisfaction, this involvement also increases the organisation's performance. Some researchers argue the importance of organisational commitments that controls the employee and organisation affiliation and attempt to explain how the employee becomes attached to their organisation (Ekmekci 2011). Others, however, see the importance of organisational commitments as a main controller of performance in an organisation (Khan et al. 2011).

Obtaining a total devotion from the staff toward the organisational goals and values, the organisation should build a psychological bond with its employees in the form of a strong organisational commitment (Singh et al. 2008). In fact, positive association between employee involvements, commitment, and organisational performance have been dealt with in a great deal of research. The findings of such research reveal that organisations with a great employee involvement approach and employee commitment are performing better than those with low employee involvement and commitment. To increase employee commitment, participation, and productivity inside their organisation, managers should successfully adopt employee involvement as a management technique to achieve that aim (Khan et al. 2011).

Organisational commitment generated from employee involvement inspires the employee to continue working in the organisation for a long time and increases his performance toward organisational performance.

The research findings explain that the high level of employees' involvement may result in high employee commitment and performance, and generate more personal thoughts (Ekmekci 2011; Ongori 2007). In fact, employee commitment is influenced by employee involvement (Schaufeli & Salanova 2007).

Employee involvement has been adopted as an effective practice to inspire great employees' commitment, and many empirical researchers have found a positive impact of employees' involvement on employees' commitment (Timming 2012; Wilkins, Butt, & Annabi 2017). Furthermore, these researchers have also discovered that organisational commitment is a mediator between employees' involvement and organisational performance. According to their results, less employee involvement in decision-making is commensurate with low employee commitment toward their organisation (Appelbaum et al. 2013).

Organisational commitment is believed to have a significant connection with employee involvement in terms of autonomy and decision-making process, but involvement through decision-making process has a stronger connection with organisational commitment than involvement through autonomy. Employee involvement is amply utilised in organisations to increase productivity and enhance work quality. Therefore, organisations do benefit from adopting employee involvement practices such as improvement of decision-making process, trust, process and procedures. Furthermore, employee involvement is also utilised as a management practice to enhance employees' motivation and boost their morale (Lawler, Mohrman, & Ledford's 1995).

Adopting employee involvement means that the organisation's structure, from top to bottom, facilitates the employees' contribution to business operations such as decision-making and problem solving. (Lawler, Mohrman, & Ledford 1995).

Many practices of employees' involvement aim at sharing knowledge, authority, and rewards. These practices enhance the employees' feelings and acceptance of involvement (Vandenberg et al.1999). Through organisational processes such as power, information, reward, and knowledge, employee involvement allows employees to carry out their job duties and responsibilities with more power and ability (Lawler et al. 1995). When employees are involved in decision-making, this will improve the quality of organisational life and increase the employees' commitment accordingly (Hrebiniak & Alutto 1992). Strong organisational commitment could be generated when the organisation involves its staff in decision-making and when the organisation allocates responsibilities and accountability with certain authority that allows employees to understand their duties clearly (Allen & Meyer 1990). Therefore, the next hypothesis is framed as follows:

*H4: Employees involvement is positively related to employee commitment to implement safe food procedures.*

### **3.5 Organisational Food Safety Performance**

A study conducted by Suleiman (2002) shows that normative and continuance commitment has different key roles as mediator in the association between perceived work environment and performance. In order to implement strategies fruitfully, organisations need competences and committed employees to devise these strategies, because commitment guides employee behaviour toward a planned direction. The findings reveal that there is a positive influence of employee commitment in implementing the strategy successfully.



Employee motivation increases with the increase of commitment, and this reduces the time required to implement the strategy and allows a readiness for business environment changes within the business environment (Dooley et al. 2000). The development of employee commitment to implement the strategy enhances the organisation's performance (Armstrong 1982).

Organisational commitment is a vital key in employees' behaviour, and this commitment is sometimes difficult to find in the organisation. According to several researchers, organisational commitment affects the organisation through participating in organisational performance. Spending more in training and staff development noticeably sustains retention of committed employees who constitute a central key to organisational survival. Training as part of management practices means ensuring that the values an organisation promotes are in line with those articulated by the employees. In addition, providing adequate opportunities for training and appreciating the employee's contributions through incentive schemes will improve the employee's performance as well as that of the organisation (Aladwan et al. 2013).

Food safety work environment influences employees' behaviour and decision-making in implementing the food safety management system. Food safety work environment such as leadership and communication is perceived of as significant, and the inspected food facilities exhibit a better performance of microbiological hygiene and safety. This is because a good implementation of food safety management system and a favourable food safety work environment exist in food facilities. Furthermore, the study shows that combination of a promising food safety work environment and the sound implementation of food safety management system leads to a better microbiological performance in food companies (De Boeck et al. 2016).

A study conducted by Kumar et al. (2009) reveals a positive impact of total quality management practices on organisational performance. When organisational performance improves, the following happens: operating procedures and product quality improve; the defects in processing are reduced; customer complaints decrease; and profits increase.

A study conducted on ISO 9001 certified manufacturing and service companies by Su et al. (2008) suggests that quality management practices such as employee training, leadership, top management commitment, and employee involvement do not directly have a positive influence on financial business performance in the companies investigated. However, they indirectly have influence on business performance mediated by quality performance.

Another study by Salahedin (2009) reveals that the following three critical factors are crucial to the success of implementing total quality management: There is, to begin with, the strategic factor such as organisational culture. Second, there is the tactical factor such as employee empowerment, involvement, teambuilding in solving problems. Finally, there is the operational factor such as process control. The findings of another related study reveal a significant positive influence of implementation of total quality management on operational performance, such as reducing defects in processing and enhancing product quality and organisational performance that include different financial enhancements (Psomas & Fotopoulos 2010).

Musran Munizu (2013) conducted a study to test the influence of implementing total management practices, such as leadership, people's management concerning product quality performance in food companies. The findings indicate a significant effect. It may be said that in the light of globalisation, quality becomes the key factor as a competitive source in every organisation.

For an organisation to survive and beat the competition, the management should implement the best practices because they assist it (management) in identifying the necessary change in a vigorous environment so that it remains proactive through sustainable improvement to accomplish the most remarkable performance (Chase et al. 2005).

Many researchers have studied the relationship between the implementation of total quality management system and performance Rahman (2001). The results indicate that successful factors of total quality management system consist of employee empowerment, engagement, training, and development. A study by Demirbag et al. (2006) has singled out management support, training, and management process as components of the success of total quality management system. Furthermore, research by Prayogo and Brown (2004), Prayogo and Dermott (2004), Prayogo and Hong (2008) supports the significant influence of implementing total quality management on performance and on financial and non-financial performance Salaheldin (2009).

The aim of integrating committed employees in an organisation is to bind such employees to the organisation and to its attitudes, beliefs, and values and thus gain behavioural commitment toward achieving outstanding performance. This will in turn enhance the employee's loyalty level to the organisation. Appreciating the employee's worth leads to the enhancement of organisational performance and effectiveness (McCabe & Garavan 2008).

Richard et al. (2009) investigated the relationship between employees' attitude and organisational performance, and the results indicate that there is an association between employee attitude and organisational performance. Employee commitment leads to organisational performance such as product quality performance, productivity performance, and financial performance.

The association between employee loyalty and organisational performance is indicated in many studies (Yee et al. 2010), and it is noted that employee loyalty is related to quality, consumer satisfaction, operation efficiency, company profits, and competition.

A study conducted by Griffith, Livesey and Clayton (2010) reveals that food safety management systems and style, food safety leadership, food safety communication, food safety commitment, food safety environment, and risk perception might enhance food safety performance. Such enhancement is in compliance with the required standards and minimises the chances of food poisoning risk.

Highly committed and loyal employees are vital to accomplish the goals of an organisation and are regarded as more productive and more responsible. Furthermore, highly committed employees are emotionally attached to their organisations and possess high aspirations toward positive contributions to organisational performance (Karim & Rehman 2012).

In a changing business environment, many organisations work hard to instill commitment in their employees with the aim of enhancing their productivity. It has been agreed that organisational commitment is beneficial for employees, for it strengthens the sense of attachment to the organisation and career progress and enhances organisational productivity and performance (Azeem & Akhtar 2014).

Numerous predictors of affective commitment and its influence on the employees have been discussed in several studies. It is believed that affective commitment creates an investment of emotional resources in the organisation (Allen & Meyer 1990). Once an employee earns organisational support and fairness, they will utilise these gains when their considerations are affiliated with the organisation.

The employee responds positively in affective behaviour toward his organisation when he receives support from organisation and feels that his needs are responded to by the organisation (Allen 2003). Therefore, when the employee strikes a balance between organisational support and work environment through his emotional attachment, he will intensify his efforts to complete the tasks efficiently and, thus, enhance the organisational performance (Sharma & Dhar 2016). The employees' affective commitment level is affected through fair procedures and organisational support. When employees feel emotional tiredness, this will affect the organisation's output and reduce their affective level toward their organisation. Empirical research indicates that the positive association between the employees' affective commitment and his job performance is reflected on organisational performance, because employees perform at a high level when they have strong emotional attachment toward their organisation (Sharma & Dhar 2016).

A study was conducted by Abdullah et al. (2008) using the soft elements of total quality management practices and overall organisational performance. The findings indicate that organisational performance is significantly and positively influenced by employee involvement and management commitment. However, Gadenne and Sharma (2009) investigated the impact of total quality management practices on organisational performance using soft and hard total quality management elements and confirmed that to enhance organisational performance, both elements are crucial.

Involvement of people as part of people management means that all employees in the firm are considered as the cornerstone of the firm. The strategies should include complete involvement of employees and should provide opportunities for contribution, under a favourable policy.

In this way, employees would feel that they are valued and rewarded by the company and, thus, intensify their efforts toward improving quality and organisational performance (Sinha, Garg & Dhall 2016). A study conducted on food firms by Das et al. (2011) concludes that firms applying the practices of total quality management with high competent leadership are capable of processing products with greater quality. Another related study conducted on food firms by Han et al. (2009) concludes that overall performance is positively influenced by soft practices.

A study conducted by Valmohammadi (2011) in a manufacturing firm concludes that organisational performance related to employee morale and customer satisfaction is significantly influenced by soft practices of total quality management. Another study conducted by Meftah Abusa and Gibson (2013) concludes that practices such as top management commitment, people management, process management, and continuous improvement have a strong impact on organisational performance including financial performance (sales and profits growth) and operational performance (production improvement, stoppage rate, production capacity, defect rate, employee morale, customer satisfaction, and overall competitive position). Process management as well as top management commitment strongly influences organisational performance. Therefore, the following hypothesis is framed as follows:

*H5: Employee commitment is positively related to organisational food safety performance.*

### **3.6 Summary**

The previous chapter reviewed the relevant literature and presented the constructs of the study. This chapter also serves to create the conceptual framework. Some previous studies carried out even in other fields were presented, and the role of management practices and commitment were highlighted and connected to organisational performance. Four hypotheses were also outlined and whose purpose was to define the relationships between management practices and food handlers' commitment to implement safe procedures. The fifth hypothesis outlined the relationship between food handlers and organisational food safety performance.

## **Chapter Four: Research Methodology**

### **4.1 Introduction to Chapter**

This chapter discusses the procedures implemented and the methodology adopted in this research and attempts to explore the aim and objectives of the research stated in the first chapter. Furthermore, this chapter will attempt to test the proposed hypotheses in order to address the research questions outlined in the second chapter and first chapter, respectively.

The following sections cover the research philosophy, approach, strategy, process and design, focus group interview, structural equation modeling using analysis of moment structures, questionnaire design and development, data collection and analysis, and sampling. This chapter includes feedback from academics and food safety experts on questionnaire validation and the results of focus groups. Finally, it discusses the statistical analysis techniques used for analysing the collected data, pilot study, and ethical considerations.

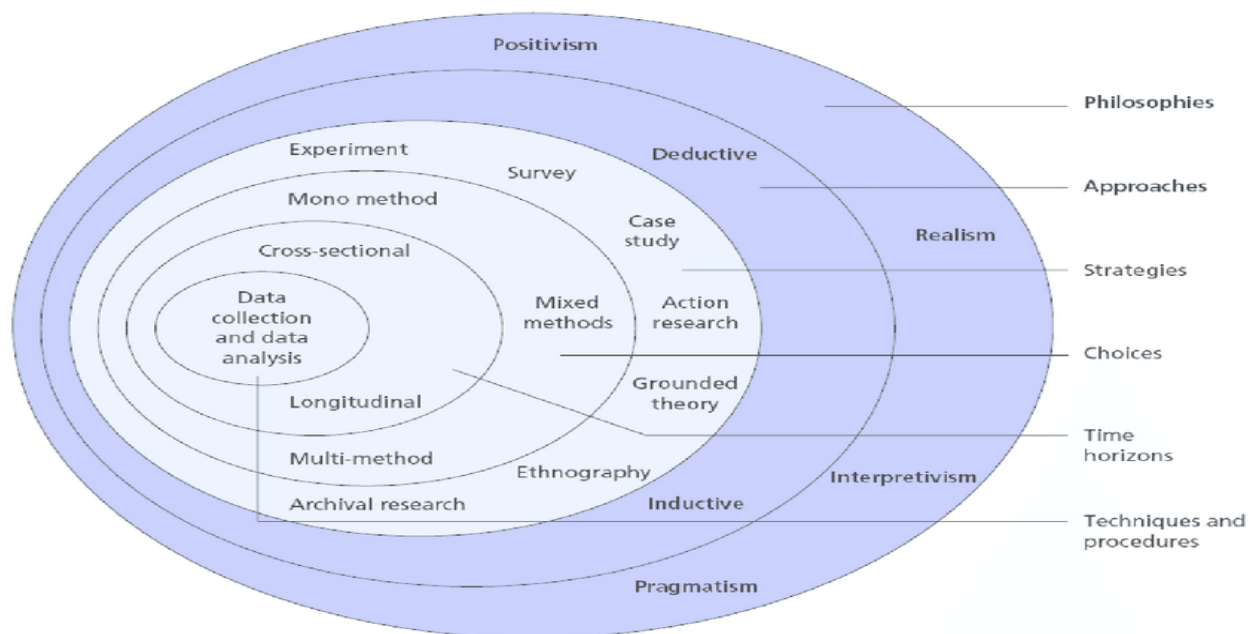
### **4.2 Research Methodology**

The systematic way used to find a solution for a research problem is adopted here as the research methodology. Kothari (2004, p. 8) explains that the distinction between research methods and research methodology is the tools adopted by researchers to conduct a research. Research methodology is a broad field from which the researcher can select the relevant and appropriate methods to address a research problem.



Therefore, a researcher would consider the logic behind selected specific methods and would question why other methods have not been utilised so that the research results are fit for being assessed either through the researcher or through others.

The research process draws upon the research process onion by Saunders, Lewis and Thornhill (2003). Each layer in the research process onion (Figure 4.1) has been examined to select the most appropriate one that fits in with this research.



**Figure 4.1:** The Research Process 'Onion' - Source: Saunders, Lewis and Thornhill (2003, p.83)

### 4.3 Research Philosophy

The research philosophy in the research hierarchy represents the second level and comes after the research approach, which sets out the logic of inquiry governing the research approach.

There are four assumptions that guide the research approach and are discussed in the research philosophy. They consist of the following: ontological assumptions (nature of reality), epistemological assumptions, that is, how reality can be recognised in the area of study (knowledge), axiological assumptions (role of values), and methodological assumptions (research strategy).

Prior to determining the ontological position of this research, the following questions are addressed: Is the concept in question something real (single reality), fixed, stable, observable, and measurable? Is it considered as an objective entity, external to social actors, or considered as consisting of multi realities constructed from perceptions and actions of social actors (Bryman & Bell 2007, p. 22)?

From an objectivist ontology perspective, the social phenomena and what this concept stands for has a real presence and is liberated from social actors. By contrast, subjectivism confirms that the social phenomena are constructed from perceptions, experience, and consequent actions of social actors (Maylor & Blackmon 2005, p. 156).

Positivist epistemology may be drawn upon if the social phenomenon in question is observable. This research adopts a value-free approach and a high structural methodology, with the aim of replication and generalisation (Gill & Johnson 2002). Thus, the statistical analysis would be achieved since the observations are quantifiable. However, the interpretivist approach may be adopted if the aim is to comprehend the investigated phenomenon through the interpretation of data by the researcher (Carson et al. 2001).

In this research, studying management practices is a real thing, for through scientific research management-related areas such as productivity may be studied and thus knowledge may be gained.

Since a generalisation of research findings is a concern for many researchers, the researcher adopts objectivity and value-free approach as described in the objectivist ontology.

There are two epistemological positions in the research: positivism and interpretivism. The former is extracted from the philosophy of science, and the latter from the philosophy of social science.

Positivist epistemology and objectivist ontology are more harmonious, and when researchers select positivist epistemology, they work exclusively with observable and quantifiable data that facilitates statistical analysis of the social phenomena. Research with a value-free approach adopts quantitative research method, which requires objective measurement and analysis, and an acceptable method usually generates valid knowledge that allows replication (Gill & Johnson 2002). By contrast, the interpretivist approach seeks to comprehend what is happening to the studied phenomena through data interpretation by the researcher (Carson et al. 2001).

Considering the objective of this research, which is testing the influence of management practices on food handlers' commitment and food safety performance, positivist epistemology seems more appropriate and pertinent. This is because it accepts that reality can be revealed and identified through observation measurement and that the association between management practices and food handlers' commitment is present. According to positivist epistemology, the facts can be generated and truths can be established, and this will help in designing a structural model that facilitates the task of testing the influence of management practices on food handlers' commitment.

The adopted research philosophy is influenced by the researcher's on research. The definition of philosophy according to Oxford Dictionary (2001) is the study of the fundamentals of knowledge, realism, and existence. Furthermore, a research that lacks a research philosophy will affect the quality and results of the research (Easterby-Smith et al. 2012).

The researcher's perceptions and views of the surrounding world are reflected in the selected research philosophy, which eventually affect the selected research strategies and methods. In addition, Johnson and Clark (2006) state that the philosophical background of a researcher influences the research strategy and their comprehension of the research topic in question. Ontology and epistemology are the two research thinking philosophies according to Bryman and Bell (2015).

In the same line of thought, Tashakkori and Teddlie (1998) argue that researchers should not treat research philosophy as being part of two opposite sides, that is, ontology versus epistemology, qualitative versus quantitative, or interpretivism versus positivism. Rather, research philosophy should be regarded as a philosophy continuum. Furthermore ontology, as described by Saunders et al. (2016), is an idea about the nature of reality and relating such idea to the researcher's assumptions on the way the world works.

Moreover, two parts of ontology may be distinguished: objectivism and subjectivism. Objectivism indicates the individuals' belief in the presence of social entities in reality, and these entities that are external and independent of individuals. Subjectivism, in contrast, indicates that social phenomena are comprehended through the perceptions and meaning of individuals (Bryman & Bell 2015).

Epistemology is associated with the extent to knowledge in a specific field of study is acceptable (Saunders et al. 2016). While ontology is concerned with how researchers view their encompassing world, epistemology is concerned with how to gain knowledge and check the reality (Easterby-Smith et al. 2012).

According to Hudson and Ozanne (1988) and Carson et al. (2001), ontology is concerned with the nature of reality; whereas, epistemology is concerned with knowing and capturing data or with the association between the researcher and the reality.

With the foregoing, positivism has been adopted here as a research philosophy because the nature of research is conducting investigations in a social science area where positivism is more appropriate for social science research, as indicated by Saunders et al. (2016). With regard to data collection and analysis, a highly-structured methodology is utilised, and positivism is related to highly-structured methodologies, Bryman and Bell (2015).

#### **4.3.1 Positivism**

According to positivist ontology, the world is considered as an external entity, and regardless of a researcher's perspective or belief, there is only one objective reality available for any research phenomenon or situation (Hudson & Ozanne 1988). Accordingly, researchers proceed with a controlled and structured approach that consists of a clear research topic, an appropriate structure of hypotheses, and a research methodology (Carson et al. 2001; Churchill 1996).

Positivist researchers do not get involved with the research participants, as this is essential in maintaining an emotionally-neutral status to achieve a clear discrepancy between reason and feeling (Carson et al. 2001). Positivist researchers draw the line between science and individual experience and between fact and value judgment. Similarly, it is crucial in positivist research to look for objectivity and utilise reliably sound and logical approaches in research. Statistical and mathematical procedures are fundamental to positivist research because they adopt accurate organised research procedures to reveal single and objective reality (Carson et al. 2001).

Positivist researchers trust that this is conceivable in light of the fact that human actions can be clarified because of the real causes that briefly go before their behaviour. Further, the researcher and his research subjects do not affect one another and are autonomous (Hudson & Ozanne 1988).

### **4.3.2 Interpretivism**

The position of interpretivism regarding ontology and epistemology is that there are numerous and relative realities (Hudson & Ozanne 1988). Lincoln and Guba (1985) clarify that these numerous realities rely upon different systems for meaning, and this makes it significantly harder to understand regarding established realities (Neuman 2000). In this respect, the gained knowledge is built socially, as opposed to the one determined objectively (Carson et al. 2001, p.5).

Unlike in positivist research, interpretivists do not adhere to solid structural research systems and embrace more individual and adaptable research structures (Carson et al. 2001) which are open to grasping meaning in human communication (Black 2006), and what is perceived is comprehended as reality (Carson et al. 2001). Interpretivists trust that the relation between the researcher and his informants are described as inter-reliant and reciprocally interactive (Hudson & Ozanne 1988).

The interpretivist researcher goes into the field with some kind of earlier knowledge and understanding of the research setting, yet accepts that this is inadequate in building up a settled research design outline. This is because the nature of what is perceived as reality is multifaceted, numerous, and unpredictable (Hudson & Ozanne 1988).

In this way, the objective of interpretivist research is to comprehend human behaviour through explaining the behaviour itself rather than predicting causes and effects toward generalisation (Hudson & Ozanne 1988; Neuman 2000).

The research aim is to explain the influence of management practices on food handlers' commitment to implement safe food procedures and deliver food safety performance. Differently put, the research explains how to condition the behaviour of food handlers toward implementing safe food procedures rather than explains the behaviour itself. Further, data collection has been conducted using and relying on mainly rely on quantitative methods.

Opting for a positivism philosophy in this research assists the researcher in collecting valid data from food handlers, the respondents in the questionnaire designed by Dubai Municipality (DM) inspector. Such philosophy helps the researcher in conducting the research in an objective way without his intervention in the data collection process. Finally, the researcher would benefit from using positivism philosophy to implement a highly-structured methodology that relies on quantitative methods and thus facilitates the statistical analysis of the collected data.

The explanation of social behaviour conducted by positivists is achieved through giving a significant account of the external causal factors that lead to the behaviour under study and by making observations on the visible characteristics and preceding situations of behaviour.

Understanding the social world through an exclusion of the subjective grounds of action according to subjectivists is nearly impractical for the researcher to adopt a value-free approach and not to be totally involved from the participants. The decision to set the research objectives and questions, the type of data to be collected and analysed are determined according to the level of the researcher's values.

On this basis, the researcher is biased to embrace a positivism philosophical research approach because the nature of research pertains to social science. Positivism is more appropriate for research conducted in social science according to Saunders et al. (2016).

For data collection and analysis, the highly-structured methodology utilised in this research draws upon the theory of positivism, as it is related to highly-structured methodologies based on Bryman and Bell (2015). Another reason for adopting positivism is that the collection of data relies on quantitative methods. From this standpoint, the aim of this research is to explain the causes that direct the food handlers' behaviour to implement safe food procedures rather than clarify the behaviour itself. One benefit may be gained from positivism philosophy is that it will empower the researcher to deal with the actual data gathered from the food handlers and DM inspector through the questionnaire.

Furthermore, positivism will enable the researcher to conduct research objectively without interfering in the data collected because there is no involvement on the researcher's part in the process of data collection.

#### **4.4 Research Approach**

Generally, a research approach relies on epistemologies and adopts various approaches, but it should be borne in mind that the pillar of scientific approach is advancing a theory supported with concrete evidence and making sense of it.

For a researcher to check everything physically remains a practically impossible task. However, the researcher should use information made available by other researchers or experts that is relevant to the topic in question. Therefore, any drawing upon the available literature should take into account accuracy in reporting, and finding data using a scientific method may be completed through different methods such as field trips, laboratory-based research, and so on and so forth.



The process of scientific research consists of a structure with systematic steps. This usually begins with general questions and then it is narrowed down to a specific aspect. The researcher observes and analyses this specific aspect, and then draws conclusions on the basis of the respective findings. There are numerous research forms that range from scientific, humanities, arts, economic, social, business, to marketing fields, and research approach should fit in with the questions a research attempts to address (Pellissier 2008).

In scientific research, systematic methods are applied to examine phenomena, gaining new knowledge, or correcting and integrating earlier knowledge for the explanation of the nature of the world around us. The methods should be based on gathering observable empirical and measurable evidence. A scientific method involves the collection of data through observation and experimentation, and the formulation and testing of hypotheses (Sneider & Lerner 2009).

The process should be objective in order to reduce the element of bias toward the interpretation of the results, and a highly-structured methodology will permit to reproduce these results for generalisation (Glazunov 2012).

In this research, the deductive and scientific approach has been adopted because it is a popular approach in many fields, considering the main research question (what?), and the literature does include commitment theory. Furthermore, the deductive approach fits in with quantitative research because it starts from the general to the specific (Pellissier 2008), derives the hypotheses from the existing theory, does not create a new theory, makes observations, and tests the hypotheses for confirmation or rejection (Wilson 2010).

According to Beiske (2007), deductive studies use a definite theory; therefore, in this research the organisational commitment theory is used and checked whether the projected theory works with the projected situations or not. In deductive approach, a new assumption results from the argument that starts with a theory, and this assumption will be matched to the observations to test it for confirmation or rejection (Sneider & Larner 2009). Deductive approach is also used in questionnaire as a tool to comprehend the statistical relationship between the perception of management practices and food handlers' commitment, and then its relationship with organisational food safety performance in food manufacturing firms.

Usually, there are five sequential stages in deductive research as stated by Robson (2002). The first stage adopts the theory to produce hypotheses; the second stage presents the hypotheses in operational condition such as explaining how the hypotheses will be measured and identifying the association between the variables. The third stage deals with data collection, which is necessary for operational hypotheses testing. The fourth stage consists of results analysis that will inform of whether to accept or reject the hypotheses; and the fifth stage is the development or adjustment of theory if it is suitable to do so.

The scientific research does provide a clear rationale that assists in addressing the research questions and explains how the research will be carried out. For instance, using quantitative data to test the hypotheses toward accepting or rejecting scientific research is common (Saunders et al. 2009, p.125). An approach with a high structure permits replication and generalisation of the findings, and these are the prominent features of scientific approach. It is anticipated that the researcher should remain objective, independent, and away from any bias regarding how the world works.

To minimise the potential of personal bias and to remain objective, a self-completed written questionnaire has been used in the survey to measure management practices and food handlers' commitment. Furthermore, an independent governmental food inspector measured the part pertaining to organisational food safety performance using Dubai Municipality inspection technique.

The research design also reduces the risk of common method personal bias through a self-completed written questionnaire. The highly-structured approach is very important in scientific approach because it facilitates the replication and generalisation of findings.

The researcher tries to clarify the associations between the research variables and test the research hypotheses. The data will be quantitatively measured, and for the purpose of repetition, a highly-structured research methodology to show that the researcher continues to keep away from the observed social object and remains independent and objective. An adequate sample has been chosen to facilitate the generalisation of research results (Saunders et al. 2016).

Adopting the deductive approach will enable the researcher to test the existing theories in the literature that influence food handlers to implement safe food procedures. Furthermore, the deductive approach is more suitable for this research since it serves to clarify the impact of management practices on food handlers' commitment to implement safe food procedures. It will also assist in using the hypotheses for testing the relationships between the research variables and the results in an attempt to confirm or reject the research hypotheses.

## 4.5 Research Strategy

According to Saunders, Lewis and Thornhill (2003), there are many research strategies such as archival research, ethnography, grounded theory, action research, case study, survey, and experiment as outlined in Figure 4.1. Because the survey strategy is the most prevalent in business and management research (Hussey & Hussey 1997) and is strongly linked with the deductive approach, it has been adopted in this research (Saunders, Lewis & Thornhill 2007).

Using the survey is an appropriate strategy to investigate the association between the management practices and commitment and food safety performance as indicated by Page and Meyer (2000). According to them, a survey strategy is a reliable research instrument in statistical analyses and helps in identifying the cause and effect associations.

Because of the limited time allowed for completion of the research and the issues relating to access to a large sample of food manufacturing firms, the cross-sectional method has been chosen and represents a ‘snapshot’ of the situation at a single point of time. The substitutional strategy ‘longitudinal approach’ includes recording occasions for a more extended timeframe is recommended for future studies based on the findings of this research (Robson 2002) in Saunders, Lewis and Thornhill (2007). In scientific fields, the researchers do use quantitative research strategy more often than other strategies. There are variances between the quantitative and qualitative approach; for instance, the quantitative approach includes measurements, which are not available in qualitative approach. Further, quantitative approach tends to be deductive, adopt objectivist ontology, and positivist epistemology; whereas, qualitative research is commonly inductive and adopts subjectivist ontology and interpretivist epistemology.

In this research, the research questions have been the main determinant for selecting the quantitative approach. As the research questions will be addressed through quantitative approach, at the same time, the quantitative research strategy is matched with the selected approach as well as the research philosophy. A qualitative approach such as interviews will produce extensive detailed data and identify many pertinent variables to study, but this is not adequate for drawing generalizations from the findings, and data analysis will not be an easy task to achieve.

Furthermore, the hypotheses and structural model testing will not be appropriate to do through qualitative approach. The concepts represent the factors around which this study revolves and include management practices, food handlers' commitment, and organisational food safety performance, which have been measured and included in quantitative research. The concepts may be in the form of independent and dependent variables as predictors to clarify a definite aspect of the social world. In order to measure the concept, indicators have been created in the form of questions in self-completed questionnaire. Quantitative research was adopted due to the following:

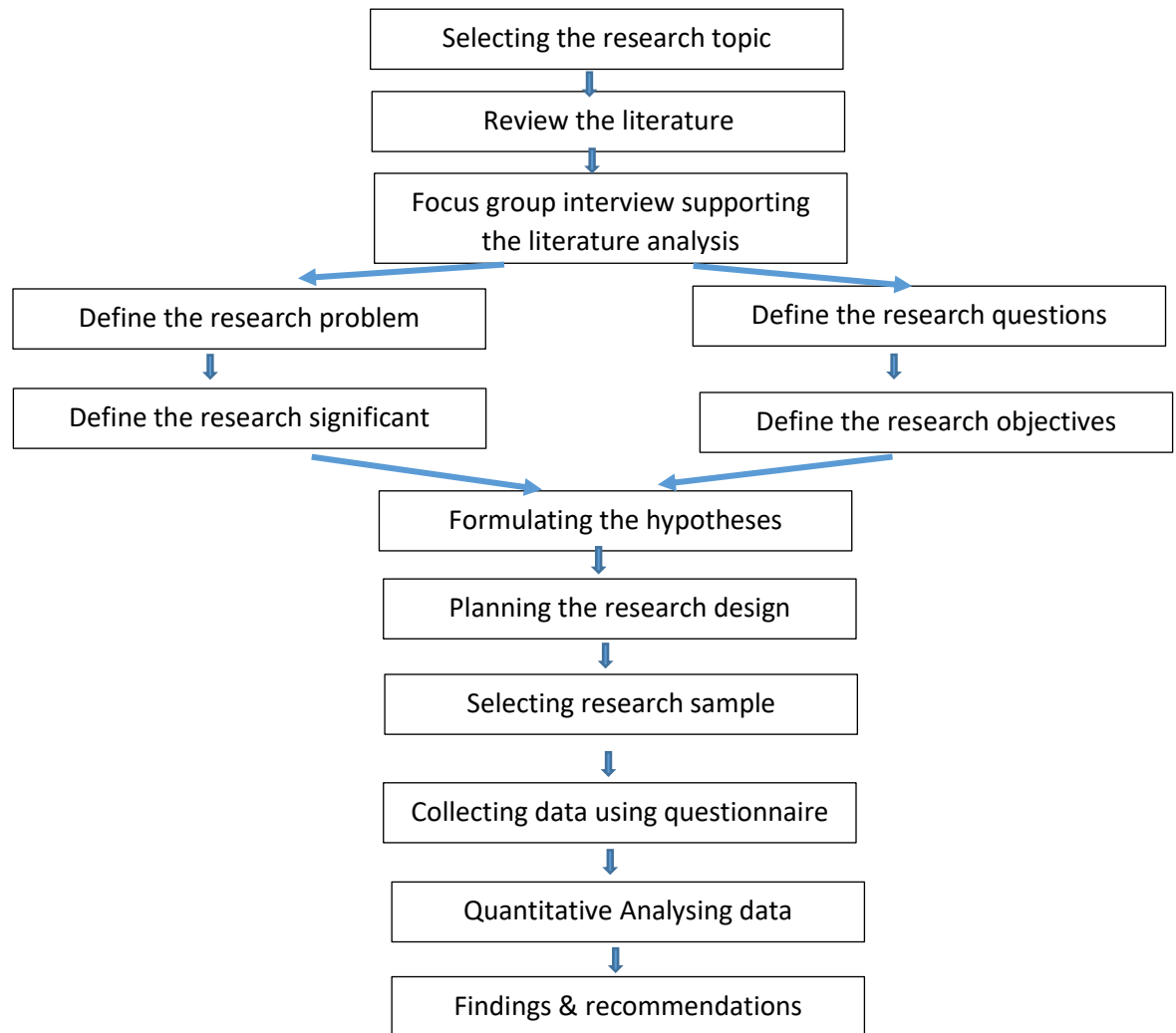
- This study is deductive in nature and help to reduce the researcher subjectivity and bias.
- The research facts will be measured quantitatively and allows generalisation.
- Quantitative data is crucial in understanding the research problem.
- It is vital to approximate the phenomena mathematically.
- The researcher attempts to explain a causal relationship between several variables.
- The researcher will deploy a structural research methodology for repetition purpose and the research includes hypotheses testing.

## **4.6 Research Process and Design**

The process in Figure 4.2 starts with selecting the research topic, outlining the research problem, questions, objectives, and significance, and investigating the influence of management practices on employee commitment and food safety performance in food manufacturing firms. The literature review examined management practices, commitment and food safety performance, and their relationships.

Management practices that would influence food handlers' commitment has been explored. The association between management practices and organisational food safety performance in food manufacturing firms has been explained.

Positivism research philosophy, deductive and scientific approach, and quantitative research have been adopted after a thorough comparison with other philosophies and approaches. Proper research methodology has been utilised and research samples have been selected. Data has been collected through the questionnaire designed for this purpose and subsequently analysed. Finally, the results were discussed and compared with the findings mentioned in the literature review chapter to answer the research questions and meet the research objectives. Then, the conclusion, recommendations, and limitations have been presented.



**Figure 4.2** Research Process Steps

The research design sets a clear and specific outline for data collection source, data analysis, research objectives, and research questions, and allows for unexpected restrictions that may be faced like data access, time constraints, and costs. In the first stage in this research, two focus group have been tasked to support the literature analysis and to gain more information from the participants to support the research aims, which validated the draft survey instrument that had been based on the literature.

The second stage of the research explains the association between management practices and food safety performance through the designed questionnaire (English version of survey questionnaire, Appendix 4.1).

The survey is an appropriate strategy to answer the wh-questions why, what, where, and how, especially in case of adopting a deductive approach. A survey-based questionnaire helps to produce massive data, particularly when the sample is adequate and, thus, represents the whole population and generates findings. Using a representative sample to collect data is inexpensive, less time-consuming, and feasible.

In this research, the sample consists of 189 food-manufacturing firms (HACCP Certified), and the questionnaire was distributed to five food handlers who have HACCP training in each food manufacturing firm. This is statistically significant (at level of confidence 95%) and adequate for the generation the findings. The sample is widely adequate and statistically significant (at the 0.05 level) thus reject the null hypothesis between the sample and the population (More details in sampling section).

In addition to expert literature, a focus group interview can be used as a complementary way to develop and select the questionnaire items (Hughes & DuMont 1993). A valued and new understanding of the research topic, concepts, and hypotheses may be obtained from the focus groups' interactions (Stewart & Shamdasani 1990).

Therefore, two focus group interviews have been used in this research (see below the details of focus group interviews) to support the literature analysis and to gain more information from the participants to support the research aims, which validated the draft survey instrument that had been based on the literature.



Empirical data collection on the influence of management practices on food handlers' commitment to implement safe food procedures has been conducted through the questionnaire. As for completion of the questionnaire, it has been done through the contribution and support from the results of literature review, focus groups, experts' reviews, and pilot outcomes.

The questionnaire has been distributed to food handlers in 189 food manufacturing food firms. As for the organisational food safety performance, it was measured by Dubai Municipality inspector using items extracted from Dubai Municipality Master Checklist, as proposed by Yiannas (2009) in (Appendix 4.2).

#### **4.7 Focus Group Interviews and Selection of Participants**

A valued and new understanding of the research topic, concepts, and hypotheses created can be obtained from the focus groups' interactions as an exploratory approach (Stewart & Shamdasani 1990). However, the focus group interview, as part of research methodology, can be adopted to develop and select the questionnaire items in the research as a complementary approach in addition to expert literature (Hughes & DuMont 1993). Focus group can assists in questionnaire designing as to what questions are pertinent. The source of more information such as new notions and experience may be obtained within a short time through the focus group (Krueger 1994).

The first focus group interview involved six food handlers from different food manufacturing firms to support the literature analysis and to gain more information on the exact management practices that could have an impact on food handlers' commitment within food manufacturing firms before the selecting of the questionnaire from the literature.

The second focus group interview has been conducted with six food safety professionals as purposive sample ( two food safety trainers, two food safety inspectors, and two managers of two food manufacturing firms) to form the focus group. The aims of the second focus group are to support the literature analysis and to gain more information from the participants to what extent the exact indicators of Dubai Municipality checklist can be used to evaluate organisational food safety performance in food manufacturing firms.

Considering the aim of the research questions and the first focus group interview, the targeted participants carry the same characteristics as food handlers from different manufacturing firms. However, the participants in the second focus group have a good knowledge in food safety performance and diverse characteristics about job field (training, inspection, and manufacturing).

The selection of the appropriate participants to establish a focus group is a difficult task. For example, the dissimilarities in the group, namely experience, characteristics, etc. would influence the significance of their contributions; whereas, a homogenous group would not produce diverse ideas.

Nevertheless, the participants in the focus group would feel more comfortable when the focus group have comparable level of thinking and experiences comparing with dissimilar level (Morgan 1988).

6 to 12 participants in the focus group is the optimum number to generate productive discussions on each question (Morgan 1998). However, some researchers consider 6 to 10 as an optimal figure (Macintosh 1993), while others suggest 4 participants (Kitzinger 1995).

The participants in each focus group consist of 6 members with knowledge in the research topic and food safety experience (more than 10 years). Furthermore, the moderator and his assistant have adequate knowledge, experience, and focus group interview management in food safety field. One hour has been allocated to the first group and 50 minutes to the second group for audio-recorded discussions. The discussions on the topic took place in favourable and stimulating conditions (Sudershan et al. 2008).

In principle, the group interview is similar to the focus group interview. While the interview technique both is unlike group interview, the moderator interviews the participants together, focusing on the questions as well as the responses. By contrast in the focus group interview, the moderator creates interaction among the participants (Morgan 1997). Unlike individual interviews, the focus group members have the chance to discuss, interact, and build up their ideas from one another's. No participant's contributing to or dominating the discussion has been recorded. In fact, the moderator has made all efforts during the discussions to direct the dialogue, encourage all participants to share in the discussions, and ensure that focus on the research topic is maintained.

The moderator attempts to discover diversity in opinions and thoughts among the participants on the research topic. When the conversation or discussion of a particular point is digressing from the research topic or when some points are exhausted, the moderator would steer the discussion back to track or move to another point within the scope of the topic in question. The moderator neither favours one participant over another nor displays emotional feelings towards a particular point throughout the course of the discussions. At the end of the panel discussion, the moderator thanked the focus group members for their valuable contributions.

Afterwards, the researcher listened to the audio recording several times to identify themes and confirm the scales previously selected from the literature. Example themes and codes from focus group data (pilot results from focus group data) in Appendix 4.8, 4.9.

In this research, the validity of the questionnaire lies in adopting previous published scales gaining more background information from experts, researchers, focus groups, and academicians who have been contacted to validate the questionnaire.

Although the opinions of the participants were diverse to determine the participants' number in the focus group, the participants' number in each focus group in this research consists of six members, as recommended by Macintosh (1993). The researcher believes that 6 is the optimum number of participants to conduct the discussion in depth.

While a figure exceeding 10 members may be difficult in controlling the discussion, securing a valuable interaction among the participants would demotivate the discussions. The small number of participants will not serve to generate diverse opinions during the discussion.

The first focus group involved food handlers who have role in food manufacturing in their firms and who have an experience of more than 10 years to explore the management practices that may affect them to implement safe food procedures. The participants were asked to define with examples the assistance they receive from their firms to implement safe food procedures. The following are examples of open-ended questions asked to initiate and inspire the discussion among the participants.

1. Does your firm support food handlers by giving them proper assistance to implement safe food procedures? Can you give any examples of such support?

2. Can you think of any examples of lack of support for food handlers to implement food safety procedures in your firm? What happened? See the full set of questions and guide (Appendix 4.3).

The following example questions were asked in the second focus group.

1. How do you think management practices affect food handlers' commitment to implement safe food procedures?

2. How do you think food handlers' commitment affects food safety performance?

3. What are the main indicators that can evaluate organisational food safety performance? See the full set of questions and guide (Appendix 4.4).

With the assistance of second researcher, the audio-records of both focus groups are not transcribed in a full verbatim version, and each interview is summarised into transcript sheet and completed according to the audio record. The transcripts were analysed manually and the themes identified through a careful reading of data several times (Rice & Ezzy 1999, p. 258). Independently, two researchers developed the themes which were discussed until consensus was reached.

The following four themes of management practices (organisational management support, communication, training, and employee involvement) were gained according to the first focus group outcomes and confirmed with the scales provisionally selected from the literature.

#### **4.7.1. Focus Group Discussion Session Plan**

Food manufacturing firms were contacted via email and requested to provide food handlers to participate in the first focus group interview discussion. The request was granted, and a separate appreciation of acceptance email was sent subsequently. See email transcripts of permission and appreciation and acceptance for focus group participation (Appendix 4.5 & 4.6).

Training consultants, managers of food manufacturing firms, and regulatory food inspectors were contacted through email to participate in the second focus group interview discussion. Their acceptance was appreciated in a separate email (Appendix 4.7). The venue, date, time and the aim of each focus group interview were announced via emails, and appreciation certificates were issued to all participants for their valuable contributions.

Though the difficulties reported in literature concerning the availability of participants in food safety in research (Arendt et al. 2012; Pragle, Harding, & Mack 2007), all the food manufacturing firms management including food handlers, training consultants and food inspectors that were contacted showed high level of interest to participate, even without email reminders.

6 participants in the first focus group interview were selected from food manufacturing firms. This selection was based on convenience sampling procedure and took into account the role in food manufacturing, as well as years of experience (more than 10 years) in different food manufacturing firms. 6 participants in the second focus group interview were selected based on purposive sampling procedure and their role in food safety performance (managers of food manufacturing firms, training consultants, and regulatory food inspectors with adequate experience in food safety in general (more than 10 years).

### **4.7.2 Focus Group Data Collection & Contribution**

Upon starting each focus group interview discussion, the moderator welcomed the participants and thanked them for their acceptance to attend the session. The aim of the topic of focus group interview discussion was announced to the participants who were made aware that the focus group is part of the research methodology and data collection, and any information would be treated with confidentiality and used for research purposes only.

The moderator asked the participants to introduce themselves as an icebreaking activity. The moderator read the guidelines that there are no right or wrong answers and encouraged the participants to feel free to share their point of view even if it conflicts with others’.

The focus group discussion session plan includes the opening, initial question, main questions, probe questions, and ending questions. The first focus group discussion includes three opening and initial questions, four main questions, seven probe questions, and one ending question. As for the second focus group discussion, it includes four opening and initial questions, four main questions, seven probe questions, and two ending questions. In case there is a need to develop or test the instrument, applying the exploratory study design is beneficial in this context as proposed by Creswell and Clark (2007).

Therefore, focus group interviews were conducted in the introductory stage in this research to support the literature analysis and to gain more information from the participants to support the research aims, which validated the draft survey instrument that had been based on the literature. Furthermore, to validate the constructs that used in the questionnaire, since those specific practices were not concretely validated by the literature.

Therefore, the focus groups provide a profound understanding of the management practices that affect the food handlers' commitment to implement safe food procedures. The focus groups interviews results used as inputs in the quantitative approach part of this study to assist in supporting and validating the questionnaire structure.

The aim of the first focus group interview to support the literature analysis and to gain more information from the participants to support the research aims, which validated the draft survey instrument that had been based on the literature. Therefore, confirming which management practices that might affect the food handlers' commitment to execute the safe food procedures. Furthermore to assist in finalising the questionnaire structure and obtain new information or new ideas. In contrast, the aim of the second focus group interview was to decide whether or not the indicators of Dubai Municipality's checklist are applicable in assessing the organisational food safety performance in food manufacturing firms.

#### **4.8 Structural Equation Modeling / Analysis of Moment Structures**

Despite the complexity of research questions, hypothesis, multidimensional and highly interrelated relationship issues, the structural equation modeling ( SEM ) can address these issues through a friendly user software of analysis of moment structures (AMOS) (Gallagher, Ting, & Palmer 2008). Determining whether or not the hypothesised model is supported by the sample data is the fundamental purpose of SEM. The software enables the researcher who does not possess enough statistics skills to analyse more than two variables at the same time. The SEM is defined as a mixture of factor analysis and path analysis" (Weston & Gore 2006, p.720). Therefore, the researcher can build, test, and confirm models of complex relationships by using SEM.



It includes two sub models known as measurement and structural models which facilitate the researcher's task of assessing how fit the observed variables represent the latent variable and evaluate interrelationships power between the latent constructs, respectively.

AMOS is widely used because it is easy to use, is closely linked to the SPSS package, and is time-saving. SEM modeling is distinguished from other analytical processes by its ability to combine valuation of measurement and relational components.

## **4.9 Questionnaire Design and Development**

276 food manufacturing firms are operating in Dubai and are accessible. They are all HACCP certified manufacturing firms with adequate HACCP trained food handlers and have complete food manufacturing food production lines. Permission was granted by managers that these firms would contribute to this research.

The target population consists of food-manufacturing firms in the person of food handlers who have experience, and their jobs are directly linked to food preparation and supervising tasks like HACCP team (Food handlers). 189 food-manufacturing firms with 945 food handlers licensed to manufacture food constitute the sample and serve as participants in the study.

To improve the food handlers' response to the questionnaire, the participants were informed clearly through the survey questionnaire document (Appendix 4.11) that the aim of the questionnaire was to gain insights into the impact of management practices on food handlers' commitment to implement safe food procedures. Furthermore, the responses would assist in enhancing food manufacturing performance.

When the researchers do sampling, they consider the level of certainty as 95% (Saunders et al.2009). In other words, at least 95 of the selected sample would definitely represent the characteristics in case the selected sample consists of 100 items.

In this research, the minimum sample size is at 5% error margin and 95% of confidence level calculated and consisted of 161 food manufacturing firms ([www.surveysystem.com/htm](http://www.surveysystem.com/htm) 2012). According to the lower limits suggested in the literature, 189 firms participated in this research in order to attain a minimum sample size (Hair et al. 2010).

A written questionnaire includes three sections that are designed to assess the management practices that could influence food handlers' commitment. The first section deal with management practices assessment. The second section looks at food handlers 'commitment. The third section consists of the participants' details in three languages, namely English, Arabic and Hindi.

In the first section, which contains 24 questions /statements, management practices are assessed and are specifically related to organisational management support, communication, training, and employee involvement. The second section, which contains 5 questions/statements, directly assesses employees' commitment toward implementing safe food procedures. A 7-point scale, ranging from 'disagree strongly (1)', 'disagree moderately (2)', 'disagree slightly (3)', 'neutral (4)', 'agree slightly (5)', 'agree moderately (6)', 'agree strongly (7)' is used to determine management practices and food handlers' commitment. The participants browse through the questions to select the answers that they think appropriate. The third section covers the participants' details and contains 4 questions /statements.

In this research, measuring the food safety performance was achieved through involving both lagging and leading indicators that cover the product, process, and people. The aim of using both reactive and proactive is to measure the performance from the behaviour based food safety management system point of view. The lagging and leading indicators included food handlers' safety knowledge, food handlers' personal hygiene, food handlers' behaviours, food safety management system (HACCP) measures, results and scores of internal, external, and regulatory food safety audit, trend of recall cases, expired, and returned of finished food products, and finished food products comply with specification and standards.

Every food-manufacturing firm represented in the survey sample was given a specific code. All food-manufacturing firms were individually assessed by the Dubai Municipality food inspector. During the course of the assessment, the inspector answered the organisational food safety performance seven items /statements and six items /statements about food manufacturing firms' details for every firm individually reported in food safety performance checklist (Appendix 4.2). The data obtained from Dubai Municipality food inspector corresponds exactly to the food-manufacturing firms represented in the survey sample. Therefore, every food-manufacturing firm was assessed by a Dubai Municipality food inspector and the data obtained were studied with the specific questionnaires answered by the food handlers that belonged to the same food-manufacturing firm. The measures of management practices (organisational management support, communication) have been adapted from the scale developed by Ungku Fatimah, Strohbehn, and Arendt (2014). The organisational management support scale used in study conducted by Ungku Fatimah, Strohbehn, and Arendt (2014) involves ten items with a Cronbach's alpha value of .95, while the communication scale involves six items with a Cronbach's alpha value of .92.

The other management practices measures (training and employee commitment) was adapted from the scale developed by Vinodkumar and Bhasi (2010). The training scale used in study conducted by Vinodkumar and Bhasi (2010) involves six items with a Cronbach's alpha value of .82, while the employee involvement scale involves five items with a Cronbach's alpha value of .69.

The measures for food handlers' commitment were adapted from the scale developed by Ungku Fatimah, Strohbehn, and Arendt (2014). The food handlers' commitment scale used in study conducted by Ungku Fatimah, Strohbehn, and Arendt (2014) involves five items with a Cronbach's alpha value of .92. Details of all scale items shown in the questionnaire (Appendix 4.1).

The questionnaire was administered to 20 food handlers from different food manufacturing firms, followed by a conducting of semi-structured face-to-face individual interviews to get valuable feedback and to ensure that the scales are clear, legible, and have the best suitable items. After analysing the focus groups discussions, the questionnaire was designed, sent to research experts and food safety experts, and then translated to Arabic and Hindi languages. Afterwards, a piloting test was conducted.

The feedback received was considered and action taken to finalise the questionnaire (in three languages: (English, Arabic and Hindi, see Appendix 4.12 & 4.13). and distribute it to the participants. The availability of the questionnaire in three languages was to facilitate access since some food handlers among the participants who do not speak English.

Valued and new understanding of the research topic, concepts, and hypotheses pertaining to the exploratory approach can be obtained from the focus groups' interactions (Stewart & Shamdasani 1990).

Therefore, two focus group interviews were used in this research (see the details of focus group interviews). Furthermore, high reliability and validated scales drawn from previous different studies have been verified by research and food safety experts to ensure clarity as well as validity with the aim of improving the design of the final version of the questionnaire.

It is assumed that other research methods like interviews or case studies would not have the same status as that of the questionnaire concerning the quantity of data collection that requires the explanation of the association between the studied variables. According to the feedback obtained from the first focus group and literature review, the management practices and commitment items in the questionnaire are well-developed.

A survey containing cross-sectional research takes a short time in terms of data collection. Researchers adopting cross-sectional survey in their research design are interested in variation (Bryman & Bell 2007, p. 55). In this research, there is an interest in variation; therefore, an adequate sample has been used to compare between the responses, and a seven-point rate scale has been used in the questionnaire.

Food safety performance has also been directly assessed by the Dubai Municipality Food inspector concerning the implementation of safe food procedures, food processing, finished products, and food safety documents. In other words, the food inspector's task involved people (food handlers), process, and products during the assessment time.

Seven items/statements were extracted from Dubai Municipality official master inspection checklist through the second focus group outcomes as proposed by Yiannas (2009).

These items had been used by the food inspector to assess food safety performance in each food-manufacturing firm using the following scales: A 7-point scale, ranging from ‘strongly poor performance’ (1), ‘moderately poor performance’ (2), ‘slightly poor performance’ (3), ‘neutral’ (4), ‘slightly excellent performance’ (5), ‘moderately excellent performance’ (6) to ‘strongly excellent performance’ (7).

The extracted seven items/statements mentioned below were used in the food safety performance checklist and the food manufacturing firms’ characteristics such as the number of food handlers, location in specific zones, risk category, firm ownership, and the number of running years.

- 1) Food handlers demonstrate food safety knowledge and competency.
- 2) Food handlers demonstrate good personal hygiene.
- 3) Food handlers demonstrate safe behaviours (practices).
- 4) Food safety management system (HACCP) measures or checks are implemented, updated, monitored, verified, validated and documented.
- 5) The results and scores of internal, external, and regulatory food safety audit.
- 6) The trend of recall cases, expired, and returned of finished food products.
- 7) Finished food products comply with specification and standards.

The food inspector used the food safety performance checklist and measured the performance. As for the food manufacturing firms’ characteristics, they are as follows:

Number of food handlers (30 food handlers or less, 31- 60 food handlers, 61- 90 food handlers, more than 91 food handlers)

Location (specific industrial zone, non-specific industrial zone).

Risk category (high risk, low risk).

Firm ownership (local ownership, non-local ownership).

Number of running years (three years or less, 3-5 years, 6-10 years, more than 10 years).

HACCP certified (three years or less, 3-5 years, 6-10 years, more than 10 years).

After reviewing the focus group outcomes, literature review, experts' contributions, and pilot outcomes, twenty-nine items were developed for each construct, and they are as follows: Organisational management support (7 items), communication (6 items), training (6 items), employee involvement (5 items), and commitment (5 items).

#### **4.9.1 Scales**

It seems that there is no standard for the rating scale points, and the basic practice differs generally. In fact, the literature proposes that some scale lengths are desirable for improving reliability and validity (Krosnick & Presser 2010).

After comparing the mean score between the 5- and 7-point scales, it appears that both scales created the same mean; whereas, there were lesser relative means created by 10-point scale than the 5- or 7- point scales.

Furthermore, the most common scales are 5- and 7-point scales according to relevant literature. Generally, the simulation and empirical studies agree that using 5- to 7-point scales improve reliability and validity compared to scales with lesser scale points. However according to Dawes (2012), no reliability and validity are achieved by the scales.

Cox (1980) concludes that the perfect point scale options focus on 7, with exceptions where the scale is less (5) or more (9). Similarly and significantly, odd-number of choices may be also taken into consideration and may be preferably used because there is the chance of neutral responses. The literature proposes that the five-point scale has all the earmarks of being less confusing and of boosting the response rate (Babakus & Mangold 1992). In European surveys, the five-point scale has been recognised as more suitable (Devlin et al. 1993).

Utilising 5-point scales will not necessarily and evaluate participant responses precisely. This finding supports the conclusion that the 7-point scale gives a more precise measure of a participant's true evaluation and is more proper for electronically-distributed questionnaires which are administered unsupervised (Finstad 2010).

Research confirms that data from Likert items turns out to be fundamentally less precise when the scale points number focuses falls under five or over seven (Johns 2010). According to relevant literature, the seven-point scale is supported; however, the prevalence of five-point scale the adoption of seven-point scale less justified (Preston & Colman 2000). Based on the above, the researcher has adopted the 7-point Likert in the questionnaire.



### 4.9.2 Questionnaire Data Coding

The response data collected through the questionnaire was coded by applying a definite procedure before inserting the data into the SPSS software. For instance, abbreviations are assigned to all variables such as management practices (Questions1-24) which cover (organisational management support - OMS) in (Questions1-7), (communication - COM) in (Questions8-13), (employee involvement - EMP) in (Questions 14-18), (training - TRA) in (Questions 19-24), and commitment (CMT) in (Questions25-29).

For instance, the code of the first item in training is TRA1 and the code of second item in communication is COM2, and so on and so forth. Also other variables of demographic and food manufacturing firms characteristics were coded in the same way. For instance, SEX, NAL, AGE, EXP for the four demographic questions related to sex, nationality, age, and experience.

Furthermore, NFH, LOC, RISKC FIROWN, NRY, and HACCP are assigned to food manufacturing firms' characteristics questions related to number of food handlers, location, risk category, firm ownership, number of running years, and HACCP certification.

As for the data related to demographics (the food handlers' characteristics), management practices (organisational management support, communication, training, and employee involvement), commitment, and food safety performance, it is distributed as follows:

Demographic questions (Q 30-33):

- Sex coded as (1) Male, (2) Female
- Nationality coded as (1) Arab, (2) South Asian, (3) East Asian, (4) Others.

- Age coded as (1) Under 26, (2) 26-40, (3) 41-55, (4) Over 55.
- Experience (Years) coded as (1) 1-3, (2) 4-6, (3) 7-9, (4) 10 and over.

The Food manufacturing firms' characteristics questions are coded as follows (Q 34-39):

- Number of food handlers coded as (1) 30 or less, (2) 31- 60, (3) 61- 90, (4) More than 91.
- Location coded as (1) Specific Industrial Zone, (2) Non-Specific Industrial Zone.
- Risk category coded as (1) High risk, (2) Low risk.
- Firm ownership coded as (1) Local Ownership, (2) Non-local Ownership.
- Number of running years coded as (1) 3 years or less, (2) 3-5, (3) 6-10, (4) More than 10.
- HACCP Certification obtained for (1) 3 years or less, (2) 3-5 years, (3) 6-10 years, (4) more than 10 years.

The items of management practices (Q1-24), commitment (Q 25-29), and food safety performance (Q40-46) are coded based on 7-point scale, ranging from (1) to (7).

Abbreviations assigned to food safety performance construct (OFSP) and its items are as follows: OFSP1, OFSP2, OFSP3, OFSP4, OFSP5, OFSP6, OFSP, corresponding to ‘food handlers demonstrate food safety knowledge and competency’, ‘food handlers demonstrate good personal hygiene’, ‘food handlers demonstrate safe behaviours (practices)’, ‘food safety management system (HACCP)’ ‘measures or checks are implemented, updated, monitored, verified, validated and documented’, ‘results and scores of internal, external, and regulatory food safety audit’, ‘trend of recall cases’, ‘expired, and returned of finished food products’, and ‘finished food products comply with specification and standards’, respectively.

#### **4.9.3 Questionnaire Validation**

The questionnaire was sent to 7 academicians, 3 food safety researchers (referred to in this research), and food handlers in food manufacturing firms. The feedback received has been examined, and the questionnaire has been updated accordingly.

The following are suggestions for further improvements of the questionnaire:

- Designing a covering letter that spells out the instructions for the respondents/participants and states what the questionnaire is going to measure;
- Including three open-ended questions in the questionnaire
- Reducing the size of the table columns; and
- Shifting the demographics information to the last section of the questionnaire.

#### **4.9.4 Construct Validity and Reliability**

When the same results are consistent and generated at different times, it may be said that this is a repetition and the measure is described as reliable. Internal consistency indicates whether or not the reliable survey items are designed to measure the same construct. In case the items intended to test the same construct produce similar scores, the internal consistency will be high.

Several measures used to assess internal consistency are generally based on assessing how the gained responses are associated and how thoroughly the items predict each other. To use the internal consistency measures perfectly and avoid confusing variables, items must be in a single measurement instrument and should be given to a group of people at one time. If the measurement results of the obtained item responses at one time have a high score and associated with one another other, validation may persist.

No internal reliability (consistency) takes place when the test result is 0; however, perfect reliability occurs when the result test is 1. The minimum alpha value recommended by Nunnally (1978) is .70. In some cases, however, lower values are permitted when, for instance, the component includes two items only.

In quantitative research, reliability plays a significant role because it is expected that the study results could be repeated. There are four issues affecting reliability negatively: respondent bias and error and researcher bias and error (Robson 2002). Therefore, it is hard to create stability in cross-sectional research as there will be little difference in the results if the researcher repeats the survey after some time.

Reliability refers to consistency of the questionnaire questions to create consistent outcomes with various respondents and under various settings. It is consequently associated with the vigor of the questionnaire and, specifically, regardless of whether it will create consistent findings at various circumstances and under various time (Saunders et al. 2016).

As a result, despite the fact that the question is reliable, this does not by any measure make a difference when the question is without internal validity, as this absence of validity will not have the question answered. Thus, the questionnaire reliability should be ensured to make the respondents understand the question in the same way as intended by the researcher. To measure the reliability of questionnaires, three approaches are available: test-re-test, internal consistency and alternative form, Mitchell (1996).

The test-re-test approach assesses the reliability by correlating the collected data when the researcher administers the same questionnaire to respondents twice under dissimilar conditions (Saunders et al. 2016). Applying this approach has prompted some difficulties as it is extremely difficult to convince the respondents to fill in the questionnaire twice.

Further, the chances to ask the respondents to fill in the same questionnaire twice are less, especially if the interval period between administering the questionnaires is long. Therefore, this approach may be utilised as a supplement to other approaches rather than used alone.

The internal consistency approach assesses reliability by correlating responses and questions with one another in the questionnaire. Therefore, the consistency of responses is measured across the subgroup of questions. There are several methods available to compute internal consistency, but the common one is Cronbach's alpha.

Usually, this method is applied to check the consistency of responses against a group of questions that combine to form the scale in order to measure a specific concept. The alpha coefficient value ranges from 0-1 and values above 0.7 mean that the items work together as a scale to measure the same thing. In this research, the Cronbach's alpha has been adopted as it easy to apply for measuring reliability.

“Alternative form” is the third approach for reliability testing. This can be conducted through comparing the responses to alternative forms of the same question or groups of questions. It is regularly hard to guarantee that these questions are equivalent. The respondents may feel tired due to the length of the questionnaire because they need to answer the same questions in different forms. This may lead the respondents to simply refer back to their previous answer.

Internal validity refers to the questionnaire ability to answer what the researcher is supposed to measure and refers to the questionnaire findings which are meant to represent the reality of what the researcher is measuring.

Content validity, criterion related validity, and construct validity are types of validity for a questionnaire. Content validity, this type alludes to the questionnaire ability as measurement tool to give the investigated question with sufficient coverage that can be complete through various ways. For instance, concluding cautious definition of the research by reviewing the literature carefully, particularly the proper earlier discussion with others and utilising a panel of persons to evaluate every question in the questionnaire as essential, useful but not essential or not necessary.

Because of the significance of approving the questionnaire questions ability in the investigative research questions measuring and constructs; the relevant types of validity: content and construct were applied in this research.

As for the content validity, it was completed through reviewing the literature carefully, particularly previous studies, discussions with food safety experts and academic researchers to evaluate the convenience and propriety of questions and their suitability to the topic of this research. The researchers usually refer to content validity while validating questionnaires to determine the sufficiency of the measurement questions used in the questionnaire (Cooper & Schindler 2008). In this research, the researcher uses the same and confirms content validity.

Criterion-related validity (predictive validity) refers to the ability of measures (questions) to do precise future predictions. This indicates that data collection from the questionnaire is used for predictions, and then the criterion-related validity test is the degree of future prediction prompted by the responses.

The criterion-related validity assessment is achieved by comparing the data obtained from the questionnaire with that specified in the criterion. In this regard, statistical analysis such as correlation is usually used.

In assessing research measures, the construct validity is the greatest significant objective. Construct validity indicates the approximate truth of whether the operationalization of a measure precisely reflects its construct or not. In this research, the constructed validity is supported by the two focus group interviews and consultant experts (Dubai Municipality the governmental food safety control). Furthermore, the scales are checked by research experts and food safety experts to ensure the construct validity for other constructs.

Construct validity implies that a test that is intended to measure a specific construct is truly measuring that construct, which consists of two types of validity, namely convergent and discriminant validity.

In the case of convergent validity, the two items (measures) intended to measure the same construct show that they are related, while in the case of discriminant validity, the two items are not made to be related and are in fact unrelated.

For outstanding construct validity, both types of validity are recommended. To ensure the used questionnaire is measuring what it is supposed to measure, construct validity (convergent validity and discriminant validity) has been applied in this research.

Heeler and Ray (1972) assert the importance of validation as the studies should have tolerable standard to support operational application and should not accept research with no appropriate scientific measures. Measures with poor indicators that are allegedly seeking to measure should be avoided, and a measure is considered dependable when it equally achieves validity and reliability.

It gives the assessment that the construct's indicators have a high level of variance in common and can be assessed through the following: To establish high convergence on a common point, the standardised factor loading must surpass .50; however, .70 is considered perfect (Hair et al. 2006).

The average of the squared factor loading for each construct is the definition of variance extracted, which is calculated by taking the total of all squared standardised factor loadings and divided by the items number (Hair et al. 2006). The convergence is described as adequate when it indicates to .50 or more. The degree to which a construct is strictly dissimilar from other constructs is discriminant validity (Hair et al.2010, p. 689).



Supporting the argument that the construct is distinctive and that it measures something that other constructs do not, then the scores of the two constructs as not associated positively are described with high discriminant validity. Acceptable discriminant validity is considered once the results of the square root of the average variance extracted for each latent variable indicates in a measurement model containing latent variables more than any of the bivariate correlations involving the latent variables in question (Fornell & Larcker 1981).

#### **4.9.5 Final Questionnaire Design and Structure**

The final questionnaire was finalised after incorporating certain design features based on academic experts, food safety experts, and food handlers' feedback from the food handlers. The following criteria have been used to evaluate the design of questionnaire before administering the final version:

1. It is clearly mentioned in the questionnaire covering letter that the survey is about the influence of management practices on food handlers' commitment to implement safe food procedures;
2. The language used throughout the questionnaire is legible to food handlers, and the questionnaire is translated into different languages for accessibility and fairness;
3. The questions in the questionnaire are short in order to motivate the respondents to answer properly;
4. Not only the extremes points were labeled, but also all rating points were labeled.

Therefore, the participants will have comparable clarification, as every point is important;

5. A number of reverse coded questions (not big number that could bother or confuse the respondents) are incorporated in the questionnaire. The aim is to keep the food handlers focused and to assist the researcher in evaluating the respondents' reliability;
6. To assist the food handler in recording their answers in simple way, each point in the rating scale is numbered for the question, and food handlers are asked to select a suitable number in each question. Furthermore, this way assists the researcher in inserting the results easier in the spreadsheet;
7. To prevent the participants from forgetting to answer a question and select the answer easily, the shading (on/off) across three rows is utilised to enable the respondents to provide answers in the rows;
8. To inspire the respondents to keep on answering the questions to the end of the questionnaire and to ensure that they do not miss any of pages in the questionnaire, the questionnaire was numbered at the bottom of each page in the form of x of y;
9. A reminder statement is put at the end of the questionnaire to make sure that all questions are answered and that there is not an extra answer for each question;
10. The beginning of the questionnaire states the purpose of the study, and the last section of the questionnaire consists of closed-ended questions that focus on demographics; and
11. All questions in the questionnaire of management practices and commitment are related to research questions, hypotheses, and objectives. Therefore, these questions are utilised and applied in further statistical tests, and 'fitness for purpose' must be the guiding the principle. (Cohen et al. 2007, p. 98).

#### **4.9.6 Administration of the Questionnaire**

The management of food-manufacturing firms in the research sample was contacted and the questionnaire to be administered, along with the objectives, goals, and time frame for completion, was explained. An email was sent to food manufacturing firms seeking permission for survey voluntary participation (Appendix 4.14). Permission was granted, with a confirmation of the date and time of submitting the questionnaire, and a person was appointed to oversee the administration of the survey.

The researcher printed out enough copies of the questionnaire in the three languages. Next, the questionnaire was handed to the participants in the presence of the researcher. The food handlers were given adequate time to complete the questionnaire, and the researcher confirmed that results of the questionnaires would be treated with strict confidentiality.

To facilitate a better response rate and overcome any barriers, the researcher was present in the food manufacturing firms. After the food handlers completed the questionnaire, they returned it to the researcher, who verified it to ensure that the questions were completely answered to avoid any missing data.

#### **4.9.7 Rationale for Survey Approach**

The questionnaire is part of the survey and has been administered to food handlers working in food manufacturing firms in Dubai, UAE. This took place after the initial contact with the management of food manufacturing food firms. A hard copy of the questionnaire was handed to both food handlers and management at a convenient time.

There are many potential advantages of using a questionnaire in a research. For instance, it is inexpensive and the results can be obtained quickly. The presence of food handlers in the firm reduces any issues relating to misunderstanding a question, and this has encouraged the respondents to complete the questionnaire and increase the response rate. Furthermore, the researcher ensures that only the targeted population (food handlers) should answer the questions not others like the unemployed or the elderly.

Another advantage of adopting a questionnaire in research is that it can cater for a large population without any problem. Conducting face-to-face interviews in doctoral research would be difficult as it is costly and time-consuming; a large number of respondents necessitates more time.

In explanatory research, using questionnaires is appropriate as closed questions are expected to be used more than open-ended questions (Saunders et al. 2009). In fact, closed questions have several advantages. For example, it may be completed in a very short time; it is fast; data is quantitative and can be computed; it is analyzable; and it is comparable.

Another advantage is that the research is easy to repeat. However, in the open-ended questions, it is difficult to quantify and analyse the data as it is qualitative. This type of data is difficult to compare with other set of data, and the interviewer could interpret the data other than what the participant intends.

Using the questionnaire generates details of food handlers' perception of management practices and explains the association between the variables of the study. The feedback has already provided insights into food handlers' implementing of safe food procedures.

To encourage the respondents not to discontinue the process of answering or giving up before completing all questions, the questionnaire is designed in a simple and friendly way. Otherwise, this may restrict the questionnaire to produce the desired quantity of data.

However, once the management of food manufacturing has consented to take part in the survey, their acceptance has motivated the food handlers to follow suit and complete the questionnaire. The presence of researcher and his explanation of the instructions to the management of food manufacturing firms on how the questionnaire ought to be filled help in overcoming any obstacles that may stand in the food handlers' way of understanding the questions.

The questionnaire design was perfectly considered to guarantee that it looked appealing in such way that the instructions are clear, the translations are legible, and the questions are short and clear and cover the research questions. The respondents' feedback prompted potential issues to be dealt with before launching the full study.

#### **4.9.8 Data Collection & Analysis**

Since it is difficult to adopt any scale in its unity as a complete scale from previous studies in the available literature, generating items began by considering literature on scales developed even in non-food safety studies. The aim is to find scales that could assist in measuring the influence of management practices on food handlers' commitment to implement safe food procedures. Some studies found constructs that are different from management practices and tried to link these management practices with employees' commitment but not in food safety area.

There are no studies on scales with specific management practices concept designed for measuring the influence of management practices on handlers' commitment and directing their behaviour towards implementing safe food procedures.

Furthermore, there are no studies that link management practices to food safety performance through the food handlers' commitment in food-manufacturing firms. Therefore, the constructs in the different scales found in the literature adopted and adapted to make them complement each other to answer the questions raised in this research.

Some parts of high reliability and validated scales have been adopted from previous studies and checked by research experts and food safety experts to ensure clarity as well as validity. Furthermore, two focus group conducted to support the literature analysis and to gain more information from the participants to support the research aims, which validated the draft survey instrument that had been based on the literature.

The scale items for management practices, commitment, and food safety performance have been finalised with the assistance of the following sources: Ungku Fatimah, Strohbehn, and Arendt (2014); Vinodkumar and Bhasi (2010), while the food safety performance items have been extracted from Dubai Municipality checklist which is accredited from international health organisations and used worldwide, as proposed by Yiannas (2009).

The researcher considered the checklist provided by Cohen et al. (2000, p.246) to assess the questionnaire effectiveness and suitability of design. This checklist includes the clarity of the questionnaire purpose, the items to be incorporated in the questionnaire, and the type of questions. Generally, the Likert and seven-point-rating scales utilised in questionnaires are appropriate because the respondents are familiar with such arrangement.

Another advantage of rating scales worth mentioning is that information is delivered in a frame that is effectively changed for statistical analysis on the computer. While there are no standards decision frame that direct the researcher to select the appropriate statistical test, Pallant (2006) states that understanding the research questions, the type of items, and the nature and level of measurement of each variable are important in a statistical test selection. Some classical assumptions should be considered and complied with as required for each statistical test.

To make sure that the approach is correct, these assumptions about data should be checked prior to test selection according to Field (2009). Normality and reliability as preliminary tests can be tested prior to conducting the main inferential statistical testing.

Three interlinked issues of missing values, which include causing obstacles in data analysis and management, reduce efficiency and influence the results due to the difference between missing and complete data.

Missing data may be attributed to human error or hardware defect, and this problem may be solved through many techniques. For instance, imputation may be used (closest value, or mean value or median value) to replace the missing values (Waqas et al. 2016). Semi-structured face-to-face individual interviews have been conducted to get feedback and to guarantee that the scales are clear, legible, and have the best suitable items. In addition, feedback is used to validate the draft questionnaire design and to get new ideas for enhancement.

The results of the individual interviews enriched the researcher's comprehension of the issues in question and gave a valuable reference source throughout the research process. According to the procedures recommended by Dillman (2007), the obtained data was coded and entered into Statistical Program for Social Science SPSS (Version 23).

This research uses the principal components of Promax Rotation Exploratory Factor Analysis used to decide the correlation between the observed variables and to give a factor structure (makes gathering of variables according to strong correlations). This was followed by confirmatory factor analysis. To check whether the responses were in the accurate range and to discover entry of double data, frequency analysis was implemented to all questionnaire items. The Summary of the collected data was done by descriptive statistics with mean, standard deviation, frequency, and percentage.

Cronbach's alpha was calculated to check the internal consistency of each construct to evaluate the instrument of reliability. Construct validity was evaluated using AMOS statistical software. The degree to which a set of test measures precisely represent the concept of interest is known as construct validity (Trochim & Donnelly 2007). Convergent and discriminant validity were tested as they are the most two broadly recognised forms of construct validity (Hair, Black, Babin, & Anderson 2010).

To estimate the constructive validity, many techniques were implemented using factor loadings as the standardised factor loading that must exceed .50; however, .70 is considered perfect and the convergence is described as adequate when it veers towards .50 or more (Hair et al. 2006).

Discriminant validity was evaluated by comparing the average squared correlations or coefficient between two constructs with the average variance extracted values for these two constructs. Acceptable discriminant validity is considered once the comparing results of the square root of the average variance extracted higher than the average of squared correlations (Fornell & Larcker 1981; Hair et al. 2010). When the degree in one construct is distinct from different constructs, it is called discriminant validity.



The construct is described with high discriminant validity when it is proved that that the construct is extraordinary and holds some phenomena, whereas different measures cannot do (Hair et al. 2010).

The general method applied to assess the models, even those with a complexity of research questions, hypothesis, and multidimensional and highly interrelated relationships issues, is structural equation modeling (SEM). The SEM can address these issues in smooth manner through friendly software user analysis of moment structures (AMOS) (Gallagher, Ting, & Palmer 2008).

The study model in this research incorporates the constructs of management practices, commitment, and food safety performance. These include the hypothesized causal relationships between management practices, commitment, and food safety performance, which were constructed and examined.

In this study, the observational unit and unit of analysis are the same for the two variables (management practices and organisational food safety performance) and both variables are attributes of the organisation. However, the food handlers' commitment is nested within organisational level, so the observational unit is the employee (individual) but the unit of analysis was the organisational level, as five food handlers with HACCP training were selected to represent their organization, and their individual scores were averaged to represent the average commitment level of food handlers in the organization.

Mainly, the concepts of both sampling and generalisation unit are related especially in studies that utilise inferential statistical analyses and are recommended to be with the unit of analysis of the study level (Dolma, 2010).

Because the unit of generalisation in this research was at organisation level, the unit of analysis of all three variables in this study were organisational level (Kenny, 2016). As the study investigate the relationship between the management practices and food safety performance in the food-manufacturing firms, it would not be notable if few numbers of firms selected with high number of employees. Therefore, this point was considered and the sample was 189 (HACCP Certified) from the total population (276) food-manufacturing firms and the questionnaire was distributed to five food handlers in each food manufacturing. Organisational food safety performance measured one time for each firm from the sample by the food inspector using a questionnaire designed that extracted from Dubai Municipality Checklist as proposed by Yiannas (2009).

#### **4.10 Sample Composition and Size**

The food-manufacturing firms in Dubai constitutes the target population in this study and the food handlers; that is, those who have role and experience in food manufacturing and are HACCP trained in these firms.

The researcher clarified the aim of this study, questionnaire distribution procedure, and confirmed that the survey would be treated in strict confidentiality. The researcher did not send follow-up emails as the food manufacturing firms showed high willingness and acceptance to participate, judging from the first email. A total of 189 food-manufacturing firms (HACCP Certified) accepted to participate in this study. In fact, the food-manufacturing firms showed their willing and interest to participate even during their peak time in the workplace.

After determining the outcomes of the second focus group interviews and discussing the Dubai Municipality checklist and literature review of food safety, the study model was confirmed and 7 lagging and leading indicators were selected. These indicators were used to measure the food safety performance within the food-manufacturing firms.

Food safety experts mainly depend on outcome-based measures (lagging indicators). For example, foodborne illness surveillance measures were used to assess the conflict movements against the foodborne disease. Such data is useful to determine the trend of foodborne disease across the years and to assess the movements being achieved in decreasing foodborne disease.

In other words, this measure evaluates the strategies followed to minimise the rate of foodborne illness and launch the priorities. As the lagging indicators are not adequate, focusing on leading indicators such as process management and people behaviour management is vital. The leading indicators are important because they proactively reduce the foodborne disease rate (Yiannas 2009).

Using a mixture of lagging and leading indicators will assist in managing food safety risks and increasing food safety performance. Therefore, using an effective measurement will show the level and trend of organisational food safety performance which will, in turn, allow for comparison and innovation to assist the food handlers in doing the right thing.

A sample is defined as a group of respondents, for instance, an individual participant or an object that is selected as representative of an entire population (Bordens & Abbott 2002). It is also defined as the technique for selecting the population sample (Moser & Kalton 2001).

The population is a complete set of cases from which the sample is drawn. Population does not reflect people only but also quantity of the things or cases that are the subject of the research. The Sample is part of a population (Walliman 2011). Each element or unit in the population has equal chance to be selected in the sample when probability sampling is used (Battaglia 2008).

Through sampling, the researcher can gather smaller amount of data which represents the entire population. Implementing sampling technique is necessary to lessen the study costs, to obtain data collection faster, and to gain more precise results. In other words, this technique will provide adequate time to gather more detailed data by professional researchers and to obtain data under more difficult conditions (Saunders et al. 2012).

The sample size partially affects the statistic test that is applied to evaluate the statistical significance of relationship between the variables (Saunders et al. 2016). Therefore, using a small sample can prove difficult to gain a significant statistic test. However, less clear differences and relationships become statistically significant once the sample size is increased. Furthermore, any differences and relationships will almost become statistically significant in cases where large samples are used.

Once the selected sample is closer to the population, the less clear differences and relationships become more significant. As a result, using a large population sample leads to highly sensitive statistic test, as opposed to the smaller one that leads to insensitive statistic test (Saunders et al. 2016). The sample size can be calculated using several approaches. For instance, it may be calculated using a formula established by Krejcie & Morgan (1970). The most well-known formula has been established by Cochran (1963) and it is specifically used for a large population (Kasiulevicius, Sapoka, & Filipaviciute 2006).

Most researchers in business and management studies are satisfied to estimate the population's characteristics of its true estimated value with a margin of plus or minus of 3% to 5% (Saunders et al. 2012). According to a great deal of research, the minimum sample size is calculated by considering 5% margin of error and 95% of confidence level. For the purpose of generalisation to the entire population, it is important that respondents are randomly selected and that the sample represents the population. For instance, if the survey were implemented 100 times, the data would be within 5% margin of error plus or minus the percentage reported most of the time (95 of the 100 surveys).

In this research, the population consists of 276 food-manufacturing firms in Dubai, and the sample size required according to Krejcie and Morgan (1970) formula is 161 firms. The sample size calculator in the following link ([www.surveysystem.com/htm](http://www.surveysystem.com/htm) 2012) validated the required sample size of 161 firms. Based on this research questions and objectives, the sampling stages began by identifying the proper sampling frame that includes the full set of all cases in the population where the sample was taken.

The sample frame was the complete, accurate, and updated list of food manufacturing firms licensed by the concerned authorities located in Dubai. This is to ensure that all cases have been included in the population and have a chance to be selected, and that the sample is representative to generalise the findings to the entire population.

There are two sampling techniques: probability or representative sampling and non-probability sampling. Each element selected from the population is predetermined, and most of the times equal to all elements in probability sampling.

Hence, there is a probability to accomplish the associated objectives that require the researcher to estimate statistically the population characteristics based on the selected sample and to answer the research questions. In contrast, there is no probability to achieve the same in non-probability sampling technique.

Survey and experimental research strategies usually use probability-sampling technique. Unlike probability sampling, the non-probability samples technique enables the researchers to generalise from the sample about the population but without statistical grounds (Saunders et al. 2012). In any probability sample, the generalisations from data collected about populations are built on statistical probability. There is likely a lower error in generalising to the population when the sample's size is large.

The data analysed should be distributed in a usual way in order to avoid any false results. Convincing results will be obtained after statisticians have verified that the larger a sample size is, the closer to normal distribution the results are.

The statisticians have proved that the sampling distribution for the mean that is very close to a normal distribution would usually occur at sample size of 30 or more. According to Stutely's (2003) recommendation, a minimum number of 30 for statistical analyses is a good example for every group in the entire sample.

The 95% certainty level used by the researcher means that if the sample is selected 100 times, the minimum 95% of these samples will surely represent the population characteristics.

The most significant feature of a probability sample is representing the population. When a probability sample accurately represents the population from which it is drawn, this phenomenon is known as a perfect representative sample.

Therefore, the researcher considered this in questionnaire design stage to achieve a high response rate and thus to confirm the representativeness of the selected sample. As Neuman (2005) suggests, the response rate calculation is to be included in the research; therefore, in this research the response rate is 68.47%. The actual sample size can be calculated once the estimation of the likely response rate and the minimum sample size have been completed.

The response rate for most academic studies is approximately 35, which is considered reasonable (Baruch 1999), while Neuman (2005) proposes that the response rates for postal questionnaire surveys and for face-to-face interviews range between 10 and 50 %, and up to 90 %, respectively.

Comparing with other multivariate approaches, SEM is more sensitive in some ways to sample size, as some of the statistical algorithms are unreliable when small samples are used in SEM programs. Like other statistical methods, the sample size gives a solid foundation for the sampling error estimation. Therefore, what the sample size in SEM needs is to obtain critical dependable results, which is an important issue (Hair et al.2010).

Ideas concerning the minimum sample sizes are different and the guidelines suggested differ according to analysis procedures used and to the characteristics of the model. (MacCallum 2003; MacCallum et al. 2011).

The multivariate normality, estimation technique, model complexity, missing data, and the average error variance of indicators are factors that affect the sample size required for SEM. As the deviation of data is more related to the assumption of multivariate normality, the respondents to parameters ratio needs to rise. To minimise the issues with deviations from normality, 15 respondents for each parameter estimated in the model are generally accepted.

Even some estimation procedures are particularly established to be dealt with no normal data, providing adequate samples size is continually recommended to minimise the impact of sampling error (Wang et al. 1996).

The maximum likelihood estimation (MLE) is the paramount shared SEM estimation procedures. The simulation studies propose that MLE gives valid and stable results when small sample sizes are used, for example, 50 under ideal conditions. Moving away from the ideal conditions but with strong measurement and no missing data, the confirming stable MLE solutions require the minimum sample sizes to rise when faced with sampling error (MacCallum 2003).

With less ideal conditions, providing a sound basis for estimation can be achieved using a sample size of 200, but the method becomes more sensitive and nearly no difference is detected, making goodness-of-fit measures suggest that poor fit occurs when the sample size is more than 400 (Tanaka 1993).

As the model is simple, the needed samples to test are small. Therefore, the larger sample should be used in cases where there are more measured or indicator variables. The complex model such as the one that has more constructs with more parameters to be estimated and constructs with measured variables less than three needs a larger sample size. The sample size role is to generate more information and high stability.



Dealing with missing data leads to a decrease in the size of sample to some level from the original number of cases. The researcher should ensure that a plan is in place to rise the sample size to solve any missing data issues dependent on the approach adopted, the expected amount of missing data, and issues increasing the amount of missing data.

Recent research shows that the communality concept is a more appropriate method that can be applied to sample size issues. Communalities exemplify the average quantity of variation between the indicator variables explained by the measurement model. The calculation of communality of an item can be directly achieved as the square of the standardised construct loadings. Research indicate that when the communalities become smaller (the unobserved constructs are not explaining as much variance in the measured items), larger sample sizes are required.

Larger sample sizes are required for the models containing multiple constructs with communalities less than .5 to achieve convergence and model stability (Enders and Bandalos 2001). Having only one or two items in a construct form emphasises the issue.

Despite the slight agreement on the recommended size of sample for SEM (Sivo et al 2006), a ‘critical sample size’ of 200 was suggested by Garver and Mentzer (1999), and Hoelter (1983) and it is common that the sample size above 200 is recognised to achieve an adequate statistical power for data analysis. To attain a preferred level of statistical power along with a given model before collecting data, it is proposed that it is vital to decide the minimum sample size required (McQuitty 2004).

In general, it is agreed upon that the value consists of 10 participants for each free parameter estimated even though the size of a sample is influenced by the data normality and the used estimation method (Schreiber et al. 2006).

In the research set up, the researcher should identify and determine the suitable reality as it is a significant step. A great deal of research works with a vague population of objects and without any indication of the size of the sample under study.

The large diversification of the population makes the sample inconsistent and estimation biased concerning the phenomenon under study due to the very heterogenic variables such as industry, position, experience, and so on and so forth. Another vital step is that the identifying respondents' number is not the reality the researcher desires to examine. Rather, the sample that is representative is part of the objective reality that the researcher actually strives to identify. The acceptable starting level of self-reported studies which deal with cross-sectional data is 15% (Hair et al. 2010).

Suitability of the utilised sample size and model should be considered by researchers in the following way: Comparing with the observations number, what is the suitable size of sample that represents the business reality? Comparing with the obtained sample size, what is the suitable indicators number to be estimated in a proposed model? (Baumgartner & Homburg 1996).

Providing a strict solution for the required observations number in SEM cannot be fixed easily, just through the rule of thumb or a given formula. There is no general rule of thumb or formula which can give an exact solution for the necessary number of observations in SEM. The multivariate normality of data; the estimation technique; the amount of missing data; and the average error variance among the reflective indicators are specific considerations that have impact on the size of sample for SEM (Hair et al. 2010).

Any maximum likelihood estimation (MLE) will provide biased results in case the data is not distributed normally. Nevertheless, moving toward larger samples sizes will increase MLE sensitivity.

Academicians and researchers look at the complexity of models as a major area of concern because complexity of models, especially when dealing with scale development, can be problematic. With larger samples, complex models can be tested, and with smaller one the simpler models can also be tested. The model must not be complex or simple. For example, in case of dealing with multi group moderation, the sample size definition for each group should be based on sufficient large samples to overcome any complexity in the established model.

The generalisation of results, the power analysis of model testing and the reliability of the parameters' estimation are influenced directly by the size of sample. The larger the sample, the better the results. However, achieving a large sample may be a challenging task.

Getting the right sample size is significant and can be reached and allowed for the derivation of precise results. In this context, there are two schools of thought: The first one deals with the question of appropriate sample size as isolated terms, while the second deals with the relation of the number of parameters to be estimated. Examples of the first school includes Ding et al. (1995) who proposes using at least 100-150 respondents; Kline (2005) proposes at least 200.

No exact sample size is fit to all SEM applications as explained in the second school according to Baumgartner and Homburg (1996). Calculating the ratio of sample size to the number of parameters estimated was recommended by Bentler and Chou (1987). Enhanced results can be achieved in the case of a higher ratio.

The sample size requirements are well-valued in SEM-based image research. 8.1%, 38.3% had a ratio of sample size to parameters estimates as low as 5 and as low as 10, respectively. As for parameters estimates above 60%, they have a valued sample size requirements as proposed by Bentler and Chou's (1987). However, Martinez-Lopez et al. (2013) found the ratio smaller than 10 in 70% of the marketing works reviewed.

Compared with SEM in overall marketing research, the most outstanding improvement of the data issue is sample size. In the latest review of SEM application, the ratio of sample size to the number of parameters estimated is higher than the one computed in marketing and greater than the limit points of 5 and 10 proposed by Bentler (1985) and exceeds the 10 limit points in more than two-thirds of the works reviewed. Bagozzi and Yi (2012, p. 29) assert that the ratio of sample size to the parameters to be estimated is 2:1 in order to obtain satisfactory models.

Along with the raised discussion on sample size to a number of parameters estimated, the complexity of models has also raised discussions. Improvement of sample size concerning the number of respondents is not adequate for obtaining genuine results, for additional parameters to estimate per model are needed compared to previous reviews.

Sample size evaluation is built on the number of respondents, and the number of parameters to estimate, and the number of path relations are suggested as combined evaluation. According to the former guidelines that suggest to 'always maximise your sample size' and 'sample sizes of 300 are required' are not suitable so far. Although the production of stable and more replicable solutions are achieved by using larger samples, still the decisions of sample size must be taken according to a series of factors.

Based on the complexity of model and the characteristics of basic measurement model, the following sample size minimum has been suggested: 100 is the suggested minimum sample size when the model has five or less constructs, with each construct containing more than three items, and .6 high item communalities or higher. However, when the model has 7 constructs or less, no underidentified constructs, modest communalities<sup>5</sup>, and the suggested minimum sample size is 150.

300 is the suggested minimum sample size when the model has seven or fewer constructs, lower communalities below .45, and /or multiple underidentified (fewer than three) constructs, whereas, when the model has large numbers of constructs, some with lower communalities, and/or having fewer than three measured items, the suggested minimum sample size is 500.

Generally, the decision of sample size is a significant requirement for completing the advanced statistical analysis. To determine the ratio between the size of sample and number of parameters, CFA and SEM were used and assigned to a 3-20 time per parameter (Sirirat Pungchompoo & Apichat Sopadang 2015). Furthermore, Hair et al. (2010) indicate that the latent variables that are fewer than seven factors need a minimum of 150 samples.

In this research, there were 36 indicators, six constructs with modest communalities, with each construct having more than three measured items, and no underidentified constructs. The ratio of sample size to parameters to be estimated is 2.5:1. Hence, the suggested minimum sample size is 100-150 according to Bagozzi and Yi (2012, p. 29); Ding et al. (1995); Hair et al. (2010).

The sample population size of this research is 189 and consists of food-manufacturing firms licensed to manufacture food products in Dubai (276 firms), which is a figure that is more than suggested as a plan to solve any missing data problems.

## 4.11 Pilot Study

Prior to distribution of the final questionnaire version to collect the final survey data, the questionnaire was reviewed by 10 research experts (seven faculty members) of different nationalities (Arab, British, and Indian) and three food safety experts (American, British and Indian) to improve the questionnaire. Minor modifications were made in response to the given suggestions. For example:

- Designing a covering letter of the questionnaire to give the instructions to the participants and announce what the questionnaire is going to measure; and
- Reducing the size of the table columns.

After this, semi-structured face-to-face individual interviews were conducted with 5 food handlers to get valuable feedback and to ensure that the scales are clear, legible, and have the best suitable items (face validity), to validate the draft questionnaire design, and to get new input for enhancement (Appendix 4.15). The developed draft questionnaire was tested through a pilot study with a convenience sample of different food-manufacturing firms. The aim of the pilot study was to get feedback from the participants that assists in ensuring the questionnaire items are functioning satisfactorily, easy to read, and legible, and to identify the real time required to answer the questionnaire.

To improve the questionnaire further, the participants are encouraged to specify any vague question related to the questionnaire items (if any) and provide suggestions as to making make it more legible and clear.

Prior to the full-scale survey, a pilot study at a small scale was carried out to obtain a better understanding of how the food handlers' perception of their management practices affect their commitment. The pilot study should answer whether the full-scale study can be performed as planned or some modifications can be made to some components in the study design. In other words, the pilot study should inform whether or not the full-scale survey is feasible or feasible with some modifications.

For the pilot study, different food manufacturing firms were used from the ones used in the final survey, and the food manufacturing firms who had participated in the pilot study did not participate in the final survey, as this would affect the samples representativeness (Bryman & Bell 2007, p. 274).

The formed pilot sample from the study population was comparable in criteria to the one used in full survey study. Nevertheless, the participants in the pilot study were not used in the full survey study. Many participants may alter their behaviour when they participated earlier in the research. Therefore, the pilot sample was excluded from the population when the full survey was launched.

The pilot study confirms that the items in the questionnaire are appropriate and the research instrument as a complete tool performs well. The feedback indicates that all questions are legible and need at least 10 minutes to answer.

Testing the reliability and validity of the measure can be achieved through conducting the pilot study as it involves respondents from the same criteria of the research target sample from which the actual data will be collected from (Bradburn, Sudman, & Wansink 2004). The reliability is consistency level estimation among multiple measurements of a construct (Hair et al. 2010).

To measure the questionnaires reliability, three approaches are available: test-re-test internal consistency and alternative form, Mitchell (1996). Many methods are used to compute the internal consistency and the most common is Cronbach's alpha. Typically, this statistics are applied to check the consistency of responses to a group of questions that join and form the scale to measure a specific concept.

The alpha coefficient value ranges from 0-1 and values above 0.7 means that the items work together as a scale to measure the same thing. In this research, the Cronbach's alpha is adopted as it is easy to apply for measuring reliability. Also in this research, high reliability and validated scales are utilised from previous different studies and checked by research experts and food safety experts to ensure clarity and validity, with the aim of improving the design of the final questionnaire.

As part of practical validation reliability, analysis is conducted in order to check whether the measurement scale properties and the items that constitute the scale are reliable. Low reliability reveals that the items constituting the scale do not correlate adequately; therefore, they might not be measuring the same construct domain. As a measure of reliability, Cronbach's Alpha was applied to check the consistency of the research items and to identify the unreliable items that need to be excluded from the scale.

According to George and Mallory's (2003), the internal consistency is excellent, good, acceptable, questionable, poor, and unacceptable when Cronbach's Alpha is  $> 0.90$ ,  $0.80 - 0.89$ ,  $0.70 - 0.79$ ,  $0.60 - 0.69$ ,  $0.50 - 0.59$ , and  $< 0.50$  respectively.



The acceptable consistency level according to Nunnally (1978) is above alpha (0.70), while Hair et al. (2010) argue that alpha (0.60) is the minimum acceptable level for any construct to measure reliability, but usually at this low level only if the scale consists of two or three items.

The Cronbach's alpha coefficients for all constructs that were within the acceptable consistency level and indicate to the components have significantly good internal consistency.

To identify the constructs, Factor Analysis is a technique that is carried out to examine whether there is an underlying association between the diverse factors in the questionnaire. Two tests were applied before proceeding to Factor Analysis: The first test was Kaiser-Mayrt-Olkin (KMO) used to measure the adequacy sampling and the applicability to perform Factor Analysis to show the amount of variance of the variables. Bartlett's test of sphericity is the second one used to check the hypothesis. Correlation matrix is an identity matrix which means variables are not related (the null hypotheses  $H_0 > 0.05$ ) and not suitable for factor analysis.

Four different variables were identified to represent management practices: organisational management support, communication, training, and employee involvement. Employee commitment and organisational food safety performance were identified as the fifth and sixth variables, respectively. The reliability and validity of the questionnaire were measured, and the results reveal that Cronbach's alpha coefficients for all constructs are within the acceptable consistency level (.842 and .967) and indicate that the components have significantly good internal consistency. The result of Kaiser-Mayrt-Olkin (KMO) test is between .809 and .876. and Bartlett's test of sphericity and Bartlett's test of sphericity significance value is .000 ( $p < 0.001$ ). The Factor Analysis was conducted beginning with Exploratory Factor Analysis (EFA) and followed with confirmatory factor analysis (CFA).

All items were successfully represented by four practices: organisational management support, communication, training, and employee involvement, and employee commitment and food safety performance were identified as the fifth and sixth variables, respectively. All the items were loaded into the correct construct and aligned with what other research discussed in the literature.

In order to check the convergent validity and discriminant validity, the Factor Analysis conducted for the four management practices (constructs) and commitment construct together (Five constructs) which include all questions in the questionnaire designed to obtain food handlers answers. The convergent validity was achieved, as Average Variance Extracted (AVE) values were more than 0.5 (Fornell & Larcker 1981). Discriminant validity of a construct was tested by comparing its shared variance (SV) and AVE values. AVE values are higher than SV values.

The Amos estimated the variances and covariances successfully in the model of management practices and commitment factors. The measurement model fit results for the management practices and commitment were within standards and, generally, showed the theoretical model fit is acceptable.

#### **4.12 Ethical Considerations**

The British University in Dubai Board and Ethical Committee reviewed and approved the study research protocol prior to the launch of the research and data collection. The informed consent and confidentiality are a very critical subject in ethical consideration (Kvale & Brinkmann 2009). Confidentiality, anonymity, informed consent, approvals were discussed, namely recruitment selection and managements' willingness to participate.

Arrangements and management agreement were made concerning food handlers' participation and audio recording. A letter was issued by BUiD to Dubai Municipality to facilitate access to food manufacturing firms for the researcher's access to complete the survey smoothly (Appendix 4.16).

The researcher informed the participants that they had the right to stop freely at any time during participation. After obtaining the approval and prior to launching the research, the researcher clarified the research purpose, procedure, expected risk, his expectations from the participants and time required. The informed consent was made to participants voluntarily and undertake to protect their dignity and rights (Flick 2014). Later, the research was carried out according to informed consent (Appendix 4.17) and the researcher stressed the following:

1. Ensuring the anonymity and privacy of all participants;
2. The confidentiality of data will be strictly maintained;
3. Reporting of data, tests, methods, results will be dealt with honestly and transparently;
4. Prior to proceeding with the research, the expected potential adverse effects on participants were highlighted, and a complete plan was in place to address these effects.

### **4.13 Summary**

In the fourth chapter, the research outline assists in achieving the aims and objectives of this research. The adopted research methodology describes in details the positivist philosophy, deductive approach, and the quantitative research adopted.

The survey strategy in this research adopts the cross-sectional approach and questionnaire for the purpose of data collection. Initially, the inductive part in this research has been done in the first stage through two focus groups appointed to explore the management practices that would influence food handlers' commitment and to confirm the proposed study model. The deductive part has been done in the second stage of this study through the developed questionnaire and explains the association between the management practices and the organisational food safety performance.

The questionnaire items have been taken partially from different previous studies, and questionnaire building completion and validation have been achieved through the contribution and supports from focus groups outcomes, literature review, food safety, research experts' review, and food handlers' feedback. The sample size and questionnaire sample selection procedure are presented in details. The subjects of reliability, validity, and Factor Analysis pilot study are also discussed. The ethical considerations are presented in detail at the end of this chapter.

## **Chapter Five: Preliminary Data**

### **5.1 Introduction to Chapter**

Before starting with data analysis of the full scale survey, the data assessment was conducted and the process of data preparation was described in this chapter. The preparation process includes, checking missing data, assessing data normality, multicollinearity and singularity, checking for outliers, reversing negatively worded items, correlation analyses, frequencies and constructs efficacy assessment of each hypothesised construct.

### **5.2 Checking Missing Values**

It is vital to know that removing any probability of violating regression analysis requirements will make a higher level of data credibility under analysis (Hair, Black & Babin 2010). According to many scholars suggestions that there are many tests assist in completing accurate results from the regression analysis like checking for outliers and missing values (Hair, Black & Babin 2010 & Tabachnick & Fidell 2007).

There are two assessment techniques in analysing missing data, which are assessing the amount of missing data and the pattern randomness of the missing data. It is vital to know that the result generalising can be influenced by the presence of a non-random pattern (Tabachnick & Fidell 2007). During the analysis, the missing observations can cause problem, as some series measures cannot be computed.

It is vital to assess missing data and its pattern that indicate to the randomness of missing data. To test the randomness of the pattern of the missing data, Little's Missing Completely at Random (MCAR) test can be used.

This test compares the pattern of missing data on all variables with the expected pattern for a random missing data process. To indicate random patterns of missing data, Little's MCAR test is expected to be nonsignificant. Little's MCAR test shows value of: Chi-Square and sig, when the p-value is more than 0.05 (non-significant level) means no significant difference between the pattern of the data and the pattern expected for random missing data.

List-wise deletion, pair-wise deletion, and imputation methods are three alternative treatments to treat the study missing data (Hair, Black & Babin 2010). The most commonly used approach for missing data treating is list-wise treatment, which exclude the whole case that has any missing values. Using this approach will lead to exclude more amount of data.

Comparing with the list wise approach, the exclusion in the pair-wise deletion treatment will be applicable for the case with missing data where the analysis confronts missing data but the case is still there for the other analyses that have variables with complete data (no missing data). This approach will not lead to exclude more amount of data but may cause inconsistency of correlation or a covariance matrix (Roth 1994).

Different of imputation methods for missing data treatment used like replacing with expectation maximisation (EM), replacing with mean, multiple imputation, and regression imputation (Hair, Black & Babin 2010). The technique of imputation based on replacing missing data with a suitable value for instance mean or expectation maximisation (EM) value.

Comparing with both list-wise and pair-wise methods, EM described with a less-biased value and extra accurate estimates (Roth1994). The data used in this research is a complete data without any of missing values. There were no variables with significant missing data among the all studied variable, therefore no data from the study was removed.

### **5.3 Assessing Data Normality**

Normality refer to the sample data distribution is identify with normal distribution. The normal distribution portrays a symmetrical, bell-shaped curve as the middle has greatest frequency of scores whereas the extremes have the smaller frequencies of scores. The normality is the most fundamental assumption in multi-variate analysis and required in some parametric tests for statistical methods (Hair et al. 2006).

Skewness and kurtosis are two measures can test the degree of normality. In the case of data distribution is different from the normal distribution; Skewness and kurtosis measures offer information of the distribution shape. The observed distribution is exactly normal when the skewness and kurtosis values are zero that is uncommon to achieve in social sciences (Pallant 2011). Furthermore, histograms shapes can be used as another test for normality assessing.

The accepted absolute values of skewness and kurtosis were suggested by Newsom (2005) as  $\leq 2$ ,  $\leq 3$  respectively whereas Curran and Finch (1996) suggested that values greater than 2 and 7, respectively indicate to somewhat non-normal distribution. Distribution symmetry can be expressed by skewness value while distribution in which scores are clustered together can be expressed by Kurtosis.

A bootstrap procedure is one approach used in case of the presence of multi-variate non-normal data (Zhu 1997) as the bootstrapping works as a re-sampling procedure that consider the original sample represent the population.

The information on the symmetry of distribution can be obtained through the skewness test. The scale is left-skewed when the skewness values are below zero while the scale is right-skewed when the skewness values are above zero. The non-zero skewness values shows that the mean is not in the center of the distribution.

The normality tests are conducted by comparing the shape of the distribution of the research sample with the normal curve shape. The normality tests assumes that when the research sample shaped normal, the population where the sample drawn is normally distributed and therefore normality can be assumed. Making accurate conclusions about reality, normality assumption is critical (Field 2009). Nevertheless, the violation of normality assumption would not cause any major issues during data analysing in case of large size of research sample that more than 30 (Ghasemi & Zahediasl 2012, Pallant 2016). Even the data is not normally distributed; parametric tests can be still used as data distribution can be ignored with large sample sizes (Elliot & Woodward 2007). The distributions be likely normal regardless of the data shape when sample size is large of more than 30 or 40 (Ghasemi & Zahediasl 2012).

Moreover, normality of data is not required for performing parametric tests as emphasised by many researchers particularly in the case of large size research sample; where others emphasised the need to have sample size more than 30 only to assume data normality (Field 2009, Pallant 2016).

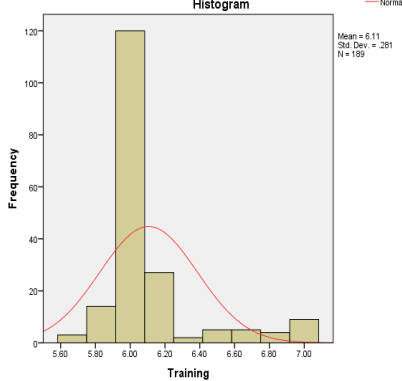
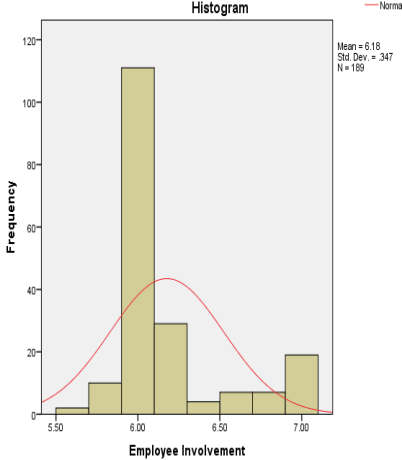
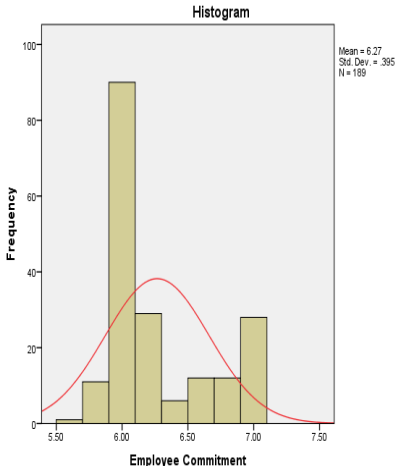


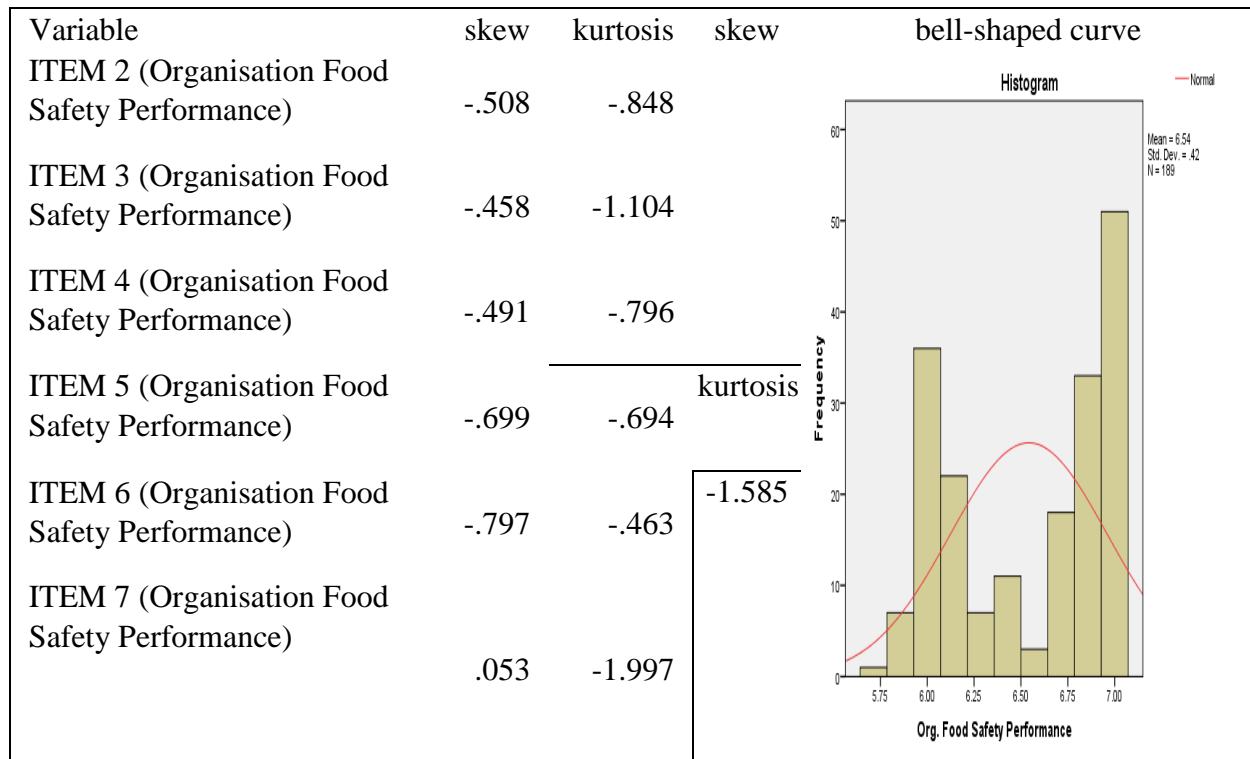
In addition to the normality frequency distributions, the normality can be checked through the visual inspection when looking to histograms (Field 2009). The graphical and visual normality assessments are important as the normality tests are considered supplementary to them (Elliot & Woodward 2007).

In this research, the data distribution could be overlooked and normality could be assumed, as the sample is 189 food manufacturing firms. Therefore, violation of normality assumption would not produce any issue in data analysing, as the sample size is more than 30 or 40 in which sampling distributions inclines to be normal in any case of the data shape (Pallant 2016). Two methods skewness and kurtosis values and visual inspection of normal plots and frequency distributions histograms were adopted to check the normality as precautionary action. These methods adopted because it is accurate, simple and commonly being used. Considering the above, the study variables in Table 5.1 close enough to and did not violate and the normality assumption and the scale has the correct shape as the data in all histograms were just under the bell-shape.

**Table 5.1:** Skewness and Kurtosis scores

Variable	skew	kurtosis	skew	bell-shaped curve
ITEM1(Org. Mg. Support)	-.235	-1.426	-.013	
ITEM2(Org. Mg. Support)	-.024	-1.702		
ITEM3(Org. Mg. Support)	.081	-1.691		
ITEM4(Org. Mg. Support)	.208	-1.644		
ITEM5(Org. Mg. Support)	.245	-1.356	kurtosis	
ITEM6(Org. Mg. Support)	-.130	-1.687	-1.508	
ITEM7(Org. Mg. Support)	.053	-1.997		
Variable	skew	kurtosis	skew	bell-shaped curve
ITEM 1 (Communication)	-1.139	-.271	-1.011	
ITEM 2 (Communication)	-1.085	-.167		
ITEM 3 (Communication)	-.821	-.967		
ITEM 4 (Communication)	-.172	-1.450	kurtosis	
ITEM 5 (Communication)	-.834	-.717	.045	
ITEM 6 (Communication)	-1.388	.913		

Variable	skew	kurtosis	skew	bell-shaped curve
Variable	skew	kurtosis	skew	bell-shaped curve
ITEM 1 (Training)	.375	.394	2.066	
ITEM 2 (Training)	2.437	6.723		
ITEM 3 (Training)	1.436	3.365		
ITEM 4 (Training)	1.252	3.573	kurtosis	
ITEM 5 (Training)	1.207	3.021	3.748	
ITEM 6 (Training)	2.517	7.435		
Variable	skew	kurtosis	skew	bell-shaped curve
ITEM 1 (Employee Involvement)	.434	.117	1.461	
ITEM 2 (Employee Involvement)	1.667	.778		
ITEM 3 (Employee Involvement)	1.311	2.350	kurtosis	
ITEM 4 (Employee Involvement)	.771	.297	.955	
ITEM 5 (Employee Involvement)	1.264	1.053		
ITEM 1 (Employee Commitment)	.760	-.176	.891	
ITEM 2 (Employee Commitment)	.737	-1.037		
ITEM 3 (Employee Commitment)	.711	-.309	kurtosis	
ITEM 4 (Employee Commitment)	1.101	-.208	-.695	
ITEM 5 (Employee Commitment)	-.118	-.690		
Variable	skew	kurtosis	skew	bell-shaped curve
ITEM 1 (Organisation Food Safety Performance)	-.257	-1.415	-.294	



## 5.4 Demographic Data






Table 5.2 displayed the frequency distribution of demographic characteristics of the sample study. A total of 189 out of 276 (68.47% response rate) completed questionnaires were returned from respondents.

The frequency distribution of demographic characteristics of the sample study shown that among 189 food manufacturing firms, 90 (47.6%) were located in specific industrial zone and 99 (52.4%) were located in non-specific industrial zone.

The number and percentage of high-risk food manufacturing firms and low risk food manufacturing firms in the selected sample were 88 (46.6%) and 101 (53.4%) respectively. The local ownership of the food manufacturing were 97 (51.3%) Arabian, while the remaining 92 (48.7%) were non-local ownership.

The number of running years statistics of 189 food manufacturing firms in the sample study as 3 years or less were 35 (18.5%) and the running years between 3-5 years were 44 (23.3%) while the running years between 6-10, and the running years more than 10 were 41 (21.7%) , 69 (36.5%) respectively. Majority of food manufacturing obtained HACCP certificate for 6-10 years were 76 (40.2%) and those obtained HACCP certificate for between 3-5 years were 44 (23.3%). While those with 3 years or less were 35 (18.5%) and those with more than 10 years were 34 (18%).

**Table 5.2:** Demographic Data of Food Manufacturing Firms

Demographic factors		Frequency	Percentage
Location	Specific Industrial Zone	90	47.6%
	Non-Specific Industrial Zone	99	52.4%
<p style="text-align: center;"><b>Location</b></p>  <p style="text-align: right;"> <span style="color: blue;">■</span> Specific Industrial Zone  <span style="color: green;">■</span> Non-Specific Industrial Zone         </p>			
Risk Category	High Risk	88	46.6%
	Low Risk	101	53.4%
<p style="text-align: center;"><b>Risk Category</b></p>  <p style="text-align: right;"> <span style="color: blue;">■</span> High risk  <span style="color: green;">■</span> Low risk         </p>			
Firm Ownership	Local Ownership	97	51.3%
	Non-local Ownership	92	48.7%
<p style="text-align: center;"><b>Firm Ownership</b></p>  <p style="text-align: right;"> <span style="color: blue;">■</span> Local Ownership  <span style="color: green;">■</span> Non-local Ownership         </p>			
Number of Running Years	3 or less	35	18.5%
	3-5	44	23.3%
	6-10	41	21.7%
	More than 10	69	36.5%
<p style="text-align: center;"><b>Number of Running Years</b></p>  <p style="text-align: right;"> <span style="color: blue;">■</span> 3 or less  <span style="color: green;">■</span> 3-5  <span style="color: yellow;">■</span> 6-10  <span style="color: purple;">■</span> More than 10         </p>			
HACCP Certificate Obtained for	3 years or less	35	18.5%
	3-5 years	44	23.3%
	6-10 years	76	40.2%
	More than 10 years	34	18.0%
<p style="text-align: center;"><b>HACCP Certificate Obtained for Years</b></p>  <p style="text-align: right;"> <span style="color: blue;">■</span> 3 years or less  <span style="color: green;">■</span> 3-5 years  <span style="color: yellow;">■</span> 6-10 years  <span style="color: purple;">■</span> more than 10 years.         </p>			

**Table 5.3:** The mean and standards deviation for all variables

Constructs	Descriptive Statistics	Std. Deviation
	Mean	
Organisational Management Support	6.4596	.45225
Communication	6.6499	.41986
Training	6.1058	.28084
Employee Involvement	6.1767	.34685
Employee Commitment	6.2667	.39465
Organisational FSP	6.5420	.41999

The respondents to other factors like organisational management support, employee commitment, employee involvement, were ( $M = 6.460$ ,  $SD = 0.452$ ), ( $M = 6.270$ ,  $SD = 0.395$ ), ( $M = 6.177$ ,  $SD = 0.347$ ) respectively. The mean and standard deviation for organisational food safety performance was ( $M = 6.542$ ,  $SD = 0.420$ ).

The level of agreement toward the factor of management practices (communication, organisational management support, employee involvement, training) were dissentingly as follows ( $M = 6.650$ ,  $SD = 0.420$ ), ( $M = 6.460$ ,  $SD = 0.452$ ), ( $M = 6.177$ ,  $SD = 0.347$ ), and ( $M = 6.106$ ,  $SD = 0.281$ ) respectively. While agreement toward the factor of employee commitment and organisational food safety performance were ( $M = 6.270$ ,  $SD = 0.395$ ), ( $M = 6.542$ ,  $SD = 0.420$ ) respectively.

**Table 5.4:** The mean and standards deviation for management practices variables as per location category

Constructs	Location	Mean	Std. Deviation
OMS	Specific Industrial Zone	6.5270	.04928
	Non-Specific Industrial Zone	6.3983	.04333
COM	Specific Industrial Zone	6.6407	.04696
	Non-Specific Industrial Zone	6.6582	.03993
TRA	Specific Industrial Zone	6.1815	.03795
	Non-Specific Industrial Zone	6.0370	.01543
EMP	Specific Industrial Zone	6.2844	.04321
	Non-Specific Industrial Zone	6.0788	.02416
CMT	Specific Industrial Zone	6.4467	.04459
	Non-Specific Industrial Zone	6.1030	.02833
OFSP	Specific Industrial Zone	6.6270	.04055
	Non-Specific Industrial Zone	6.4646	.04396

**Table 5.5:** The mean and standards deviation for management practices variables as per risk category

Constructs		Risk Category	Mean	Std. Deviation
OMS	High Risk		6.5552	.44833
	Low Risk		6.3762	.44111
COM	High Risk		6.6572	.44302
	Low Risk		6.6436	.40071
TRA	High Risk		6.1629	.34369
	Low Risk		6.0561	.20038
EMP	High Risk		6.2568	.38231
	Low Risk		6.1069	.29741
CMT	High Risk		6.4205	.41803
	Low Risk		6.1327	.31910
OFSP	High Risk		6.6218	.39050
	Low Risk		6.4724	.43413

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**Table 5.6:** The mean and standards deviation for management practices variables as per ownership category

Constructs	Firm Ownership	Mean	Std. Deviation
OMS	Local Ownership	6.3785	.44704
	Non-local Ownership	6.5450	.44421
COM	Local Ownership	6.6426	.40109
	Non-local Ownership	6.6576	.44086
TRA	Local Ownership	6.0567	
	Non-local Ownership	6.1576	.20396
EMP	Local Ownership	6.1113	.33731
	Non-local Ownership	6.2457	.30272
CMT	Local Ownership	6.1278	.37750
	Non-local Ownership	6.4130	.32170
OFSP	Local Ownership	6.4624	.41277
	Non-local Ownership	6.6258	.43192

**Table5.7:** The mean and standards deviation for management practices variables as per number of running year's category

Constructs	Number of Running Years	Mean	Std. Deviation
OMS	3 or less	6.5143	.43303
	3-5	6.3344	.39808
	6-10	6.6899	.42607
	More than 10	6.3747	.46233
COM	3 or less	6.6571	.40411
	3-5	6.5947	.46227
	6-10	6.7927	.32442
	More than 10	6.5966	.43762
TRA	3 or less	6.1286	.26224
	3-5	6.0492	.23455
	6-10	6.1138	.26987
	More than 10	6.1256	.32136
EMP	3 or less	6.2457	.37600
	3-5	6.1091	.30333
	6-10	6.1951	.38076
	More than 10	6.1739	.33591

CMT	3 or less	6.2686	.41711
	3-5	6.1591	.33013
	6-10	6.3220	.39466
	More than 10	6.3014	.41533
OFSP	3 or less	6.5551	.37280
	3-5	6.4156	.39313
	6-10	6.7073	.40526
	More than 10	6.5176	.44310

**Table 5.8:** The mean and standards deviation for management practices variables as per HACCP certificate obtained category

Constructs	HACCP Certificate Obtained	Mean	Std. Deviation
OMS	3 or less	6.5143	.43303
	3-5	6.3344	.39808
	6-10	6.5075	.46388
	More than 10	6.4580	.49709
COM	3 or less	6.6571	.40411
	3-5	6.5947	.46227
	6-10	6.6579	.42591
	More than 10	6.6961	.37261
TRA	3 or less	6.1286	.26224
	3-5	6.0492	.23455
	6-10	6.1118	.30109
	More than 10	6.1422	.30741
EMP	3 or less	6.2457	.37600
	3-5	6.1091	.30333
	6-10	6.1974	.37593
	More than 10	6.1471	.29257
CMT	3 or less	6.2686	.41711
	3-5	6.1591	.33013
	6-10	6.2658	.36425
	More than 10	6.4059	.47860
OFSP	3 or less	6.5551	.37280
	3-5	6.4156	.39313
	6-10	6.5695	.44964
	More than 10	6.6303	.41182

## **5.5 Multicollinearity and Singularity**

Multicollinearity and singularity are issues come from too high correlation among predictors. Multicollinearity when the variables having correlation (0.90 or above) whereas the singularity is when the correlation among the variables is perfect. The presence of multicollinearity and singularity can make problems from logical and statistical point of view. In this research, no high correlations were exist among the variables and no variables were perfectly correlated.

Multicollinearity occurs when two or more predictors in the model are correlated and provide redundant information about the response. Multicollinearity was measured by variance inflation factors (VIF) and tolerance. If VIF value exceeding 4.0, or by tolerance less than 0.2 then there is a problem with multicollinearity (Hair et al. 2010). Collinearity statistics were conducted and the results showed that Variance Inflation Factor were less than 4 which is ideal and tolerance greater than 0.2 indicating there is no multicollinearity issues (Hair et al. 2010).

## **5.6 Checking for Outliers**

Many statistical techniques are sensitive to outliers that data values usually below the majority of all other data or above them. In this research, the outliers were tested calculating the variables 5% trimmed mean to find whether there were any outliers that may affect the analysis of data. The variables 5% trimmed mean was calculate using the SPSS by removing 5% of data from bottom and 5% from the top and generate new 5% trimmed mean values. The original mean values compared with 5% trimmed mean values for all variables. The compression results were indicate the two means were very close to each other which means absence of outliers and the extreme data are not having lot of influence on the mean.

**Table 5.9:** Comparison between original mean values and 5% trimmed mean values for all studied variables.

Variables	Original mean	5% trimmed mean
Organisational management support	6.4596	6.4618
Communication	6.6499	6.6764
Training	6.1058	6.0747
Employee involvement	6.1767	6.1543
Employee commitment	6.2667	6.2530
Organisational food safety performance	6.5420	6.5542

## 5.7 Reversing Negatively Worded Items

Before testing the scale reliability, Pallant (2016) affirmed the need to reverse the negatively worded items. To reduce the response bias, two items in the research questionnaire that negatively worded were reversed. Therefore, prior starting with data statistical analysis two items that were negatively worded in the questionnaire. The first item was in training variable “Staff are not adequately trained to respond to emergency situations in my workplace area”. While the second item was in employee involvement variable, “Employees do not sincerely participate in identifying food safety problems”. Negatively worded items for the two items were conducted using of “transform” and “record into same variable” available in SPSS software. This completed to ensure that high score signposts the high training level and high level of employee involvement.

## 5.8 Reliability

Reliability of accumulated data was verified prior to do any relationship analysis between the independent and dependent variables. This test assures inter-correlations and internal consistency in sample data and guaranties its fit for modeling and analysing (correlation and regression).

For this purpose, Cronbach's Alpha coefficient as an estimation of reliabilities has been calculated, and a minimum of 0.7 has been considered as the acceptance limit (Nunnally & Bernstein 1994). The reliability statistics is noteworthy that all of the 36 questions variables are acceptable since the values of Cronbach's Alpha are more than 0.7. In conclusion, all of the results indicate that the applied scales in this research are reliable. Therefore, performing the correlation and the regression analysis to test the research hypotheses is acceptable.

## **5.9 Constructs Efficacy Assessment**

Constructs efficacy assessment of each hypothesised construct was carried out as preliminary analysis. This assessment was prior assembling the structural equation model and completed which include exploratory factor analysis (KMO and Bartlett tests), adequate identification, model fit, reliability, construct validity (convergent and discriminant). The assessment showed that hypothesised constructs have adequate information to identify a solution to a set of structural equations and the results of model fit, reliability, and construct validity were satisfactory.

## **5.10 Summary**

The suitability of the data in this study was focused in this chapter and presented in details. For instance, checking missing values, assessing data normality, multicollinearity and singularity, checking of outliers, reversing negatively worded items, and reliability. No missing values were found to replace it and no outliers were found as well. The study variables were close enough to and did not violate the normality assumption and the scale has the correct shape as the data in all histograms were just under the bell-shape. There is no problem with any of multicollinearity issues.

Two items in the research questionnaire that negatively worded were reversed. The applied scales in this research were reliable. The constructs efficacy assessment, model fit, reliability, and construct validity results were satisfactory.

## **Chapter Six: Results and Data Analysis of the Findings**

### **6.1 Introduction to Chapter**

The research results chapter presented the preliminary data analysis through the Statistical Package for the Social Sciences (SPSS). Other parts of the chapter discussed the instrument data reliability and validation. Exploratory measurement assessments were conducted such Exploratory Factor Analyses (EFA), scale reliabilities and corrected item-total correlations. The exploratory factor analysis was conducted to categorise the research measurements based on the loading and of minimum five items in each construct (Hair, Black & Babin 2010).

The reliability of each construct is examined by conducting Cronbach's Coefficient Alpha, item-to-total correlations and composite reliability. These tests followed by Confirmatory Factor Analysis (CFA) to examine the scale validity. Measurement model validity assessment which cover convergent validity like Average Variance Extracted (AVE), t-value for each loading, significance, squared correlation and fit indices like Normed  $\chi^2$ , Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Residual (RMR), Root Mean Square Error of Approximation (RMSEA), discriminant validity. Then structural model validity assessment conducted followed by hypotheses testing and mediation analyses. The selected statistical tests were conducted in this research based on 'fitness for purpose' must be guiding the principle (Cohen et al. 2007, p. 98). In the end, the chapter presented the summary and conclusion.

## 6.2 Correlation

Pearson test correlation is a correlation coefficient assist the researchers with numerical summary of the strength of the linear relationship as well as the direction between two research variables (Pallant 2016). Pearson correlation coefficients ranged from -1 to +1. When the correlation is negative means that increases in one variable will result in decrease in the other variable.

On other hand, when the correlation is positive means that increases in one variable will result in increase in the other variable. Therefore, the strength between the two variables can be expressed by the absolute correlation coefficient value whereas the direction of this relationship the coefficient sign.

A perfect correlation between the two variables can be occurred when correlation coefficients of -1 or +1. Whereas in case of non-existence of relationship between two variables, the correlation coefficient indicates zero. The correlation coefficient enables the researcher to explore the strength of the relation and direction and not enable to predict the value of one variable by knowing the value of another variable (Pallant 2016).

The results of correlation will help in measuring the association of relationships between variables research and find out answer to the research questions related to the relationship between the management practices and commitment and the relationship between the commitment and organisational food safety performance. Three categories are suggested by George & Mallery (2003) for the strength of the association between variables based on the correlation coefficient value as small, medium, and large.



## **6.3 Correlation Analyses**

Table 6.8 showed the results of correlation analyses between management practices and commitment and between the commitment and organisational food safety performance as well. Better results of regression are achieved in case of significant correlations between dependent and independent variables (Pallant 2016).

### **6.3.1 Correlation Tests of Management Practices and Employee Commitment**

There was a small positive correlation between communication and employee commitment as proposed in H2 [ $r=.244$ ,  $n=189$ ,  $p<.01$ ], where a medium positive correlation between organisational management support and employee commitment [ $r=.365$ ,  $n=189$ ,  $p<.001$ ], and a high positive correlation between training and employee commitment [ $r=.512$ ,  $n=189$ ,  $p<.001$ ]. Another high positive correlation between employee involvement with employee commitment [ $r=.506$ ,  $n=189$ ,  $p<.001$ ].

### **6.3.2 Employee Commitment and Organisational Food Safety Performance**

Moreover, a high positive correlation between employee commitment and organisational food safety performance [ $r=.481$ ,  $n=189$ ,  $p<.001$ ]. These results as summarised in Table 6.1 supports all the proposed relation among the studied variables. It was noticed that there is a high positive correlation between employee involvement and training [ $r=.522$ ,  $n=189$ ,  $p<.001$ ].

**Table 6.1:** Significant correlations between management practices and employee commitment and significant correlations between employee commitment& organisational food safety performance.

	OMS	COM	TRA	EMP	FSP
H1 CMT	.365**				
H2 CMT		.244**			
H3 CMT			.512**		
H4 CMT				.506**	
H5 CMT					.481**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## 6.4 Measuring of the Reliability and Validity

Many methods used to compute the internal consistency and the most regularly one applied is Cronbach's alpha. Typically, this statistics applied to check the consistency of responses to group of questions that joint and form the scale to measure a specific concept. The alpha coefficient value ranged from 0-1 and values above 0.7 means that the items work together as scale to measure the same thing. In this research, the Cronbach's alpha adopted as it easy to apply to measure the reliability.

In this research, high reliability and validated scales utilised from previous different studies and the same checked by research experts and food safety experts to ensure the clarity as well as the validity in the aim of improving the design of final questionnaire.

As part of practical validation reliability analysis conducted in order to check whether the measurement scale properties and the items that constitute the scale are reliable. Low reliability displays that the items that constitute the scale do not correlate adequately strongly; therefore, they might not be measuring the same construct domain. To find out the relationship between items in every variable and to get indication of the reliability of scale, inter item correlation conducted for all variables in this study; organisational management support, communication, training, employee involvement, commitment, and organisational food safety performance.

The results of inter item correlations were showed that the correlations between the items in the scale were positively related to each other statistically significant. These indicate the reliability of scales and measure the same variable in question.

As a measure of reliability, Cronbach's Alpha was checked the consistency of the research items and to identify the unreliable items that need to be excluded from the scale. According to George and Mallory's (2003) the internal consistency is excellent, good, acceptable, questionable, poor, and unacceptable when Cronbach's Alpha is  $> 0.90$ ,  $0.80 - 0.89$ ,  $0.70 - 0.79$ ,  $0.60 - 0.69$ ,  $0.50 - 0.59$ , and  $< 0.50$  respectively. The acceptable consistency level above alpha ( $0.70$ ) according to Nunnally (1978), while Hair et al. (2010) argued that alpha ( $0.60$ ) is the minimum acceptable level for any construct to measure reliability.

Table 6.2 presented the Cronbach's alpha coefficients for all constructs that were within the acceptable consistency level between  $.863$  and  $.955$  which indicate to the components have significantly good and excellent internal consistency.

**Table 6.2:** Reliability Analysis

Constructs	No. of original items	Cronbach's Alpha
Organisational Management Support (OMS)	7	.955
Communication (COM)	6	.923
Training (TRA)	6	.863
Employee Involvement (EMP)	5	.877
Employee Commitment (CMT)	5	.879
Organisational Food Safety Performance (FSP )	7	.893

## 6.5 Composite Reliability

The following formula used to calculate the composite reliability for each variable manually (Wilkins 2013).  $(\sum \text{standardized loading})^2 / (\sum \text{standardized loading})^2 + \sum \text{measurement errors}$

### Reliability of organisational management support

Sum of the standardized loadings =  $.871 + .940 + .792 + .879 + .744 + .892 + .921 = 6.039$

$6.039^2 = 36.469$

Sum of 1- squared multiple correlations =  $(1-.758) + (1-.883) + (1-.628) + (1-.773) + (1-.553) + (1-.796) + (1-.848) = 1.761$

$36.469 / (36.469 + 1.761) = .953$ , indicating that organisational management support has good reliability.

### Reliability of communication

Sum of the standardized loadings =  $.947 + .915 + .922 + .635 + .900 + .606 = 4.925$

$4.925^2 = 24.255$

Sum of 1- squared multiple correlations =  $(1-.897) + (1-.838) + (1-.850) + (1-.404) + (1-.811)$   
 $+ (1-.368) = 1.832$

$24.255 / (24.255 + 1.832) = .929$ , indicating that communication has good reliability.

### **Reliability of training**

Sum of the standardized loadings =  $.469 + .881 + .697 + .744 + .716 + .872 = 4.379$

$4.3972 = 19.175$

Sum of 1- squared multiple correlations =  $(1-.220) + (1-.776) + (1-.486) + (1-.454) + (1-.512)$   
 $+ (1-.760) = 2.792$

$19.175 / (19.175 + 2.792) = .872$ , indicating that training has good reliability.

### **Reliability of employee involvement**

Sum of the standardized loadings =  $.682 + .858 + .866 + .696 + .810 = 3.912$

$3.9122 = 15.303$

Sum of 1- squared multiple correlations =  $(1-.465) + (1-.736) + (1-.750) + (1-.485) + (1-.656)$   
 $= 1.908$

$15.303 / (15.303 + 1.908) = .889$ , indicating that employee involvement has good reliability.

### **Reliability of commitment**

Sum of the standardized loadings =  $.735 + .712 + .700 + .753 + .526 = 3.426$

$3.4262 = 11.737$

$$\begin{aligned}\text{Sum of 1- squared multiple correlations} &= (1-.540) + (1-.506) + (1-.490) + (1-.567) + (1-.277) \\ &= 2.620\end{aligned}$$

$11.737 / (11.737 + 2.620) = .817$ , indicating that commitment has good reliability.

### **Reliability of organisational food safety performance**

$$\text{Sum of the standardized loadings} = .794 + .814 + .758 + .668 + .796 + .776 + .408 = 5.014$$

$$5.014^2 = 25.140$$

$$\begin{aligned}\text{Sum of 1- squared multiple correlations} &= (1-.630) + (1-.662) + (1-.575) + (1-.446) + (1-.634) \\ &+ (1-.602) + (1-.166) = 3.285\end{aligned}$$

$25.140 / (25.140 + 3.285) = .884$ , indicating that organisational management support has good reliability.

The high value of composite reliability ( $> 0.9$ ) of organisational management support and communication constructs indicates the high internal consistency reliability of these constructs, which is generally desirable. However, not all construct items highly correlated (inter-item correlations) which indicate that the items used to build the mentioned constructs are not redundant. The items tap into different aspects of measured constructs, adding additional information and not repeating the same aspect of the phenomenon. Values above 0.9 is acceptable, as it affirms unidimensionality of the construct, as long as items in the scale are not redundant. Therefore, the items used are valid measures of the constructs (Hair et al. 2017). Furthermore, it was judged good practice to not unnecessarily modify the original published scales.

## 6.6 Factor Analysis

To identify the constructs, factor analysis is a technique carried out to examine whether there is an underlying association between the diverse factors in the questionnaire. Furthermore, it used for reduction of data by minimise variables numbers that have similar information and grouping them to a smaller set. Furthermore, to handle the analyses in more efficient way particularly can assist to solve the multicollinearity issues when applying multiple regression test with big quantity of variables by linking the ones are collinear.

Two tests were applied before proceeding with factor analysis: The Kaiser-Mayrt-Olkin (KMO) used to measure the adequacy sampling and the applicability to do factor analysis to show the amount of variance of the variables. The smaller partial correlation between all variables' pairs, KMO test near to (1.0) the data is not valuable in the case of value less than (0.50). According to Kaiser (1974) the acceptable KMO value is more than 0.50 and minutely the KMO values is good, great, superb when the value between (0.50 and 0.70), between (0.70 and 0.80), and above (0.80) respectively.

Bartlett's test of sphericity used to check the hypothesis the correlation matrix is an identity matrix which means variables are not related (the null hypotheses  $H_0 > 0.05$ ) and not suitable for factor analysis. Therefore, some relationships between variables and the significance value to be ( $p < 0.05$ ) are needed to be useful for factor analysis. The results showed that values of  $p$  for all variables highly significant which indicates the availability of some relationships among the variables and the correlation matrix is not an identity matrix.

When the population correlation matrix look like the identity matrix indicates each variable correlates very badly with all other variables in which all correlations are near to zero (Field 2013). The findings in Table 6.2 and 6.3 demonstrated factor analysis is suitable for these data as Cronbach's alpha ranged between .863 and .955 and the KMO was 0.885 and Bartlett's test of Sphericity significance value .000 (  $p < 0.001$ ).

**Table 6.3:** Results of KMO and Bartlett tests

Constructs	Kaiser – Meyer- Olkin (KMO) Sampling Adequacy	Bartlett's Test of Sphericity (Significance Value)
MP1, MP2, MP3, MP4, CMT	.885	.000

## 6.7 Exploratory Factor Analysis (EFA)

Factor is used as another name for an independent or predictor variable, however it used synonymously in factor analysis with 'latent variable' (Field 2009, p. 786). While it used for the continuous latent variables, the 'factor indicators' also used to signifying the observed variables.

The idea of factor analysis that constructed on the reduction of observable variables to lesser latent variables that are unobservable and share a common variance, which is acknowledged as decreasing dimensionality (Bartholomew, Knott, & Moustaki 2011). The unobservable factors are basically hypothetical constructs used to represent variables as the unobservable factors are difficult to measured directly (Cattell 1973).

To conduct EFA, SPSS used which is common used by researchers in different fields like management. It readily available in the universities and operates like Microsoft's Excel which is easy for researchers, thus SPSS was selected in this research.



Therefore, the exploratory factor analysis conducted in this research to identify the component of latent variable as could not depend completely on the existing scales. As the EFA is a multivariate technique, it has used to identify whether the correlations among a group of observed variables are driven by a common underlying latent construct.

It is likely to define a smaller set of underlying dimensions once identifying the strength of the association between variables. It decreases the large number of correlated variable to manageable level. To extract the factors, the principal components method adopted in this research to identify the factors that can explain the largest share of variance (Wilkins 2013).

Using the Exploratory Factor Analysis enables the researchers to find out the factor structure of a measure and to test its internal reliability. The researchers are often use EFA particularly when they no hypotheses concerning the nature of the underlying factor structure of their measure. Three basic decision points should be decided by the researcher when apply EFA about deciding the number of factors, selecting the extraction method, and rotation method.

Generating a scree plot is the utmost common approached used by researchers to decide the number of factors. The scree plot illustrates two-dimensional graph in which factors on the x-axis and eigenvalues on the y-axis. Using the principal components analysis (PCA) produces eigenvalues that exemplify the variance accounted for by each underlying factor.

The eigenvalues are represented by scores not percentages that total to the number of items (29). Theoretically, the 29-item scale will have 29 possible underlying factors; every factor will have an eigenvalue that shows the variation amount in the items accounted for by each factor. The first factor has an eigenvalue of 9.470 it accounts for 32.654% of the variance ( $9.470/29=.32654$ ).

After the number of factors are identified, the principal component technique was run as the total variance in the data is considered. When the principal concern is limiting the minimum number of factors that produce the largest variance in the data to use it in following multivariate analysis (Conway & Huffcutt 2003).

Therefore, to extract the largest variance from the data set with every component so decreasing the large number of variables to lesser number of components (Tabachnick & Fidell 2007).

The factors rotation used to increase the interpretation, as the factors that not rotated are vague. Achieving an optimal simple structure is the aim of the rotation, which tries to have each variable load on as few factors as possible, but make best use of high loadings on each variable (Rummel1970). In the end, each factor with outline of a distinct cluster of interrelated variables which the simple structure tries to have towards easier interpretation (Cattell 1973). For instance, the variables that tell about knowledge, learning should load highly on training factor but they should have loadings near zero on communication factor.

After obtaining the initial solution, the rotation of loadings will start through maximising high loadings and minimising low loadings that leads to ultimate solution and achieves the simplest possible structure.

Two basic kinds of rotation orthogonal and oblique. While orthogonal rotation derives factor loadings based on the assumption factors to be uncorrelated with one another, the oblique rotation assumed that the factors are correlated which this case may be represent utmost measures. Varimax, quartamax, equamax are examples of algorithms for orthogonal and oblimin, promax, direct quartimin are examples of algorithms for oblique. In this research, promax rotation used as it acknowledged being efficient relatively attaining simple oblique structure.

In many sciences such as social sciences, it is commonly expected that there are some correlations between the factors. For instance, behaviour is difficult to be isolated in packaged units that function independently of one another. Thus, adopting orthogonal rotation gives a less useful solution when there are correlations between the factors.

Oblique rotation produces either identical or superior results compared with results of orthogonal rotation as it can produce cleaner results and is more easy to interpret. While the orthogonal rotations cannot effectively handle correlated factors, the oblique rotations can handle both uncorrelated and correlated factors accurately.

The confirmatory factor analysis was conducted to evaluate model fit as the EFA cannot deliver a unique solution and test the good fit between the model and data. In other words, testing the fitness of data with the model of hypothesised measurement is the objective of confirmatory factor analysis (CFA).

### **6.7.1 Factor Analysis for Management Practices and Commitment Factors**

The Table 6.4 that showed the analysis of management practices & employee commitment factors, just five components carry an eigenvalue of more than 1 and account for nearly 72.855% of the variance, that is the result of the selected five components present 72.855% of the whole variance. Consequently, these five components can be considered representative of all 29 management practices factors and commitment factors which included in this study.

The results of the factor loading of the items test showed that all items were more than the acceptable values 0.50 according to Hair et al. (2010). Considering other tests findings no item has been removed from the questionnaire for data collection purpose.

The technique of extraction adopted for EFA analysis was established on principle component analysis with promax rotation method. Table 6.4 showed that all of the questions have loaded successfully (loading > 0.50) according to Hair et al. (2010) on the associated factors with no case of cross loading and no one item from the questionnaire has been not loaded.

On other words, the SPSS software has characterised the questions in an order that mirrored the theoretical constructs (latent variables). The association between each variable and the certain components presented in the Table 6.4. The strongest association is between MP1 (Management Practice 1) and component # 1, with the .941 as the highest loading value.

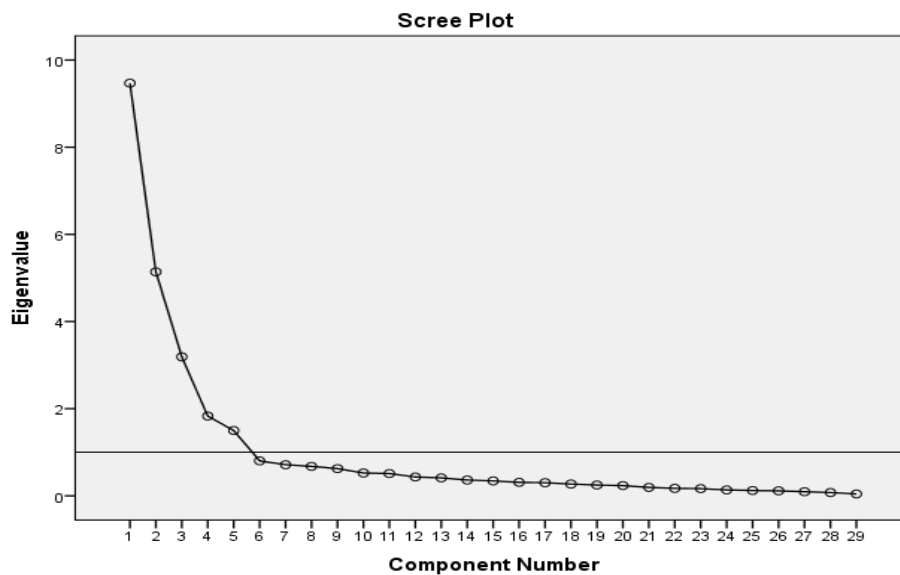
**Table 6.4:** Factor Analysis and Reliability of the Final Instrument for Management Practices and Commitment.

Constructs	No of Items	Factor loading for items in first factor	Eigen-Value	% of Variance	% of Cumulative Variance	Cronbach 's Alpha
MP1	7	.941 .928 .909 .904 .899 .875 .757	9.470	32.654	32.654	.955
MP2	6	.964 .929 .927 .889 .774 .590	5.140	17.723	50.377	.923
MP3	6	.878 .862 .854 .788 .738 .552	3.189	10.998	61.375	.863
MP4	5	.921 .860 .805 .761 .747	1.831	6.312	67.688	.877
CMT	5	.892 .887 .761 .739 .629	1.499	5.168	72.855	.879

As can be seen from Figure 6.1, the curve starts to slightly flatten out and become horizontal after component 5 and that the point of interest was defined between components 4 and 6, where the curve connects the points, which is considered to be the point where eigenvalues of less than 1 are placed.

As there are 29 items, the total of all the eigenvalues will be 29, but some factors have smaller eigenvalues less than 1. The PCA produces five underlying factors with eigenvalues more than 1 that have influence and must be in the model to provide ultimate solution while the balance of factors are just error variation or “scree”. Usually they are organised in a scree plot in decline order as in the Figure 6.1.

**Figure 6.1:** Scree plot of exploratory factor analysis for management practices and commitment factors



As indicated in the Table 6.5 factors SR6, SR7, SR2, SR3, SR4, SR1, and SR5 have greater influence on component 1 (Management Practice 1) compared to other components. Similarly, factors SR8, SR9, SR10, SR12, SR13 and SR11 have greater influence on component 2 (Management Practice 2) compared to other components.

Factors SR19, SR15, SR17, SR18, SR16 and SR14 have greater influence on component 3 (Management Practice 3) compared to other components.

Whereas factors SR22, SR21, SR20, SR23 and SR24 have greater influence on component 4 (Management Practice 4) compared to other components. Factors SR25, SR29, SR26, SR27 and SR28 have greater influence on component 5 (Employee Commitment) compared to other components.

**Table 6.5:** Extractions of components – management practice and commitment

SR	Component				
	1 (MP1)	2 (MP2)	3 (MP3)	4 (MP4)	5 (CMT)
SR 06	.941				
SR 07	.928				
SR 02	.909				
SR 03	.904				
SR 04	.899				
SR 01	.875				
SR 05	.757				
SR 08		.964			
SR 09		.929			
SR 10		.927			
SR 12		.889			
SR 13		.774			
SR 11		.590			
SR 19			.878		
SR 15			.862		
SR 17			.854		
SR 18			.778		
SR 16			.738		
SR 14			.552		
SR 22				.921	
SR 21				.860	
SR 20				.805	
SR 23				.761	
SR 24				.747	
SR 25					.892
SR 29					.887
SR 26					.761
SR 27					.739
SR 28					.629

(n = 189)

After applying factor analysis and data reduction to the management practices factors and commitment factors, the questionnaire's 29 factors are reduced to five components, which are shown in table 6.6. The table showed the percentages of variance of each component, eigenvalue, loading score and the management practices factors which are extracted from.

**Table 6.6:** Management practices and commitment factors aggregated to component following rotation

Management Practices component	Extracted eigenvalue	Rotation sum of squared loadings: variance %	Management practices aggregated to component following rotation		
			Factor loading score	Factor Code	Factor Statement
Component 1 Organisational Management Support	9.470	32.654	.941	SR 06	Managers reminds staff about following food safety practices
			.928	SR 07	Employees are disciplined or reprimanded when they fail to follow food safety practices
			.909	SR 02	Managers are actively involved in making sure safe food handling is practiced
			.904	SR 03	Managers ensure good cooperation among departments so that customers receive safely prepared food
			.899	SR 04	Managers enforce food safety rules consistently with all employees
			.875	SR 01	Managers inspire staff to follow safe food handling practices
			.757	SR 05	Managers always watch to see if employees are practicing safe food handling
Component 2 Communication	5.140	17.723	.964	SR 08	Food handlers can freely speak up if they see something that may affect food safety
			.929	SR 09	Managers generally give appropriate instructions on safe food handling
			.927	SR 10	All of the necessary information for handling food safely is readily available to food handlers
			.889	SR 12	Food handlers are encouraged to provide suggestions for improving food safety practices
			.774	SR 13	All managers give consistent information about food safety
			.590	SR 11	Managers provide adequate and timely information about current food safety rules and regulations
Component 3	3.189		.878	SR 19	Food safety training given to staff is adequate to enable to them to assess hazards in workplace
			.862	SR 15	New recruits are trained adequately to learn food safety rules and procedures

<b>Training</b>		10.998	.854	SR 17	Staff are not adequately trained to respond to emergency situations in my workplace area
			.778	SR 18	Management encourages the staff to attend food safety training programs
			.738	SR 16	Food safety issues are given high priority in training programs
			.552	SR 14	My company gives comprehensive training to the employees in workplace health and food safety issues
<b>Component 4 Employee Involvement</b>	1.831	6.312	.921	SR 22	Management promotes employee involvement in food safety related matters
			.860	SR 21	My company has food safety committees consisting of representatives of management and employees
			.805	SR 20	Management always welcomes opinions from employees before making final decisions on food safety related matters
			.761	SR 23	Management consults with employees regularly about workplace health and food safety issues
			.747	SR 24	Employees do not sincerely participate in identifying food safety problems
<b>Component 5 Employee Commitment</b>	1.499	5.168	.892	SR 25	I follow food safety rules because it is my responsibility to do so
			.887	SR 29	I keep my work area clean because I care about food safety
			.761	SR 26	Food safety is a high priority to me
			.739	SR 27	I follow food safety rules because I think they are important
			.629	SR 28	I am committed to following all food safety rules

## 6.7.2 Management Practices (MP) Factors Classification

Management practices factors were classified into four latent constructs:

### 6.7.2.1 MP1 (Cluster 1) Organisational Management Support

This cluster as shown in Table 6.6 comprises one component and represents 32.654% of the total variance explained.



It is made up of seven factors and they relate to the management assurance of cooperation among departments, disciplining & reprimanding, reminding of following food safety practices, enforcing food safety rules, management involves in safe food handling assurance, management inspiration, and management role in food safety practices.

The measurements in this cluster adopted form one source and the researcher detected the items loaded highlighted the clue of the importance of the support from the organisation in the form of management practices that assist the food handler to execute the safe food procedures.

This cluster aligned with what Ungku Fatimah, Strohhahn, and Arendt (2014) have argued about the appropriateness of the loaded items to measure the organisational management support construct and importance of support of management in the food safety issues in the food businesses management. Consequently, this cluster named as organisational management support.

#### **6.7.2.2 MP2 (Cluster 2) Communication**

This cluster as shown in Table 6.6 comprises one component and represents 17.723 % of the total variance explained. This cluster is made up of six factors and they relate to providing of current information of food safety rules, encouraging of food safety suggestions, assurance of the availability of necessary information for handling food safely, and issuance of appropriate instructions on safe food handling, consistent of the information, and food handlers can freely speak up about food safety issues.

The measurements in this cluster adopted form one source and the researcher detected the items loaded highlighted the clue of the importance of communication among the organisation in the form of management practices that assist the food handler to execute the safe food procedures.

This cluster aligned with what Ungku Fatimah, Strohbehn, and Arendt (2014) have argued about the appropriateness of the loaded items to measure the communication construct. Furthermore, the importance of communication between management and food handlers in the food safety issues in the food businesses management. Consequently, this cluster named as communication.

#### **6.7.2.3 MP3 (Cluster 3) Training**

This cluster as shown in Table 6.6 comprises one component and represents 10.998% of the total variance explained. This cluster is made up of six factors and they relate to high priority of food safety training programs, adequate training for staff, providing comprehensive training, adequate training for new recruits, adequate training about hazards assessment, and management encouragement for training attendance.

The measurements in this cluster adopted form one source and the researcher detected the items loaded highlighted the clue of the importance of food safety training management in the organisation in the form of management practices that assist the food handler to execute the safe food procedures. This cluster aligned with what Vinodkumar and Bhasi (2010) have argued about the appropriateness of the loaded items to measure the training construct and the importance of training issues in the food businesses management. Consequently, this cluster named as training.

#### **6.7.2.4 MP4 (Cluster 4) Employee Involvement**

This cluster as shown in Table 6.6 comprises one component and represents 6.312 % of the total variance explained.

This cluster is made up of five factors and they relate to movement welcoming of staff opinions before making final decisions, staff participation of food safety problems identification, establishing food safety committees from management and employees, management promotes employee involvement, and regular of consults with employees concerning food safety issues.

The measurements in this cluster adopted form one source and the researcher detected the items loaded highlighted the clue of the importance of involving the food handlers in food safety issues form of management practices that assist the food handler to execute the safe food procedures.

This cluster aligned with what Vinodkumar and Bhasi (2010) have argued about the appropriateness of the loaded items to measure the employee involvement construct and the importance of employee involving in issues related to their work in the organisation. Consequently, this cluster named as employee involvement.

### **6.7.3 Employee Commitment (CMT) Factors Classification**

Employee commitment factors were classified into one latent construct as fifth cluster:

#### **6.7.3.1 CMT (Cluster 5) Employee Commitment**

This cluster as shown in Table 6.6 comprises one component and represents 5.168 % of the total variance explained. This cluster is made up of five factors and they relate to the following of food safety rules because it is important, commitment to food safety rules, caring of food safety, following of food safety rules because it is employee responsibility, high priority of food safety to employees.

The measurements in this cluster adopted form one source and the researcher detected the items loaded highlighted the clue of the importance of food handlers commitment in food safety that necessary to execute the safe food procedures.

This cluster aligned with what Ungku Fatimah, Strohbehn, and Arendt (2014) have argued about the importance of employee commitment related to their work in the organisation. Consequently, this cluster named as employee commitment.

#### **6.7.4 Organisational Food Safety Performance (OFSP) Classification**

Organisational food safety performance factors was separately classified into one latent construct as sixth cluster.

##### **6.7.4.1 OFSP (Cluster 6) Organisational Food Safety Performance**

After applying factor analysis and data reduction to the organisational food safety performance factors, the questionnaire's seven factors are reduced to only one component, which are shown in Table 6.7.

The table also showed the percentages of variance of the component, eigenvalue, loading score and the organisational food safety performance factors that were extracted. The results of the factor loading of the items test showed that all items were more than the acceptable values 0.50 according to Hair et al. (2010) except item #7. However, the loading was .494 that is very close to the acceptable values 0.50 and the construct has good composite reliability. The factor loading of the items were between .494 and .847 indicated in the Table 6.7, factors SR(2), SR(3), SR(5), SR(6), SR(1) SR(4), and SR(7) have greater influence on component1.

**Table 6.7:** Factor Analysis and Reliability of the Final Instrument for Food Safety Performance

Constructs	No of Items	Factor loading for items in first factor	KMO	Eigen-Value	% of Variance	% of Cumulative Variance	Cronbach's Alpha
Organisational FSP	7	.847 .839 .837 .827 .820 .781 .494	.901	4.332	61.890	61.890	.893

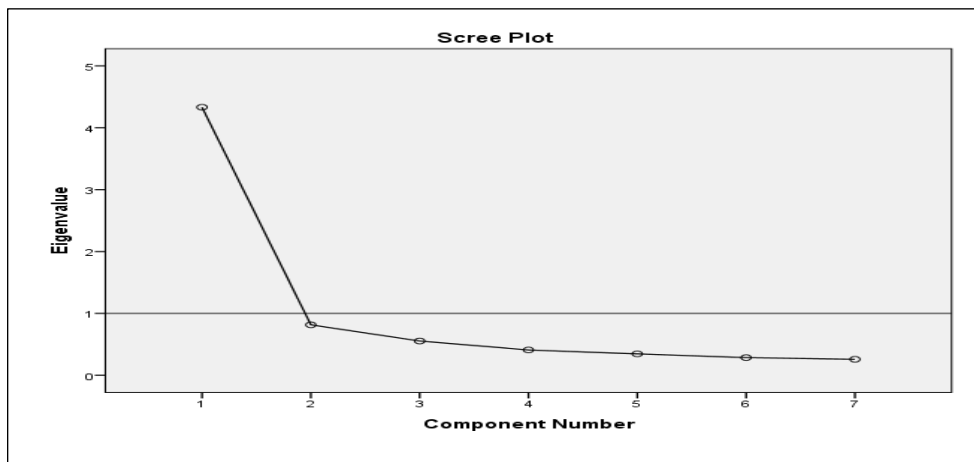
As in Table 6.7 there is one component and represents 61.890 of the total variance explained. This cluster is made up of seven factors and they relate to the food handlers food safety knowledge and competency, good personal hygiene, food safety practices of food handlers, food safety management system checks are in place, results of internal, external, and regulatory food safety audits, trend of recall cases, expired, and returned of finished food products, and finished food products specification.

The measurements in this cluster adopted form one source (Dubai Municipality) and the researcher detected the items loaded highlighted the clue of the importance to measure the comprehensive food safety performance in food manufacturing firms. This cluster as clear in Table 6.8 aligned with what Yiannas (2009) have argued about the importance of measuring the food safety performance and mixing of leading and lagging indicators to be used. Consequently, this cluster named as organisational food safety performance.

**Table 6.8:** Organisational Food safety performance factors aggregated to component following rotation

Management Practices component	Extracted eigenvalue	Rotation sum of squared loadings: variance %	Food safety performance aggregated to component following rotation		
			Factor loading score	Factor Code	Factor Statement
Component 1 Organisational Food Safety Performance	4.332	61.890	.847	SR(2)	Food handlers demonstrate good personal hygiene
			.839	SR(3)	Food handlers demonstrate safe behaviours (practices)
			.837	SR(5)	The results and scores of internal, external, and regulatory food safety audit
			.827	SR(6)	The trend of recall cases, expired, and returned of finished food products
			.820	SR(1)	Food handlers demonstrate food safety knowledge and competency
			.781	SR(4)	Food safety management system (HACCP) measures or checks are implemented, updated, monitored, verified, validated and documented
			.494	SR(7)	Finished food products comply with specification and standards

As can be seen from Figure 6.2, the curve starts to slightly flatten out and become horizontal after component 1 and that the point of interest where the curve connects the points, which is considered to be the point where eigenvalues of less than 1 are placed.

**Figure 6.2:** Scree plot of exploratory factor analysis for OFSP factors

In conclusion, four different variables identified to represent management practices: organisational management support, communication, training and employee involvement and identified the fifth and sixth variables the employee commitment and organisational food safety performance are all summarised in Table 6.9.

**Table 6.9:** Latent variables of organisational management support, communication, training, employee involvement, employee commitment and organisational food safety performance

Variable	Factor Code	Factor Statement
Variable 1 (Organisational Management Support)	SR 06	Managers reminds staff about following food safety practices
	SR 07	Employees are disciplined or reprimanded when they fail to follow food safety practices
	SR 02	Managers are actively involved in making sure safe food handling is practiced
	SR 03	Managers ensure good cooperation among departments so that customers receive safely prepared food
	SR 04	Managers enforce food safety rules consistently with all employees
	SR 01	Managers inspire staff to follow safe food handling practices
	SR 05	Managers always watch to see if employees are practicing safe food handling
Variable 2 (Communication)	SR 08	Food handlers can freely speak up if they see something that may affect food safety
	SR 09	Managers generally give appropriate instructions on safe food handling
	SR 10	All of the necessary information for handling food safely is readily available to food handlers
	SR 12	Food handlers are encouraged to provide suggestions for improving food safety practices
	SR 13	All managers give consistent information about food safety
	SR 11	Managers provide adequate and timely information about current food safety rules and regulations
Variable 3 (Training)	SR 19	Food safety training given to staff is adequate to enable to them to assess hazards in workplace
	SR 15	New recruits are trained adequately to learn food safety rules and procedures
	SR 17	Staff are not adequately trained to respond to emergency situations in my workplace
	SR 18	Management encourages the staff to attend food safety training programs
	SR 16	Food safety issues are given high priority in training programs
	SR 14	My company gives comprehensive training to the employees in workplace health and food safety issues
Variable 4 (Employee Involvement)	SR 22	Management promotes employee involvement in food safety related matters
	SR 21	My company has food safety committees consisting of representatives of management and employees
	SR 20	Management always welcomes opinions from employees before making final decisions on food safety related matters

Variable 5 (Food Handler Commitment)	SR 23	Management consults with employees regularly about workplace health and food safety issues
	SR 24	Employees do not sincerely participate in identifying food safety problems
	SR 25	I follow food safety rules because it is my responsibility to do so
	SR 29	I keep my work area clean because I care about food safety
	SR 26	Food safety is a high priority to me
	SR 27	I follow food safety rules because I think they are important
	SR 28	I am committed to following all food safety rules

Variable	Factor Code	Factor Statement
Variable 6 (Organisational Food Safety Performance)		Food handlers demonstrate good personal hygiene
	SR (2)	
	SR (3)	Food handlers demonstrate safe behaviours (practices)
	SR (5)	The results and scores of internal, external, and regulatory food safety audit
	SR (6)	The trend of recall cases, expired, and returned of finished food products
	SR (1)	Food handlers demonstrate food safety knowledge and competency
	SR (4)	Food safety management system (HACCP) measures or checks are implemented, updated, monitored, verified, validated and documented
	SR (7)	Finished food products comply with specification and standards

## 6.8 Convergent Validity and Discriminant Validity

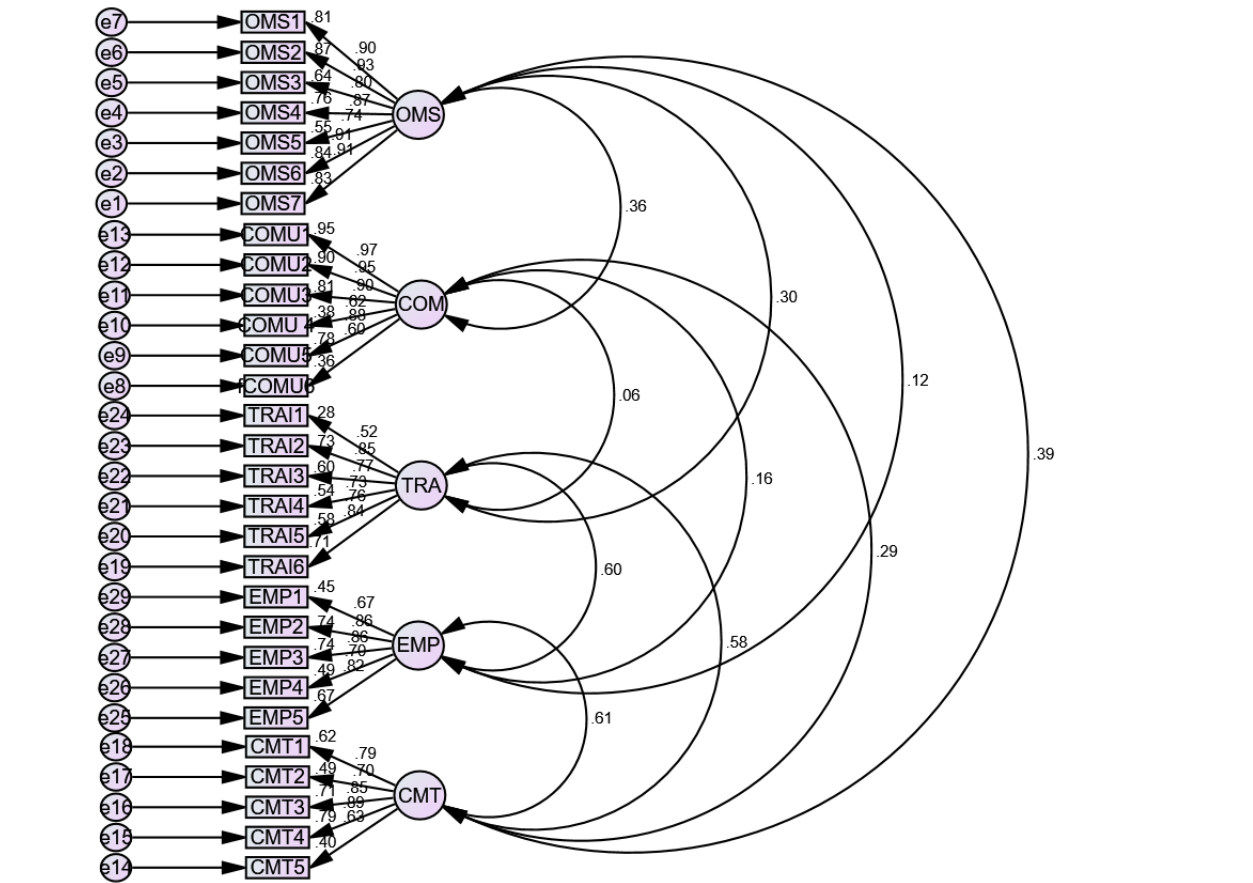
In order to check the convergent validity and discriminant validity, the factor analysis conducted for the four management practices (constructs) and commitment construct together (Five constructs) which include all questions in the questionnaire that developed to oblation food handler answerers.



Table 6.10: Discriminant validity test amongst constructs

Constructs	OMS	COM	TRA	EMP	CMT
OMS	<b>0.757</b>				
	0.129	<b>0.696</b>			
COM	0.090	0.004	<b>0.573</b>		
TRA	0.014	0.026	0.360	<b>0.618</b>	
EMP	0.152	0.084	0.360	0.372	<b>0.602</b>
CMT					

Table 6.10 presented the convergent validity was achieved as Average Variance Extracted (AVE) values were more than 0.5 (Fornell & Larcker1981). Discriminant validity of a construct was tested by comparing its shared variance (SV) and AVE values. AVE values higher than SV values.



**Figure 6.3:** Confirmatory factor analysis of management practices and commitment

Figure 6.3 showed that Amos estimated the variances and covariances successfully in the model of management practices and commitment factors.

## 6.9 Model Identification

In Structural Equation Modeling (SEM) analysis, the concept of identification is a very essential. To find out a solution to a set of structural equations, model identification is needed that directs whether there is information adequate to identify a solution. SEM does analysis the variance/covariance matrix of the observed variables as it does not analysis raw data.

For each unique variance and covariance in the observed covariance data matrix, one parameter can be estimated. Consequently, the covariance matrix offers the degrees of freedom to be used in parameters estimation.

The unique variance / covariance number can be calculated through  $1/2[p(p+1)]$  as  $p$  represent the measured items. One degree of freedom is lost for each parameter to be estimated then AMOS achieves the calculation appropriately. The identification can be examined by comparing the number of data points to number of parameters to be estimated. For instance, if the hypothesised model indicates 25 parameters to be estimated and the unique variance / covariance number (data points) calculated and was 55 when the observed variable is 10, the model would be over identified with 30 degree of freedom.

Upon comparing covariance and variance data with the parameters to be estimated, the model is an over- identified when the covariance and variance data is more. In the case of observed variance / covariance matrix has unique indicator variable variance and covariance less than the parameters to be estimated in the model, finding a unique solution will not be probable and the model is an under- identified (Wilkins 2013).

The just- identified model is with zero degrees of freedom, which indicates just sufficient degrees of freedom are available to estimate all free parameters. While this model can produce a unique solution for all parameters, scientifically it is not interesting as this model with zero degrees of freedom and consequently cannot ever be rejected (Byrne 2010, p.34) due to its fit has been determined by circumstance (Hair et al. 2010, p. 699). Increasing the measured items number in the model will increase the identification, which this may force to do survey instrument revising and proceed again with the process of data collection from beginning (Wilkins 2013).

Besides to the insufficient degrees of freedom problem, the identification problems can be affected by not ‘setting the scale’ of a construct and not correct specification of indicator. Sometimes mistakes can be made by a researcher like an item is not linking to a construct, or linking one indicator with two constructs, or picking one indicator variable in the same model two times. Another mistake can be happened as an error term for each indicator not been created or linked.

The researcher should not only depend on SEM software to highlight the identification problem. Researchers can identify the identification problems through looking to the large standard errors for one or more coefficient; negative error variances or very big parameter estimates, like standardized factor loadings and correlations outer the range +1 to – 1 according to Hair et al. (2010, p. 705) in (Wilkins 2013).

## **6.10 Model Fit**

The main interest of researcher in SEM is the level to which a hypothesised model ‘fit’, or sufficiently describes, the sample data. The SEM models can yield estimations of parameters even with no identification problems which are unreasonably or difficult logically.

The variance (variance = [standard deviation]<sup>2</sup>) is the range to which each observation is different from the mean (Muijs 2004). Amos can yield variance estimates that are negative though variances cannot be negative and the solution in this case named inadmissible. When the negative variances and R-squared values more than one are occurred which are theoretically cannot be, therefore the solution considered improper and other estimates are not dependable and this known a Heywood case. In order to ensure that the parameters estimates are displayed the correct sign, size and are within the tolerable range, parameters estimates should be checked (Byrne 2013).

Outer the range + 1 to -1 in correlations or negative variances would point out an issue. The existence of standardized errors that are extremely large or small is another sign of poor model fit.

The standard errors value mirror the accuracy of the parameter was estimated as a big value that indicate imprecise estimation. There is no way that an error term can be negative (a Heywood case) suggesting that extra than 100% of the variance is explained in a variable or construct (Hair et al. 2010, p. 706). When the sample size is less than 300 and the construct has less than three items, the chance for the Heywood cases would be more to occur.

Assessment of the measurement relationships between items and constructs is one of the greatest main assessments of the validity of construct.

The models comparatively with great loading, e.g., standardized loadings above .50 is acceptable (Janssens et al. 2008, p.294), and values above .70 are ideal (Hair et al.2010, p.708). High loading indicates that strong relation linking the indicators to their related constructs. The statistical significance of each estimated coefficient should be examined by researchers and non-significance estimates to be excluded. Furthermore, the critical ratio (C. R.) is the test statistic to be considered as parameter estimate divided by its standard error which should be more than 1.96.

The main objective of the process of SEM estimation is produce parameter values while the residuals (differences) are negligible between the estimated/implied covariance matrix and the observed sample covariance matrix.

Many goodness- of-fit test results are yields by AMOS. In SEM, when the chi square ( $\chi^2$ ) statistic is non- significant indicate to a good fit. Nevertheless, as  $\chi^2$  statistic is sensitive to the size of sample which makes achieving satisfactory model fits is difficult when sample sizes increase.

Producing a significant result of  $\chi^2$  test is a common in everyday research, however in the case of sample above 200 risk would occur that a valid model could be rejected by the researcher (Bagozzi 2010). On the other hand, there is increased risk that researchers accept invalid models because the result of a non - significant  $\chi^2$  test in the case of small sample sizes.

Accordingly, in published studies there are arrange of alternative fit indices the researchers generally examine to confirm the results of several goodness- of- fit tests. Below some of the most commonly fit indices used:

#### **6.10.1 Normed Chi- Square Test ( $\chi^2$ /df)**

To yield precise result more comparing with  $\chi^2$  test particularly sample ( $> 200$ ), the normed chi-square is used (Hoe 2008, p. 78). Normed chi- square test calculated by dividing  $\chi^2$  by degrees of freedom and the result will be presented in AMOS as CMIN/DF.

#### **6.10.2 Root Mean Square Error of Approximation (RMSEA)**

The difference between the observed and estimated covariance matrices per degree of freedom measured by RMSEA. The difference measurement according to the population rather than the sample therefore it signifies how good model fits a population, not only the used sample. The REMSEA attempts clearly to do correction for complexity of model and size of sample through considering both in its computation (Hair et al. 2010, p.667).

#### **6.10.3 Comparative Fit Index (CFI)**

The Comparative Fit Index is enhanced form of the Normed Fit Index (NFI), which considers the sample size (Byrne1998) and achieves fine performance in the case of small size sample.

All latent variables are uncorrelated (null/independence model) as assumed by this statistic and compares the sample covariance matrix with this null model. CFI is one of the most commonly used in all SEM programs as it is least effected by the size of sample (Fan et al. 1999). The statistic range for this index between 0.0 and 1.0 and the value that close to 1.0 showing good fit. A cut-off criterion of  $CFI \geq 0.90$ .

#### **6.10.4 Tucker-Lewis Index (TLI)**

An example of incremental fit index is Tucker-Lewis Index (TLI), which is Non-Normed Fit Index (NNFI). This index advanced as a result of the disadvantage of Normed Fit Index concerning being influenced by the size of sample.

Higher value of TLI means the model is better fit and the acceptable value is more than 0.95. The value 0.97 is accepted as the cut-off value in a great deal of researches while TLI is non-normed not required to be between 0 and 1 (Schermelel-Engel & Moosbrugger 2003).

#### **6.10.5 Root Mean Square Residual (RMR) and Standardized RMR (SRMR)**

The square root of the difference between the residuals of the sample covariance matrix and the hypothesized covariance model is expressed as RMR and the SRMR. The RMR range is calculated which considering the scales of each indicator, hence the RMR becomes difficult to interpret when a questionnaire contains items with varying levels (some items may range from 1 – 5 while others range from 1 – 7) (Kline, 2005). This difficulty resolves by the SRMR as assist in much more meaningful to interpret the values of RMR.

The value range of SRMR between 0 and 1, and values less than .05 indicates well-fitting models (Diamantopoulos & Siguaw 2000), while a high values like 0.08 are considered tolerable (Hu & Bentler 1999). Perfect fit can be obtained when SRMR of 0 value and generally in case of a model has high number of parameters and large sample sizes, the SRMR will be lower.

Three indices groups named absolute, incremental and parsimony are the goodness - of- fit statistics. The incremental do compare with null/ baseline models, whereas absolute indices do not compare the hypothesized model with another model. Considering the models fit relative to their complexity, the parsimony fit indices offer information regarding which the model among a set of competing models is best (Wilkins 2013).

Advice from Hair et al. (2010, p. 721) to researchers to use at least one absolute fit index ( e.g.,  $\chi^2 / df$ , RMSEA) and one incremental fit index ( e.g., NFI, CFI) in addition to  $\chi^2$  results and Bentler ( 1990) debated that the CFI to be the index of select over the NFI incremental fit index.

Another advise from Hairs et al. ( 2010,p.678) that applying one set of cut-off values to all measurements or structural models is not practical , equally set of index values that able to distinct the good models from the poor ones is not exist.

It is not vital or realistic to use every index in the program's output as it will confused a reader and as well as a reviewer. As there are many of fit indices, it is difficult to select those fit indices that indicate the best fit. CFI, GFI, NFI and the NNFI are the most commonly reported fit indices based on the review conducted by McDonald and Ho (2002). While adopting what is most frequently used is not certainly worthy practice because some of these statistics regularly are purely depend on for historical reasons, rather than for their sophistication.



Whereas, there are no standard rules for the model fit assessment, using several a diversity of indices is vital (Crowley & Fan 1997) as diverse indices mirror a diverse model fit aspect.

It is still vital that Chi-Square statistic, along with its degrees of freedom and associated p value, should reported at all times in spite of the Model Chi-Square has many problems associated with it (Kline 2005; Hayduk et al. 2007). Hu and Bentler (1999) suggested a two-index presentation format like NNFI (TLI) and SRMR, RMSEA and SRMR, CFI and SRMR. Kline (2005) supported using of the Chi-Square test, the RMSEA, the CFI and the SRMR.

Founded on the above review it is workable to adopt the Chi-Square statistic, its degrees of freedom and p value, the RMSEA, SRMR, CFI and TLI. These selected out of the several indices because they are the most insensitive to size of the sample, model misspecification and parameter estimates.

The tolerable ranges and cut-off values are: for chi-square (CMIN) the p-value > 0.05 (Bagozzi & Yi 2012; Hair et al.2010) ; CMIN/ DF with a range from 1 to 5 (Schumacker & Lomax, 2004; Ullman 2001); TLI with a range from 0 to 1 (Hu & Bentler 1999); CFI  $\geq$  0.9 (Bentler 1995); and RMSEA  $\leq$  0.1 (MacCallum, Browne, & Sugawara1996) ;RMR with a range from 0 to 1 with well-fitting models obtaining values less than .05 (Diamantopoulos & Siguaw 2000). The measurement model fit results for the management practices and commitment are summarised in Table 6.11 that are within standards and showed overall, the measurement model fit is acceptable.

**Table 6.11:** Summary of goodness- of fit tests and values indicating good measurement model fit

CMIN	CMIN/ DF	RMR	TLI	CFI	RMSEA
780.946 p-value .000	2.128	.015	.900	.910	.077

## 6.11 Analysis of the Empirical Results Overall Model Fit

The following tolerable ranges and cut-off values been used in analyzing the empirical results overall model fit : for chi-square (CMIN) the p-value > 0.05 (Bagozzi & Yi 2012; Hair et al. 2010) ; CMIN/ DF with a range from 1 to 5 (Schumacker & Lomax 2004; Ullman 2001);TLI with a range from 0 to 1 (Hu & Bentler 1999); CFI  $\geq$  0.9 (Bentler 1995); and RMSEA  $\leq$  0.1 (MacCallum, Browne, & Sugawara 1996) ;RMR with a range from 0 to 1 with well-fitting models obtaining values less than .05 (Diamantopoulos & Siguaw 2000).

The results of the structural model fit indices for the management practices, employee commitment and organisational food safety performance are summarised in Table 6.12 that are within standards and showed overall, the theoretical model has good fit to the observed data.

**Table 6.12:** The Summary of structural model fit indices

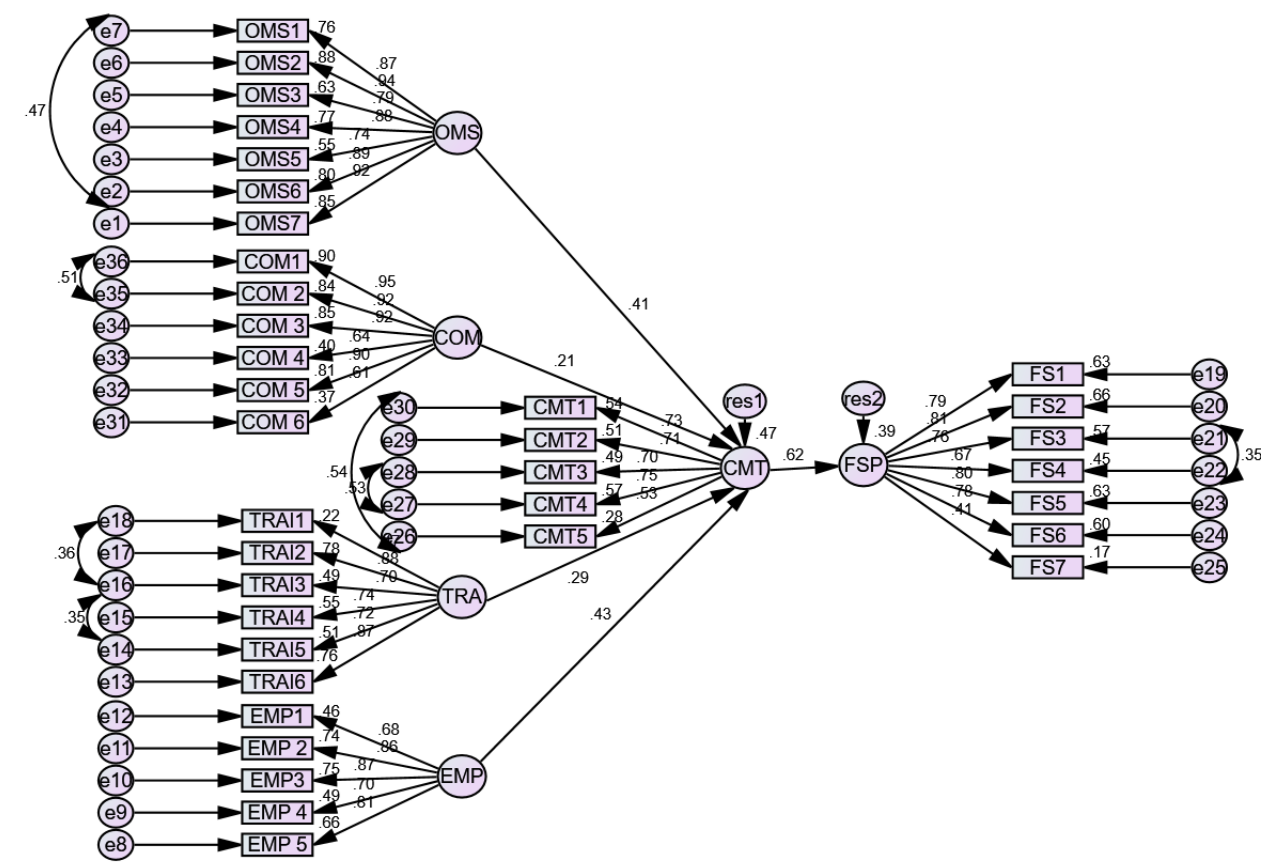
CMIN	CMIN/ DF	RMR	TLI	CFI	RMSEA
1137.001 p-value .000	1.954	.041	.892	.900	.071

## 6.12 Structural Model: Hypotheses Testing Results

The full measurement model has achieved the reliability, convergent and discriminant validity with over- identified. This achievement confirmed the measuring of the latent construct were carried out in a reliable as well as valid way. After confirmation of this step, the researcher could proceed to specify the structural model. The results of model fit was accepted pushed to progress and specify the structural model.

The structural model can be showed in the form of visual diagram that signifies a set of structural equations. The structural relationships between latent constructs is a conceptual representation of a structural model. Such relationships can be empirically expressed by the structural parameter estimate which is recognises as a path estimate (Hair et al. 2010).

Typically, the measurement models signify non- casual or correlational relationships between construct, whereas the aim of the structural model is construct the casual relationships between constructs. A structural model was created (portrayed in Figure 6.4) to test the hypotheses that proposed in the chapter three.



**Figure 6.4:** Structural model with six latent constructs showing all hypothesised relationship

The proposed relationships between the management practices and employee commitment and the relationship between the employee commitment and organisational food safety performance were examined. SEM analysis on data collected from 189 food manufacturing firms with the AMOS 23.0 statistical package software.

While the CFA illustrated in previous section, this section illustrated the SEM analyses results as latent variables reflected in circles and measure variables in rectangles.

### 6.12.1 Determining the Influence of the Management Practices on the Employee Commitment

By using the AMOS 23.0 statistical package software, the proposed relationships between the management practices (organisational management practices, communication, training, and employee involving), employee commitment, and the relationship between the employee commitment and organisational food safety performance. The critical ratio (CR) was  $> 1.96$  and significant which all illustrated in the Table.6.13.

**Table 6.13:** Hypothesis test results

Hypothesis	Standardised estimate	Standard Error	Critical Ratio	Result
H1 OMS to CMT	0.251	0.053	4.770***	Supported
H2 COM to CMT	0.196	0.070	2.806*	Supported
H3 TRA to CMT	0.334	0.091	3.660***	Supported
H4 EIN to CMT	0.376	0.079	4.745***	Supported
H5 CMT to OFSP	0.873	0.159	5.472***	Supported

\* =  $p < .05$ , \*\*\* =  $p < .001$

### **6.12.1.1 Determining the Influence of the Organisational Management Support on Employee Commitment**

The first hypothesis that proposed in chapter three was *H1: Organisational management support is positively related to employee commitment to implementing the safe food procedures* was tested. The results showed that the relationship is positive and significant (t-value = 4.770,  $p < 0.001$ ) which support the hypothesis.

### **6.12.1.2 Determining the Influence of the Communication on Employee commitment**

The second hypothesis that proposed in chapter three was *H2: Communication is positively related to employee commitment to implementing the safe food procedures* was tested. The results showed that the relationship is positive and significant (t-value = 2.806,  $p < 0.05$ ) which support the hypothesis.

### **6.12.1.3 Determining the Influence of the Training on Employee Commitment**

The third hypothesis that proposed in chapter three was *H3: Training is positively related to employee commitment to implementing the safe food procedures* was tested. The results showed that the relationship is positive and significant (t-value = 3.660,  $p < 0.001$ ) which support the hypothesis.

#### **6.12.1.4 Determining the Influence of the Employee Involvement on Employee Commitment**

The fourth hypothesis that proposed in chapter three was *H4: Employees involvement is positively related to employee commitment to implementing the safe food procedures* was tested. The results showed that the relationship is positive and significant (t-value = 4.745,  $p < 0.001$ ) which support the hypothesis.

#### **6.12.2 Determining the Influence of the Employee Commitment on Organisational Food Safety Performance**

The fifth hypothesis that proposed in chapter three was *H5: Employee commitment is positively related to organisational food safety performance* was tested. The results showed that the relationship is positive and significant (t-value = 5.472,  $p < 0.001$ ) which support the hypothesis.

Therefore, it was found that all of the studied management practices have a direct significant positive impact on the food handlers' commitment to implementing safe food procedures. Furthermore, the food handlers' commitment has a significant positive impact on organisational food safety performance.

### **6.13 Testing the Mediation Effects**

The four causal steps procedure in founding mediation discussed by Baron and Kenny (1986) is the well-known approach. Focusing on the regression equations connected to the independent variable, mediator variable, and dependent variable (Zhao, Lynch & Chen 2010) as follows:

1. The causal variable is related to the outcome variable. This step to determine that there is an effect that may be mediated. (The relation is significant).
2. The causal variable is related to the mediator. This is the first step in the determination of the mediation effect. (The relation is significant).
3. The mediator relate the outcome variable. This is the second step in the determination of the mediation effect. (The relation 3 is significant).
4. The causal variable no longer relate the outcome variable. This step shows the mediation effect result. (The relation is not significant after the mediator is controlled).

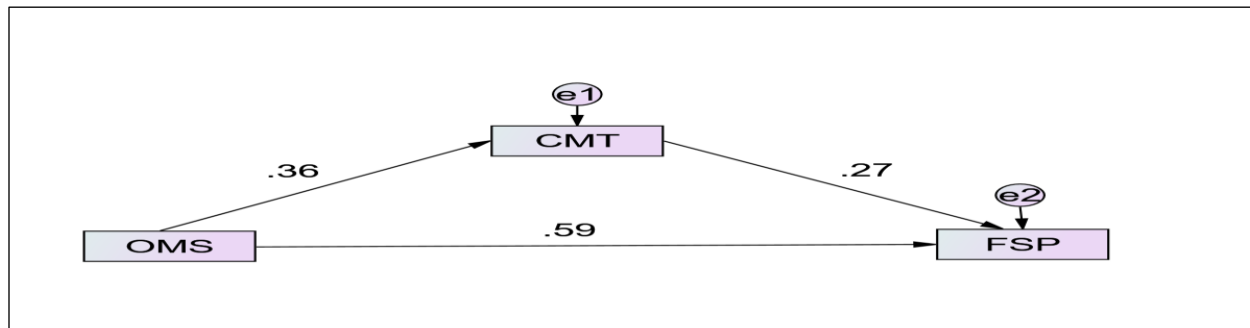
In other words, when the mediation effect conveyed through the mediator is taken into account, the relationship between causal variable outcome variable mentioned in step #1 disappeared.

Complying with the first three steps indicates to partial mediation whereas complying with all four steps indicates to full mediation (Zhao, Lynch & Chen 2010).

SEM technique is gradually replaced the traditional approach to test the mediation between the constructs. Hence, to examine the direct and indirect effects between the constructs for relatively small sample size, the bootstrapping was considered (Zhang and Wang 2008). Furthermore, bootstrapping procedure is considered is to be suitable due to its capability in mediation analysis of complex latent constructs (Shrout & Bolger 2002). The results of mediation were founded on the extraction of 2000 bootstrap and bias corrected confidence intervals with 95% guarantee the mediations is significant among the respective constructs. The third research question in this study asking whether the employee commitment has a mediating role in the association between the management practices and organisational food safety performance.

This question had been raised for testing mediation in order to comprehend the mechanism through which the causal variable affects the outcome variable.

Testing the mediating role of commitment on the relationship between the organisational management support and organisational food safety performance illustrated in Figure 6.5 was conducted through examining the related significant of the both effects direct and indirect. The results showed that the mediation analysis is achieved the first three steps mentioned in Baron and Kenny (1986) procedure and indicates to partial mediation.



**Figure 6.5:** The mediation of CMT on the relationship between OMS and OFSP

Furthermore, the results showed that both direct and indirect effect of organisational management support on organisational food safety performance were significant, therefore representing that the relationship between the organisational management support and organisational food safety performance is partially mediated by commitment. The bootstrapping mediation results presented in Table 6.14.



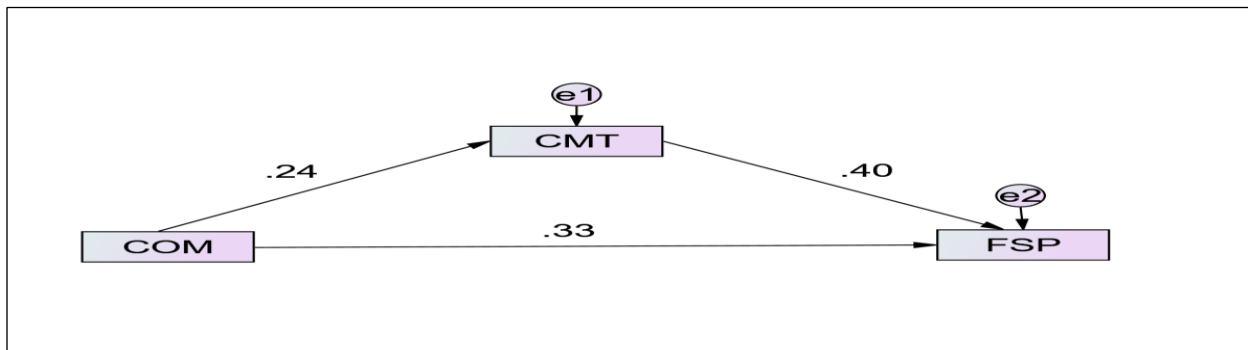
**Table 6.14:** Results of mediation test

Relationship	Mediator	Standardized Direct Effect	Standardized Indirect Effect	Mediation Result
OMS to OFSP	Commitment	.587**(.002)	.098*** (.000)	Partial

\*\*\* =  $p < .001$

\*\* =  $p < .01$

Testing the mediating role of commitment on the relationship between the communication food safety performance illustrated in Figure 6.6 was conducted through examining the related significant of the both effects direct and indirect. The results showed that the mediation analysis is achieved the first three steps mentioned in Baron and Kenny (1986) procedure and indicates to partial mediation.



**Figure 6.6:** The mediation of CMT on the relationship between COM and OFSP

Furthermore, the results showed that both direct and indirect effect of communication on organisational food safety performance were significant, therefore representing that the relationship between the communication and organisational food safety performance is partially mediated by commitment. The bootstrapping mediation results presented in Table 6.15.

**Table 6.15:** Results of mediation test

Relationship	Mediator	Standardized Direct Effect	Standardized Indirect Effect	Mediation Result
COM to FSP	Commitment	.329**(.002)	.098** (.001)	Partial

\*\* =  $p < 0.01$

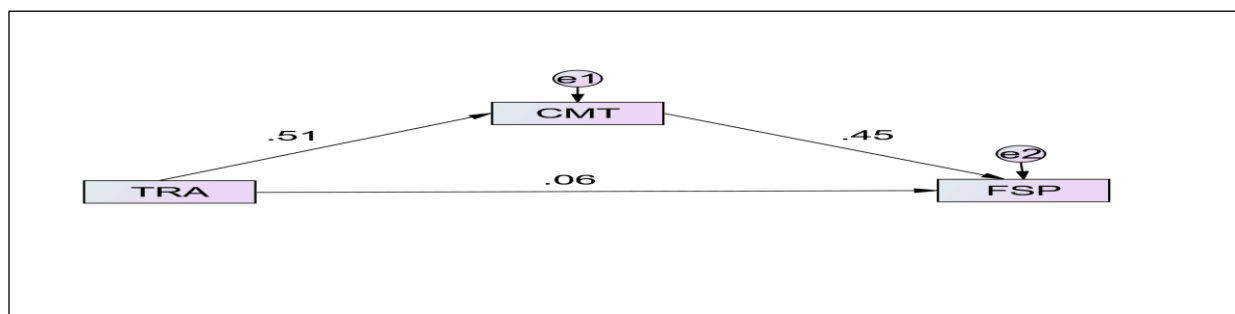
Testing the mediating role of commitment on the relationship between the training and

Relationship	Mediator	Standardized Direct Effect	Standardized Indirect Effect	Mediation Result
TRA to FSP	Commitment	.061(.232) ns	.230 ** (.001)	Full

ns = not significant

\*\* =  $p < .01$

organisational food safety performance illustrated in Figure 6.7 was conducted through examining the related significant of the both effects direct and indirect. The results showed that the mediation analysis is achieved all fourth steps mentioned in Baron and Kenny (1986) procedure and indicates to full mediation.

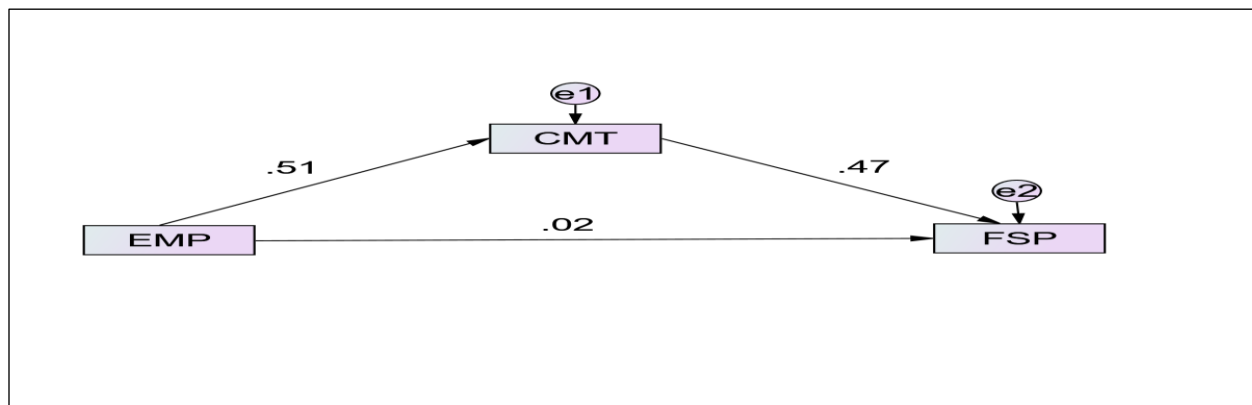


**Figure 6.7:** The mediation of CMT on the relationship between TRA and OFSP

Furthermore, the results showed that the indirect effect of training on organisational food safety performance was significant, while the direct effect of training on organisational food safety performance was not significant. Therefore, the results represented that the relationship between the training and organisational food safety performance is full mediated by commitment. The bootstrapping mediation results presented in Table 6.16.

**Table 6.16:** Results of mediation test

Testing the mediating role of commitment on the relationship between the employee involvement and organisational food safety performance illustrated in Figure 6.8 was conducted through examining the related significant of the both effects direct and indirect. The results showed that the mediation analysis is achieved all fourth steps mentioned in Baron and Kenny (1986) procedure and indicates to full mediation.



**Figure 6.8:** The mediation of CMT on the relationship between EMP and OFSP

Furthermore, the results showed that the indirect effect of employee involvement on organisational food safety performance was significant, while the direct effect of employee involvement on organisational food safety performance was not significant. Therefore, the results represented that the relationship between the employee involvement and organisational food safety performance is full mediated by commitment. The bootstrapping mediation results presented in Table 6.17.

**Table 6.17:** Results of mediation test

Relationship	Mediator	Standardized Direct Effect	Standardized Indirect Effect	Mediation Result
EMP to FSP	Commitment	.016(.809) ns	.239 ** (.001)	Full

ns = not significant

\*\* =  $p < 0.01$

The results also indicate that the food handlers' commitment fully mediates the relationship between the training and food safety performance of food manufacturing firms. Similarly, the food handlers' commitment fully mediates the relationship between employee involvement and the food safety performance of food manufacturing firms. The food handlers' commitment was found to partially mediate the relationship between organisational management support and the food safety performance, and similarly the food handlers' commitment was found to partially mediate the relationship between communication and the food safety performance. These results indicate that food handlers' commitment is a mediator in the relationship between all of the studied management practices and the food safety performance of food manufacturing firms. Based on the mediation results, the association between employee involvement and training was examined and found significantly associated.

This suggests that employee involvement can be an important factor in boosting training effectiveness, such as the food handlers' skills levels and their work performance when they are involved in decision making, or their problem solving in daily work activities. This indicates that learning is not a product with an identifiable outcome endorsed with a completion or attendance certificate. Rather, it is a process in which learners enhance their work performance when they are involved and able to translate the knowledge obtained through training into practice during daily work activities.

## **6.14 Summary**

This chapter presented the measurement model and structural model with six latent constructs and were statistically acceptable. In addition to test the hypothesised relationships, the meditational hypothesised relationships were tested. The results showed that all management practices have a positive direct relationship with the employee commitment and the employee commitment has positive direct relationship with organisational food safety performance.

At the same time, the results showed that the food handlers' commitment was found to partially mediate the relationship between organisational management support and the food safety performance, and similarly the food handlers' commitment was found to partially mediate the relationship between communication and the organisational food safety performance. The results also indicate that the food handlers' commitment fully mediates the relationship between the training and food safety performance of food manufacturing firms.

Similarly, the food handlers' commitment fully mediates the relationship between employee involvement and the food safety performance of food manufacturing firms. These results indicate that food handlers' commitment is a mediator in the relationship between all of the studied management practices and the food safety performance of food manufacturing firms.

## **Chapter Seven: Discussion of the Research Findings**

### **7.1 Introduction to Chapter**

The first part of this chapter summarised and explained the research findings. Furthermore, presented the discussion on the research hypotheses separately. The key findings were presented and then related to the existing literature.

### **7.2 Summary of Findings**

The data were analysed using IBM SPSS Statistics and SPSS AMOS (version 23.0). A series of preliminary statistical analyses were conducted to establish the reliability and validity of the scales. Cronbach's alpha test was used to establish the internal consistency of the scales. The scores ranged from .86 to .95, suggesting that the scales are reliable. Exploratory factor analysis was conducted to establish factor convergence. The four management practices, with eigenvalues ranging from 9.47 to 1.49 together explained 72.8% of variance. All items loaded on the correct construct. Harman's one-factor test was applied to investigate for possible common method bias in the data. Exploratory factor analysis on a single fixed factor revealed that the factor explained 32.6% of the variance of the 29 observed variables compared to 72.8% of variance explained by the five factor model, suggesting that common method bias is not a problem in the data.

Then, confirmatory factor analysis was conducted to establish the convergent and discriminant validity of the measurement scales. All the scales yielded acceptable values for average variance extracted ( $>.50$ ) and composite reliability ( $>.70$ ), thus establishing convergent reliability. To establish discriminant validity, the approach suggested by Fornell and Larcker (1981) was adopted. As all constructs have correlations that are lower than the square root of average variance extracted for their respective construct, and all average variance extracted values are higher than the shared variance values, there appear to be no issues of discriminant validity in the data.

A selection of fit indices indicate that the data has a reasonably good fit with the measurement model:  $\chi^2 (367) = 780.95$ ,  $p < .001$ ;  $\chi^2/df = 2.128$ ; RMR = .015; TLI = .900; CFI = .910; RMSEA = 0.077.

After achieving acceptable results for the measurement model, model identification was confirmed and then the full structural model and hypotheses were tested. The structural model results indicate that the data has a good fit with the proposed model:  $\chi^2 (582) = 1137.00$ ,  $p < .001$ ;  $\chi^2/df = 1.954$ ; RMR = .041; TLI = .892; CFI = .900; RMSEA = 0.071. Table 6.20 presents the results of the proposed hypotheses. Each of the study's five hypotheses are supported.

Next, tests were conducted to assess whether employee commitment acts as a mediator in the relationships between the four management practices and firms' food safety performance. The results are summarised in Table 6.14, 6.15, 7.16, & 6.17. It was found that employee commitment is a full mediator in the relationships between training and firm food safety performance and employee involvement and firm food safety performance. In the relationships between communication and firm food safety performance and organisational management support and firm food safety performance, employee commitment acts as a partial mediator.



### 7.3 Research Key Findings

A number of key findings found in this research contribute to management practices, food handlers' commitment and organisational performance, as summarised below:

1. All proposed hypotheses were supported. Thus, each of the four management practices has a positive relationship with food handlers' commitment, and food handlers' commitment is positively related to firms' food safety performance.
2. The results indicated that food handlers' commitment act a mediator (full or partial) in the relationship between all of the studied management practices and the food safety performance of food manufacturing firms.
3. Enhancing the food safety performance in food manufacturing firms needs employees with high commitment to direct their behaviour toward food safety.
4. Achieving food safety performance needs to go beyond the traditional interventions (traditional training, food testing, and inspection). It needs to understand how to manage the food safety and understand how the food handlers handle food safety.
5. Investigating the behaviour itself (normative influences) without considering the environmental factors or behaviour cause that may affect an employee intention to accomplish a behaviour is not adequate. This research explained the behaviour cause and its impact on the organisational food safety performance using the commitment theory focusing on antecedents to the behaviour.
6. This research has indicated the influence of management practices on food handlers' commitment, which directs their behaviour to implement the safe food procedures and food safety performance in the food manufacturing firms.

7. The organisational commitment theory succeeds to measure the commitment of food handlers and explains the connection between the management practices and organisational food safety performance.
8. The potential influences of management practices are vital to improve the traditional interventions effectiveness as the management practices have a key role in implementing the safe food procedures significantly as well as the organisational food safety performance.
9. Employee involvement can be an important factor in boosting training effectiveness, such as the food handlers' skills levels and their work performance when they are involved in decision making, or their problem solving in daily work activities.

## **7.4 Discussion**

This study reviewed the literature concerning the management practices, commitment and food safety performance concepts. The findings obtained from the literature review assist the researcher to find out the research gap and set the research questions mentioned in Chapter 1. Therefore, it is concluded that the existing literature emphasises the need for researchers to investigate the organisational factors that could influence the behavioural intentions of food handlers. However, no studies have been conducted to investigate the impact of different management practices on food handlers' behavioural commitment with regard to the implementation of safe food procedures and organisational food safety performance.

The objectives of this research are to critically investigate the impacts of several management practices – specifically, management support, communication, training, and employee involvement – on food handlers’ commitment towards food safety performance in food manufacturing firms based in the United Arab Emirates (UAE). The study examines the mediation effect of the food handlers’ commitment on the relationship between the management practices and the food safety performance of the firms.

The organisational commitment used in many studies conducted in both the private and public sectors has found that organisational commitment is connected to the behaviour, performance and achievement of employees. It used to measure the impact of organisational life on the behaviour and performance of the employees successfully (Cohen 2007; Lawrence et al. 2012).

For improving the organisational performance, implanting organisational commitment among employees is very important. Employees with high commitment level results promising organisational performance.

An effective management of the manpower, methods, machine, and materials (4M) leads to produce safe food products and ultimately achieve safer food better business (SFBB). Therefore, managing the manpower (food handlers) by following good management practices (GMP) will increase their commitment to implement the procedures (methods) and using the (material) and (machine) efficiently and effectively. Involving the employees and make them part of solution by talking with them, trusting, thanking, training, and teamwork (5Ts) will increase their commitment and enhance the organisational food safety performance. The results support that the food manufacturing firms those focus on soft management that emphasises employee commitment and behaviour will lead to enhance the performance.

Having a food safety management system (HACCP) will not be in place and enhance the performance unless committed employees implement the HACCP procedures and its principles.

Traditional food safety management depend completely on the health authorities to achieve its objectives. Such management are waiting the health authorities to check their food safety system.

In other words, the authority will give commands and after some times will control whether the food manufacturing firms have complied or not with the commands which were given (Command & Control) (C&C).

The results indicate that employee involvement has a strong influence on food handlers' commitment to implement safe food procedures. Training is also has a strong influence on food handlers' commitment, but the mediation tests suggest that training will only have a positive influence of firms' food safety performance if training is accompanied with food handlers' commitment. Previous studies have found that training, and even food handlers' knowledge, does not necessarily result in food handlers practicing safe food handling procedures. Existing training in food safety tends to be didactic and knowledge/competency based, yet it often does not yield the desired work outcomes. The results of this study suggest that firms may promote employee involvement not only in work contexts, such as involving employees in decision-making and encouraging them to make suggestions for improvement, but also during the training and learning processes.

The following is a summary of discussion of the research hypotheses:

*H1: Organisational management support is positively related to employee commitment to implement safe food procedures.*

Perceived organisational support will produce a committed employee to participate towards improving the organisational performance. Therefore, the organisational support used as predictor to organisational commitment.

The perceived organisational support influences the commitment and employee performance positively. If employees perceive higher organisational support, their engagement is more likely to be at a higher level. Accordingly, the employees may achieve better and complete the required tasks with higher commitment level. Management support may involve managers walking around the food production area to observe food handlers' behaviours, and then offering praise and thanks or feedback and guidance, as is appropriate.

Management support was found to have direct effects on both food handlers' commitment and firm's food safety performance. These results are consistent with previous studies such as (Nazir & Islam 2017; Simosi 2012; Wilkins, Butt, & Annabi 2017).

*H2: Communication is positively related to employee commitment to implement safe food procedures.*

Two-way communication between managers and employees is usually desirable in every work context, but in this study, communication had the weakest influence on food handlers' commitment. This finding may be explained by the nature of food manufacturing environments, which are sometimes noisy, and where food handlers often work in isolation, on production lines or operating/overseeing the working of machines.

Nevertheless, the relationship between communication and food handlers' commitment was statistically significant as illustrated in Table 6.15. Top-down communication can inform, educate and motivate food handlers, while bottom-up communication can be used by managers to: assess food handlers' attitudes and perceptions; acquire suggestions for improvement; and obtain information on problems or issues that may have an impact on the firm's food safety performance.

Thus, effective communication between the management and food handlers may have positive impacts upon coordination, cooperation and food handlers' compliance with policies and procedures.

Depending on a limited number of communication channels to communicate the food safety message is ineffective. Management may use multiple media to communicate with food handlers, such as posters, newsletters, signs, videos, meetings and site visits.

The observable specific simple communication of food safety message concerning a particular task will be more effective to reach the food handlers. Posters and signs will be most effective when they are placed in the most suitable locations, where they will be seen by the food handlers constantly or regularly. Meeting and site visits will be most effective when the communication is two-way. Managers should emphasise the key requirements and expectations of the food handlers, but they should also be prepared to listen and learn from the food handlers. During management site visits, the management can talk friendly about food safety with the food handlers in order to remove the barriers and enhance the understanding of many issues of food safety.

Such conversations from two –way is necessary to solve the food safety issues during the processing steps before the finished products reaches the customers. Such practices (Good Management Practices) support the core principle of HACCP, which based on the analysis and control the hazards in each processing steps.

The organisation in this case adopting the proactive and not reactive approach that will enhance the compliance rate with standards, improve the performance and reduce the cost as well. Therefore, better communication within the organisation will produce superior levels of employee commitment toward enhancing work performance.

Improving the communication channels in the organisation will enhance the commitment towards job performance enhancement. The communication of food safety is significantly perceived as regular communication that enhances the food safety behaviour among the food handlers.

The findings of this study also revealed that the communication influences the food handlers' commitment that direct their behaviour to implement the safe food procedures toward enhancing the organisational food safety performance and consistent with (Chen, Silverthorne & Hung 2006 ; De Boeck et al. 2016; Sharma & Dhar 2016).

*H3: Training is positively related to employee commitment to implement safe food procedures.*

Often, professionals mention that training is the solution when the organisations need to achieve positive food safety behaviours and enhance the firm's food safety performance. However, many food handlers still choose to not implement safe food procedures even the food handlers obtain traditional training (training heavily based on scientific knowledge presentation). Therefore, it is clear that such training can fail to change employee behaviour.

Focusing more on why the food safety is important and ignoring teaching the trainees how to do food safety by demonstration of tasks and duties assigned to trainees is the issue. The training should answer why food safety is important as this will lead to positive attitude and the chances for the right behaviour will be increased. At the same time, it is needed to train the trainees on how to do food safety as the aim to influence the behaviour ultimately. This can be achieved where the organisation nature works with high employee involvement.

Providing the food handlers with traditional training is important but such training may increase the knowledge but would not translate the knowledge into practices. The way the organisation followed like involving the employees have a powerful relationship with quality of training.

The organisations focus on employee involvement and give flexibility in the way they conduct their tasks are more able to translate the knowledge they received through training into practices and improve the performance. This indicates that the quality of training the employees received and working with low involvement organisation will be different with those working with high involvement organisation. In high involvement organisation, the training is more efficient (Doing the thing right) and more effective (Doing the right thing).

Good management practices such providing the employees with training has a significant positive impact on employee commitment. Offering adequate chances for training with more employee involvement will improve the employees' performance as well as organisational performance. The findings of this study also revealed that the training influences the food handlers' commitment that direct the behaviour to implement the safe food procedures toward enhancing the organisational food safety performance and consistent with (Aladwan et al. 2013; Bashir & Long 2015; Hanaysha 2016).



*H4: Employee involvement is positively related to employee commitment to implement safe food procedures.*

Involving employees more in decision making is required to make the employee more committed to quality or to any form of continual process improvement, as committed employees have been found to be a key factor in a firm's quality system implementation.

Involvement of food handlers as part of people management means that all employees in the firm are considered to be at the core of the firm. Therefore, strategies should include the involvement of employees and the opportunity to contribute with quality policy. In this way, the employees feel that they are valued and rewarded by the company that lead them to maximise their efforts toward improving the quality and organisational performance.

The results showed the employee involvement among the studied management practices has strong influence on food handlers' commitment and consistent with (Bosak et al. 2017; Ekmekci 2011; Sinha, Garg & Dhall 2016; Wilkins, Butt, & Annabi 2017).

Based on the correlations and mediation results, the association between employee involvement and training was examined and found significantly associated. This suggests that employee involvement can be an important factor in boosting training effectiveness, such as the food handlers' skills levels and their work performance when they are involved in decision making, or their problem solving in daily work activities. This consistent with study conducted by Felstead et al. (2010). This indicates that learning is not a product with an identifiable outcome endorsed with a completion or attendance certificate. Rather, it is a process in which learners enhance their work performance when they are involved and able to translate the knowledge obtained through training into practice during daily work activities.

*H5: Employee commitment is positively related to organisational food safety performance.*

Measuring food safety performance in food manufacturing firms by food safety management based on behaviour instead of relying on actual food testing is vital needed. The measuring of the food safety performance quantitatively will give deep understanding of the interventions effects in food industry or government. Therefore, building committed employees would assist the management to enhance the organisational performance positively. Without employee commitment, the top management cannot attain the success for their organisations in the most creative plans and programs. Improving the food safety performance like reducing the food borne diseases can not be performed without measuring the food safety. Measuring the target in the organisation will enable to manage it and indicate to the performance level accordingly.

Improving the performance of the employees will result in organisational performance improvement, as competent management with employee performance are essential foundation that contribute in organisational performance.

Most probably the committed employees used to continue with their current organisation and give the most efforts towards his organisation performance whereas non-committed employees are most likely to leave their organisation and contributions towards the organisation performance will be less.

Several diverse, definitions and conceptualisations of employee commitment, however shared themes between these are the individual's sense of belonging and attachment to the organisation that may lead to job involvement and loyalty to the organisation (Meyer et al. 2002).

The research has found through a diversity of organisational contexts that the employee commitment influences the job performance as well as organisational citizenship behaviors like undertaking to mentor a new employee or giving new ideas for product or process enhancement (Coffman & Gonzalez-Molina 2002; Snape & Redman 2007; Wilkins, Butt, & Annabi 2017).

The findings of this study also revealed that the employee commitment influences the food handlers' commitment that direct the behaviour to implement the safe food procedures toward enhancing the organisational food safety performance and consistent with (Azeem & Akhtar 2014; Richard et al. 2009; Sharma & Dhar 2016).

The results showed the direct relationship between the training and organisational food safety performance was not significant while the indirect relationship was significant when the commitment intervention in the relationship as a mediator. Same happened with employee involvement construct which this explain that training and employee involvement on their own will not increase the food safety performance of firms, but it also requires employee commitment in combination with training and employee involvement to have a positive effect.

Furthermore, the both direct and indirect relationships between the organisational management support and commitment and the relationship between the communication and commitment were significant. Therefore, organisational management support and communication are still can affect the organisational food safety performance without commitment but their effect is weak in this case.

## **7.5 Summary**

This chapter summarised the research findings and highlighted the key findings of this research. The research hypotheses were discussed separately and linked to the related studies have mentioned in the literature review chapter.

## **Chapter Eight: Conclusion and Contributions**

### **8.1 Introduction to Chapter**

This chapter presents the conclusions and contribution of the research from two perspectives (academic and practical perspectives). The theoretical and practical implications, research limitations and suggestions for possible future research are also presented.

### **8.2 Conclusion**

The potential influences of management practices are important for improving the effectiveness of traditional interventions, as the management practices have a key role in implementing safe food handling procedures and ensuring the organisational food safety performance. Commitment theory succeeded in measuring the commitment of food handlers and explained the connection between the management practices and organisational food safety performance. It became clear that the management practices are connected to the food handlers' safety attitudes and practices. Failures of the management to plan, organise and control the procedures could cause several outbreaks of foodborne disease, lead to low inspection scores and reduce food safety performance.

Focusing solely on analytical methods of processing and product formulations (technological solutions) and having food safety management system (managerial solution) will not be adequate to enhance the food safety performance. Therefore, firms should focus on employee behaviours (behavioural solution) to enhance the food safety performance, as the direction of employee behaviour will lead to the actual implementation of food safety procedures. The actual implementation of such procedures is affected by the perceived food safety climate by employees.

Managers should ensure they have the ability to implement the procedures of a food safety management system and know how to direct the employees' behaviour to implement the procedures efficiently and effectively. Achieving this will enable them to establish behaviour among their employees that commits to following a food safety management system (based behaviour food safety management system).

While several previous studies have examined the effects of training, food handlers' knowledge, attitude, practices (KAP) and some have examined the effects of organisational culture, such as leadership style, on food handlers' behaviours, to the researcher's knowledge, this study is the first to specifically consider the employee commitment of food handlers. The key practical implication resulting from this study is that gaining their commitment will likely yield superior levels of food safety performance. Having policies, procedures and management systems will not alone guarantee the production of safe food. Similarly, training and employee involvement on their own will not necessarily result in positive food safety outcomes, unless accompanied with food handlers' commitment. Hence, a key objective for managers must be to identify the drivers of employee commitment.

Social exchange theory suggests that employees deliver the behaviours desired by management based on reciprocity. Thus, managers need to find out what motivates and satisfies their employees and act accordingly. For example, food handlers might want or expect training, respect, praise, decision-making responsibilities, involvement, two-way communication with management, career progression and support with personal issues and problems. Involving employees and making them part of the solution by training, trusting, talking to, and thanking them, in addition to effective teamwork (the 5Ts) will typically have positive effects on employee commitment, which will in turn have a positive effect on the firm's food safety performance.

Training is vital in every food-manufacturing firm because food handlers must be equipped with the knowledge and skills needed to perform their jobs effectively. Although previous studies, such as da Cunha et al.'s (2015) study, have highlighted the importance of training, fewer studies have examined the reasons why food handlers fail to implement the behaviours taught in training.

This study offers a simple explanation: the food handlers have not been suitably stimulated or motivated to commit to their work. This research suggests that the training needs to emphasise to food handlers the need for safe handling procedures and their individual roles, responsibilities and contributions in producing food that is safe for consumers to eat or drink.

Senior management and supervisors or team leaders need to not only demonstrate their concern and interest in how the food handlers perform their jobs, but also identify and emphasise the achieved desired outcomes. Finally, management needs to implement effective monitoring systems to ensure that food handlers are following the prescribed safe food handling policies and procedures.

### **8.3 Contributions of this Research**

The food safety interventions or strategies such as food testing, food safety management systems inspections, and training applied in different countries in the world are similar. In this research, these strategies were discussed more generic in terms of food safety with a case of UAE. Therefore, the contributions of this research would be beneficial to UAE as well as other countries. This research contributes to the literature by providing empirical evidence of the association between the studied management practices and employee commitment and between employee commitment and organisational food safety performance, which previous studies have not explored.

This study lists four key factors of management practices and provides a model that contains management practices, commitment and food safety performance, which could be helpful to the managements of food manufacturing firms, training consultants and health authorities in UAE, and in other countries.

Most important, it contributes by concentrating of the causes of food poisoning outbreak occurred in the world. Such outbreaks can be avoided by managing the food safety considering the food handlers' commitment that direct them to implement safe food procedures and ensure the food safety management system in place.

The research findings herein expand the body of knowledge in the literature on management practices, commitment and the organisational food safety performance and indicate the influence of management practices on food handlers' commitment to implement safe food handling procedures and food safety performance in the food-manufacturing firms. Furthermore, the findings of this study answer the question as to why food handlers are still not executing safe food handling procedures despite having obtained food safety training.

Despite the extensive documented research conducted on the safety behaviours of employees working in the field of health and occupational safety, researchers have recently called for studies on the influences of food handlers' behaviours in food businesses (e.g. Griffith, Livesey, & Clayton 2010; Yiannas 2009).

Most previous studies have focused on explaining the behaviour itself using behavioural theories by considering the normative influences without considering the effect of environmental or behavioural cause that might affect an employee's intention to accomplish a behaviour.



By contrast, this study explains the cause of the behaviour and its impact on the organisational food safety performance using commitment theory. While many researchers have investigated the organisational commitment of employees, none have measured the food handlers' commitment or focused on the antecedents to the behaviour.

The following two sections discuss the contribution of this research from two perspectives: the academic perspective and the practitioner's perspective.

### **8.3.1 Academic Perspective**

As mentioned in the literature review chapter, existing literature has examined the relationships between management practices and commitment in non-food safety fields. However, this research investigates the relationships between management practices with commitment in the food safety field that it links with food safety performance. Previous studies have also investigated the performance of an organisation from different perspectives such as market share performance or financial performance, whereas this study examined the actual food safety performance.

Therefore, this study provides an understanding of the management practices that have a critical role in motivating food handlers' commitment and directing their behaviour positively toward enhancing the organisational food safety performance. As that aspect was not explored in the previous literature, it is considered a completely new contribution of this study. As food safety research is limited in UAE, this study is a useful addition and provides a concrete foundation for further academic research.

### **8.3.2 Practitioners' Perspective**

The implications of this research have significant importance for the management of food manufacturing firms, training consultants and health authorities. The findings of this study contribute to the knowledge of management practices that influence food handlers to enhance the organisational food safety performance.

This study also informs the management of food manufacturing firms, training consultants and health authorities of how to enhance the food safety performance by focusing on the identified management practices in their fields. As there is a scarcity of literature on food safety in UAE, this research will contribute to the knowledge of management practices, commitment and organisational food safety performance to help understand and apply these concepts in their areas.

## **8.4 Theoretical Implications**

This research has some important implications for the food safety literature. While many studies have focused on investigating the effects of traditional training, food testing, inspections and adopting various food safety management systems on food handlers' behaviours, this study investigated the influence of four keys of management practices on food handlers' commitment to implement safe food handling procedures. Furthermore, this study linked commitment with the organisational food safety performance. However, to the knowledge of the researcher, this is the first empirical study that uses commitment theory to investigate the antecedents of food handlers' commitment to implement safe food handling procedures, and the influence of management practices and food handlers' commitment on organisational food safety performance.

Most previous studies have used behavioural theories to focus on explaining the behaviour itself, and thus considered the normative influences without accounting for the environmental or behaviour cause that may affect an employee's intention to perform a particular behaviour. Some previous behavioural studies have taken a macro perspective, e.g. focusing on measuring organisational culture through investigating individual's attitudes, perceptions and behaviour. However, this research has focused on how management practices influence the individual's behavioural commitment to implement safe food handling procedures and linked this with organisational food safety performance.

Many previous studies were conducted based on TPB to evaluate the KAP model, while other studies measured the organisational culture at the macro level. The KAP model considers knowledge a precursor to influencing the employees' attitudes and accordingly their behaviour. However, these studies have shown that the knowledge obtained is not translated into positive behaviour. Sometimes food handlers obtain theoretical and practical training from supervisors in their firms and yet they still have little food safety knowledge, thus disproving the idea based on the behavioural theories that the knowledge trainees obtain will lead to a positive attitude towards implementing safe food handling procedures.

According to Reasoned Action Theory, an employee's intention to execute a particular behaviour may be influenced first by a positive attitude regarding the behaviour and, second, if they are aggravated to confirm to social norms. Even when there is an ability to implement safe food handling procedures as per the third construct of TPB (perceived behavioural control), food handlers might still not do it (one of the limitations of TPB).

The food handler may build up a positive attitude to follow safe procedures during the training but fail to translate this attitude in practice because of a lack of support from management or their environment does not emphasise the importance of following safe food handling procedures. Therefore, the positive behaviour is not achieved or not translated to actual performance.

Behavioural theories focus on explaining the behaviour itself and do consider the normative influences without considering the environmental or behavioural cause that may affect an employee's intention to accomplish a behaviour. Thus, the positive behaviour of employees is influenced by many factors beside their attitude toward the behaviour. The food handlers' behaviour needs to be directed positively towards implementing safe food handling procedures.

As employee commitment is a constant power that directs the behaviour to comply with the organisations' norms, standards and values, this study added commitment to the existing behavioural models and investigated the behavioural commitment of food handlers. The results showed that the management practices influence the food handlers' proficiency and they consequently become behaviourally committed to that performance level by implementing safe food handling procedures towards organisational food safety.

Adding commitment to the existing models (e.g. Al-Shabib, Mosilhey, & Husain 2016; Rebouças et al. 2017) has succeeded in explaining the impact of management practices to increase the behavioural commitment of food handlers to implement safe food handling procedures and aim towards organisational food safety. Considerable research in private and public sectors has found that organisational commitment is connected to behaviours, performance and achievements. Organisational commitment is used to measure the impact of organisational life on the behaviours and performance of the employees successfully (Cohen 2007; Lawrence et al. 2012).

Thus, this study expanded the literature and used commitment theory to assess how a range of management practices influences food handlers' commitment and organisational food safety performance.

This study showed the importance of the management practices that affect the food handlers' commitment to implement safe food handling procedures. This study also showed that high employee commitment is vital for improving the firm's food safety performance. These findings add to the body of food safety literature because the results showed that food handlers' commitment acts a mediator in the relationship between all of the studied management practices and the food safety performance of food manufacturing firms.

## **8.5 Practical Implications**

This study has given empirical evidence of the relationship between different of management practices and employee commitment, and of the mediator role of commitment between the management practices and organisational food safety performance.

This study has also explained how management practices affect the food handlers' commitment, which influences their behaviour to implement safe food handling procedures and thus affects the organisation's food safety performance. Such relationships have not been explored in previous studies and this research is the first to explore and explain these relationships using commitment theory in the field of food safety.

The findings were obtained through empirically testing the influence of management practices on commitment and support the following message to the management of food manufacturing firms: 'Safer Food, Better Business'.

The management of food manufacturing should use the findings herein to identify which management practices have a significant role on food handlers' commitment to implement safe food handling procedures. They can discover the possibilities for enhancing and creating policies that motivate and improve employees' commitment and performance. In addition to a techno approach, food-manufacturing firms will be able to manage food safety by adopting food safety management based on behaviour.

As the correlation and mediation results found a significant association between employee involvement and training, this suggests that employee involvement is important for boosting the effectiveness of training, which should raise the food handlers' skills and performance levels when involve them in decision-making or problem solving in their daily work activities.

It is also recommended that food manufacturing firms focus on employee involvement to enhance the training effectiveness and employ training consultants to focus on behavioural aspects. The health authorities can include management practice items in their inspection checklist to include the behavioural aspects.

This study provided reliable and valid measurements to the management of food manufacturing, training consultants and health authorities to enhance their roles in the food safety field.

This study contributes to knowledge by presenting a conceptual model, which builds upon and improves the existing models of food safety management, by introducing commitment theory to the present behavioural theories. It succeeded in explaining the management practices that influence food handlers' commitment to implementing safe food procedures, and how both these practices and the food handlers' commitment may impact upon organisational food safety performance.

It is concluded that food handlers with strong commitment are more likely to implement safe food procedures, thus contributing to the organisation's food safety performance. The findings suggest that the managers of food manufacturing firms should analyse the impacts of their management practices and create policies that motivate and improve employee commitment and performance. Further implications of the results and future research directions are also presented.

## **8.6 Limitations and Recommendations**

Despite the original and important contributions that this research makes to the existing literature, some limitations remain. These are summarised below with suggestions for future research.

Owing to time limitations, a cross-sectional survey design was conducted in a limited time, which is not the ideal way to capture accurate responses because it makes the findings difficult to generalise; a cross-sectional survey design provides only a snapshot of the existing food safety management practices and commitment rather than a comprehensive view of food handlers' perceptions over time. As the research focused on a specific kind of industry (food manufacturing), a longitudinal design would be valuable and recommended for future studies.

The research strongly depended on the respondents' self-reports; however, the food handlers might have hesitated to answer to the questionnaire statements correctly in case their answers affected their firms negatively. Additionally, as this research measured certain management practices, it is recommended that future research include more alternative management practices and different food establishments (restaurants or hotels) in the food sector to investigate the influence of management practices on commitment and food safety performance.

This study is constrained to the setting of food manufacturing firms based in Dubai and, subsequently, the results may only be viewed as legitimate for this specific setting or a similar context. Future research is thus recommended to collect data from different countries to confirm whether the research findings can be replicated. The scale used in this study has a high degree of reliability and construct validity and could thus be used in future studies.

Finally, future studies should investigate the influence of informal communication on commitment and organisational food safety performance and examine the influence of training on the organisational food safety performance using employee involvement as a second mediator.

## **8.7 Summary**

This chapter discussed the results obtained from this research study, analysed the results and illustrated the theoretical contributions. The practical implications, research limitations and recommendations for future researchers were addressed in detail.



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## APPENDIX 4.1 ENGLISH VESSION OF SURVEY QUESTIONNAIRE

Survey on Food Safety	Food Manufacturing Firm Code Number (     )
<b>Please read and rate all questions by putting a circle about the chosen answer. Your answers will always remain anonymous and confidential. The results will be used for research purposes only.</b>	

	Disagree Strongly (1)	Disagree Moderately (2)	Disagree Slightly (3)	Neutral (4)	Agree Slightly (5)	Agree Moderately (6)	Agree Strongly (7)
1) Managers inspire staff to follow safe food handling practices	1	2	3	4	5	6	7
2) Managers are actively involved in making sure safe food handling is practiced	1	2	3	4	5	6	7
3) Managers ensure good cooperation among departments so that customers receive safely prepared food	1	2	3	4	5	6	7
4) Managers enforce food safety rules consistently with all employees	1	2	3	4	5	6	7
5) Managers always watch to see if employees are practicing safe food handling	1	2	3	4	5	6	7
6) Managers reminds staff about following food safety practices	1	2	3	4	5	6	7
7) Employees are disciplined or reprimanded when they fail to follow food safety practices	1	2	3	4	5	6	7
8) Food handlers can freely speak up if they see something that may affect food safety	1	2	3	4	5	6	7
9) Managers generally give appropriate instructions on safe food handling	1	2	3	4	5	6	7
10) All of the necessary information for handling food safely is readily available to food handlers	1	2	3	4	5	6	7
11) Managers provide adequate and timely information about current food safety rules and regulations	1	2	3	4	5	6	7
12) Food handlers are encouraged to provide suggestions for improving food safety practices	1	2	3	4	5	6	7



	Disagree Strongly (1)	Disagree Moderately (2)	Disagree Slightly (3)	Neutral (4)	Agree Slightly (5)	Agree Moderately (6)	Agree Strongly (7)
13) All managers give consistent information about food safety	1	2	3	4	5	6	7
14) Management always welcomes opinions from employees before making final decisions on food safety related matters	1	2	3	4	5	6	7
15) My company has food safety committees consisting of representatives of management and employees	1	2	3	4	5	6	7
16) Management promotes employee involvement in food safety related matters	1	2	3	4	5	6	7
17) Management consults with employees regularly about workplace health and food safety issues	1	2	3	4	5	6	7
18) Employees do <i>not</i> sincerely participate in identifying food safety problems	1	2	3	4	5	6	7
19) My company gives comprehensive training to the employees in workplace health and food safety issues	1	2	3	4	5	6	7
20) New recruits are trained adequately to learn food safety rules and procedures	1	2	3	4	5	6	7
21) Food safety issues are given high priority in training programs	1	2	3	4	5	6	7
22) Staff are <i>not</i> adequately trained to respond to emergency situations in my workplace area	1	2	3	4	5	6	7
23) Management encourages the staff to attend food safety training programs	1	2	3	4	5	6	7
24) Food safety training given to staff is adequate to enable them to assess hazards in workplace	1	2	3	4	5	6	7

	<b>Disagree Strongly (1)</b>	<b>Disagree Moderately (2)</b>	<b>Disagree Slightly (3)</b>	<b>Neutral (4)</b>	<b>Agree Slightly (5)</b>	<b>Agree Moderately (6)</b>	<b>Agree Strongly (7)</b>
25) I follow food safety rules because it is my responsibility to do so	1	2	3	4	5	6	7
26) Food safety is a high priority to me	1	2	3	4	5	6	7
27) I follow food safety rules because I think they are important	1	2	3	4	5	6	7
28) I am committed to following all food safety rules	1	2	3	4	5	6	7
29) I keep my work area clean because I care about food safety	1	2	3	4	5	6	7
<b>( About You ) Please tick the appropriate answer as required</b>							
30) Sex	: Male	Female					
31) Nationality	: Arab	South Asian	East Asian	Others			
32) Age	: Under 26	26-40	41-55	Over 55			
33) Experience (Years)	: 1-3	4-6	7-9	10 and Over			

Please make sure that all 33 questions are answered and no more one answer for each question.

## APPENDIX 4.2 FOOD SAFETY PERFORMANCE CHECKLIST

**Food Safety Performance Checklist /Food Manufacturing Firm Code Number (     )/Food Inspector Code (     )**

This food manufacturing firm was inspected on     /     / 2017 as routine inspection.

**About the Food Manufacturing Firm**

**Number of food handlers** : (30 or less), (31- 60), (61- 90), (More than 91).  
**Location** : (Specific Industrial Zone), (Non-Specific Industrial Zone).  
**Risk category** : (High risk), (Low risk).  
**Firm ownership** : (Local Ownership), (Non-local Ownership).  
**Number of running years** : (3 or less), (3-5), (6-10), (More than 10).

**HACCP certificate obtained for:** (3 years or less), (3-5 years), (6-10 years), (More than 10 years).

	Strongly Poor Performance  (1)	Moderately Poor Performance  (2)	Slightly Poor Performance  (3)	Neutral  (4)	Slightly Excellent Performance  (5)	Moderately Excellent Performance  (6)	Strongly Excellent Performance  (7)
<b>Organisational Management Support</b>							
1) Food handlers demonstrate food safety knowledge and competency.							
2) Food handlers demonstrate good personal hygiene.							
3) Food handlers demonstrate safe behaviours (practices).							
4) Food safety management system (HACCP) measures or checks are implemented, updated, monitored, verified, validated and documented.							
5) The results and scores of internal, external, and regulatory food safety audit.							
6) The trend of recall cases, expired, and returned of finished food products.							
7) Finished food products comply with specification and standards.							

## **APPENDIX 4.3 FIRST FOCUS GROUP SESSION PLAN INCLUDING QUESTIONS & GUIDELINES**

### **The First Focus Group Discussion - Food handlers in Food Manufacturing**

**Date 25<sup>th</sup> September 2017 starting time 10:00 am for 60 min**

#### **(1) Welcome and Introduction**

Good morning and welcome to our session. Thanks for taking the time to join us to talk about food safety. My name is Sadi Taha and assisting me Mr. Mohammad Yousuf as moderator assistant who has twenty-five years' experience in food safety. Our topic is “**The Management of Food Safety Performance in Food Manufacturing Firms**” The aim of this focus group interview to explore and outline which management practices you think that affect the food handlers to follow the safe food procedures. Furthermore to assist in questionnaire designing and obtain new information or new ideas. This focus group is part of our research methodology and the collected data will be used confidentially for the research purpose only.

You are invited (6 members) from different food manufacturing firms because you as food handlers, who have more than ten years' experience in food safety and distinctive knowledge in the topic study, enrich the discussion. Please start by introducing yourself, to get to know each other.

#### **(2) Guidelines**

- There are no right or wrong answers, only differing points of view. Please feel free to share your point of view even if it differs from what others have said
- We are tape recording, one person speaking at a time.
- We are on a first name basis.
- You do not need to agree with others, but you must listen respectfully as others share their views.
- We ask that you turn off your phones.
- My role as moderator will be to guide the discussion.
- Talk to each other.
- Assistant Moderator: his role to take notes throughout the discussion & operate recording equipment.
- Keep in mind that we are just as interested in negative comments as positive comments, and at times the negative comments are the most helpful.

### **(3) Preparation/ Set up**

- The facilitator shall arrive at the location before the participants and ensure that: domestic arrangements and any refreshments in place.
- The moderator facilitates 60 minutes' discussion concerning the topic in a comfortable, encouraging atmosphere.
- Location selected near all participants in Jebel Ali, U-shaped setting arranged to enable all participants to view one another.

**Well, let us begin and ask the questions**

### **(4) Opening and initial questions**

1. Please tell us how many years you have been working with your food establishment?  
How many years' experience you have in food sector in total?
2. In what ways may individual food handlers be responsible for food poisoning?
3. What is the role of individual food handlers in food safety implementation?

### **(5) Main questions**

The following examples of open- ended questions asked to initiate and inspire the discussion among the participants.

1. Does your firm support food handlers by giving them proper assistance to execute safe food procedures? Can you give any examples of such support?
2. Can you think of any examples of lack of support for food handlers to execute food safety procedures in your firm? What happened?
3. In your opinion, does your company possess needed equipment and infrastructure needed for managing food safety? Does your company management value food safety? Can you give any examples?
4. What can your company do to assist you to follow and ensure the safe food procedures are practiced?

## **(6) Probe questions**

- 1) In your opinion, is the commitment to practicing food safety procedures the responsibility of all employees?
- 2) What the company may do better to achieve high standards of food safety?
- 3) Based on your experience, do you think your company values and is committed to food safety? How can you tell?
- 4) Can you recall any instances where food handlers' lack of training and knowledge has caused problems for food safety?
- 5) Could you explain and give example how your supervisor communicates the food safety rules, procedures with the food handlers?
- 6) Can you give examples how your company ensures that safe food procedures are in place? How do they deal with food safety audit and inspection scores?
- 7) Explain the positive incentives for the staff when the company has complied with the rules and procedures?

## **(7) Ending Questions**

- 1) Do you have any other comments about how the company or food handlers achieve food safety?

## **(8) Thank you for your valuable information and contributions**

Best Regards,

Sadi Taha- PhD Student – Business Management- BUiD

## **APPENDIX 4.4 SECOND FOCUS GROUP SESSION PLAN INCLUDING QUESTIONS & GUIDELINES**

### **The Second Focus Group Discussion - Food safety professionals**

**Date 27<sup>th</sup> September 2017 starting time 10:00 am for 50 min**

#### **(1) Welcome and Introduction**

Good morning and welcome to our session. Thanks for taking the time to join us to talk about food safety. My name is Sadi Taha and assisting me Mr. Mohammad Yousuf as moderator assistant who has twenty-five years experience in food safety. Our topic is **“The Influence of Management Practices on Employee Commitment and Food Safety Performance in Food Manufacturing Firms”**. The aim of this focus group interview is to confirm the proposed study model and to decide which indicators of Dubai Municipality’s checklist will be used to measure the food safety performance in food manufacturing firms. This focus group is part of our research methodology and the collected data will be used confidentially for the research purpose only.

You are invited (Two food safety trainers, two food safety inspectors, two managers of two food-manufacturing firms from different food manufacturing firms) because you as food safety professional who have more than ten years’ experience in food safety and distinctive knowledge in the topic study, which will enrich the discussion. Please start by introducing yourself to get to know each other.

#### **(2) Guidelines**

- There are no right or wrong answers, only differing points of view. Please feel free to share your point of view even if it differs from what others have said.
- We are tape recording, one person speaking at a time.
- We are on a first name basis.
- You do not need to agree with others, but you must listen respectfully as others share their views.
- We ask that you turn off your phones.
- My role as moderator will be to guide the discussion.
- Talk to each other.
- Assistant Moderator: his role to take notes throughout the discussion & operate recording equipment.
- Keep in mind that we are just as interested in negative comments as positive comments, and at times, the negative comments are the most helpful.

### **(3) Preparation/ Set up**

- The facilitator shall arrive at the location before the participants and ensure that: domestic arrangements and any refreshments in place.
- The moderator shall facilitate 50 minutes' discussion concerning the topic in a comfortable, encouraging atmosphere.
- Location selected near to all participants in Jebel Ali, U-shaped setting arranged to enable all participants to view one another.

**Well, let us begin and ask the questions**

### **(4) Opening and initial questions**

- 1) Please tell us how many years you have been working in your current organisation? How many years' experience you have in food safety field in total?
- 2) Could you describe the importance of the positive food safety performance?
- 3) Could you explain the management and food handlers' roles in food safety implementation?
- 4) Could you explain the management and food handlers' roles in food safety performance?

### **(5) Main questions**

The following examples of open- ended questions asked to initiate and inspire the discussion among the participants.

1. How do you think the management practices affect the food handlers' commitment to implement the safe food procedures?
2. How do you think the food handlers' commitment affect the food safety performance?
3. How do you think the food safety performance in food manufacturing firms can be measured?
4. What are the main indicators that can measure the food safety performance?

### **(6) Probe questions**

- 1) Could you give examples about how management practices such as communication, training, employee involvement, and organisational management support may influence the food handlers' commitment to implementing safe food procedures?
- 2) Do you think that employees are more willing to implement safe food procedures if they are well treated by their employer?



- 3) Could you explain and give examples of how food handlers' commitment may lead to improvement in food safety performance?
- 4) Can you think of any ways how to improve management practices to encourage improving food safety performance?
- 5) Could you give examples of food safety performance related to food products specifications?
- 6) Could you give examples of food safety performance related to food process?
- 7) Could you give examples of food safety performance related to the people practices (food handlers)?

**(7) Ending Questions**

1. Do you have any other comments about food safety management in food manufacturing firms?
2. Do you have any other comments about how firms or the Dubai Municipality may measure food safety performance?

**(8) Thank you for your valuable information and contributions**

Best Regards,

Sadi Taha- PhD Student – Business Management- BUiD

## **APPENDIX 4.5 STANDARD E-MAIL SCRIPT TO**

### **Seek Permission for the First Focus Group Voluntary Participation**

Dear Food Manufacturing Firm Manager,

I am a student in the PhD Program at The British University in Dubai. I am conducting a study the influence of management practices on the employee commitment and food safety performance in food manufacturing firms in Dubai.

I am sending this email to get your permission to nominate food handlers those have adequate experience in food safety and have role in food manufacturing in your firm. Food handlers will be invited to participate in the first focus group session on 25<sup>th</sup> September 2017 for 60 minutes that will be conducted in Al Sounbula FZE JA Gate 12 which very close to your firm.

Your response and confirmation on above mentioned details will be highly appreciated.

If you have any concern regarding the participation in this study, you may communicate the researcher on (2015256024@student.buid.ac.ae) or the Director of Studies Dr. Stephen Wilkins T: 04 279 1482 | stephen.wilkins@buid.ac.ae

Best Regards,

Sadi Taha- PhD Student – Business Management- BUiD

**APPENDIX 4.6 STANDARD E-MAIL SCRIPT OF  
Appreciation for Confirming for the First Focus Group Voluntary Participation**

Dear Food Manufacturing Firm,

Subject: Appreciation for Confirming the Focus Group Voluntary Participation

Mr. Ahmed,

With reference to our earlier discussion on above-mentioned subject, I would like to appreciate your cooperation and accept our invitation to recruit food handlers to participate in focus group discussions to talk about the topic of **Management of Food Safety Performance in Food Manufacturing Firms**.

The aim of this focus group interview to explore and outline which management practices you think that affect the food handlers to follow the safe food procedures. Furthermore to assist in questionnaire designing and obtain new information or new ideas. This focus group is part of our research methodology and the collected data will be used confidentially for the research purpose only.

**Location** of focus group discussion will be in the meeting room in Al Sounbula FZE JA Gate 12

**Date: 25/09/2017**

**Time 11:00 am**

Best Regards,

Sadi Taha- PhD Student – Business Management- BUiD

## **APPENDIX 4.7 STANDARD E-MAIL SCRIPT TO**

### **Seek Permission for the Second Focus Group Voluntary Participation**

Dear Food Manufacturing Firm Manager,

I am a student in the PhD Program at The British University in Dubai. I am conducting a study the influence of management practices on the employee commitment and food safety performance in food manufacturing firms in Dubai.

I am sending this email to get your permission to nominate food safety professional those have adequate experience in food safety consultant, training, inspection and food manufacturing management. The food safety professionals will be invited to participate in the second focus group session on 27<sup>th</sup> September 2017 for one hour that will be conducted in Universal Islamic Meat FZE JA Gate 5 which very close to your firm.

Your response and confirmation on above-mentioned details will be highly appreciated.

If you have any concern regarding the participation in this study, you may communicate the researcher on (2015256024@student.buid.ac.ae) or the Director of Studies Dr. Stephen Wilkins T: 04 279 1482 | stephen.wilkins@buid.ac.ae

Best Regards,

Sadi Taha- PhD Student – Business Management- BUiD

#### APPENDIX 4.8 EXAMPLE OF THEMES AND CODES FORM FOCUS GROUP DATA

Theme	Quote	Focus Group	Participant	Code
Communication	<i>“My direct supervisor actually assure to us the importance of food safety to our work as regular subject in our always meeting; we you can say always ahh free to speak and talk freely about all problems we faced.</i>	1	[Food handler1]	Openness
	<i>Our work is very important and we follow steps like like ah freezing the meat. You see someone handling that in wrong way, the friend in the work, supervisor, aaa manager remind him to do correct.</i>	1	[Food handler 2]	Openness
	<i>...I think it is difficult to me as like a twenty-nine -year-old compared to what they have to deal with, like telling them...you know, like you need to follow these safety practices when they're fifty years old, work-, working there many years. It is just like...does not seem ok, I guess.</i>	1	[Food handler 3]	Openness
	<i>Even though I was like food handler, so, after I become feel comfortable with all food handlers I like re-, reminded them more often.</i>	1	[Food handler 4]	Openness
	<i>In our company, we talk about difficulties with other colleague, supervisor, and manager in factory, office, and canteen every place you can say smoothly...every thing ok.</i>	1	[Food handler 5]	Openness
	<i>I think what he said fantastic because yaa if no door open to discuss may be many mistakes can happened every day and problems the company have too much problem can stopped if mu supervisor manger help us to do our work perfect.</i>	1	[Food handler 6]	Openness
	<i>It is not enough to do it if I am just told to... I need to know why should do it in this way... the reason. It makes sense. If he (manager) told me the reason and how to do it in simple way and language I sure I will do it.</i>	1	[Food handler 3]	Clarity
	<i>In our company actually before I got start the job , right in my interview, like before I was offered the job, so..., our boss told us what was expected of us to follow standards, we need high inspection results, no need customer complaints like...basic stuff to expect.</i>	1	[Food handler 5]	Clarity

Theme	Quote	Focus Group	Participant	Code
Communication	<i>If we have any question about it any procedure, we just ask like the supervisor there how to do it. Ok supervisor around us always available to ask questions if you need to and they will give the proper answer. Also I want to say ...we ask our colleagues that have been there a long time that work every day and make the procedures more clear.</i>	1	[Food handler1]	Clarity
	<i>The management define the policy and procedure it was definitely stressed from orientation and training and they (management) make it clear.... they clarify everything step by step.</i>	1	[Food handler2]	Clarity
	<i>So even if our supervisor leaves early sometimes... and we're continue working 'till the evening, we're still following those procedures because it's just been learn in that way, everything clear and we do the standards procedures , even nobody watching.</i>	1	[Food handler3]	Clarity
	<i>In our meeting or during manager visiting us in plant they answer all our questions and both us happy because everything easy to do and problems in production I think...</i>	1	[Food handler4]	Clarity
	<i>....the manager over there ,he assist us remember, if somebody having problem or coming close to not implementing the food safety regulations, mm, the food temperatures are become low. So, they review accordingly with us, making sure that, we should to be within this guideline so that way it destroy all the bacteria. And we need to try to keep that temperature.</i>	1	[Food handler 4]	Feedback
	<i>Supervisor ok...helps me, you know, remember. Suppose I forget to clean a definite thing, if I do clean production lines and I may be forget one because I am busy in other works. he will remind and tell," when just you get a time..." immediately clean it. So, if the supervisor noticed somebody do errors, he, mentioned...ok...make, just reminds everybody to do as per the procedures.</i>	1	[Food handler 6]	Feedback

	<i>Not only what I can say... indicating the mistakes but the help us nicely to the corrective action and show the results after the corrective action. They keeping update us.</i>	1	[Food handler 3]	Feedback
	<i>The Municipality report results always our management discussed with us... you know especially when the score not ok.</i>	1	[Food handler 5]	Feedback
	<i>Company should announce the results good and give some gifts so we will work more to keep very good results ... because no penalty from municipality inspector.</i>	1	[Food handler 2]	Feedback
	<i>Even if we have something wrong in procedures or that affect the food safety ... may be from raw material or machines not ok and .... the results was not within standards we give feedback to our supervisor, because we have to tell.</i>	1	[Food handler 3]	Feedback
	<i>We have meeting every monthly, ah, just to refresh our knowledge and do communicate with each other an...and discuss everything related to our work.</i>	1	[Food handler 5]	Availability
	<i>In our company the supervisor visit us and speak to us ... in everything ... we are friends</i>	1	[Food handler 2]	Availability
	<i>In case I mean if ... a new guideline or circular or something or from the company itself the supervisor will bring it to our the attention and he will answer our questions if there in it not clear.</i>	1	[Food handler 3]	Availability
	<i>Every new procedures or circular or any general or special news.. we get it through the noticed board in our dining hall.</i>	1	[Food handler 4]	Availability
	<i>Our colleague the person in charge always talking with food inspector and when inspector leave ... we know the safety rules, procedures from him (person in charge).</i>	1	[Food handler 1]	Availability

	<i>Procedures are available with pictures everywhere and different languages like wash your hands posters... any procedures you can find.</i>	1	[Food handler 6]	Availability
	<i>If the correct procedures not followed and there some issues regarding food safety we can easily go to the manager office and inform him, after that aah... he will take action or to stop the errors.</i>	1	[Food handler 5]	Bottom-up Approach
	<i>Managers always asks when they visit us do you think we could do to improve? Is there any tools we need or do we need to increase the staff or do you have any suggestion?</i>	1	[Food handler 2]	Bottom-up Approach
	<i>It is very important that if I..or anybody to point out the food safety mistakes in processing to inform his supervisor ....we don't want food safety complaints</i>	1	[Food handler 6]	Bottom-up Approach
	<i>My friend working in company he told me they (the company where his friend working) give good money for good suggestion.</i>	1	[Food handler 5]	Bottom-up Approach
	<i>In our company appreciate the suggestion and say thank you....</i>	1	[Food handler 2]	Bottom-up Approach
	<i>Sometime food handlers not give any suggestion ... I do not know for any reason ...any way there is box for suggestion they can use it.</i>	1	[Food handler 1]	Bottom-up Approach
	<i>Management give us always the update guidelines, information about the food safety</i>	1	[Food handler 2]	Consistency
	<i>Even you know if there is no issues happened with us regarding food safety always the meetings on time. Just 15 minutes.</i>	1	[Food handler 1]	Consistency
	<i>Before every shift change the supervisor... come and ask us if there is any issues regarding the machine, quality, damage .Because the second shift will start...</i>	1	[Food handler 6]	Consistency
	<i>Every 3 months the supervisors check the posters and sometimes change the design but should be always posters in the notice board.</i>	1	[Food handler 5]	Consistency



# **APPENDIX 4.9 DATA ANALYSIS AND PILOT RESULTS- FOCUS GROUP CONSEQUENCE EXAMPLE OF MANAGEMENT PRACTICES – COMMUNICATION**

The scope of question was about the firms’ support to the food handlers by giving them proper assistance to execute safe food procedures. How the firms communicate the food safety rules, procedures with the food handlers.

The participants portrayed the important of efficient and effectiveness of the communication on the implementing safe food procedures. For instance, “communication openness”.The open communication among the food handlers in which they could totally talk up if something that may influence the food safety behaviour implementation or when they fail to implement the safe procedures. Furthermore, they appreciate the feedback from the management on the food safety management system in pleasant approach and with full respect. Others participants recognised that the appropriate instructions from the management to food handlers obviously (clarity) is playing a main role in food safety management system implementation effectively. At the same time the participants portrayed the important of efficient and effectiveness of the management timely feedback about the food safety regulations (feedback). They recognised the importance of easy access of the necessary information for handling food safely (availability).The food handlers are encourage to provide suggestions for improving the food safety implementation (bottom – up approach).The participants portrayed the important of efficient and effectiveness of the consistent information about food safety (consistency).

Themes	Subthemes	Question Scope	Questionnaire Items Examples
Communication	Openness	Firm support an transfer of food safety messages between management and food handlers	Food handlers can freely speak up if they see something that may affect food safety
	Clarity		
	Feedback		All managers give consistent information about food safety
	Availability		
	Bottom- up approach		
	Consistency		

**APPENDIX 4.10 STANDARD E-MAIL SCRIPT OF  
Permission for the Second Focus Group Voluntary Participation**

**Appreciation for Confirming for the Second Focus Group Voluntary Participation**

Dear Food Manufacturing Firm Manager/ Training Consultant/ Food Inspector

Subject: Permission for Focus Group Voluntary Participation

Mr. Tariq,

With reference to our earlier discussion on above-mentioned subject, I would like to appreciate your cooperation and accept our invitation to participate in focus group discussions to talk about the topic of **The Influence of Management Practices on Employee Commitment and Food Safety Performance in Food Manufacturing Firms.**

The aim of this focus group interview is to confirm the proposed study model and to decide which indicators of Dubai Municipality's checklist will be used to measure the food safety performance in food manufacturing firms.

Furthermore to assist in questionnaire designing and obtain new information or new ideas. This focus group is part of our research methodology and the collected data will be used confidentially for the research purpose only.

**Location** of focus group discussion will be in the meeting room in Universal Islamic Meat FZE JA Gate 5

**Date: 27/09/2017**

**Time 11:00 am**

Best Regards,

Sadi Taha- PhD Student – Business Management- BUiD

## **APPENDIX 4.11 SURVEY QUESTIONNAIRE DISTRIBUTION DOCUMENT**

Dear Food handler,

Presently we are studying the management practices that can have impact on implementing the safe food procedures in food manufacturing firms. Despite the deferent interventions applied in food manufacturing firms, but still the unhygienic practices are occurred and food safety performance not improved. Therefore, the aim of this research is studying the employees' perception of management practices that influencing the food handlers' commitment behaviours to comply with safe food procedures and its relation with organisational food safety performance in food manufacturing firms. There are no probable of any kind of risks events you would face during your participation in this study. You are requested to answer the enclosed questionnaire as food handlers, which may needs 10 minutes time approximately to complete.

Your contribution will be vital for the community and enable us to understand the influence of management practices on food handlers' commitment to execute the safe food procedures in food manufacturing firms. All the received individual responses will be treated with complete confidentiality, combined, analyzed, summary reported as a whole to keep the confidentiality.

The participants' identity and information will remain confidential (completely anonymous) and the collected data will be used for the research purpose only confidentially. All information will be secured and no access for anybody will be given. In case of any part of this material will published you will have chance to review toward your approval.

If you have any concern regarding the questionnaire or your participation in this study, you may communicate the researcher on (2015256024@student.buid.ac.ae) or the Director of Studies Dr. Stephen Wilkins T: 04 279 1482 | stephen.wilkins@buid.ac.ae

Once you put your signature that means you have determine to be a research participant's volunteer and you have read and understood the above-mentioned information.

Thank you for your valued contribution and full cooperation,

Yours faithfully,

Sadi Taha- PhD Student – Business Management- BUiD

## APPENDIX 4.12 ARABIC VERSION OF SURVEY QUESTIONNAIRE

أوافق بشدة (7)	أوافق باعتدال (6)	أوافق الى حد ما (5)	محايد (4)	لا أوافق الى حد ما (3)	لا أوافق باعتدال (2)	لا أوافق بشدة (1)	
7	6	5	4	3	2	1	(1) الإدارة تلهم وتشجع العاملين بالقيام بممارسة إجراءات السلامة الغذائية
7	6	5	4	3	2	1	(2) يشارك المديرون بفاعلية لضمان قيام العاملين بممارسة إجراءات السلامة الغذائية
7	6	5	4	3	2	1	(3) تضمن الإدارة التعاون الجيد بين الإدارات المختلفة بحيث يحصل العملاء على منتج غذائي آمن
7	6	5	4	3	2	1	(4) تقوم الإدارة بفرض مبادئ وقواعد سلامة الأغذية بين جميع العاملين باستمرار
7	6	5	4	3	2	1	(5) يقوم المديرون بمراقبة العاملين لمعرفة ما إذا كان العاملين يمارسون إجراءات السلامة الغذائية
7	6	5	4	3	2	1	(6) تقوم الإدارة بتذكير العاملين بممارسة إجراءات السلامة الغذائية
7	6	5	4	3	2	1	(7) تقوم الإدارة بتأديب وتوبيخ العاملين في حالة عدم ممارستهم إجراءات السلامة الغذائية
7	6	5	4	3	2	1	(8) يمكن للعاملين التحدث بحرية إذا رأوا شيئاً قد يؤثر على سلامة الأغذية
7	6	5	4	3	2	1	(9) يعطي المديرون عموماً التعليمات المناسبة بشأن إجراءات السلامة الغذائية
7	6	5	4	3	2	1	(10) جميع المعلومات الضرورية واللازمة للتعامل مع الأغذية بأمان متاحة بسهولة للعاملين
7	6	5	4	3	2	1	(11) توفر الإدارة المعلومات السارية (الحالية) والخاصة بقوانين وأنظمة السلامة الغذائية بكفاية وباستمرار
7	6	5	4	3	2	1	(12) يتم تشجيع العاملين من قبل الإدارة على تقديم إقتراحات لتحسين ممارسات سلامة الأغذية
7	6	5	4	3	2	1	(13) يقدم جميع المديرون معلومات متسقة حول سلامة الأغذية

رقم الصفحة 2-1

أوافق بشدة (7)	أوافق باعتدال (6)	أوافق الى حد ما (5)	محايد (4)	لا أوافق الى حد ما (3)	لا أوافق باعتدال (2)	لا أوافق بشدة (1)	
7	6	5	4	3	2	1	14) الإدارة ترحب دائما بأراء الموظفين قبل إتخاذ القرارات النهائية بشأن المسائل المتعلقة بسلامة الأغذية
7	6	5	4	3	2	1	15) لدى شركتي لجان سلامة الأغذية تتألف من ممثلين عن الإدارة والعاملين
7	6	5	4	3	2	1	16) الإدارة تعزز مشاركة العاملين في المسائل المتعلقة بسلامة الأغذية
7	6	5	4	3	2	1	17) تتشاور الإدارة مع العاملين بانتظام حول الأمور الصحية في مكان العمل وقضايا سلامة الأغذية
7	6	5	4	3	2	1	18) العاملون لا يشاركون بصدق في تحديد مشاكل سلامة الأغذية
7	6	5	4	3	2	1	19) شركتي تعطي تدريباً شاملاً للعاملين في قضايا الصحة والسلامة في مكان العمل
7	6	5	4	3	2	1	20) يتم تدريب العاملين الجدد بشكل كاف لتعلم قواعد وإجراءات سلامة الأغذية
7	6	5	4	3	2	1	21) تعطي قضايا سلامة أولوية قصوى في برامج التدريب
7	6	5	4	3	2	1	22) لا يتم تدريب العاملين بشكل كاف على الإستجابة لحالات الطوارئ في مكان عملي
7	6	5	4	3	2	1	23) تشجع الإدارة العاملين على حضور برامج التدريب على سلامة الأغذية
7	6	5	4	3	2	1	24) برامج التدريب على سلامة الأغذية المقدمة للعاملين كافية لتمكينهم من تقييم المخاطر في مكان العمل
7	6	5	4	3	2	1	25) أنا أتبع قواعد السلامة الغذائية لأن من مسؤوليتي القيام بذلك
7	6	5	4	3	2	1	26) سلامة الأغذية هي أولوية قصوى بالنسبة لي
7	6	5	4	3	2	1	27) أنا أتبع قواعد السلامة الغذائية لأنني أعتقد أنها مهمة
7	6	5	4	3	2	1	28) أنا ملتزم باتباع جميع قواعد السلامة الغذائية
7	6	5	4	3	2	1	29) أنا أبقي منطقة عملي نظيفة لأنني أهتم بسلامة الأغذية

المعلومات الشخصية			
يرجى إختيار الوصف الصحيح للمعلومات الشخصية الواردة أدناه بدقة وموضوعية.			
30) النوع	ذكر	أنثى	
31) الجنسية	العربية	جنوب آسيا	شرق آسيا
32) العمر	أقل من 26 سنة	26-40 سنة	أكثر من 55 سنة
33) الخبرة بالسنوات:	1-3 سنة	4-6 سنة	7-9 سنة

يرجى التأكد من إجابة جميع الأسئلة (33) وإجابة واحدة فقط لكل سؤال

رقم الصفحة 2-2

# APPENDIX 4.13 HINDI VESSION OF SURVEY QUESTIONNAIRE

## Survey on Food Safety

Food Manufacturing Firm Code Number ( )

Please answer all questions. Your answers will always remain anonymous and confidential. The results will be used for research purposes only.

कृपया सभी प्रश्नों का उत्तर दें. आपका उत्तर हमेशा अज्ञात और गोपनीय रहेगा. परिणाम केवल अनुसंधान उद्देश्यों के लिए उपयोग किया जाएगा.

	Disagree Strongly दृढ़ता से असहमत (1)	Disagree Moderately मध्यम से असहमत (2)	Disagree Slightly थोड़ा असहमत (3)	Neutral तटस्थ (4)	Agree Slightly थोड़ा सहमत हूँ (5)	Agree Moderately सहमत मध्यम रूप से (6)	Agree Strongly दृढ़ता से सहमत (7)
1) Managers inspires staff to follow safe food handling practices प्रबंधन ने सुरक्षित भोजन से निपटने के तरीकों का पालन करने के लिए कर्मचारियों को प्रेरित किया?	1	2	3	4	5	6	7
2) Managers are actively involved in making sure safe food handling is practiced प्रबंधकों को यह सुनिश्चित करने में सक्रिय रूप से शामिल है कि सुरक्षित भोजन से निपटने का अभ्यास किया जाता है	1	2	3	4	5	6	7
3) Managers ensures good cooperation among departments so that customers receive safely prepared food प्रबंधन विभागों के बीच अच्छा सहयोग सुनिश्चित करता है ताकि ग्राहक सुरक्षित रूप से तैयार भोजन प्राप्त कर सकें	1	2	3	4	5	6	7
4) Managers enforce food safety rules consistently with all employees प्रबंधन सभी कर्मचारियों के साथ नियमित रूप से खाद्य सुरक्षा नियमों को लागू करता है	1	2	3	4	5	6	7
5) Managers always watch to see if employees are practicing safe food handling प्रबंधक हमेशा यह देखते हुए देखते हैं कि क्या कर्मचारी सुरक्षित भोजन से निपटने का अभ्यास कर रहे हैं	1	2	3	4	5	6	7
6) Manageress remind staff about following food safety practices प्रबंधन निम्नलिखित खाद्य सुरक्षा अभ्यासों के बारे में कर्मचारियों को याद दिलाता है	1	2	3	4	5	6	7
7) Employees are disciplined or reprimanded when they fail to follow food safety practices जब वे खाद्य सुरक्षा अभ्यासों का पालन करने में विफल रहते हैं तो कर्मचारियों को अनुशासित या निर्दिष्ट किया जाता है	1	2	3	4	5	6	7

	<b>Disagree Strongly दृढ़ता से असहमत (1)</b>	<b>Disagree Moderately मध्यम से असहमत (2)</b>	<b>Disagree Slightly थोड़ा असहमत (3)</b>	<b>Neutral तटस्थ (4)</b>	<b>Agree Slightly थोड़ा सहमत हूँ (5)</b>	<b>Agree Moderately सहमत मध्यम रूप से (6)</b>	<b>Agree Strongly दृढ़ता से सहमत (7)</b>
8) Food handlers can freely speak up if they see something that may affect food safety अगर वे कुछ देखते हैं जो खाद्य सुरक्षा को प्रभावित कर सकता है तो कर्मचारी आज़ादी से बात कर सकते हैं	1	2	3	4	5	6	7
9) Managers generally give appropriate instructions on safe food handling प्रबंधकों को आम तौर पर सुरक्षित भोजन से निपटने पर उचित निर्देश देते हैं	1	2	3	4	5	6	7
10) All of the necessary information for handling food safely is readily available to staff भोजन से सुरक्षित रूप से निपटने के लिए सभी आवश्यक जानकारी आसानी से कर्मचारियों के लिए उपलब्ध है	1	2	3	4	5	6	7
11) Management provides adequate and timely information about current food safety rules and regulations प्रबंधन वर्तमान खाद्य सुरक्षा नियमों और विनियमों के बारे में पर्याप्त और समय पर जानकारी प्रदान करता है	1	2	3	4	5	6	7
12) Food handlers are encouraged to provide suggestions for improving food safety practices खाद्य सुरक्षा अभ्यासों में सुधार के लिए सुझाव देने के लिए कर्मचारियों को प्रोत्साहित किया जाता है	1	2	3	4	5	6	7
13) All managers give consistent information about food safety सभी प्रबंधकों को खाद्य सुरक्षा के बारे में लगातार जानकारी मिलती है	1	2	3	4	5	6	7
14) Management always welcomes opinions from employees before making final decisions on food safety related matters खाद्य सुरक्षा संबंधी मामलों पर अंतिम निर्णय लेने से पहले प्रबंधन हमेशा कर्मचारियों के विचारों का स्वागत करता है	1	2	3	4	5	6	7
15) My company has food safety committees consisting of representatives of management and employees मेरी कंपनी के पास खाद्य सुरक्षा समितियां हैं जिनमें प्रबंधन और कर्मचारियों के प्रतिनिधि शामिल हैं	1	2	3	4	5	6	7
16) Management promotes employee involvement in food safety related matters प्रबंधन खाद्य सुरक्षा संबंधी मामलों में कर्मचारी की भागीदारी को बढ़ावा देता है	1	2	3	4	5	6	7
17) Management consults with employees regularly about workplace health and food safety issues प्रबंधन कर्मचारियों के साथ नियमित रूप से कार्यस्थल स्वास्थ्य और खाद्य सुरक्षा के मुद्दों पर विचार करता है	1	2	3	4	5	6	7

	Disagree Strongly दृढ़ता से असहमत (1)	Disagree Moderately मध्यम से असहमत (2)	Disagree Slightly थोड़ा असहमत (3)	Neutral तटस्थ (4)	Agree Slightly थोड़ा सहमत हूँ (5)	Agree Moderately सहमत मध्यम रूप से (6)	Agree Strongly दृढ़ता से सहमत (7)
18) Employees do <i>not</i> sincerely participate in identifying food safety problems कर्मचारी खाद्य सुरक्षा समस्याओं की पहचान करने में ईमानदारी से भाग नहीं लेते हैं	1	2	3	4	5	6	7
19) My company gives comprehensive training to the employees in workplace health and food safety issues मेरी कंपनी कार्यस्थल स्वास्थ्य और खाद्य सुरक्षा के मुद्दों में कर्मचारियों को व्यापक प्रशिक्षण देती है	1	2	3	4	5	6	7
20) New recruits are trained adequately to learn food safety rules and procedures खाद्य सुरक्षा नियमों और प्रक्रियाओं को जानने के लिए नए रंगरूटों को पर्याप्त रूप से प्रशिक्षित किया जाता है	1	2	3	4	5	6	7
21) Food safety issues are given high priority in training programs खाद्य सुरक्षा के मुद्दों का प्रशिक्षण कार्यक्रमों में उच्च प्राथमिकता दी गई है	1	2	3	4	5	6	7
22) Staff are <i>not</i> adequately trained to respond to emergency situations in my workplace area मेरे कार्यस्थल क्षेत्र में आपातकालीन स्थितियों के जवाब में कर्मचारियों को पर्याप्त रूप से प्रशिक्षित नहीं किया जाता है	1	2	3	4	5	6	7
23) Management encourages the staff to attend food safety training programs प्रबंधन कर्मचारियों को खाद्य सुरक्षा प्रशिक्षण कार्यक्रमों में भाग लेने के लिए प्रोत्साहित करता है	1	2	3	4	5	6	7
24) Food safety training given to staff is adequate to enable them to assess hazards in workplace कर्मचारियों को दिया गया खाद्य सुरक्षा प्रशिक्षण कार्यस्थल में खतरों का आकलन करने के लिए सक्षम होने के लिए पर्याप्त है	1	2	3	4	5	6	7
25) I follow food safety rules because it is my responsibility to do so मैं खाद्य सुरक्षा नियमों का पालन करता हूँ क्योंकि ऐसा करने की मेरी ज़िम्मेदारी है	1	2	3	4	5	6	7
26) Food safety is a high priority to me खाद्य सुरक्षा मेरे लिए एक उच्च प्राथमिकता है	1	2	3	4	5	6	7
27) I follow food safety rules because I think they are important मैं खाद्य सुरक्षा नियमों का पालन करता हूँ क्योंकि मुझे लगता है कि वे महत्वपूर्ण हैं	1	2	3	4	5	6	7



	<b>Disagree Strongly</b> दृढ़ता से असहमत (1)	<b>Disagree Moderately</b> मध्यम से असहमत (2)	<b>Disagree Slightly</b> थोड़ा असहमत (3)	<b>Neutral</b> तटस्थ (4)	<b>Agree Slightly</b> थोड़ा सहमत हूँ (5)	<b>Agree Moderately</b> सहमत मध्यम रूप से (6)	<b>Agree Strongly</b> दृढ़ता से सहमत (7)
28) I am committed to following all food safety rules मैं सभी खाद्य सुरक्षा नियमों का पालन करने के लिए प्रतिबद्ध हूँ	1	2	3	4	5	6	7
29) I keep my work area clean because I care about food safety मैं अपने काम के क्षेत्र को साफ रखता हूँ क्योंकि मुझे खाद्य सुरक्षा के बारे में परवाह है	1	2	3	4	5	6	7

About You ) Please tick the appropriate answer as required				
30) Sex	: Male	Female		
31) Nationality	: Arab	South Asian	East Asian	Others
32) Age	: Under 26	26-40	41-55	Over 55
33) Experience (Years)	: 1-3	4-6	7-9	10 and Over

Please make sure that all 33 questions are answered and no more one answer for each question.

## **APPENDIX 4.14 STANDARD E-MAIL SCRIPT TO**

### **Seek Permission for Survey Voluntary Participation**

Dear Food Manufacturing Firm Manager,

I am a student in the PhD Program at The British University in Dubai. I am conducting a study the influence of management practices on the employee commitment and food safety performance in food manufacturing firms in Dubai.

I am sending this email to get your permission to nominate food handlers those have adequate experience in food safety and have role in food manufacturing in your firm. Food handlers will be invited to participate in questionnaire answering which may take 10 minutes time that will be conducted in your firm.

Your contribution will be vital for the community and enable us to understand the influence of management practices on food handlers' commitment to execute the safe food procedures in food manufacturing firms. All the received individual responses will be treated with complete confidentiality, combined, analyzed, summary reported as a whole to keep the confidentiality.

The participants' identity and information will remain confidential (completely anonymous) and the collected data will be used for the research purpose only confidentially. All information will be secured and no access for anybody will be given. In case of any part of this material will published you will have chance to review toward your approval.

Your response and confirmation to this mail will be highly appreciated.

If you have any concern regarding the participation in this study, you may communicate the researcher on (2015256024@student.buid.ac.ae) or the Director of Studies Dr. Stephen Wilkins T: 04 279 1482 | stephen.wilkins@buid.ac.ae

Best Regards,

Sadi Taha- PhD Student – Business Management- BUiD

## **APPENDIX 4.15 REVIEW DEVELOPED DRAFT QUESTIONNAIRE FORM**

Dear Pilot Study Participant,

Your contribution is very important to enable us to improve and finalize the given questionnaire in order to make it more easily readable and understandable.

Upon completion the answering the questionnaire, please provide your feedback and comments on the following:

- 1) How many minutes needed to complete the questionnaire answering?
- 2) Is there any ambiguous question needed improvement?
- 3) Did you find any wrongs or faults in any question?
- 4) Please specify the question number in case of any ambiguous question or you noticed bumpy for answering found in the questionnaire that needed improvement?
- 5) To maximise the questionnaire quality, please give your valuable suggestions?

Best Regards,

Sadi Taha- PhD Student – Business Management- BUiD

**APPENDIX 4.16 STANDARD LETTER SCRIPT TO  
Seek Assistance for Conducting Survey in Food Manufacturing Firms**

10/4/2017

**Head of Food Inspection Section -Food Safety Dept.**

**Dubai Municipality**

**Dubai - UAE**

This is to certify that Mr. SADI TAHA with Student ID number 2015256024 is a registered full-time student in the PhD in Business Management offered by The British University in Dubai since January 2016.

Mr. TAHA is currently collecting data for his thesis (The Influence of Management Practices on Employee Commitment and Food Safety Performance in Food Manufacturing Firms).

He is required to gather data through conducting survey with questionnaire that will help his in writing the final thesis. Your permission to conduct his research in the selected food-manufacturing firms located in Dubai is hereby requested. Further support provided to his in this regard will be highly appreciated.

Any information given will be used solely for academic purposes.

This letter is issued on Mr.TAHA's request.

Yours sincerely,

**Amer Alaya**

**Head of Academic and Student Administration**

## **APPENDIX 4.17 CONSENT TO PARTICIPATE IN THE SURVEY**

Title of Study: The Influence of Management Practices on Employee Commitment and  
Food Safety Performance in Food Manufacturing Firms

**Investigator:** Sadi Taha - PhD Candidate

Please have your time to determine if you would like to participate in this study and do not hesitate to ask any question at any time.

### **Introduction**

The aim of this survey to get perception of food handlers concerning the management influence on food handlers to execute the safe food procedures in food manufacturing firms. You are being invited as you are a food handler who have experience in food safety in food manufacturing firms. If you accept to participate, please read this form and do not hesitate to ask questions you have prior starting with the study.

### **Description of Procedures**

Agreeing to participate with this survey, the participation time will take ten minutes approximately. The following procedure to be followed. Please read all the questionnaire closed questions and select the appropriate answer (one answer only) and be informed that the collected data will be used confidentially for the research purpose only. If you have any question please ask the researcher directly as he will be available during the answering the questionnaire.

### **Risks of Participating in this Study**

During the participating time, no risks are expected can be occurred in this study.

### **Benefits of Participating in the Study**

No direct benefits you will obtain because of participation in this survey but it expected that study would provide with valued information that help the food manufacturing firms, regulatory inspection departments and food safety training agencies to increase food safety performance.

## **Costs and Compensation**

No any kind of cost you will have from participating with this study and you will get appreciation certificate.

## **Participation Rights**

You can stop your participation at any rime and you have the right to reject the participation and leave as it will not be any kind of punishment or lose welfares against your decision.

## **Confidentiality**

The participants' identity will remain confidential (completely anonymous) and the collected data will be used for the research purpose only confidentially. All data will be secured and no access for anybody will be given. In case of any part of this material will be published you will have chance to review toward your approval.

## **Right to Ask Questions**

The participants has the right to ask any question regarding this study, got answered for those questions completely and to obtain copy of results summary. If you have any concern was not clarified by the investigator or any issue about your participation, you may contact Dr. Stephen Wilkins T: 04 279 1482 | F: 04 279 1490.

## **Consent**

Once you put your signature that means you have determine to be a research participant's volunteer and you have read and understood the above-mentioned information.

Participants' Name & Signature:

Date:

Investigator' Name & Signature: