



**AN EVALUATION OF THE IMPACT OF FOOD SAFETY MANAGEMENT  
SYSTEMS WITHIN THE WINE INDUSTRY IN THE WESTERN CAPE, SOUTH  
AFRICA**

by

**SONJA DAVIDS**

**Thesis submitted in fulfilment of the requirements for the degree**

**Master of Technology in**

**the Faculty of Engineering**

**at the Cape Peninsula University of Technology**

**Supervisor: Dr. Bingwen Yan**

**Bellville**

**01 November 2011**

**CPUT Copyright Information**

The dissertation/thesis may not be published either in part (in scholarly, scientific or technical journals), or as a whole (as a monograph), unless permission has been obtained from the university

## **DECLARATION**

I, Sonja Mary-Ann Davids, declare that the contents of this dissertation represent my own unaided work, and that the dissertation has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

---

**Signed**

---

**Date**

## **ABSTRACT**

During recent years the wine industry has become increasingly dynamic due to competition among wine organisations worldwide. In order to be competitive, many South African wine organisations have implemented and maintained a Food Safety Management System (FSMS). The Western Cape Province is one of the typical regions of wine-manufacturing in the country. However, the impact of FSMSs on the effectiveness of work performance among wine organisations in the Western Cape is unknown. There is scant literature that focuses on this particular issue. Thus, this study investigates the effectiveness of FSMS implementation to determine whether wine organisations consolidate the fundamental requirements of the FSMSs.

Nineteen (19) wine organisations situated in the Western Cape who are currently implementing FSMSs were chosen as the research sites. A group of participants (n=46) who are implementing FSMSs from these wine organisations were selected as samples. A questionnaire based on the Likert scale was used as an instrument for data collection. Statistical package for social science (SPSS) version 19 was employed to generate statistical results such as frequencies, mean, standard deviation, percentage, skewness, etc. In particular, Cronbach's alpha was utilised to test the reliability of the key items of FSMSs.

The findings of this study indicate that the majority of the wine organisations consolidate the fundamental requirements of FSMS. Certification audits, management systems, prerequisite programs, Hazard Critical Control Points (HACCP), validation and verification, emergency preparedness and quality management are used as the main activities to measure the performance of FSMS. Based on the study results, this study recommended that wine organisations should provide regular training to internal auditors and shopfloor employees in order to enhance the effectiveness of FSMSs. The significance of this study is to contribute a valuable guideline to the South African wine industry to consolidate their performances on the implementation of FSMSs.

**Keywords:** food safety management systems (FSMSs), quality management, impact, effectiveness, wine industry.

## **ACKNOWLEDGEMENTS**

**I wish to express my sincerest gratitude to the following individuals for their guidance and assistance:**

- my Heavenly Father, who granted me the wisdom to complete this dissertation;
- my supervisor, Dr. Bingwen Yan, for his guidance and knowledge that he was willing to share with me;
- my employer, Distell, for providing me with the financial aid to complete this study; and
- all the participants from the wine industry for taking time to complete the questionnaires.

## **DEDICATION**

This study is dedicated to my mother, Maurina Davids – the most loving and encouraging mother anyone could ever wish for. My sincerest thanks to her for her constant inspiration. To my late father, Galant Davids, who always believed in the importance of educating his children.

## TABLE OF CONTENTS

Declaration	ii
Abstract	iii
Acknowledgements	iv
Dedication	v
Table of contents	vi
Glossary	xi

### CHAPTER 1: SCOPE OF THE RESEARCH

1.1	Background and Motivation of the Research	1
1.2	Background to the research problem	2
1.3	Problem statement	3
1.4	Research questions	3
1.4.1	Primary research question	3
1.4.2	Investigative research questions	4
1.5	Research objectives	4
1.6	Ethics	4
1.7	Research assumptions	5
1.8	Research constraints	5
1.8.1	Limitations	6
1.8.2	Delimitations	6
1.9	Significance of the study	6
1.10	Chapter content and analysis	6
1.11	Conclusion	7

### CHAPTER 2: A HOLISTIC OVERVIEW OF THE RESEARCH ENVIRONMENT

2.1	The Global Wine Industry an Overview	9
2.2	Food safety management systems (FSMSs) in the global wine industry	9
2.3	Food Safety Management Systems in the Western Cape, South Africa	11
2.3.1	Dynamic growth	11
2.3.2	Wine tourism in South Africa	12
2.3.3	Western Cape wine industry	13
2.4	FSMS in Cape Wine Companies: A Case Study	14
2.4.1	Cape Wine Company	15
2.4.2	International accreditation	15
2.4.3	The wine segment	15
2.4.4	Wine-production – primary and secondary	15
2.4.5	The division of quality management and research (QM&R)	17
2.4.6	QM&R unit at Cape Wine Company	19
2.5	Conclusion	21

## **CHAPTER 3: FOOD SAFETY MANAGEMENT SYSTEMS WITHIN THE WESTERN CAPE: LITERATURE REVIEW**

<b>3.1</b>	<b>Introduction</b>	<b>22</b>
<b>3.2</b>	<b>Food Safety Management Systems (FSMSs)</b>	<b>22</b>
<b>3.2.1</b>	<b>Quality Management System (QMS)</b>	<b>23</b>
<b>3.2.2</b>	<b>Hazard Analysis Critical Control Points (HACCP)</b>	<b>24</b>
<b>3.2.3</b>	<b>Global Standard for Food Safety: British Retail Consortium (BRC)</b>	<b>25</b>
<b>3.2.4</b>	<b>International Organisation for Standardisation (ISO) 22000</b>	<b>26</b>
<b>3.2.5</b>	<b>International Food Standard (IFS)</b>	<b>27</b>
<b>3.2.6</b>	<b>Good Manufacturing Practices (GMP)</b>	<b>28</b>
<b>3.2.7</b>	<b>ISO 9001</b>	<b>28</b>
<b>3.2.8</b>	<b>South African National Standard (SANS) 15161</b>	<b>29</b>
<b>3.3</b>	<b>Requirements for FSMSs</b>	<b>29</b>
<b>3.3.1</b>	<b>QMS clauses</b>	<b>29</b>
<b>3.3.2</b>	<b>GMP requirements</b>	<b>30</b>
<b>3.3.3</b>	<b>HACCP requirements</b>	<b>31</b>
<b>3.3.4</b>	<b>ISO 22000 requirements</b>	<b>32</b>
<b>3.3.5</b>	<b>BRC requirements</b>	<b>33</b>
<b>3.3.6</b>	<b>IFS requirements</b>	<b>33</b>
<b>3.3.7</b>	<b>ISO 15161 requirements</b>	<b>35</b>
<b>3.3.8</b>	<b>Comparison among the requirements of FSMSs</b>	<b>37</b>
<b>3.4</b>	<b>Key success factors of FSMS implementation</b>	<b>37</b>
<b>3.4.1</b>	<b>Verification and validation of FSMSs</b>	<b>37</b>
<b>3.4.2</b>	<b>The rationale for FSMSs</b>	<b>38</b>
<b>3.4.3</b>	<b>Drivers of FSMS implementation</b>	<b>40</b>
<b>3.4.4</b>	<b>Benefits of FSMS implementation</b>	<b>40</b>
<b>3.4.5</b>	<b>Challenges of FSMS implementation</b>	<b>41</b>
<b>3.4.6</b>	<b>Measurement of FSMS implementation</b>	<b>43</b>
<b>3.5</b>	<b>The impact of FSMS on the wine industry</b>	<b>45</b>
<b>3.5.1</b>	<b>Process and improvement of a FSMS</b>	<b>46</b>
<b>3.6</b>	<b>Conclusion</b>	<b>46</b>

## **CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY**

<b>4.1</b>	<b>Introduction</b>	<b>48</b>
<b>4.2</b>	<b>Research design and methodology</b>	<b>48</b>
<b>4.2.1</b>	<b>Types of research</b>	<b>49</b>
<b>4.2.2</b>	<b>The appropriate research method</b>	<b>49</b>
<b>4.3</b>	<b>The target population</b>	<b>50</b>
<b>4.3.1</b>	<b>Company identification</b>	<b>50</b>
<b>4.4</b>	<b>Data collection</b>	<b>50</b>
<b>4.4.1</b>	<b>Survey research design</b>	<b>51</b>
<b>4.4.2</b>	<b>Questionnaire</b>	<b>51</b>
<b>4.4.2.1</b>	<b>List of questions / statements to respondents</b>	<b>52</b>
<b>4.4.3</b>	<b>Interviews</b>	<b>53</b>
<b>4.4.3.1</b>	<b>Interview technique</b>	<b>54</b>
<b>4.4.4</b>	<b>Measurement scales</b>	<b>54</b>
<b>4.5</b>	<b>Survey design</b>	<b>55</b>

4.6	Survey validity and reliability	55
4.7	Conclusion	56

## **CHAPTER 5: ANALYSIS AND INTERPRETATION OF SURVEY RESULTS**

5.1	Introduction	57
5.2	Method used to analyse data	57
5.2.1	Validation of survey results	57
5.2.2	Data format	58
5.2.3	Inferential statistics	58
5.2.4	Assistance to the researcher	58
5.2.5	Sample	58
5.3	Demographical results and statistics for sample	58
5.3.1	Individual information	58
5.3.1.1	Gender	59
5.3.1.2	Years of work at company	59
5.3.1.3	Educational level	60
5.3.1.4	Job title	60
5.3.2	Company's profile	60
5.3.2.1	Number of employees	56
5.3.2.2	Main markets for product	61
5.3.2.3	Main activities on production information	61
5.3.2.4	The organisational certification	62
5.3.2.5	The standards used as audit criteria	62
5.4	Descriptive statistics for questionnaire	63
5.4.1	Reliability of data	66
5.4.2	Descriptive statistics for general questions on FSMS	66
5.4.3	Descriptive statistics for decision-making	67
5.5	Conclusion	68

## **CHAPTER 6: DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

6.1	Introduction	69
6.2	The research problem revisited	70
6.3	The research question revisited	70
6.4	The investigative questions revisited	70
6.5	Key research objectives revisited	71
6.6	Analogies drawn for responses from organisations visited with implemented FSMS	72
6.7	Recommendations	72
6.8	Final conclusion	72

<b>REFERENCES</b>	<b>74</b>
-------------------	-----------

<b>APPENDICES</b>	<b>80</b>
-------------------	-----------

Appendix A: Consent letter	80
----------------------------	----

Appendix B: The questionnaire	82
-------------------------------	----

Appendix C: Interpretation of statistics - Statistics interpretation	88
--	----

Appendix D: Interpretation of statistics	111
--	-----



## **LIST OF FIGURES**

<b>Figure 1.1 Simplified model of an IMS</b>	<b>2</b>
<b>Figure 2.1 Simplified schematic presentation of the wine-making process</b>	<b>16</b>
<b>Figure 2.2 QM&amp;R organisational structure</b>	<b>18</b>
<b>Figure 3.1 Food chain</b>	<b>21</b>
<b>Figure 5.1 Gender</b>	<b>59</b>
<b>Figure 5.2 Years of work at company</b>	<b>59</b>
<b>Figure 5.3 Educational level</b>	<b>60</b>
<b>Figure 5.4 Job title</b>	<b>60</b>
<b>Figure 5.5 Number of employees</b>	<b>61</b>
<b>Figure 5.6 Main markets for products</b>	<b>61</b>
<b>Figure 5.7 Main activities on production information</b>	<b>61</b>
<b>Figure 5.8 Organisational certification</b>	<b>62</b>
<b>Figure 5.9 The standards used as audit criteria</b>	<b>63</b>
<b>Figure 5.10 Responses regarding food safety questions</b>	<b>62</b>
<b>Figure 5.11 Responses regarding decision-making questions</b>	<b>63</b>

## **LIST OF TABLES**

<b>Table 2.1 The five different stages in the wine market evolution (Adapted from Introducing the global wine market evaluation model)</b>	<b>10</b>
<b>Table 2.2 Wine sold by wine route estates per market channel (excludes bulk sales)</b>	<b>14</b>
<b>Table 2.3 FSMSs in Cape Wine Company</b>	<b>20</b>
<b>Table 3.1 Key common factors of FSMS</b>	<b>37</b>
<b>Table 5.1 Descriptive statistics for FSMS and decision-making questions</b>	<b>63</b>

## GLOSSARY

<b>British Retail Consortium (BRC)</b>	The British Retail Consortium is the leading trade association for retailing. They have developed the BRC Global Standard for Food Safety in order to help the food industry meet legislative requirements of the EU General Product Safety Directive and the UK Food Safety Act. (Cert-id, 2011: <b>Online</b> ).
<b>Continual Improvement</b>	The term continual improvement refers to an ongoing need to improve the effectiveness of a FSMS (ISO 22000 Food Safety, 2011: <b>Online</b> ).
<b>Effectiveness</b>	The extent to which planned activities are realised and planned results achieved (South African National Standard 103 30,2007:6).
<b>Food</b>	An article or substance ordinarily eaten or drunk by man or purporting to be suitable, manufactured or sold for human consumption. This includes any part or ingredient of any such article or substance, or any substance used or intended or destined to be used as part or ingredient of any such article or substance (South African National Standard 103 30,2007:6).
<b>Food safety</b>	Refers to the conditions and practices that preserve the quality of food to prevent contamination and food-borne illnesses (Codex Alimentarius, 2011).
<b>Food Safety Management System (FSMS)</b>	Is a network of interrelated elements that combine to ensure that food does not cause adverse human health effects. These elements include programs, plans, policies, procedures, practices, processes, goals, objectives, methods, controls, roles, responsibilities, relationships, documents, records and resources (ISO 22000:2005).
<b>Hazard Analysis and Critical Control Point (HACCP)</b>	HACCP is a methodology and management system. It is used to identify, prevent and control food safety hazards (ISO 22000 Food Safety, 2011: <b>Online</b> ).
<b>Good Manufacturing Practices (GMP)</b>	Signifies those aspects of quality assurance which ensure that materials and articles are consistently produced and controlled to ensure conformity with the rules applicable to them as well as with the quality standards appropriate to their intended use by not endangering human health or causing deterioration in the organoleptic characteristics thereof (SANS 1049:2007).
<b>International Food Standard (IFS)</b>	IFS is a standard for the auditing of companies that process food or companies that pack loose food products. (IFS, 2011: <b>Online</b> ).
<b>ISO 22000</b>	ISO 22000:2005 specifies requirements for a FSMS where an organisation in the food chain needs to

demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption (ISO, 2005:**Online**).

**Quality Management System (QMS)**

A QMS can be defined as the managing structure, responsibilities, procedures, processes and management resources to implement the principles thereof, as well as the action lines needed to achieve the quality objectives of an organisation (ISO 9001:2008).

**Wine Industry**

Is a sector of the food industry producing grape wines, champagne, cognac, and berry fruit wines. Grapes, fruits and berries are the raw materials of the wine industry. Grape cultivation (viticulture) and the production of grape wine have been known since antiquity (SAWIS, 2011:1).

# CHAPTER 1

## SCOPE OF THE RESEARCH

### 1.1 Background and Motivations of the Research

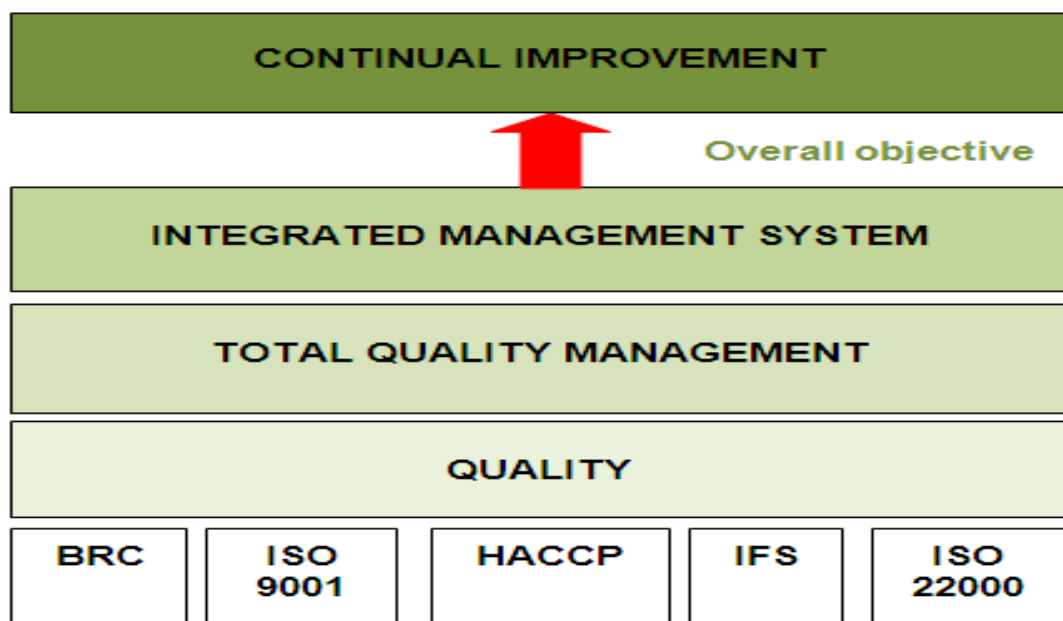
This chapter is an overall orientation to the study. It includes a brief introduction; background to the research problem; problem statement and research question. It further explains the research objective; ethical considerations; research assumptions; research constraints; the significance of the study; the chapter outline and the research time schedule.

The history of South African wine dates back to 1659. In terms of world wine-production, South Africa ranks ninth in volume production and produces 3.3% of the world's wine [South African Wine Industry Information and Systems (SAWIS) 2010]. Production is concentrated around Cape Town, with major production centers at Paarl, Stellenbosch and Worcester (Platter, 2010: **Online**). The wine regions of South Africa are spread out over the Western and Northern Cape regions, covering 500 kilometers west to east and 680 kilometers north to south (SAWIS, 2010). In order for wine organisations to remain competitive and to satisfy customer requirements, wine organisations have to produce a wine that is of good quality and, more importantly, poses no harm to the consumer. Wine must therefore be produced under food safety requirements. In recent decades many of the wine organisations situated in the Western Cape have successfully implemented and maintained Quality Management Systems (QMSs) and Food Safety Management Systems (FSMSs). The most recognised QMS implemented by cellars are ISO 9001 and FSMSs are: Hazard Critical Control Points (HACCP), British Retail Consortium (BRC), International Food Standard (IFS) and ISO 22000:2005.

The research is undertaken to identify the similarities among the FSMSs that are implemented at the selected wine organisations in the Western Cape. Various FSMSs are implemented at wine organisations, including the primary production cellars and secondary bottling plants. Although many wine organisations have implemented FSMSs over the past years, the impact of these FSMSs and how they reflect on the effectiveness of performance on the wine industry in the Western Cape, has however not been evaluated. It is therefore imperative that this study identifies whether these wine organisations conform to the fundamental requirements of the FSMSs, and to evaluate their performance in order to establish whether they meet the fundamental requirements of FSMSs.

## 1.2 Background to the research problem

Due to proliferation of FSMSs such as HACCP, BRC, IFS and ISO 22000, a need has emerged to somehow evaluate and identify the similarities between the various systems. Over recent years many companies in the wine industry in the Western Cape have successfully implemented and maintained these FSMSs. A simplified model of an IMS comprises only a QMS and a FSMS. As illustrated in figure 1.1 below, the objective of a FSMS is to continually improve the performance of organisations. Figure 1.1 describes that a FSMS is one of the fundamental blocks that results in improved quality through total quality management (TQM) and an Integrated management system (IMS).



**Figure 1.1 Simplified model of an IMS**  
(Source: Developed for this study)

In order for wine organisations to be competitive and to satisfy customer needs, wine organisations must produce good quality products. Over the last decades, many wine cellars situated in the Western Cape have implemented FSMSs. The most recognised FSMSs implemented by these wine organisations include ISO 9001, ISO 22000, HACCP, BRC and IFS.

According to South African Wine Industry Information and Systems (SAWIS), the South African Wine and Spirit Board operate a voluntary program that allows South African wine to be “certified” for quality and accuracy in labelling (SAWIS, 2010). All wine in South Africa is produced in accordance to the following governmental regulations:

- the Liquor Products Act 60 of 1989;
- the Foodstuffs, Cosmetics and Disinfectants Act, 1972; and
- the Liquor Act 59 of 2003.

The SAWIS certification process focuses mainly on the classification and labelling of wine products. For this reason food safety is most likely not very prevalent. It is therefore crucial that wine organisations need to conform to national and international FSMSs in order to:

- produce a food-safe product that poses no risk to the consumer;
- improve continual improvement;
- enhance customer satisfaction; and
- remain competitive.

According to the South African Auditor and Training Certification Association (SAATCA) (2011: **Online**) FSMSs include the following certifications:

- ISO 22000:2005 FSMSs: requirements for any organisation;
- SANS 10330: Requirements for a hazard analysis and critical control point (HACCP) system;
- BRC: British Retail Consortium;
- SABS 049: Food hygiene measurement;
- ISO 15161: Guidelines on the application of ISO 9001 for the food and drink industry; and
- Act 54 of 1972: Foodstuffs, Cosmetics and Disinfectants Act, Regulation R908.

### **1.3 Problem statement**

Due to the diversity of the various FSMSs available in the industry, the need was identified to consolidate the fundamental requirements of these FSMSs. Therefore the problem to be studied reads as follows: “There is not a consolidated approach to validate the performance of the implementation of the FSMS, which culminates in poor results.”

### **1.4 Research questions**

#### **1.4.1 Primary research question**

The primary research question to be researched within the ambit of this research study, reads as follows:

Which criteria can be used to measure the FSMSs effectively?

## **1.4.2 Investigative research questions**

Four investigative questions will be researched in support of the primary research question:

- What are the current criteria for measuring the effectiveness of FSMSs?
- Which key factors affect the performance of FSMSs?
- What are the similarities among the fundamental requirements of the various FSMSs available?
- How to improve the effectiveness of FSMSs in order to maintain the required certification?

## **1.5 Research objectives**

The primary research objectives of this research are:

- to determine the current criteria which is used to measure the performance of the FSMSs effectively;
- to determine the key factors that affect the performance of the FSMSs;
- to identify the similarities among the various FSMSs; and
- to determine an effective approach to improve the performance of FSMSs.

## **1.6 Ethics**

In the context of research, according to Saunders, Phillips and Thornhill (2000:130) "... ethics refers to the appropriateness of your behaviour in relation to the rights of those who become the subject of your work, or are affected by it". According to Leedy and Ormrod (2001:108) most ethical issues in research fall into one of four categories, namely protection from harm, informed consent, right to privacy and honesty with professional colleagues. Such a form should contain the following information (Leedy & Ormrod, 2001:107-108):

- A brief description of the nature of the study.
- A description of what participation will involve in terms of activities and duration.
- A statement indicating that participation is voluntary and can be terminated at any time without penalty.
- A list of potential risk and/or discomfort that participants may encounter.
- The guarantee that all responses will remain confidential and anonymous.
- The researcher's name, plus information about how the researcher can be contacted.
- An individual or office that participants can contact, should they have questions or concerns about the study.



- An offer to provide detailed information about the study (e.g. a summary of findings) upon its completion.
- A place for participants to sign and date the consent form, indicating an agreement to participate.
- Right to privacy: Any research study should respect participants' right to privacy. In general, a researcher must keep the nature and quality of participants' performance strictly confidential.
- Honesty with professional colleagues: Researchers must report their findings in a complete and honest fashion, without misrepresenting what they have done or intentionally misleading others as to the nature of their findings. Under no circumstances should a researcher fabricate data to support a particular conclusion, no matter how seemingly 'noble' that conclusion may be.

Based on Leedy and Ormrod (2001:108) the following ethical considerations are applied in this research:

- Informed consent: Participants were informed in advance regarding the nature of the study to be conducted, and were given the choice whether to participate or not. Furthermore, they were also given the right to withdraw from the study at any time, as participation in this study is strictly voluntary.
- It is suggested that an informed consent form (Appendix A) that describes the nature of research as well as the nature of the required participation be presented to participants in a research study.

## **1.7 Research assumptions**

The following assumptions were raised in this study:

- certifications audits as conducted by independent certification bodies are the only means to successfully verify the effectiveness of a FSMS;
- FSMSs are solely implemented as a licence to trade to foreign countries;
- FSMSs are implemented to satisfy customer's requirements; and
- a quality representative is responsible for the maintenance of the FSMSs.

## **1.8 Research constraints**

As with every research study, one might expect some limitations that can be related to the field of study. Some of these constraints are listed below:

- Wine organisations not able to maintain the desired FSMS certification as audited by an independent certification body.

- Wine organisations that are working according to an industry acceptable FSMS, but are not formally certified.

### **1.8.1 Limitations**

Some wine organisations in the Western Cape are not certified due to their size and limited capabilities. In order to make this research manageable, this study only selected large wine organisations in the Cape winelands, Western Cape, as they are certified with FSMSs. Although some other regions in South Africa such as Northern Cape and KwaZulu-Natal Midlands are also certified, the Cape winelands in the Western Cape is the most representative region in the country. These regions include:

- Cape Town, which is perceived to be the centre of the South African wine industry.
- The Cape Wine Route, South Africa's most prestigious wine route.
- As the researcher is based in Stellenbosch, the heart of the Cape winelands, it was economically feasible for the researcher to conduct the empirical study in Stellenbosch and its surrounding towns.

### **1.8.2 Delimitations**

FSMS is relatively covered in more broad perspectives and disciplines. This study only addressed those systems which are derived from or form part of FSMS for the wine industry, as many wine organisations, such as HACCP, BRC, IFS, GMP and ISO 22000 currently implement these FSMSs.

## **1.9 Significance of the study**

There is no doubt that the wine industry plays a major role in the South African economy (Li, 2009:16). For this reason FSMSs that are merely a licence to trade locally and to export are crucial to a wine organisation's economic status.

FSMS is not only limited to the wine industry. As food is defined as an article or substance ordinarily eaten or drunk by man (SANS 10330, 2007:6) the findings and recommendations concluded in this study will therefore not only benefit the wine industry, but the food industry in South Africa as well.

## **1.10 Chapter content and analysis**

This thesis comprises the following six chapters, and each chapter has its own nature with different functions.

### **Chapter 1: Scope of the research**

This chapter provides a introduction and background of the study, consisting of: the introduction; background of the research problem; research problem; aim and research objectives; primary research question; motivation for the study; scope; limitations and delimitations of the study; significance of the study; abbreviated literature review; overview of structure and dissemination of the findings.

### **Chapter 2: A holistic overview of the research environment**

This chapter provides a holistic overview of the research environment and also describes the background and environment in which the research will be conducted.

### **Chapter 3: Literature review**

This chapter presents an extensive literature review, focusing on the application and validation of an IMS in the wine industry. It also provides an overview of research collaboration and reviews previous studies.

### **Chapter 4: FSMS measurement questionnaire design**

This chapter explains the research methodology, presents the study area, target population, research instruments, data collection procedures and data presentation and analysis approaches.

### **Chapter 5: Analysis and interpretation of survey results**

This chapter analyses the data obtained from the questionnaires and discusses the research findings with regard to the verification and evaluation of a food safety management system and IMS in the wine industry.

### **Chapter 6: Conclusion and recommendations**

This chapter presents the conclusions and recommendations, implications for further study and limitations of this study.

## **1.11 Conclusion**

This chapter establishes the basis for the evaluation of FSMSs in the wine industry in the Western Cape. A basic understanding of various FSMSs can be gained through this chapter. Summarily, the chapter provides an introduction and background to the

study, the problem statement, research objectives, motivation of the study, scope, limitations and delimitations of the study, significance or value of the study and the means of disseminating the research findings.

## **CHAPTER 2**

### **A HOLISTIC OVERVIEW OF THE RESEARCH ENVIRONMENT**

#### **2.1 The Global Wine Industry: An Overview**

As a significant role-player in the nation's economy, South African wine reflects the country's colourful history and cultural diversity (Li, 2009:2). South Africa's wine-making history dates back more than 300 years. Jan van Riebeeck, the first governor of the Cape, planted a vineyard in 1655. On 2 February 1659 the first wine was made from Cape grapes (Capewine, 2005) cited by Li, 2009:2). According to Li (2009:2) South Africa is one the few countries within the African continent that produces wine. South African Wine Institute (SAWIS) (2011: **Online**), stated that South Africa is the world's ninth largest wine producer, representing about 3.3% of the global market. SAWIS (2011: **Online**) also points out that South African wine exports are on the rise again, recording a 16% increase in volumes sold for the first 11 months of 2007, as compared to the same period in 2006.

#### **2.2 Food safety management systems (FSMSs) in the global wine industry**

Globalisation is not new to the world's wine markets, but its influence over the past decade or so has increased significantly, with the most outstanding indicator the global production that is exported (Anderson, Norman & Wittwer, 2001:1). Anderson *et al.* (2001:1) further indicates that this influence is very positive for stakeholders in the New World such as North and South America, South Africa and Australasia. The wine world has experienced some remarkable swings over the past 20 years. According to Anderson *et al.* (2001:1-2) there are many trends and opportunities shaping the global wine industry, including:

- exports to different countries;
- taste of consumers;
- tourism, especially wine tourism; and
- the stage of the wine market.

**Table 2.1 The five different stages in the wine market evolution**

<b>Traditional Established</b>	<b>Mature Established</b>	<b>High Established growth</b>	<b>Emerging</b>	<b>New Emerging</b>
Wine-producing countries with high residual per capita consumption, but stable or declining	Markets with strong historical growth which is tailing off	Markets where wine is becoming a mainstream product and is experiencing above-trend growth	Markets where wine is experiencing rapid growth from a relatively low base	Markets where wine is still a relatively new and unknown beverage
Argentina Croatia France Georgia Germany Italy Portugal Spain	Denmark Belgium Ireland Japan Netherlands Switzerland UK	Australia Canada Finland New Zealand Norway Sweden USA	Angola China Brazil Hong Kong Mexico Poland Russia Singapore <b>South Africa</b> South Korea	India Malaysia Nigeria Taiwan Thailand UAE

**(Source: Wine Intelligence, 2011:2)**

The Wine Intelligence (2011:3) is of the opinion that we inhabit a wine business world experiencing widespread changes in consumer spending – both upwards and downwards – coupled with equally widespread producer cost increases and a structural oversupply of wine of the order of 30 million hectolitres a year (the equivalent of around 19 million cases). The wine industry and the wine-producing organisations have specific markets into which they sell. Consumer behaviour from one market to the next is patterns of market trends, as shown in Table 2.1. Table 2.1 also illustrates how wine markets have evolved and have been established in different countries across the world. South Africa is classified as an emerging wine market due to its rapid growth in wine volume.

According to Wine Intelligence (2011:7) growth in the emerging markets is typically driven by more affluent younger drinkers. Young consumers are characterised by the reassurance of prestigious familiar brands which are the dominant choice of consumption. These emerging markets have the opportunity to influence a new generation of wine drinkers in each of these markets:

- persons who are receptive to educational information;
- persons who are increasingly willing to try new wines; and

- persons who are open to directing more of their rising disposable income toward the wine category (Wine Intelligence 2011:7).

### **2.3 Food Safety Management Systems in the Western Cape South Africa**

The South African liquor industry, comprising beer, wine and spirit segments, is characterised by high levels of concentration where virtually the entire market is served by a mere handful of companies (Naumann, 2005:3). Cape Town is best known as the gateway to the South African winelands. The Cape wine-growing areas, situated mainly in the province of the Western Cape, mostly have a Mediterranean climate. The climate in the Cape which is characterised by long, sunny summers and mild, wet winters provides the ideal conditions for viticulture. According to South African Wine (2011:**Online**) approximately 275 000 people are employed in the South African wine industry, which includes farm labourers and persons involved in packaging, retailing and wine tourism. According to SAWIS (2011: **Online**) the wine industry contributes 8.2% to the Western Cape's gross geographic product. The South African industry is backed by the Niertvoorbij Institute for Viticulture and Oenology, a state research body.

The wine industry in South Africa has experienced major changes in the past decade or two. On the surface, certain statistics may indicate an industry that seems stagnant, but a closer look reveals dramatic shifts in consumer and customer preferences. This has triggered various responses from producers.

Lastly, the South African wine industry is fast gaining a reputation as a wine destination of quality due to winning numerous international awards.

#### **2.3.1 Dynamic growth**

Wine produced in South Africa is distributed to a network of wholesalers and retailers by producing cellars, estates and other organisations that market wine directly. In the past most wines were sold through domestic wholesalers. However, with more foreign markets opening their doors to us, quantities of South African wines being sold abroad are rapidly increasing.

Exports of South African wines have increased significantly over the past two decades to approximately 50% of total production in 2009 (SAWIS, 2010:Online). In comparison to the national industry, producer cellars export only about 11% of their production directly. Some producer cellars make use of export companies, but most

producers sell their product in bulk to wine buyers or wholesalers who export the wine. From recent studies it became clear that over a period of seven years, the EU is still the biggest market for South African wine, but it is also clear that growth has become flat especially since 2007 (SAWIS, 2011:Online). According to SAWIS (2011:Online), of particular significance is the sharp decline in exports to the UK where volumes in 2010 at about 104,000,000 liters are less than the volumes registered in 2008 and far less than the highest volumes recorded in 2009 namely about 125,000,000 liters (packaged and bulk). The following exported volumes (bulk and packaged wine) for selected markets were indicated by SAWIS (2011: Online), for the period -2008-2010:

- Canada - 91 280 358 liters
- China - 14 989 635 liters
- Germany - 394 103 935 liters
- Japan - 15 280 879 liters
- United Kingdom - 815 469 176 liters

Many countries to which wine is exported require that the producing cellar should have a FSMS in place. The majority of the respondents chosen for this research are exporting either in bulk or packed wine.

### **2.3.2 Wine tourism in South Africa**

Wine tourism is a form of special-interest tourism (Hall, 1998). The winery tour aspect is indeed an example of a well-established special interest tourism product (Weiler & Hall, 1992). According to Bruwer (2002:423) wine is a beverage that is associated with relaxation, communicating with others, complementary to food consumption, learning about new things and hospitality. The Western Australian Wine Tourism Strategy (2000) defines wine tourism as “to travel for the purpose of experiencing wineries and wine regions and their links to lifestyle”.

In the geographic sense, the South African wine industry is more regionally concentrated than in most other wine countries, with 95% of the country's 105 000 hectare of vineyards producing grapes for wine-making concentrated in the Western Cape area (Bruwer, 2002:424). The Stellenbosch Wine Route became the first official wine route in South Africa when it was established in 1971 (Bruwer, 2002:424). According to Bruwer (2002:424) the Stellenbosch Wine Route is still by far the largest. It consumes 36% of the local tourist market and is the most influential in the South African wine tourism industry, followed by its neighbouring regions, Paarl and Franschhoek (Bruwer, 2002:424).



Bruwer (2002:428-429) describes the following characteristics that the wine market segments are dependent of:

- the individual characteristics of each winery and wine region in terms of accessibility;
- the profile of the wine;
- the types of wine produced;
- marketing and promotion;
- attractiveness; and
- facilities.

Bruwer (2002:432) further indicates that the income earned by wine route estates can be split into two main categories, namely income from wine sales through the cellar door and income from other wine tourism related activities.

### **2.3.3 Western Cape wine industry**

The Western Cape is a province of diversities. Production is concentrated around Cape Town, with major production centres at Paarl, Stellenbosch and Worcester (Platter, 2010). The wine regions of South Africa are spread out over the Western and Northern Cape regions, covering 500 kilometres west to east and 680 kilometers north to south (SAWIS, 2010).

The wine industry in the Western Cape is clustered in and around Cape Town. According to Cape Wine Estates (2011:**Online**) the most popular wine routes where all the producer cellars are situated are:

- McGregor in the south and Montagu in the east.
- Cape Agulhas Wine Route – vineyards are situated in the little village of Elim.
- Cape Point Wine Route.
- Constantia Wine Route – includes five wine producers situated just minutes outside of Cape Town.
- Darling Wine Route.
- Durbanville Wine Route – vineyards and cellars are situated only 20km north of Cape Town.
- Elgin Wine Route – situated only 45 minutes drive from Cape Town.
- Franschhoek Wine Route – the heart of one of the oldest and most beautiful wine routes in the Cape.
- Little Karoo Wine Route.
- Olifants River Valley Wine Route – starts at Citrusdal, 180 km outside of Cape Town.

- Paarl Vintners – vineyards and wine cellars situated only 50km outside the Mother City.
- Robertson Wine Route – only 90 minutes drive from Cape Town.
- Stellenbosch Wine Route – considered the forefront of viticulture and viniculture.
- Swartland Wine Route.
- Tulbagh Wine Route.
- Walker Bay Wine Route – situated 6km from Hermanus.
- Wellington Wine Route – situated only 45 km outside Cape Town.
- Worcester Wine Route.

It is quite evident from the above section that all the major wine routes, vineyards and wine-producing cellars are situated in close proximity to Cape Town.

Table 2.2 shows the percentage of packed wine sold by wine estates on the major wine routes as indicated. The most wine sold in South Africa itself, is to domestic consumers. The highest percentage (38.6) of wine is sold within South Africa itself on these major wine routes. Furthermore, 37.9% is being exported to other continents, 20.2% is being sold at the cellar doors and the smallest percentage (3.3) derives from intercontinental sales.

**Table 2.2 Wine sold by wine route estates per market channel (excludes bulk sales)**

<b>Market</b>	<b>%</b>
Cellar door	<b>20.2</b>
Domestic Retail (inside RSA)	<b>38.6</b>
Intercontinental (inside Africa)	<b>3.3</b>
Export to other continents	<b>37.9</b>
Total	<b>100.0</b>

**(Source: Bruwer, 2002:432)**

## **2.4 FSMS in Cape Wine Companies: A Case Study**

The following section provides detailed information of Cape Wine and how the company operates in the industrial environment. Cape Wine is one of the leading wine-manufacturing companies in the Western Cape. The company also is South Africa's premier producer of fine wines, spirits and flavoured alcoholic beverages. For this reason Cape Wine is involved in this study.

### **2.4.1 Cape Wine Company**

The company was formed in 2001. Cape Wine company boasts over 125 years of experience in the wine and spirit industry. It is the leading producer and marketer of fine wines, spirits and flavoured alcoholic beverages in South Africa. The group is listed on the JSE Securities Exchange South Africa with a shareholding base that includes the powerful Rembrandt Group (Remgro) and SAB Miller (Distell, 2010).

The company has:

- approximately 4 000 permanent employees;
- a 40% share of South Africa's premium and super-premium wine markets;
- the capacity and infrastructure to source and produce over 180 million litres of wine a year; and
- the company has a portfolio consisting out of three segments, namely wine, cider and ready-to-drink spirits.

### **2.4.2 International accreditation**

Cape Wine Company has the following international accreditations that are applicable to the wine industry in South Africa:

- all wine cellars are ISO 9001 certified;
- all wine cellars and wine-bottling plants are certified by the British Retail Consortium (BRC), International Food Standard (IFS) and Hazard Analysis and Critical Control Points (HACCP) to comply with food safety standards; and
- all distribution centres are ISO 9001 certified.

### **2.4.3 The wine segment**

The wine portfolio boasts a wide spread of brands, including some of South Africa's best-loved labels. The company also presides over the marketing and sales of a number of boutique wine cellars, some of which are wholly owned, some partly owned and some for whom the company merely markets their wines.

### **2.4.4 Wine-production – primary and secondary**

Figure 2.1 is a basic diagram describing the process of wine-production from the primary production (cellar) through to the secondary production (bottling). Once the wine is bottled and labelled, it is distributed to the distribution centres across the country.

One of the most important customer expectations when producing wine, is to ensure that the product is food-safe. ISO 9001:2008 allows an organisation to integrate its

QMS with the implementation of a food safety system (Aggeloginnopoulos, Drosinos & Athanasopoulos, 2006:1078). The simultaneous operation of a QMS and a FSMS such as HACCP is most common in the food and drink industries (Aggeloginnopoulos *et al.*, 2006).

With the application of HACCP within an ISO 9001, QMS can result in a food management system that is more effective than the application of either ISO 9001 or HACCP alone, leading to enhanced customer satisfaction and improving organisational effectiveness (Aggeloginnopoulos *et al.*, 2006:1079). Aggeloginnopoulos *et al.* (2006:1079) further mentions that HACCP as part of a quality system not only manages to provide safety to the products, but also ensures a better and more effective implementation of the whole quality system. The quality of wine is usually related to the product's appearance, acceptability, taste, flavour, colour and components (alcohol, acid) – characteristics important for consumer acceptance (Christaki & Tzia, 2002:505). As wine-making is a very sensitive procedure, the assurance of quality during the whole procedure is significant for the acceptance by consumers. The implementation of a QMS according to ISO 9001:2008 and the adoption of a food safety system such as HACCP in the wine sector will provide a suitable frame to the organisation to ensure the quality characteristics and the safety of the final product.

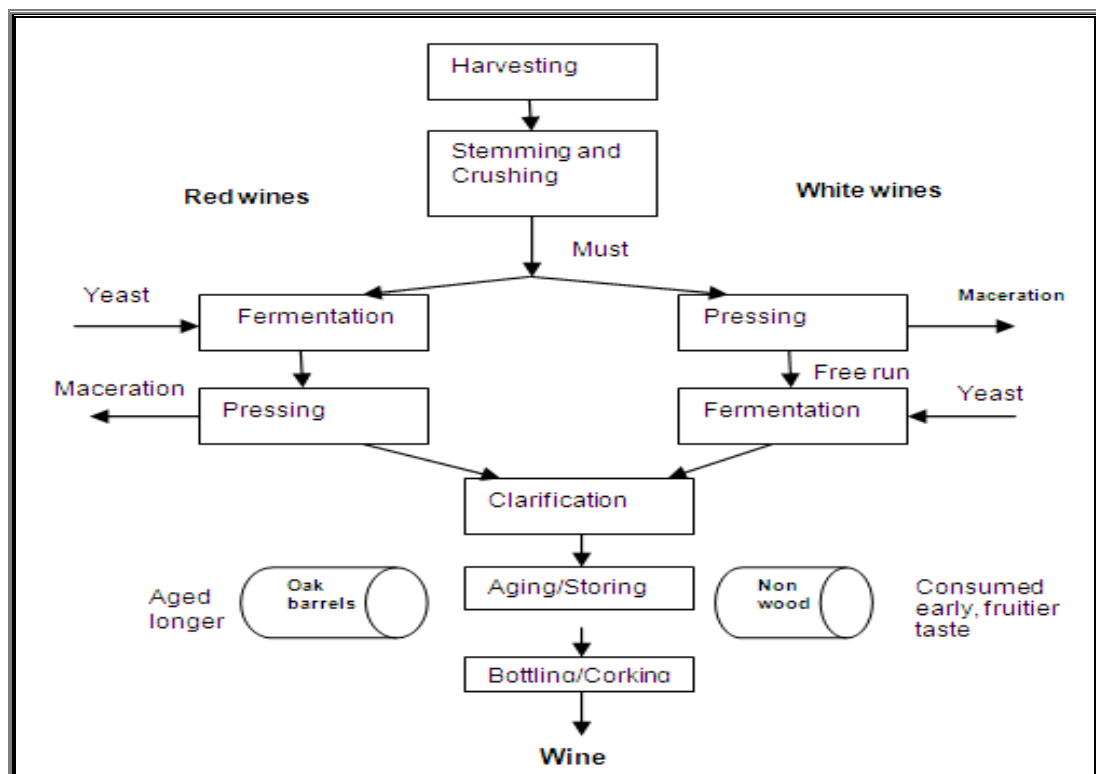


Figure 2.1 Simplified schematic presentation of the wine-making process

(Source: Distell, 2011)

Figure 2.1 illustrates a simplified process for the production of wine. Wine-production can be split into two phases namely: primary (wine-making) and secondary (bottling). The following section describes the steps in wine-making as illustrated in Figure 2.1:

- Harvested grapes are received from the farm
- Mash / whole bunches are transferred to the press, drainer or fermentation tanks for crushing.
- Grape juice is settled or cooled and transferred to fermentation tanks.
- Fermentation is managed according to the desired style.
- Wine is transferred to oak barrels for maturation.
- Bottling of wine.

#### **2.4.5 The division of quality management and research (QM&R)**

QM&R is a corporate research department in Cape Wine Company focusing on quality management, new product development, routine laboratory analysis, research laboratory analysis, packaging developments and chemistry research. The quality management department is consists of 6 key positions that are vital to the maintenance of the FSMSs as shown in Figure 2.2 below:

Group Quality Manager who are responsible for:

- Corporate Policy documentation
- Quality Control
- Quality Measurements
- Handling of Non-conforming products
- Audits
- Training
- Problem Solving

Quality Systems Manager is responsible for:

- Liaise with various certification bodies
- Ensure Distell remains up to date with latest requirements
- Facilitate roll out maintenance of ISO 9001:2000, IFS, BRC, HACCP and ISO 14001
- Co-ordinate Training and Train
- Co-ordinate Audits (External and Internal) and Audit

Quality Manager International

- To provide Quality management support into Africa and International
- To provide Technical support where required in Africa and International to Distell partners i.e. Joint Ventures and Contract packers

Customer Relations Officer

- To ensure that all consumer complaints are logged, samples are obtained, replaced and feedback is given to the consumer, Primary Production and Operations.

Quality Technologist's duties include:

- Co-ordinate and manage information related to quality reports and audits.
- Monitor and coordinates corrective actions pertaining to non-conforming products ex-secondary production.
- Establish an information centre for the co-ordination of all product and legal enquiries
- Co-ordinate all product intrinsic change requests

Laboratories Manager



**Figure 2.2 QM&R organisational structure**

**(Source: Distell, 2011)**

In figure 2.2 a closer look is taken at the division of QM&R in Cape Wine Company. To satisfy the purpose of this research, a closer look is only taken at the quality management division, as this is applicable to the aim of this study. The main responsibilities of the quality management division are:

- to ensure and set the parameters of quality control for the company;
- to establish communication lines regarding quality aspects of the product;
- to be responsible for providing the guidelines to properly manage the write-off of nonconforming products;

- to be responsible for the procedure of controlling the re-call of suspect products from the trade;
- to establish quality measurement and key performance indicators;
- to indicate the most important quality measures of the company;
- to plan and perform quality index audits in secondary production, distribution and in the trade;
- to train sales representatives on quality guidelines; and
- to solve problems pertaining to customer complaints, out of spec products, product write-offs and recalls.

#### **2.4.6 QM&R unit at Cape Wine Company**

The company has an IMS based on ISO 9001. The “foundation” standard of the company is ISO 9001:2008 – a documented business management tool that addresses quality related issues of all products and services. This quality assurance model is compiled from quality system requirements.

The other certifications that the company complies with are: British Retail Consortium (BRC), SANS 10330:2007, Hazard Analysis and Critical Control Points (HACCP), ISO 14001 – an Environmental management standard, Internal Food Standard (IFS), SANS 1841 – a volume control standard, GOST – a Russian technical standard, and many more certifications that are not applicable to this research. The following are food safety standards as derived from the above mentioned list:

- **Hazard analysis critical control points (HACCP).**

The HACCP system was first developed in the 1960s in the United States of America as a response to the food safety requirements imposed by the National Aeronautic and Space Administration (NASA) for “spaced foods” produced for manned space travels. HACCP controls food safety, not food quality. HACCP is a preventative system. It identifies and controls potential or specific hazards that have an important effect on the safety of food. It also involves a thorough analysis of the complete chain – from raw materials to the consumer. After analysis of the involved processes, hazards can be identified and control points established. HACCP is therefore a food safety management system.

- **British Retail Consortium (BRC)**

The BRC, a global standard for food safety, was originally published by the BRC in 1998 for food producers supplying own-brand goods into the United Kingdom (UK) retail market. It has specific requirements for export into EU

markets and has been developed to specify the safety, quality and operational criteria required to be in place within food-manufacturing organisations to fulfil the legal compliance and protection of consumers. It is a food standard which includes QMS and HACCP. This standard addresses all food SAFETY related issues. The British Retail Consortium (the leading trade association for retail industry in the United Kingdom) released Issue 5 of its revised BRC food standard in July 2008 for the food industry to establish hygiene practices and food safety. By implementing the BRC food standard, companies obtain confidence, credibility, consistency, competence and continual improvement in a cost-effective manner. BRC is basically an industry-recognised system of best practice on how to operate a food business.

- **International Food Standard (IFS)**

The Associated members of the German retail federation and its French counterparts drew up a quality and food safety standard for retailer-branded food products. This is a European food standard which is based on the first version of BRC and improved through additional requirements. The IFS builds on ISO 9001 and implements additional legislative requirements, the principles of good practice, The HACCP risk analysis and also refers to EU legislation concerning the handling of allergens and genetically modified organisms (GMOs).

- **GOST**

GOST (Russian: ГОСТ) refers to a set of technical standards maintained by the Euro-Asian Council for Standardisation, Metrology and Certification (EASC), a regional standards organisation operating under the auspices of the Commonwealth of Independent States (CIS). Regulated standards range from charting rules for design documentation to recipes and nutritional facts of Soviet-era brand names.

**Table 2.3 FSMSs in Cape Wine Company**

Site	HACCP	BRC	IFS	GOST	Total
Primary	2	3			5
Secondary	3	6	3	1	13
					18

Table 2.3 emphasises the various FSMSs that do exist in industry. It also shows that the Cape Wine Company has all these various FSMSs implemented. This table illustrates that more secondary production sites than primary production sites are certified for a FSMS, and also that 13 secondary production sites are certified versus 5 primary production sites. It is also evident to conclude from Table 2.3 that most of



the production sites (a total of 9) are BRC certified. The reason for secondary production sites being certified as opposed to primary production sites is that processes in primary production sites pose fewer risks to the consumer. Another reason could be that all risks, if any, are mitigated by the time they reach secondary production sites, and also that processes at the secondary production plants are aligned in such a manner to eliminate or reduce any risks.

## **2.5 Conclusion**

In this chapter it is quite evident to notice the dynamic and the interaction which exists between the wine industry, the local tourist market and the exporting of these wine products. The interaction between wine-production, wine-making, the quality of the wine and how all this relates to food safety was discussed. Therefore it is almost safe to say that food safety and the certification that comes along with it can be used to firstly produce a safe product which can cause no harm to the consumer and secondly be used as a marketing tool to remain competitive. The selected company,, Cape Wine Company, which is one of the leading liquor companies in the country, was identified to evaluate how they manage quality and food safety. For the aim of this research this leading company will be used as the backbone of the environment in which this research will be conducted.

## CHAPTER 3 LITERATURE REVIEW

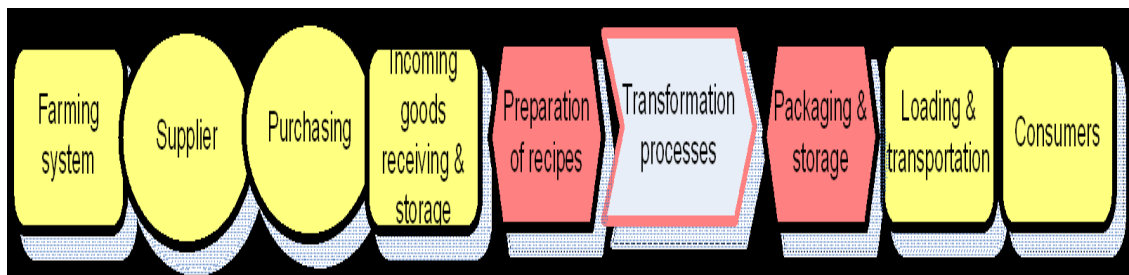
### 3.1 Introduction

This chapter aims to conduct a literature review to validate the concept of FSMSs and to identify effective measures for the performance of these management systems. Firstly, the chapter defines various FSMSs, but also defines QMS. Secondly, the requirements of these various FSMSs are explored. It also covers a comparison, validation, application and the key factors affecting the FSMS.

FSMSs are essential for any organisation producing food or beverages in order to provide credibility that the organisation can produce safe food. Whatever the product involved, a FSMS is designed to allow an organisation to guarantee food safety to consumers as (Surak, 2003:1). The primary function of food safety standards is to define a set of requirements and associated systems of conformity assessment directed at regulatory compliance (Henson and Humphrey, 2009:vi).

### 3.2 Food Safety Management Systems (FSMSs)

Surak (2003:3) defines a FSMS as auditable standard which defines HACCP's role in a FSMS. Surak, (2003:1) also explains that a HACCP based FSMS must be supported by the foundation of prerequisite programs. According to Dunlop (2005:4) FSMSs are applied throughout a product's whole life cycle. FSMSs are applicable to product suppliers and service providers of food products.



**Figure 3.1 Food chain**  
(Source: Hoffman, 2009)

In the diagram (Figure 3.1) an illustration of the global food chain is illustrated which is generic and relevant to all sectors of the food and beverage industry. Dunlop (2005:5) further explains that the following control mechanisms have to be in place in a country in order to produce food-safe products: regulations, codes of practice, inspection regimes, and risk reduction methodologies such as HACCP and ISO 9001-based management systems.

According to van der Spiegel (2004:13) food quality management is complicated because it involves the complex characteristics of food and their raw materials due to variability, restricted shelf life and their large range of (bio)chemical, physical and microbial processes.

Good FSMSs contain the following components:

- a Quality Management System (QMS) or adherence to the International Organisation for Standardisation (ISO);
- Good Manufacturing Practices (GMPs); and
- Hazard Critical Control Points (HACCP).

Henson and Humphrey (2009:4) explain that FSMSs necessarily involve the following:

- they provide a basis for making claims about processes and practices relating to how food is produced, transported or processed;
- they necessarily involve some form of monitoring and enforcement through second party (which is increasingly the case) and third party certification;
- they are codified into a written statement that sets out rules and procedures and also provides clear instructions as to how rules are to be implemented, monitored and enforced; and
- they include some form of traceability to link particular food products at some point downstream in the value chain, up to the point which the standard specifies and the control processes.

### **3.2.1 Quality Management System (QMS)**

According to CERCO Working Group on Quality (2000:7) a QMS can be defined as the managing structure, responsibilities, procedures, processes, and management resources to implement the principles and action lines needed to achieve the quality objectives of an organisation.

A QMS is defined by Business Dictionary (2011) as a system by which an organisation aims to reduce and eventually eliminate non-conformance to specifications, standards, and customer expectations in the most cost-effective and efficient manner.

According to the Department of Trade and Industry (2000) a QMS is defined as a set of co-ordinated activities to direct and control an organisation in order to continually improve the effectiveness and efficiency of its performance.

A QMS can be seen as a complex system consisting of all the parts and components of an organisation dealing with the quality of processes and products.

### **3.2.2 Hazard Analysis Critical Control Points (HACCP)**

Ropkins and Beck (2000:10) defines HACCP as a management tool developed in the late 1960s, to ensure the safety of foods for space travels.

HACCP is a production control system for the food industry. It is a process that identifies where potential contamination can occur at the critical control points (CCPs) and strictly manages and monitors these points as a way of ensuring the process is in control and that the safest product possible is being produced. HACCP is designed to prevent rather than catch potential hazards (Cross, 1994).

Surak (2003) describes HACCP as a systematic method that serves as the foundation for assuring food safety in the modern world. The HACCP system is designed to be used to prevent the occurrence of food-borne hazards from production through to manufacturing, storage and distribution of a food product (Surak, 2003).

Corlett (1998:13) emphasises that HACCP is a scientifically-based protocol that is applied directly to the food procurement, production and distribution process.

Unnevehr and Jensen (1998:3) describe the six principles in developing and operating a HACCP program:

- assess the hazard, list the steps in the process where significant hazards can occur and describe the prevention measures;
- determine critical control CCPs in the process;
- establish critical limits for each CCP;
- establish corrective actions to be taken when monitoring indicates a deviation from the CCP limits;
- establish record keeping for the HACCP system; and
- establish procedures to verify that the HACCP system is working correctly.

### **3.2.3 Global Standard for Food Safety: British Retail Consortium (BRC)**

According van der Spiegel (2004:16) BRC aims to ensure product quality and food safety. This is a technical standard for companies which explains retail-branded food products.

The Global Standard for Food Safety sets out the requirements for the manufacture of processed foods and their preparation of primary products supplied as retailer-branded products and food or ingredients for use by food service companies, catering companies and food manufacturers (Global standard for food safety, 1998:1).

The BRC Global Standards is a leading global product safety and quality certification program used by certificated suppliers in over 100 countries (Global Standard for Food Safety, 2011).

The BRC, is a UK trade organisation that represents the interests of UK retailers. The BRC's Global Standard for Food Safety was created to establish a standard for due diligence and supplier approval.

The Global Standard for Food Safety was first developed in 1998 by the food service industry to enable suppliers by third party certification bodies (British Retail Consortium 2011).

The Global Standard for Food Safety sets out the requirements for the manufacture of processed foods and their preparation of primary products supplied as retailer-branded products and food or ingredients for use by food service companies, catering companies and food manufacturers (Global Standard for Food Safety 1998:1). The Global Standard for Food Safety (1998:1) further explains that certification will apply to products that have been manufactured or prepared at the site where the audit also has taken place and will also include storage facilities that are under the direct control of the production site's management.

BRC is regarded as the benchmark for best practices in the food industry (SAI Global, 2011: **Online**). SAI Global (2011: **Online**) further states that the fundamental requirements within this standard include senior management participation, the adoption of HACCP, a documented QMS and control of factory environmental standards, processes and personnel.

SAI Global (2011: **Online**) points out the following reasons for an organisation to choose BRC:

- Clarity – created by retailers and adapted to manufacturers. Contains well-defined requirements and a straight forward certification process.
- Credibility – an experienced technical services team, plus expanding customer support, giving manufacturers peace of mind.

- Collaboration and continual improvement – multiple technical experts and committees regularly review the standard in order to improve and remain current around food safety trends.
- Consistency – a global training infrastructure allows for localised, language-based training and auditing teams. Audit reports are standardised around the world.
- Confidence – robust performance assessment tools and a transparent complaint procedure help maintain rigorous requirements for the competence, qualifications and experience of auditors.

### 3.2.4 International Organisation for Standardisation (ISO) 22000

According to ISO (2005: **Online**) ISO 22000:2005 specifies requirements for a food safety management system where an organisation in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. The ISO (2011: **Online**) standard specifies requirements enabling an organisation to:

- plan, implement, operate, maintain and update a FSMS aimed at providing products that, according to their intended use, are safe for the consumer;
- demonstrate compliance with applicable statutory and regulatory requirements;
- evaluate and assess customer requirements and demonstrate conformity with those mutually agreed customer requirements that relate to food safety, in order to enhance customer satisfaction;
- effectively communicate food safety issues to their suppliers, customers and relevant interested parties in the food chain;
- ensure that the organisation conforms to its stated food safety policy;
- demonstrate such conformity to relevant interested parties; and
- seek certification or registration of its FSMS by an external organisation or make a self-assessment or self-declaration of conformity to ISO 22000:2005.

Faegemand and Jespersen (2004:21) explain that ISO 22000 specifies requirements for a FSMS in the food chain where an organisation:

- needs to demonstrate its ability to control food safety hazards in order to consistently provide safe end products that meet with both the requirements agreed with the customer and those applicable to food safety regulations; and
- aims to enhance customer satisfaction through the effective control of food safety hazards, including processes for the updating the system.

Hoffman (2009) defines ISO 22000 as management systems designed to enable organisations to control food safety hazards along the food chain (as illustrated in Figure 3.1) in order to ensure that food is safe at the time of consumption. Hoffman (2009) further explains that ISO 22000 specifies the requirements for a FSMS that combines the following generally recognised key elements:

- interactive communication;
- system management;
- prerequisite program; and
- Codex HACCP principles.

Aside from Codex, the main international organisation that develops food safety standards is ISO (Henson & Humphrey, 2009:17). The ISO is an international non-profit organisation (NGO) that develops standards across a wide range of areas and sectors, from product specifications through to management systems (Henson & Humphrey, 2009:17). Henson and Humphrey (2009:17) also mentions that the function of ISO is to set international standards that are predominantly voluntary in nature and extend across a wide range of products, services and management systems. In the realm of food safety, ISO has developed the ISO 22000:2005 standard on FSMSs: Requirements for any organisation in the food chain.

### **3.2.5 International Food Standard (IFS)**

The Food Dictionary (2011) defines IFS as a set of quality control standards applied to food manufacturers and retailers across Europe. The associated members of the German Retail Federation, Hauptverband des Deutschen Einzelhandels (HDE) and of its French counterpart, Federation des Entreprises du Commerce et de la Distribution (FCD), drew up a quality and food safety standard for retailer-branded food products, named the International Food Standard (IFS), which is intended to allow the assessment of suppliers' food safety and quality systems, in accordance with a uniform approach (IFS, 2007:11).

IFS (2007:11) explain that the basic objectives of the IFS are:

- to establish a common standard with a uniform evaluation system;
- to work with accredited certified bodies and qualified auditors;
- to ensure comparability and transparency throughout the entire supply chain; and
- to reduce costs and time for both suppliers and retailers.

The IFS Audit-portal (2011) describes IFS food as a standard for the auditing of companies that process food or companies that pack loose food products. IFS food is applied to (IFS Audit-portal, 2011):

- processing and working;
- handling of loose products; and
- activities undertaken during the primary packaging.

### **3.2.6 Good Manufacturing Practices (GMP)**

The South African National Standard (SANS 10049:2011) describes Good Manufacturing Practices (GMP) or prerequisites for HACCP as basic good hygiene practices that need to be in place before HACCP can be implemented.

The World Health Organisation (WHO, 2011) defines GMP as that part of quality assurance which ensures that products are consistently produced and controlled to the quality standards appropriate to their intended use and required by the marketing authorisation.

Dewanti-Hariyadi (2009:30) defines GMP as the foundation of the food-processing operation to achieve consistent quality and safety. It also provides the basic requirements that should be fulfilled to assure good practices pertaining to the workers, the facility, the environment, the equipment and process control.

### **3.2.7 ISO 9001**

ISO 9001 is an international standard that specifies requirements for a QMS where according to ISO 2008 an organisation:

- needs to demonstrate its ability to consistently provide product that meets customer and regulatory requirements; and
- aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to the consumer and applicable statutory and regulatory requirements (ISO 2008:1).

All the requirements of ISO 9001 are generic and are intended to be applicable to all organisations, regardless of type, size and product provided (ISO 2008:1). ISO 9001 is underpinned by eight management principles (ISO 2008:1):

- a customer-focused organisation;
- leadership;



- involvement of people;
- ensuring a process approach;
- a systematic approach to management;
- a factual approach to decision-making;
- mutually beneficial supplier relations; and
- continual improvement.

### **3.2.8 South African National Standard (SANS) 15161**

According to the South African National Standard (SANS) (SANS15161, 2003:1) this international standard provides a guideline to organisations in applying the requirements of ISO 9001 during the development and implementation of a QMS in the food and drink industry. This international standard also gives information on the possible interactions of the ISO 9001 series of standards and the HACCP systems for food safety requirements (SANS 15161, 2003:1).

## **3.3 Requirements for FSMSs**

As far as the requirements for FSMSs are concerned, a few common requirements are identified among the various FSMSs. This sections aims to elaborate on the specific requirements of the FSMS and also to draw a comparison between them. The following section explores the requirements for ISO 9001.

### **3.3.1 QMS clauses**

According to ISO9001 there are five clauses. The fourth to eighth ISO clauses are included in QMS standards as below:

In clause four, QMSs include the following requirements (ISO9001, 2008:2):

- documentation;
- a quality manual;
- control of documents; and
- control of records.

The fifth clause, being management responsibility requirements, includes (ISO 2008:3):

- management commitment;
- customer focus;
- quality policy;

- planning;
- responsibility and authority; and
- management review.

Clause six, resource management, requires that provision of resources, human resources, infrastructure and work environment should be in place (ISO 2008:6).

Clause seven, product realisation, requires the following (ISO 2008:7-12):

- planning of product realisation;
- customer related processes;
- design and development;
- purchasing;
- product and service provision; and
- control of monitoring and measuring equipment.

The final requirement, clause eight, requires monitoring and measurement, control of nonconforming product, analysis of data and improvement (ISO 2008:12-14).

### **3.3.2 GMP requirements**

GMP requirements include, where appropriate, (SANS 10049:3):

- cleaning and sanitation;
- maintenance;
- personnel hygiene and training;
- pest control;
- plant and equipment;
- premises and structure;
- services;
- storage;
- waste management; and
- zoning.

### **3.3.3 HACCP requirements**

South African National standard (SANS) 10330:2007– Requirements for a Hazard Analysis and Critical Control Point (HACCP) system. The standard prescribes the requirements for the development, implementation and maintenance of a HACCP system as a preventative system to enhance the safety of food (SANS 2007:5).

SANS 10330:2007 has the following very specific requirements:

The documentation requirements require that a HACCP manual, control of documents and records should be in place (SANS 2007:8).

Management responsibility (clause five) requires appointment of the management representative, resources and management review. Requirement six describes the prerequisite program (PRPs). Requirement seven is dedicated to corrective action.

Clause eight, the HACCP study requirements provide an in-depth study of the HACCP study, which are:

- assemble the HACCP team;
- describe the product;
- identify the intended use of the product;
- construct a product flow diagram;
- arrange on-site confirmation of the flow diagram;
- list the food safety hazards and measures to control the hazards;
- determine the critical control points (CCPs);
- establish critical limits for each CCP;
- establish a monitoring system for each CCP;
- establish corrective action plans;
- establish validation, verification and review procedures; and
- establish control of documents and records (SANS 2007:11-17).

SANS 10330 is most often used as a guideline and also incorporated into most of the recognisable FSMSs. The South African National Standard was written in conjunction with the Codex Alimentarius commission. This commission was created in 1963 by the Food and Agriculture Organisation (FAO) and the World Health Organisation (WHO) to develop food standards, guidelines and related texts such as codes of practice under the joint FAO/WHO food standards program (Codex Alimentarius, 2011).

Tuominen (2009:29) describes HACCP as the world's best-known food safety management system concerning the food industry. According to Tuominen (2009:29) all the hazards that may cause adverse health effects in the end-product need to be identified and evaluated along the process during HACCP studies.

#### **3.3.4 ISO 22000 requirements**

This international standard specifies requirements for a food safety management system where and organisation in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe for human consumption (ISO 2005:1).

The main requirements of this standard will be reviewed to provide the reader with a holistic overview of what the standard requires.

Food safety management (clause 4) only has general and document requirements (ISO 2005:4-5).

Management commitment, the fifth requirement, requires that according to (ISO 2005:5-8) an organisation must have:

- management commitment;
- a food safety policy;
- food safety management system planning;
- responsibility and authority;
- a Food-safety team leader;
- communication;
- emergency preparedness and response; and
- management review.

Resource management (clause six) requires the following: provision of resources, human resources and infrastructure (ISO 2005:8-9).

Planning and realisation of safe products, the seventh requirement, focuses largely on HACCP and the realising of safe products through risk assessments. The ISO 2005:9-18 requirements are:

- prerequisite programs;
- preliminary steps to enable hazard analysis;
- hazard analysis;
- establish the operational prerequisite programs;
- establish the HACCP plan;
- update preliminary information and documents specifying the PRP's and HACCP plan;
- verification planning;
- a traceability system; and
- control of non-conformity (ISO 2005:9-18).

Clause eight deals with the validation, verification and improvement of the food safety management system and requires that an organisation has control measure combinations, control of monitoring and measuring, food safety management verification and improvement (ISO 2005:18-19).

It is evident to conclude that ISO 22000 is a food safety management system based on the foundation of ISO 9001:2008. All the requirements of ISO 9001:2008 is incorporated into ISO 22000:2005.

### **3.3.5 BRC requirements**

The Global Standard for Food Safety was first developed in 1998 by the food service industry to enable suppliers through third-party certification bodies (British Retail Consortium 2011).

The Global Standard for Food Safety sets out the requirements for the manufacture of processed foods and their preparation of primary products supplied as retailer-branded products as well as food or ingredients for use by food service companies, catering companies and food manufacturers (Global Standard for Food Safety 1998:1). The Global Standard for Food Safety (1998:1) further explains that certification will apply to products that have been manufactured or prepared at the site where the audit has taken place and will also include storage facilities that are under the direct control of the production site management.

BRC's Global Standard for Food Safety give the following requirements which a production site has to comply with: senior management commitment, the food safety plan – HACCP, QMS, site standards, product control, process control and personnel (Global Standard for Food Safety 1998:8-9).

### **3.3.6 IFS requirements**

The IFS further explains the following very explicit requirements: Senior management commitment that includes a corporate policy / corporate principles, corporate structure, customer focus and management review (IFS, 2007:7). The second requirement is HACCP, documentation requirements and record-keeping (IFS, 2007:7). Resource management requirements, human resources, training, sanitary facilities, equipment for personal hygiene and staff facilities (IFS, 2007:7). The product process requirements which relate to the physical production of the product, include the following knock-out requirements:

- contract review;

- product specifications;
- product development;
- purchasing;
- housekeeping and hygiene;
- waste / waste disposal;
- risk of foreign bodies, metal, broken glass and wood;
- pest monitoring / pest control;
- receipt of goods and storage;
- transport;
- maintenance and repair;
- equipment;
- process validation;
- traceability;
- genetically modified organisms; and
- allergens and specific conditions of production (IFS, 2007:7-8).

Measurement, analysis and improvement requires, internal audits, factory site inspections, process control, calibration and checking of measuring and monitoring devices, quantity checking, product analysis, product quarantine and product release, as well as management of complaints from authorities and customers, management of incidents, product withdrawal, product recall, management of nonconforming products and corrective actions (IFS, 2007:8).

According to Schulze, Albersmeier, Gawron, Spiller and Theuvsenour (2008:104) the IFS is divided into four parts: the IFS Protocol, the Catalogue of Requirements, the Requirements for Certification Bodies and Auditors and the IFS report. Schulze *et al.* (2008:104) also noted that the main chapter, called the Catalogue of Requirements, is based on the structure of the ISO 9001; the main technical chapters are quality system management, management responsibility, resource management, product realisation, measurements, analysis and improvements. The similarity between the IFS and the ISO 9001 was one of the main considerations in the development of the new standard (Schulze *et al.* 2008:104). Furthermore, the IFS depends, for the most part, on the evaluation system and structure of the BRC, which also refers to the ISO 9001.

### **3.3.7 ISO 15161 requirements**

This section shows the requirements of ISO 9001 and its relation to food safety production.

The requirement that deals with documentation SANS 15161, 2003:4 requires the following: Documents needed by the organisation to ensure the effective planning, operation and control of its processes may include the current issue of relevant legislation pertaining to food and drink manufacture. In order for any organisation to ensure traceability of their products the control of records is required. (SANS 15161, 2003:6) stipulates the following: within the food and drink industry retention periods for records may be stipulated as a customer requirement and this normally includes as minimum the product's shelf life period. Particular consideration should be given to the retention of management system records, for example internal audit, management reviews, system changes and HACCP documentation, as they contain important historical data (SANS 15161, 2003:6).

In terms of the requirements for management commitment, they should be committed to develop, maintain and operate the HACCP system and continually improve its effectiveness and provide the required resources (SANS 15161, 2003:7).

The quality objectives should indicate the nature of the hazards that the organisation considers critical for the safety of foodstuffs (SANS 15161, 2003:8).

Management reviews should, as a minimum of the results of the internal quality audit, take the following into account: corrective and preventative action, the control of suppliers, customer complaints, hygienic conditions, HACCP and other indicators (e.g. statistical data on product quality) of the effectiveness of QMS.

The management review provides the overview of the company, i.e. is the direction into which the company is moving still in line with long-term goals and aspirations. Human resources require that staff should be trained with the relevant work instructions / standards / specifications and legislation relating to food safety. The facilities and design of processing areas should be designed in such a way that it reduces hazards that pose a risk to food safety.

The following list highlights the relevant aspects which should be considered at all stages from raw material reception to product delivery:

- environment;
- buildings;
- plant, equipment and utilities;

- personnel;
- legislation;
- health-screening;
- waste and by-products; and
- pest control.

Validation of processes for production and service provision explains that reliance on post-process inspection and testing should be minimal. Product identification and traceability are regarded as prerequisite conditions before the application of HACCP (SANS 15161, 2003:24).

Verifying that a process is capable of meeting requirements may be done by process capability studies. High or low customer satisfaction could be measured by the number of compliments or complaints received (SANS 15161, 2003:27).

It is important that the internal audit system ensures that the agenda for management review takes the HACCP and its associated outputs into account since the QMS is used to manage the HACCP process (SANS 15161, 2003:28).

Any organisation should have appropriate procedures in place for dealing with nonconforming products. SANS 15161 (2003:30) states that the three most usual methods of dealing with nonconforming product are:

- making an agreement with the customer for a concession;
- ensuring that the product is safely disposed of in accordance with any relevant regulations and guidance; and
- that it is retained for alternative use.

The concept of corrective action in ISO 9001 is based on searching for causes in such a way as to perpetuate the elimination of the problem at the source of the non-conformity.

Preventive action in terms of ISO 15161 (2003:31) explains that causes of problems, when clearly identified, should be captured within the organisation and used to re-engineer processes and/or procedures to avoid recurrence of the non-conformity.

### **3.3.8 Comparison among the requirements of FSMSs**

Mensah et al (2011:1218) highlighted the key common factors when compared with the various FSMSs available to the food and beverage industry. In Table 3.1 all the fundamental requirements of the various FSMSs are listed. BRC and ISO22000, meet



all the FSMS elements, whereas HACCP does not include emergency preparedness / crisis management and quality management. The only requirement that IFS does not contain is emergency preparedness / crisis management. These fundamental requirements will form the basis for data collection.

**Table 3.1 Key common factors of FSMS**

<b>FSMS Elements</b>	<b>BRC</b>	<b>HACCP</b>	<b>ISO 22000</b>	<b>IFS</b>
Management system	√	√	√	√
Prerequisite programs	√	√	√	√
HACCP	√	√	√	√
Validation & verification	√	√	√	√
Emergency preparedness / crisis management	√		√	
Quality Management	√		√	√

(Source: Mensah *et al.*, 2011:1218)

### **3.4 Key success factors of FSMS implementation**

The following key success factors (KSFs) deal with the most important element in the research. It covers the application as well as the benefits and challenges associated with FSMS implementation.

#### **3.4.1 Verification and validation of FSMSs**

In order for a management system to be effective and to improve continual improvement, it has to be verified and validated at regular intervals.

According to Sperber (1998:157) in food safety circles, use of the term ‘verification’ is sometimes intertwined with term, validation. Sperber (1998:157) defines validation as the determination that the intended result is achieved. Sperber (1998:157) also explains that verification is the determination that a procedure is performed according to the intended design.

During an international symposium which was held in Brussels on 17 November 2010, Jacxsens and Luning delivered a presentation where a self-checking assessment for FSMSs based on the following components was proposed:

Part 1: Introductory section for FSMS.

- Introduction questions.
- Selection of representatives for self-assessment.

Part 2: Assessment of contextual factors.

- Assessment of production characteristics.
- Assessment of process characteristics.
- Assessment of organisation characteristics.
- Assessment of chain environment characteristics.

Part 3: Assessment of core safety control activities.

- Assessment of preventative measure design.
- Assessment of intervention processes design.
- Assessment of monitoring system design.
- Assessment of operation of preventive e measures.

Part 4: assessment of core assurance activities.

- Assessment setting system requirements activities.
- Assessment validation activities.
- Assessment verification activities.
- Assessment of documentation and record-keeping to support food assurance.

### **3.4.2 The rationale for FSMSs**

Food safety regulation may be justified by the existence of failure in the market for safety attributes (Unnevehr & Jensen, 1998:5). Tuominen (2009:35) noted that in spite of regulation requiring FSMSs to be in place, some plants may repeatedly produce downgraded products due to improper food safety management. The underlying hindrances to compliance with the regulations may also include a lack of trust in food safety legislation and authorities, a lack of motivation in dealing with food safety legislation and a lack of knowledge and understanding (Yapp & Fairmann 2006:44).

In order to systematise the large number of different food safety standards, the following criteria can be applied (Schulze *et al.* 2008:103-104):

- Focus: product characteristics.
- Target group: consumer-oriented schemes.
- Goal: guarantee of legal minimum requirements in a mass market.
- Contents: product quality, process quality, product safety.
- Standard owner: state-run systems, international standardisations organisations, stakeholder approaches, producer schemes, private inspection bodies and retailer-driven schemes.
- Area of application: local and international.
- Number of stages involved along the food supply chain.

Although standards are generally non-mandatory, most customers demand they be implemented by their suppliers (Schulze *et al.* 2008:113). Therefore most schemes now have the status of a “licence to operate” in most businesses. Gorris (2005:801) states that globally, both with governments and food professionals, there is a good buy-in for HACCP and food safety management systems that are based on comparable standards. In many European countries the implementation of FSMSs are mandated by government. Food safety certifications are, given the nature of food, one of the most certain ways of ensuring food safety as well as identifying difficulties associated with determining its safety before consumption and the potentially devastating effects of unsafe food on human life (Mensah & Julien, 2011:1216).

The development of food safety has significantly evolved over the last two decades. Food safety control presently combines both performance-based approaches (end-product testing, inspection and sample testing) and integrated process-based approaches (regular audits, assessment by third party auditors, accreditation) to food safety management (Mensah *et al.* 2011:1217).

There has also been an increase in the number of standards that seek to promote food safety (Mensah *et al.* 2011:1217). These include the BRC’s Global Standard for Food Safety, the International Food Standard (IFS) and ISO 22000:2005.

The BRC standard was developed in 1998 to respond to the needs of UK retailers and brand manufacturers. However, this standard has gained global popularity (Mensah *et al.* 2011:1217).

The IFS on the other hand was drawn up by the German and French retailers and wholesalers associations and their Italian counterparts. IFS aim to create a consistent evaluation system for all enterprises supplying retailer-branded food products (Mensah *et al.* 2011:1217).

According to Mensah *et al.* (2011:1217) ISO 22000 is a global standard that was developed to harmonise the requirements for food safety management globally and businesses in the food industry. This excludes food manufacturers. The standard combines interactive communication, system requirements, prerequisite programs and HACCP principles to assure food safety (Mensah *et al.* 2011:1217).

Mensah *et al.* (2011:1217) explains that most of the standards discussed above are similar in the sense that they all have one main objective: to protect consumer health

through an integrated process-based food safety management system. This is achieved by specifying the basic minimum requirements acceptable for food safety and third party audits. They provide a framework for uniformity in requirements, audit procedures and mutual acceptance of audits as well as reassuring retailers and branded manufacturers of the capability and competence of suppliers (Mensah *et al.* 2011:1217). All the standards have Codex Alimentarius Commissions's HACCP principles as their foundation and some, such as BRC and IFS, integrate quality management system requirements into food safety standards (Mensah *et al.* 2011:1217).

### **3.4.3 Drivers of FSMS implementation**

With regard to the evolution of public food safety standards as opposed to the use of private food safety standards the following could have different implications for various sectors in the food industry. According to Henson and Humphrey (2009:9) there are four key drivers for FSMS implementation: Firstly, reforms of food safety regulatory systems respond to real and/or perceived risks in food production. Secondly, heightened interest among consumers and businesses in food production processes and changes in their conceptions of food safety and quality are reinforced by company competitive strategies. Thirdly, the globalisation of food supply and the increased role of coordination economies in defining competitiveness create new risks and new challenges for value chain coordination and control. Fourthly, responsibility for ensuring food safety has been devolved from the state towards the private sector (Henson & Humphrey 2009:iv).

### **3.4.4 Benefits of FSMS implementation**

Development, implementation, integration and improvement of FSMSs have many associated benefits. In literature extensive research has been conducted on these benefits and motivations for FSMS implementation. According to Mensah *et al.* (2011:122) the benefits for FSMS compliance are:

- increased customer satisfaction;
- improved internal procedures;
- improved product quality;
- compliance with regulatory requirements;
- improved corporate image;
- improved employee morale;
- enhanced prospect of trading in other countries;
- reduced operating costs; and

- lower insurance changes.

Mensah *et al.* (2011:122) notes that the motivations for FSMS compliance are:

- product quality improvements;
- customer requirements;
- regulatory requirements;
- enhanced marketing advantage;
- Fotopoulos, Kafetzopoulos and Gotzamani (2011:592) suggests that the motives for implementing a FSMS are: legal requirements, to increase the reputation of the company, to improve competence, to expand foreign markets, to reduce cost, to obtain other third party accreditations, to obtain a leadership position, to improve profit margins, to improve product quality, to avoid media pressure, to reduce waste and to reduce customer complaints.
- improved corporate image;
- the acknowledgement of competitors
- prevention of liability claims;
- the prospect of operational cost reductions;
- insurance requirements; and
- avoidance of potential export barriers.

### **3.4.5 Challenges of FSMS implementation**

FSMS implementation faces various challenges when being implemented and maintained. These challenges usually occur at the implementation stage of the FSMS, but are not restricted to it. Mensah *et al.* (2011:122) notes that the challenges for FSMS compliance are:

- employee resistance to change;
- lack of technical knowledge and skill of employees;
- lack of awareness of the requirements;
- the high cost of development and implementation;
- inappropriate infrastructural capabilities for validating and verifying a FSMS;
- the high cost of education and training;
- blame culture;
- rapid changes in regulation;
- lack of access to adequate information; and
- lack of government support.

Yapp and Fairman (2006:4) note that the main barriers seen to prevent regulatory compliance include:

- Lack of money.

The major financial implications for an organisation in terms of FSMS implementation relates to investment in structure, equipment and staff training. FSMS maintenance may also become problematic due to budget constraints.

- Lack of time.

The lack of time for regulating the FSMS is quite common as well as the lack of time for maintaining the system.

- Lack of experience.

Upon the implementation of a FSMS it is reasonable to expect that employees will be lacking in experience.

- Lack of access to information.

FSMS information is not always communicated to all the organisation's employees.

- Lack of interest.

FSMS and its application is not always a priority to all the organisation's employees. Therefore they seem to show no or little interest in FSMS implementation.

- Lack of knowledge.

Extensive literature has revealed that the majority of the workforce in an organisation does not understand what hazard analysis is. They do not understand what is required, how to implement it in their business or how to evaluate and monitor the steps taken (Yapp and Fairman, 2006:45)

According to research done by Bas *et al.* (2007:127-128) the barriers identified by managers to implement food safety management systems are: lack of prerequisite programs, lack of knowledge about HACCP, cost, time, staff turnover, lack of management, lack of suitable physical conditions, lack of employee motivation, complicated terminology, the need for simple guidelines, the volume of paperwork, lack of personnel training and the lack of support from authorities.

According to Fotopoulos, Kafetzopoulos and Gotzamani (2011:592) barriers related to the implementation of FSMS are: difficulties related to production technology and design, difficulties related to product type, the size of companies, the lack of support from government and authorities, difficulties in verification and validation, insufficient planning, lack of suitable physical conditions in the company and poor reliability of certification bodies.

Besides the above challenges, there are studies that language barriers, excessive cost implementation and lack of resources affect the implementation of FSMSs. Dewanti-Hariyadi (2009:32) noted that in non-English speaking countries language can be a barrier for understanding FSMS. People are sometimes unwilling to adapt to FSMS implementation because the food safety hazards are not apparent to them. Due to a lack of knowledge, people working in direct contact with food are sometimes hesitant to adapt to FSMS implementation.

In many cases the cost implication of implementing a FSMS is related to GMP/prerequisite programs for HACCP (Dewanti-Hariyadi, 2009:33). The prerequisites having the most significant financial impact are: building, ground, hygiene and sanitation, pest control, personnel training, and calibration and maintenance. Many resources are necessary for the implementation of FSMS, but some organisations were found to be lacking the following:

- finances;
- skilled personnel;
- training;
- motivation of personnel;
- leadership;
- management commitment; and
- motivation.

#### **3.4.6 Measurement of FSMS implementation**

The analysis on the effectiveness of a FSMS in the wine industry almost always relates to validation and verification activities. To understand the contributing factors that influence FSMS performance, a few key factors in literature were reviewed. The measuring and monitoring of a FSMS includes the analysis of data, customer satisfaction, internal audits, control of nonconforming product, continual improvement, and corrective action.

##### **Analysis of data**

According to ISO 9001, the analysis of data should provide information relating to:

- customer satisfaction;
- conformity to product requirement;
- characteristics and trends of processes and products including opportunities for preventive action; and
- suppliers.

The analysis of data is derived from measuring the performance of the FSMS, customer satisfaction, number of nonconforming products, customer complaints and from rejects and reworks.

### **Customer satisfaction**

As one of the measurements of the performance of the QMS, the organisation should monitor information relating to customer perception to establish whether the organisation has met customer requirements (ISO 9001).

High or low customer satisfaction can be measured by the number of compliments or complaints received. However, a more proactive approach is to develop some key performance indicators and measures with the customer (ISO 15161, 2003:27).

### **Internal audits**

The organisation should conduct internal audits at planned intervals to determine whether the QMS conforms to quality objectives and is effectively managed. Internal audits are to be conducted at planned intervals.

### **Control of nonconforming product**

The organisation should ensure that product which does not conform to product requirements is identified and controlled to prevent its unintended use or delivery. Nonconforming products can be identified by inspection at various stages of the processes, internal quality audits or as a result of any other audit result derived from any type of audit (ISO 15161, 2003:29).

### **Continual improvement**

The organisation should continually improve the effectiveness of the QMS through the use of the quality policy, quality objectives, audit results, analysis of data corrective and preventive actions as well as management reviews (ISO 2008).

### **Corrective action**

The organisation should take action to eliminate the cause of nonconformities in order to prevent recurrence. Corrective actions should be appropriate to the effects of the nonconformities encountered (ISO 2008).



### **3.5 The impact of FSMS on the wine industry**

According to Louw and van Schoor (2011:2), no wine company, whether a tiny producer or a market leader, can longer ignore the fact that critical requirements around legal, regulatory, social, environmental, health and safety, food safety and quality aspects of the winemaking process should be met to be able to compete on the international market.

The senior management of an organization should identify the FSMS that is most relevant and applicable to the business.

The following list as described by Louw and van Schoor (2011:4) provides guidelines to the FSMS to be implemented:

- The standard(s) should support the business values.
- What standards are suitable for the wine industry and sector?
- Is the product intended for the local or international market?
- What is the scope in the wine company that needs to be certified?
- Where does this scope fit into the supply chain?
- What is required/needed/recognised by the relevant retailers and/or customers?
- What is required/needed/recognised by the targeted future customers?
- Can the requirements of the preferred management system(s) actually be implemented?
- The resources required by the standard(s) should be considered in terms of:
  - Staff requirements;
  - Time spent on management and record keeping;
  - Costs of training courses and auditing, and
  - Capital expenses that might be necessary.

The most common, in the food and drink industries, is the simultaneous operation of a QMS and food safety system such as HACCP. According to Aggeloginnopoulos et al., (2006:1078), the application of HACCP within an ISO 9001QMS can result in a food management system that is more effective than the application of either ISO 9001 or HACCP alone, leading to enhanced customer satisfaction and improving organizational effectiveness.

#### **3.5.1 Process assessment and improvement of a FSMS**

Currently FSMSs are inspected or audited by an external party e.g. a certification body or third party audits. After an audit has been conducted corrective actions need

to be made in order to comply with the requirements of the applicable FSMS standard. However the need has always existed for organizations to diagnose and improve their FSMS themselves.

According to Jacxsensa, Luningb, Marcelisc, van Boekelb, Rovirad, Osesd, Koustaee, Drosinose, Jassona and Uyttendaelea (2011:2), tools to diagnose the performance of a current FSMS present in the processing industry, are diagnostic (FSMS-diagnostic instrument (FSMS-DI), Microbial Assessment Scheme (MAS) selection (MAS, Quality assurance grid (QA grid) and improvement (roadmaps for improvement and protocol validation and verification of FSMS tools. The first objective for an organization is to diagnose the current situation of his FSMS by applying the FSMS-DI (Jacxsensa et al. 2011:2). The tool is measuring the performance of an FSMS independently from customer requirements (e.g. Quality Assurance standard, legislation).

### **3.6 Conclusion**

Over the last two decades, FSMS has emerged as a key element for any organisation which produces any type of food product. FSMS aims to mitigate the risks associated with food production and is also perceived as an organisation's license to trade. This chapter provides a comprehensive literature review of the various FSMSs applicable to this research.

Based on the literature review, GMP and HACCP are foundation systems to FSMS in the wine industry. The most internationally recognised FSMSs that are applicable to the wine industry are BRC, IFS and ISO 22000. Many of these FSMSs are implemented in the wine producing organizations, to continually improve their business, to conform to customer requirements and also to gain market share.

To conclude this chapter, the five different elements of a FSMS are mentioned to illustrate the cycle of the certification process.

- Standard setting. The introduction and operationalisation of a standard through the formulation of written rules and procedures (Henson and Humphrey, 2009:7).
- Adoption. A decision by an entity to adopt the standard (Henson and Humphrey, 2009:7).
- Implementation. The implementation of the rule is carried out by the organisation that is conforming to the standard (Henson and Humphrey, 2009:7).

- Conformity assessment. This involves the procedures employed to verify that those claiming to comply with the standard and provide documented evidence to show that this is the case (Henson and Humphrey, 2009:7).
- Enforcement. Approaches to respond to non-compliance and sanctions to withdraw recognition if corrective action is taken (Henson and Humphrey, 2009:7).

At first the prospect of a FSMS may seem daunting or even unnecessary, but when the food safety risks of the industry are considered, the implementation of these FSMSs is a small price to pay for peace of mind. Not only will FSMSs be valuable for the wine company to meet regulatory and legal needs, but the wine company will be showing due diligence towards the consumer in terms of a food safe, quality product and is vital for earning international market share.

## **CHAPTER 4 RESEARCH SURVEY DESIGN AND METHODOLOGY**

### **4.1 Introduction**

This chapter focuses on aspects of the research methodology used to identify and investigate the research question. The research design, data collection, sampling and questionnaire design are discussed. Chapter 5 will explain the data analysis and findings of the empirical study in order to solve the research problem.

### **4.2 Research design and methodology**

Methodology is the application of various methods of techniques and principles in order to create scientifically based knowledge by means of objective methods and procedures within a particular discipline (Welman & Kruger, 1999). Leedy (1997:9) points out that research methodology guides the research effort, controls a study, dictates the acquisition of data, sets up a means redefining the raw data and formulates an approach to manifest the underlying meaning.

According to Yin (1994:19) a research design can be defined as, "... the logical sequence that connects the empirical data to a study's initial research question and ultimately, to its conclusions".

To reach the objectives of this research an explanatory research will be conducted whereby existing FSMSs will be examined and compared in order to understand how each of the chosen respondents measure the performance of their FSMSs.

Leedy (1993:12) states that certain criteria are commonly applied to all true research and must be built into the planning stage of research design. These criteria are:

- research is a human activity that promotes critical thinking in a cross-functional approach;
- if there is no discovery, there is no research;
- data must be interpreted for the enlightening awareness of what the facts mean;
- research must always answer questions to solve problems; and
- effective research is rational, systematic and is guided by constructive, critical assumptions and measurable data.

#### **4.2.1 Types of research**

According to Akker, Kumar and Day (2004:75) three types of research can be applied to research design, namely exploratory research, descriptive research and casual research, which are stated as the following:

##### ***Exploratory research***

Sekaran (2003:123) explains that exploratory research can always contribute to research in which few prior researchers have studied similar problems in a particular field.

##### ***Descriptive research***

According to Parasuraman, Grewal and Krishan (2004:72) descriptive research is to appropriately collect or analyse the quantitative data.

##### ***Casual research***

Tustin, Ligthelm, Martins and Van Wyk (2005: 85) describe casual research as the examining of cause and effect relationships that always employ experiments to examine these relationships between two or more variables.

For the purposes of this research, descriptive research was chosen as the most appropriate approach in collecting and analysing the quantitative data to solve research problems.

#### **4.2.2 The appropriate research method**

Watkins (2008:43) indicates that research methods are commonly associated with quantitative and qualitative research paradigms. Parasuraman *et al.* (2004:195) states that qualitative research is usually employed for exploratory research and focuses on small respondent samples. It collects analyses and interprets data that cannot be meaningfully quantified. Parasuraman *et al.* (2004:195) further indicates that quantitative research is usually adopted to collect, analyse and interpret data to describe the characteristics of large respondent samples. It is appropriate for collecting quantitative data and always employs a questionnaire survey as a research technique.

According to Leedy (1993:145) the question of how to choose the appropriate research method is based on the nature of the data, the problem of the research, the location of the data, the obtaining of the data and for what intention the data is collected. The objective of this research is to determine the criteria that can be used

to measure FSMSs effectively. For this reason a quantitative research design is applied.

### **4.3 The target population**

The target population is, "...the complete group of objects or elements relevant to the research project" (Hair, Babin, Money and Samouel, 1999:2009).

For the purpose of this study, the research population consists of 19 wine organisations situated in Stellenbosch, Somerset West, Paarl and Wellington. These wine organisations should already have successfully implemented a FSMS in their organisation.

According to Leedy (1993:199) a sample should be carefully chosen to reflect all the characteristics of the total population in the same relationship that they would be found in the total population. The total number of wine producing organizations in South Africa is around 430 cellars, with the majority situated in the Western Cape (Explore South Africa, 2011: **Online**).

A total of 30 wine-producing organisations were selected as respondents of which only 19 organisations responded. A total of 46 responses from all of the participants of the 19 organisations were received by means of the completion of the questionnaires.

#### **4.3.1 Company identification**

All organisations were identified through the internet. The internet has a database of all wine-producing organisations in the Stellenbosch, Somerset West, Franschhoek and Paarl regions. Wine is classified as a food product, because it is consumed by humans. Therefore it is almost mandatory for the chosen wine organisations to have a FSMS implemented (ISO 2005).

### **4.4 Data Collection**

There were 46 participants selected from 19 wine producing organizations in the Western Cape. These organizations are typically in the Cape Winelands of South Africa. Aaker *et al.* (2004:432) explain that data collection is critical in obtaining useful knowledge for an individual research by examining the raw data from the questionnaires.

Emory and Cooper (1995:278) distinguish between three primary data collection methods, namely:

- personal interviewing
- telephone interviewing; and
- self-administered questionnaires.

Research often involves a survey, making use of questionnaires to gather information in order for the researcher to arrive at an educated conclusion. The data collected is analysed at a later stage.

#### **4.4.1 Survey research design**

According to Leedy and Ormond (2001:196) a survey should be simple in design. The researcher poses a series of questions to willing participants: summarises the responses with percentages, frequency counts or more sophisticated indexes, and then draws inferences about a particular population from the responses of the sample. Surveys can be divided into two categories: the questionnaire and the interview. The aim is to establish what selected group of participants do, think or feel.

Qualitative research data forms the core of this research. Data collection methods used in the survey falls within the context of a survey. According to Gay and Diebl (1992:238) a survey is an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables. A survey allows a researcher to collect a large amount of data from a sizable population in an economical manner.

#### **4.4.2 Questionnaire**

Parasuraman (1990:363) describes a questionnaire as a carefully designed set of questions to generate the necessary data for accomplishing a research project's objectives. According to the Business Dictionary (2001: **Online**) a questionnaire is a list of research questions asked to respondents and is designed to extract specific information. It serves four basic purposes:

- to collect the appropriate data;
- to make data comparable and amendable to analysis;
- to minimise bias in formulating and asking question; and
- to make questions engaging and varied.

The data used in Chapter 5 was collected through a questionnaire (see Appendix B). The questionnaire, based on the Likert five-point scale, was sent to 19 organisations and was divided into 3 sections: individual information; company profile; and decision-making. According to Martins, Loubser and Van Wyk (1996:73) questions based on the Likert five-point-type scale allow researcher to gauge the respondent's attitude toward a concept. The question is normally in the format of a statement and has a scale which allows the respondent to indicate the degree to which he or she agrees or disagrees with the statement.

For the individual information required, the respondents had to complete information regarding their gender, age, their level of responsibility at the organisation and their educational qualification. The decision-making part consisted of questions each respondent had to answer and were ranked from 1-5. The rankings signified the following: (1) strongly agree; (2) agree; (3) do not know; (4) do not agree; and (5) strongly disagree. The respondents had to indicate their decision with an X. A space for comments was left below.

The questionnaires were given to quality managers, cellar managers, quality assurance managers, quality systems co-ordinators, wine-makers, laboratory technicians and shop floor workers in the cellar.

#### **4.4.2.1 List of questions / statements to respondents**

Sekaran (2003:237) indicates that the questionnaire needs to be designed to focus on the wording of questions; planned to categorise variables; scaled and coded after responses are received; and that attention should be paid to the general appearance of the questionnaire. In the survey the following list of statements was posed to the respondents, being quality managers, cellar managers, administrative staff and shopfloor workers (see Appendix B). For the purpose of data analysis, the main body of the questionnaire includes food safety and decision-making sections which were coded as FS and DM respectively.

The food safety section includes the following statements:

- **FS1:** GMP as a prerequisite for FSMS is implemented at your organisation;
- **FS2:** HACCP is implemented to support FSMS at your organisation;
- **FS3:** Your organisation reviews and improves the FSMS regularly;
- **FS4:** Your organisation measures the effectiveness of the FSMS regularly;
- **FS5:** Your organisation measures the performance of the FSMS regularly; and
- **FS6:** Your organisation has training programs on FSMS for staff.



The decision-making section contains the following statements:

- **DM7:** Management is committed to maintain FSMS at your organisation;
- **DM8:** HACCP is used to improve the performance of FSMS at your organisation;
- **DM9:** Customer complaints are used to improve the performance of FSMS at your organisation;
- **DM10:** The volume of returned products is used to measure the performance of FSMS at your organisation;
- **DM11:** Your organisation applies document control to improve the performance of FSMS at your organisation;
- **DM12:** Corrective actions are used to improve the performance at your organisation;
- **DM13:** Certification audits are used to measure the performance of FSMS at your organisation;
- **DM14:** Process control is applied to measure the performance of FSMS at your organisation;
- **DM15:** Your organisation provides training programs for employees to improve the performance of FSMS at your organisation;
- **DM16:** The results of accurate laboratory analysis are used to improve the performance of FSMS at your organisation;
- **DM17:** The results of audits are used to improve the performance of FSMS at your organisation;
- **DM18:** Statistical tools are used to measure the performance of FSMS at your organisation;
- **DM19:** FSMS helped to make your product more food-safe;
- **DM20:** FSMS helped your organisation to improve the quality of products;
- **DM21:** FSMS helped your organisation to reduce waste;
- **DM22:** FSMS helped your organisation to improve customer satisfaction;
- **DM23:** Internal audits are used to verify FSMS at your organisation; and
- **DM24:** The analytical results of verification activities identified the need for updating or improving the FSMS at your organisation.

#### 4.4.3 Interviews

Interviews in combination with questionnaires were used to collect data. A semi-constructed personal interview was conducted by the researcher with the staff member responsible for the FSMS. Besides data collected through questionnaires some key issues regarding FSMSs, were covered by gathering some personal

opinions, which were not easy to obtain through questionnaires, thus some of the experienced quality managers from the wine manufacturing organizations were interviewed. Savenye and Robinson (2001:1056) explain that an interview is a form of conversation in which the purpose is for the researcher to gather data that address the study's goals and questions. Structured interviews may be conducted in which the researcher follows a sort of script of questions, asking the same questions, and in the same order, of all respondents (Savenye and Robinson, 2001:1056). The Social Dictionary of Research methods (2011: **Online**), defines an interview as a method of data collection, information or opinion gathering that specifically involves asking a series of questions. Watkins (2008:60) explains that a semi-structured interview generally starts with a few specific questions and then follows the each individual's tangents of thought with interviewer probes. Watkins (2008:60) further indicates that an individual in-depth interview represents an interaction between an individual interviewer and a single participant. Interviewees are often provided with advance material to prepare them for the anticipated interview.

#### **4.4.3.1 Interview technique**

The interviews were all semi-structured and were individual in-depth type of interviews. The following interview questions were asked to a few of the respondents:

- Question 1: What are your organisation's quality objectives?
- Question 2: What does your organisation use as measurement tools to measure you qualitative goals?
- Question 3: How often does your organisation have a QMS review?
- Question 4: Does your organisation make use of electronic capturing of real-time data?
- Question 5: Does your organisation have a quality dashboard?
- Question 6: On which components of the FSMS does your organisation report on the quality dashboard?

The data obtained from the interviews was not included in the data analysis in Chapter 5.

#### **4.4.4 Measurement scales**

In the field of academic research various measurement scales are available for academic research, the Likert five-point scale will be used within the ambit of the research study.

Bertram (2007:1) defines a Likert five-point scale as a psychometric response scale primarily used in questionnaires to obtain participants' preferences or degree of agreement with a statement or set of statements. Respondents are asked to indicate their level of agreement with a given statement by way of an ordinal scale. According to Emory & Copper (1995:180-181) making use of the Likert five-point scale has the following advantages:

- easy and quick construction;
- each item meets an empirical test for discriminating ability;
- the Likert five-point scale is also treated as an interval scale; and
- the Likert five-point scale is probably more reliable than the Thurston scale, and provides a greater volume of data than the Thurston differential scale.

#### **4.5 Survey design**

According to Mouton (2001:152) surveys are studies that are usually quantitative in nature and which aim to provide a broad overview of a representative sample of a large population. A survey should be designed in accordance with the following stages:

- Stage 1: Identify the topic and set some objectives.
- Stage 2: Pilot a questionnaire to find out what people know and what they see as the important issues.
- Stage 3: List the areas of information needed and refine the objectives.
- Stage 4: Review the responses to the pilot.
- Stage 5: Finalise the objectives.
- Stage 6: Write the questionnaire.
- Stage 7: Re-pilot the questionnaire.
- Stage 8: Finalise the questionnaire.
- Stage 9: Code the questionnaire.

The data was collected over a period of eight weeks. The respondents' answers and responses to the questionnaires are ranked according to the Likert five-point scale. The results of the data collected for this study are discussed in Chapter 5, namely Data Analysis.

#### **4.6 Survey validity and reliability**

According to Collis and Hussey (2003:186) validity is concerned with the extent to which the research findings accurately represents what is happening, and more specific, whether the data is a true reflection of what is being studied is applicable.

According to Cooper and Schindler (2006:318-320) three major forms of validity can be identified, namely content validity, criterion-related validity and construct validity.

Reliability according to Collis and Hussey (2003:186) is concerned with the findings of the research. There are three common ways of estimating the reliability of the responses to questions in questionnaires or interviews, namely the test and re-test method, the split halves method and the internal consistency method, (Watkins, 2008:68). According to Babbie (2005:285) survey research is generally weak on validity and strong on reliability.

#### **4.7 Conclusion**

In this chapter, the survey methodology and design was discussed, namely: research design and methodology; the target population; data collection; survey design and survey; and validity and reliability.

In the next chapter, Chapter 5, a data analysis (descriptive and inferential statistics) will be conducted and the survey results will be interpreted.

## **CHAPTER 5 ANALYSIS AND INTERPRETATION OF SURVEY RESULTS**

### **5.1 Introduction**

This chapter focuses on the analysis of the survey conducted among various wine-producing organisations. The respondents who participated in this study were all employees of the organisations where FSMSs are implemented. Questionnaires were distributed to participants to determine the fundamental requirements of the FSMSs. A personal interview was conducted with the respondent responsible for the maintenance of the FSMS.

Comparative statistics could not be used to serve the purpose of this research, as the respondents per company were not significant enough to compare. Descriptive and inferential statistics were used to analyse the data. The data was analysed by means of Statistical Package for Social Science (SPSS) version 19 software. The graphs derived from the data analysis were also analysed using the SPSS, but as the quality of the graphs generated was not satisfactory it was not imported to Excel.

The quantitative data collected was coded into numerical representations, such as gender, age, years of work experience, job titles and qualifications. For analysis purposes the respondents were asked to rank their responses to the questions according to the Likert scale format. These responses were then turned into a series of numbers for capturing, using SPSS. The data analysed by SPSS generated the results of descriptive statistics such as frequency, means, standard deviation, etc. These distributions show the frequencies of participants' responses and percentages for each of the items in the questionnaire with regard to the evaluation of FSMS in wine-producing organisations. Chi-Square was used to test for significant differences (Alpha level = 0.05). In addition, Cronbach's Alpha was utilised to test the reliability of all the items from both food safety (FS1~6) and the decision-making section (DM7~24).

### **5.2 Method used to analyse data**

#### **5.2.1 Validation of survey results**

The results of the survey were analysed by means of a descriptive analysis. The responses obtained from the questionnaires are indicated in table format and specific frequency tables were used for ease of reference. Each aspect within a question is

compared with each other. Each aspect within a question was also analysed with analysis of variance (ANOVA).

Frequency tables are for each aspect from questions 2.2 to 2.5. For general questions on FSMS (FS1-6) and decision-making questions (DM7-24) responses are compared with a frequency table.

### **5.2.2 Data format**

The data was provided in the original format of questionnaires, which was then captured on a Microsoft Access database. The data was then imported into a SAS format through the SAS ACCESS module. The information derived from the survey results was then analysed and interpreted.

### **5.2.3 Inferential statistics**

Only ANOVA for the comparison between the general questions and decision-making questions were performed on the data.

### **5.2.4 Assistance to the researcher**

All the conclusions and findings made by the researcher were validated by means of this statistical report. The final report written by the researcher was validated by a qualified statistician to eliminate any misleading interpretations.

### **5.2.5 Sample**

The target population consisted out of 19 wine organisations situated in the Stellenbosch, Paarl, Wellington and Somerset West regions. All organisations were randomly selected with only one prerequisite: they should already have FSMS implemented. From a total of 60 possible respondents only 46 responded.

## **5.3 Demographical results and statistics for sample**

The demographical results and statistics include the section from the questionnaire (Appendix B) which is individual information, such as gender, number of years worked at the company, educational level and job title.

### **5.3.1 Individual Information**

#### **5.3.1.1 Gender**

Figure 5.1 indicates that the majority (72%) of participants are female and only 28% male. Based on the gender status of South Africa in the Western Cape, the majority of employees in the wine industry are male.

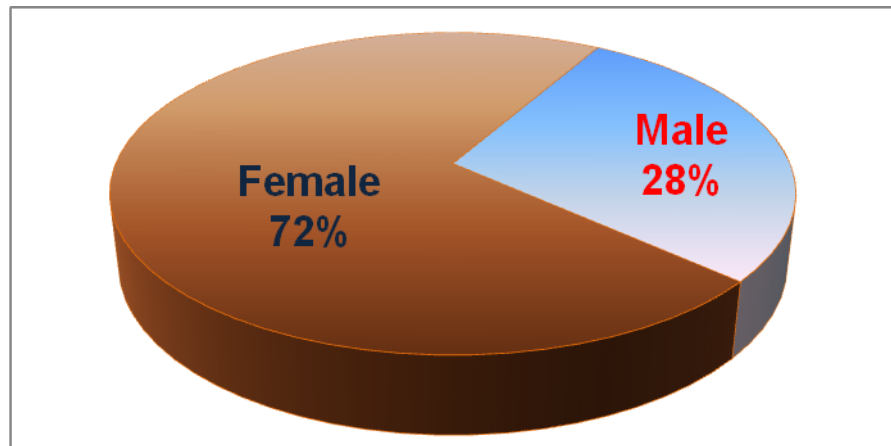


Figure 5.1 Gender

### 5.3.1.2 Years of work at company

According to Figure 5.2 nearly half of the participants (46%) have between 1-5 years working experience at their present company, 20% have 6-10 years working experience, 15% have 11-15 years working experience, 11% have more than 15 years working experience, and only 9% have less than 1 year working experience at their present company.

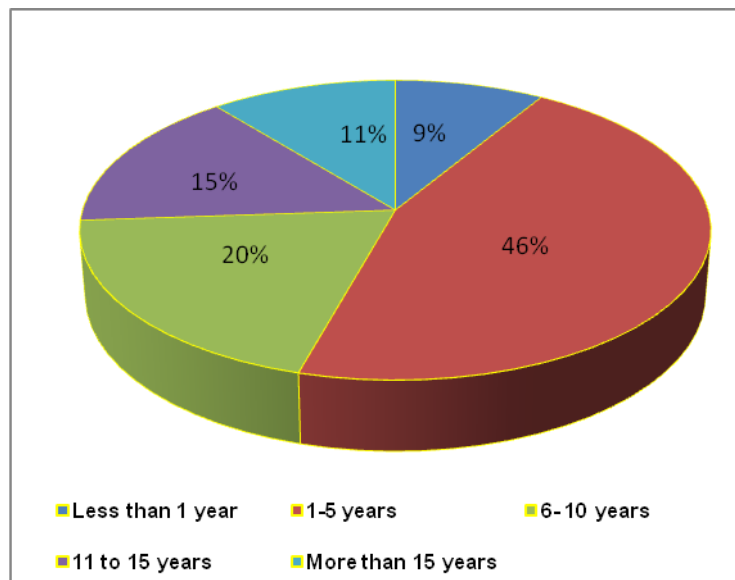


Figure 5.2 Years of work at company

### 5.3.1.3 Educational level

As indicated in Figure 5.3, both participants (Grade 12 and Bachelors degree) have 28% (13+13, n=46) for educational level, 22% (10) have a Technikon National Diploma, 15% (7) have post-graduate degrees and 7% (3) have other qualifications.

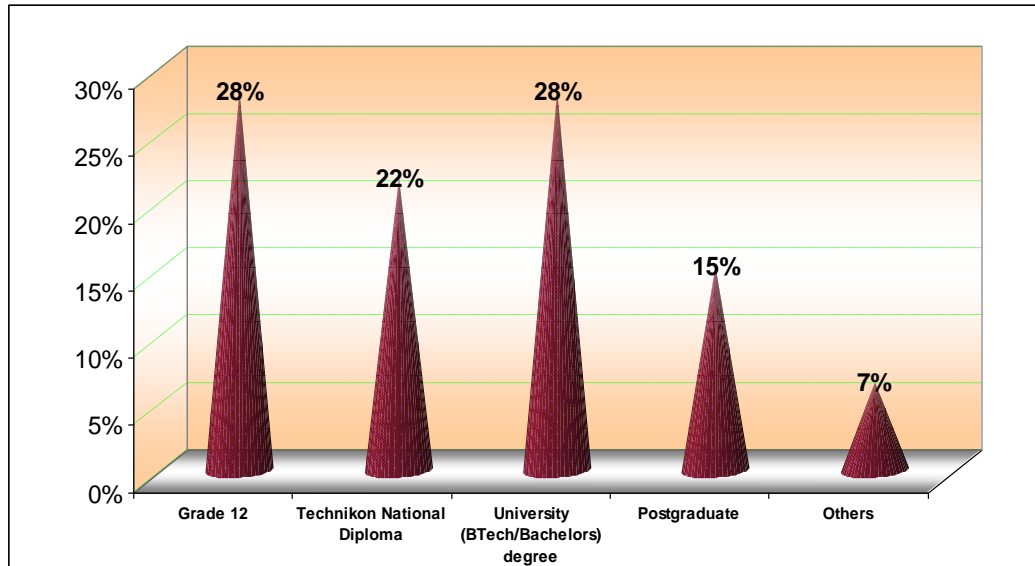


Figure 5.3 Educational level

### 5.3.1.4 Job title

According to Figure 5.4 7% (3) of the participants are shopfloor workers/supervisors, 24% (11) are in administrative positions, 39% (18) are in middle management positions and those in senior manager/director and other positions have 15% (7+7 n=46) respectively.

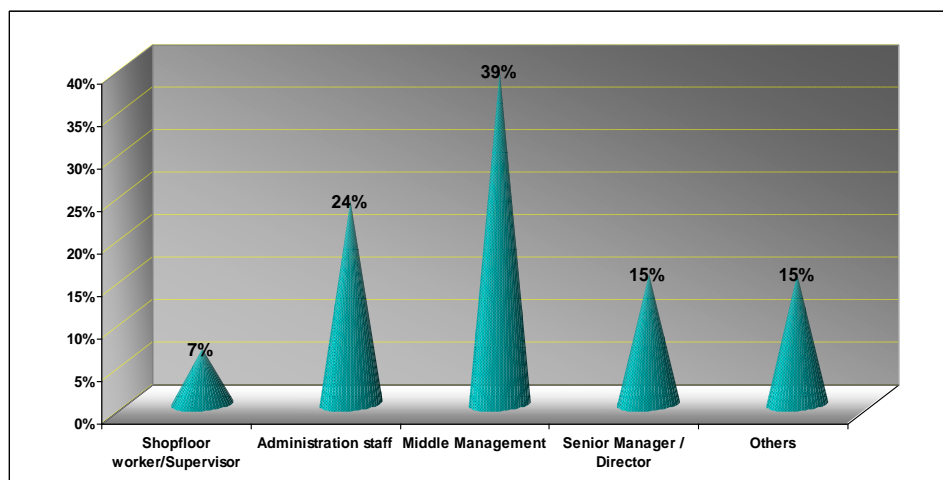


Figure 5.4 Job title

## 5.3.2 Company's profile

### 5.3.2.1 Number of employees



Shown in figure 5.5 is the number of employees in graphical format. 30% (14) of the companies have less than 100 employees, 37% (17) have 100-200 employees, 13% (6) have 200-300 employees, 9% (4) have 300-400 employees, 4% (2) have 400-500 employees and 7% (3) have more than 500 in their employ.

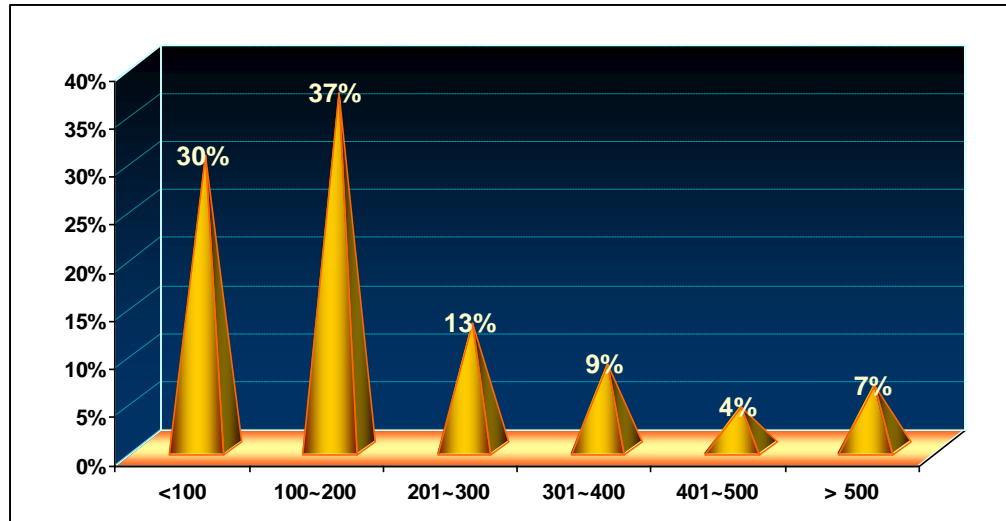


Figure 5.5 Number of employees

### 5.3.2.2 Main markets for product

Figure 5.6 shows the main market for the wine products produced in graphical format. Results in Figure 5.6 depict that 69.5% (25+7, n=46) of the wine organisations export wine to other countries, whilst 26.1% produce wine for the local market.

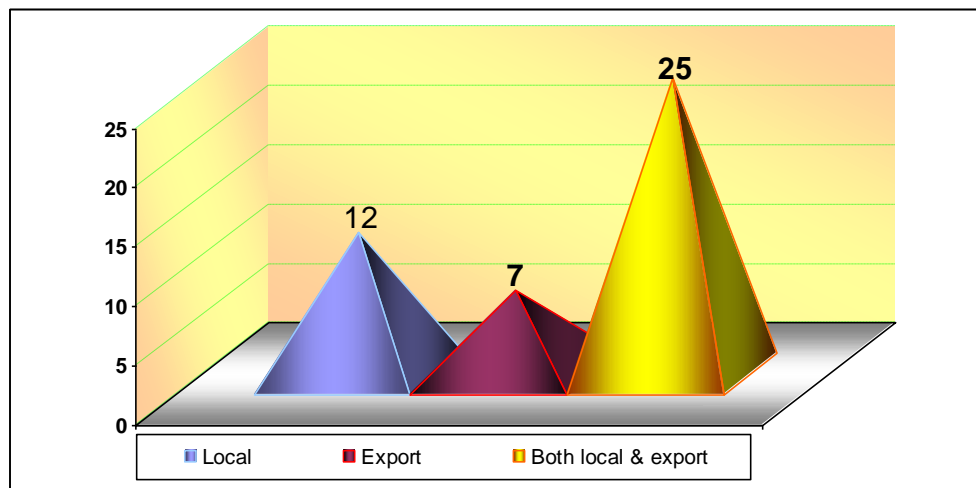


Figure 5.6 Main markets for product

### 5.3.2.3 Main activities on production information

Shown in figure 5.7 are the main activities of the wine organisations. Of the 46 respondents 76% (35) indicated that they only make wine, 78.2% (36) indicated that

they also bottle wine, 52.1% (24) distribute their wine and 45.6% (21) market their own wine.

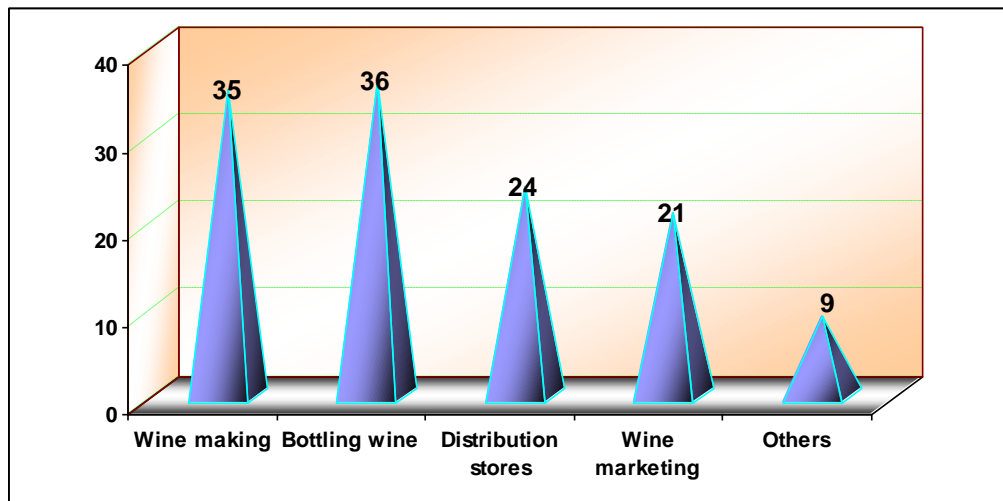


Figure 5.7 Main activities on production information

#### 5.3.2.4 The organisational certification

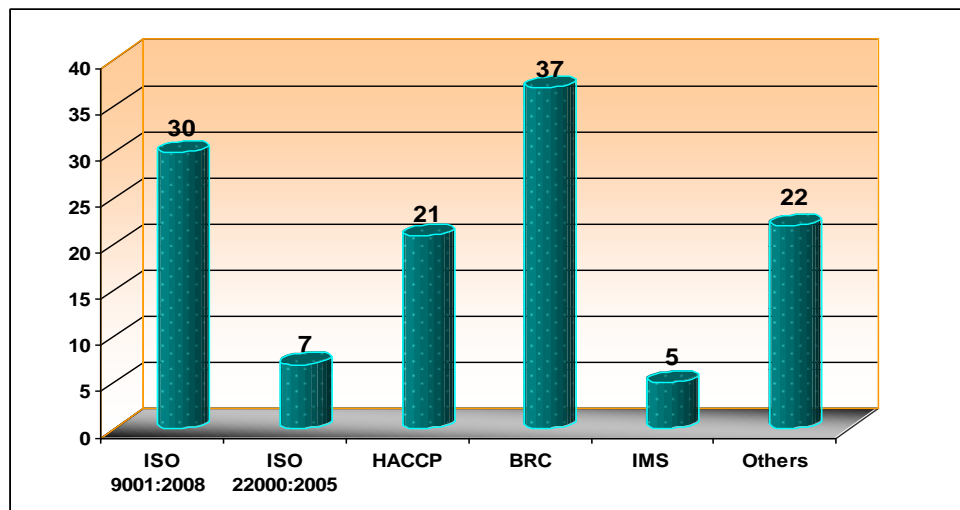


Figure 5.8 Organisational certification

Figure 5.8 indicates the FSMS that the organisation is certified for. 65.2% (30) of the organisations are ISO 9001:2008 certified, 15.2% (7) are certified for ISO 22000:2005, 45.6% (21) are certified for HACCP, 78.2% (37) are BRC certified, 8.1% (5) are have an IMS and 47.8 % (22) indicated that they are certified for other listings.

#### 5.3.2.5 The standards used as audit criteria

Figure 5.9 provides an overview of the audit criteria that organisations use. 56.5% (26) of the respondents use ISO 9001:2008 as audit criteria, 17.3% (8) use ISO 22000:2005, 80.4% (38) use BRC issue 5 as audit criteria, 21.7% (13) use IFS

version 5, SANS 10330:2007 are being used by 30.4% (15) and 26.0% (13) indicated that they use other audit criteria.

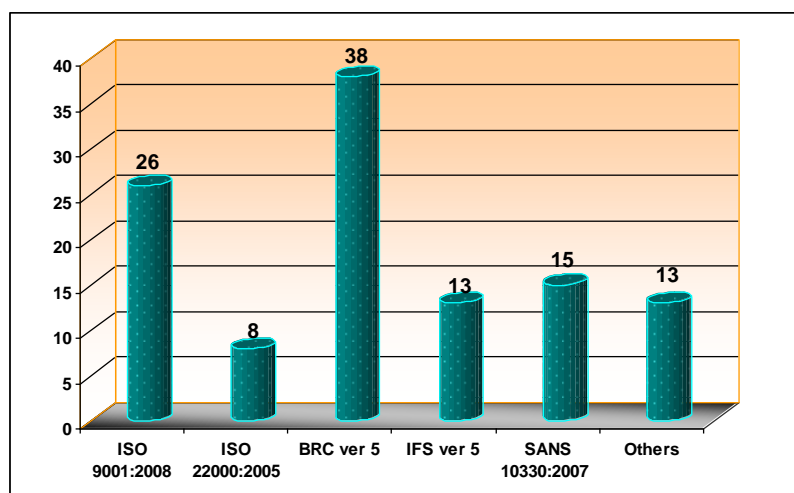


Figure 5.9 The standards used as audit criteria

#### 5.4 Descriptive statistics for questionnaire

In Table 5.1 and 5.2 the descriptive for all the variables in the questionnaires are shown, with the frequencies in each category and the percentage out of the total of questionnaires. These descriptive statistics are also shown in Appendix D.

Table 5.1 Descriptive statistics for FSMS systems and decision-making questions

Variables	Categories	f*	%**
<b>Food Safety (FS)</b>			
FS1. GMP as a prerequisite for FSMS is implemented at your organisation.	Strongly agree	31	67.39
	Agree	13	28.26
	Do not know	2	4.35%
	Disagree	0	0%
	Strongly disagree	0	0%
FS2. HACCP is implemented to support FSMS at your organisation.	Strongly agree	31	67.39
	Agree	13	28.26
	Do not know	1	2.17%
	Disagree	1	2.17%
	Strongly disagree	0	0
FS3. Your organisation reviews and improves the FSMS regularly.	Strongly agree	32	69.57
	Agree	13	28.26
	Do not know	1	2.17%
	Disagree	0	2.17%
	Strongly disagree	0	0%
FS4. Your organisation measures the effectiveness of the FSMS regularly.	Strongly agree	31	67.39
	Agree	13	28.26
	Do not know	1	2.17%
	Disagree	1	2.17%
	Strongly disagree	0	0%
FS5. Your organisation measures the	Strongly agree	28	60.87



programs for employees to improve the performance of FSMS at your organisation.	Agree	11	23.91
	Do not know	1	2.17%
	Disagree	0	0%
	Strongly disagree	0	0%
DM16. The result of accurate laboratory analysis is used to improve the performance of FSMS at your organisation.	Strongly agree	27	58.7%
	Agree	14	30.43
	Do not know	1	2.17%
	Disagree	4	8.7%
	Strongly disagree	0	6.52%
DM17. The results of audits are used to improve the performance of FSMS at your organisation.	Strongly agree	35	76.09
	Agree	9	21.74
	Do not know	2	2.17%
	Disagree	0	0%
	Strongly disagree	0	0%
DM18. Statistical tools are used to measure the performance of FSMS at your organisation.	Strongly agree	19	41.3%
	Agree	17	36.96
	Do not know	3	6.52%
	Disagree	4	8.7%
	Strongly disagree	3	6.52%
DM19. FSMS has helped your product to be more food-safe.	Strongly agree	35	76.09
	Agree	10	19.57
	Do not know	1	4.35%
	Disagree	0	0%
	Strongly disagree	0	0%
DM20. FSMS has helped your organisation to improve the quality of products.	Strongly agree	32	69.57
	Agree	12	26.09
	Do not know	1	2.17%
	Disagree	0	0%
	Strongly disagree	1	2.17%
DM21. FSMS has helped your organisation to reduce waste.	Strongly agree	22	47.83
	Agree	17	36.96
	Do not know	3	6.52%
	Disagree	4	8.7%
	Strongly disagree	0	0%
DM22. FSMS has helped your organisation to improve customer satisfaction	Strongly agree	28	60.87
	Agree	15	32.61
	Do not know	3	6.52%
	Disagree	0	8.7%
	Strongly disagree	0	0%
DM23. Internal audits are used to verify FSMS at your organisation.	Strongly agree	32	69.57
	Agree	13	28.26
	Do not know	1	2.17%
	Disagree	0	0%
	Strongly disagree	0	0%
DM24. The analytical results of verification activities identified the need for updating or improving the FSMS at your organisation.	Strongly agree	27	58.7%
	Agree	17	36.96
	Do not know	1	2.17%
	Disagree	1	2.17%
	Strongly disagree	1	0%

f<sup>\*</sup>: Frequency

%: Percentage out of total

#### 5.4.1 Reliability of data

Based on the results of reliability from Appendix C, indicated that the Cronbach's Alpha is 0.872, and the Cronbach's Alpha, based on standardised items, is 0.880. The results of the total value of Cronbach's Alpha are above 0.70.

#### 5.4.2 Descriptive statistics for general questions on FSMS

The data analysed in Figure 5.10 below was collected from the 46 respondents from the various wine-producing organisations participating in this research study.

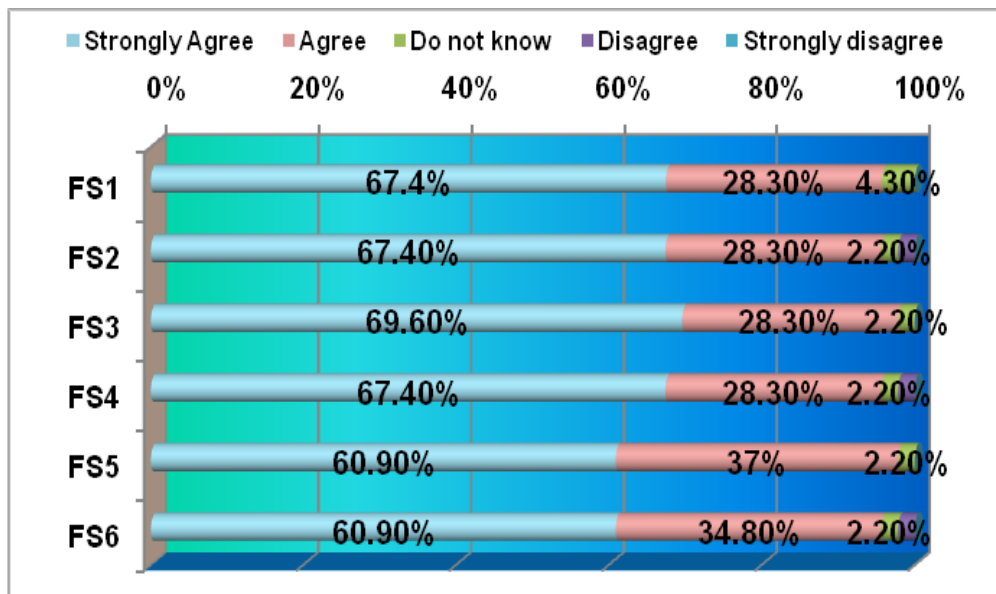


Figure 5.10 Responses regarding food safety questions

Figure 5.10 depicts the respondent's opinions on general statements about FSMS. It is of importance to note that the majority of the respondents all strongly agree on the general questions asked about the FSMS. All the organisations that participated in the survey already had a FSMS implemented and it was for this reason that most of them strongly agreed. Most of the statements 1-6 had a positive response.

Results from table 5.1 results indicate that:

- GMP is a prerequisite for FSMS implementation (FS1)
- HACCP is implemented as foundation for the FSMS (FS2)
- wine organisations review and improve their FSMS (FS3)
- wine organisations measure the effectiveness and the performance of the FSMS (FS4 &5)
- FSMS training programs are in place for staff members (FS6)

### 5.4.3 Descriptive statistics for decision-making

According to Figure 5.11, the results from all 46 participants are positive. In particular, many responses are very positive, as above 90% agree with the statements, such as DM7, DM12, DM13, DM14, DM15, DM17, DM19, DM20, DM22, DM23, and DM24. This indicates that the following areas are considered significant among these wine organisations:

- management is committed to maintain FSMS (DM7);
- corrective actions are used to improve the performance of FSMS (DM12);
- certification audits are used to improve the performance of FSMS (DM13);
- process control is applied to measure the performance of FSMS (DM14);
- training programs for employees are in place to improve the performance of FSMS (DM15);
- audit results are used to improve the performance of FSMS (DM17);
- FSMS is helpful to make product safer (DM19);
- FSMS is helpful in improving the quality of products (DM20);
- FSMS is helpful in improving customer satisfaction (DM22);
- internal audits are used effectively to verify FSMS (DM23); and
- the analytical results of verification activities identified the need for updating or improving the FSMS (DM24).
- DM10, DM18 and DM21 indicates that FSMS has no positive implication on the volume of the returned products, statistical tools as measuring tool of FSMS and the reduction of waste.

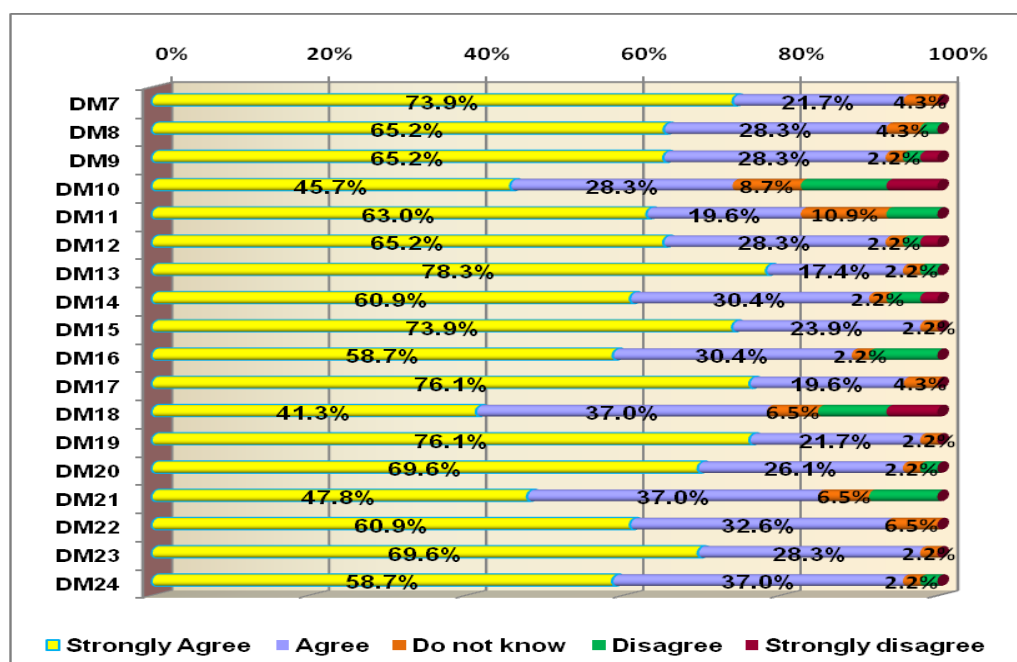


Figure 5.11: Responses regarding decision-making questions

## 5.5 Conclusion

Overall, the total responses from the decision-making statements (1-24) indicate a positive response. Only statements 10 and 18 tend to have a more negative tendency. According to the total count of responses, 63.89 % strongly agreed, 27.53 % agreed, 4.10 % do not know, 3.26 % disagree and 1.20 % strongly disagree.

Based on the results from table 5.1 the majority of the respondents agreed that, GMP is a prerequisite for FSMS implementation, HACCP is implemented as foundation for the FSMS, the wine organisations review and improve their FSMS, that they also measure the effectiveness and the performance of the FSMS and that training programs are in place for staff members. For the decision making statements the respondents strongly disagree that the volume of the returned products, statistical tools can be used as a measuring tool of FSMS and that FSMSs reduce waste.

This chapter analysed the impact of the fundamental requirements of a FSMS. In the industry several FSMSs are available, but the literature review showed that all the various FSMSs share the same fundamental requirements. The data obtained from the survey results also indicated that the performance measuring of the fundamental requirements differ from organisation to organisation. It is also evident that the measuring of a FSMS is not quantifiable and straightforward, but rather subjected to objective evidence. The fundamental requirements of a FSMS that an organisation should focus on are: Corrective actions, internal audits, control of nonconforming products, HACCP and customer complaints.



## CHAPTER 6 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

### 6.1 Introduction

FSMSs are implemented in many organisations to satisfy one of the many customer requirements. For many organisations they are perceived as a licence to trade. Over recent years many researchers have studied the benefits of implementing these FSMSs to establish whether the certification has achieved the desired result. To reiterate the relevance of this study and its application to the wine industry, the following:

- The large volumes of wine exported
- FSMS as a customer requirement
- FSMS to ensure food safety to customers and consumers

According to Quality Digest (2011: **Online**) certification to management systems results in benefits to the organisation and its employees, business becomes more profitable and they are in a position to pay their employees more.

This researcher has provided the scope of the research in Chapter 1. The following headings were discussed:

- Introduction and motivation.
- Background to the research problem.
- Problem statement.
- Research questions.
- Research objectives.
- Ethics.
- Research assumptions.
- Research constraints.
- Significance of the study.
- Research time schedule.

Chapter 2 provides a holistic overview of the research environment, which explored FSMSs in both the global wine industry and in the context of the South African wine industry, and in particular how FSMS is implemented in Cape Wine, Western Cape, South Africa.

In Chapter 3 a literature review was conducted on the FSMSs available to the industry and the key FSMS related programs / systems were defined, such as FSMS, QMS, Hazard Critical Control Points (HACCP), British Retail Consortium (BRC), International Food Standard (IFS), ISO 22000 and Good Manufacturing Practices (GMP). In addition, the requirements of a FSMS, applications of FSMS and the key factors affecting FSMS implementation were discussed.

In Chapter 4 the research design and methodology was broadly discussed. Chapter 5 provides an analysis of the data collected through the survey conducted. In this chapter, Chapter 6, the research will be summarised and recommendations, if any, will be provided.

## **6.2 The research problem revisited**

The primary problem researched within the ambit of this dissertation reads as follows: "There is not a consolidated approach to validate the performance of the implementation of the FSMS, which culminates in poor results." The researcher is of the opinion that all the organisations seems to report on the performance of the fundamental requirements of the FSMS, but not the FSMS as a whole.

## **6.3 The research question revisited**

The primary research question to be researched within the ambit of this research study, reads as follows:

Which criteria can be used to measure the FSMSs effectively? In general, the responses of the participants were mostly positive towards the decision-making statements of the study. This is an indication that most organisations use the fundamental requirements as listed in the questionnaire to measure their FSMS.

## **6.4 The investigative questions revisited**

According to the research findings and the literature review, the four investigative questions that will be researched in support of the primary research questions are addressed. The investigative questions read as follows:

### ***What are the current criteria for measuring the performance of FSMS?***

According to Chapter 3, Paragraph 3.3 the requirements for FSMSs – the main criteria against which the FSMS are measured – are the certified standard which an

organisation is certified for. Certification audits act as a measuring activity of the performance of the FSMS. Not one organisation had their own model for measuring the FSMS. Paragraph 3.4.6 also mentions that all the FSMSs measure the following: Customer satisfaction, internal audits, control of nonconforming product, continual improvement and customer complaints.

### ***Which key factors affect the performance of FSMSs?***

There are many influencing factors affecting the performance of the FSMS. In the literature review, Chapter 3, Paragraph 3.4 three components influence a FSMS, namely drivers, benefits and challenges.

### ***What are the similarities among the various FSMSs?***

In Chapter 3, Table 3.2 the key common factors are listed, being management systems, prerequisite programs, HACCP, validation and verification, emergency preparedness and quality management.

### ***How to improve the performance of the FSMSs in order to maintain the required certification?***

The continual improvement of the FSMS is vital to the effectiveness of any FSMS and can be verified annually with the next certification audit. Certified auditors will commend an organisation on the performance and the outcome of their audits from one audit to the following one.

## **6.5 Key research objectives revisited**

The primary research objectives of this research are:

- To determine the current criteria used to measure the performance of the FSMSs effectively.

This research highlighted that the only criteria available to measure FSMS performance are the requirements of the standards.

- To determine the key factors that affect the performance of the FSMSs.

All key factors affecting FSMS performance are listed in Chapter 3, Paragraph 3.4.

- To identify the similarities among the various FSMSs.

A comparison between the requirements of the FSMS is illustrated in Table 3.2. According to SAI Global, the following are the most frequent FSMS standards in the industry which they audit against: BRC Global Standard for

Food Safety, Global GAP, HACCP certification, IFS and ISO 22000 (SAI Global, 2011:Online).

- To determine an effective approach to improve the performance of FSMSs. The researcher was unable to draw any conclusions to address this research objective.

## **6.6 Analogies drawn for responses from organisations visited with implemented FSMS**

The following analogies can be drawn from the responses for the management representatives responsible for the FSMS:

- Organisations need to measure the performance of their FSMS regularly.
- Organisations only need to rely on the annual certification audit as the only indicator of the performance of their FSMS.
- Auditors performing internal audits should be trained auditors.
- Organisations should provide refresher HACCP training courses to employees.
- QMS reporting should be visible.
- A quality dashboard based on the fundamental requirements should be developed by organisations.

## **6.7 Recommendations**

To probe an answer to the research questions asked for this research, the following are provided:

- Food Safety training bodies should provide training to management representatives responsible for the FSMS on the verification and validation of the FSMS.
- Organisations should reiterate to employees that FSMSs are primarily implemented to produce a food-safe product.
- Internal auditors performing audits should be trained.
- A quality dashboard reflecting on the fundamental requirements should be developed by organisations.

## **6.8 Final conclusion**

In the South African wine industry a majority of the wines produced are exported to foreign markets. One of the major requirements of these export markets is that organisations should have a recognisable FSMS implemented. The importance of

these FSMSs is to protect the consumer from any possible unsafe products produced.

Over recent decades many organisations across the food spectrum have implemented a FSMS as their licence to trade. One major concern arising from the implementation of these FSMSs is the measuring of the performance measurement of the FSMS. Most organisations rely solely on the certifications audits as their only means of measuring the FSMS.

The aim of this study was to evaluate the requirements of the FSMSs that need to be reported on to indicate effectiveness.

## REFERENCES

- Aaker, D.A., Kumar, V. & Day, G.S. 2004. *Marketing Research* (8<sup>th</sup> ed). New Jersey. John Wiley & Sons.
- Ahmed, S. Aoieong, R. Tang, S. Zheng D. 2003. *A comparison of quality management systems in the construction industries in Hong Kong and the USA*. International Journal of Quality & Reliability Management. 22(2): 141-169.
- Anderson, K. Norman, D. Wittwer, G. 2001. *Globalization and the world's wine markets: overview*. Discussion 0143 paper prepared by the Centre for International Economics Studies of the University of Adelaide Australia.
- Arifin, K. 2009. *Implementation of Integrated Management System in Malaysia: The levels of Organization's understanding and awareness*. European Journal of Scientific Research, 13(2):188-195.
- Aggeloginnopoulos, D. Drosinos, E. Athanasopoulos, P. 2006. *Implementation of a quality management system (QMS) according to the ISO 9001 family in a Greek small-sized winery: a case study*. Food Control, 18 (2007):1077:1085.
- Babbie, E. 2005. *The basics of social research*. Belmont: Thomson Wadsworth.
- Bas, M. Yuksel, M. Cavusoglu, T. 2007. *Difficulties and barriers for the implementation of HACCP and food safety systems in food business in Turkey*. Food Control, 18(2007):124-130.
- Bertram, D. 2007. *Likert Scales*. [Online]. Available from <http://www.pages.cpsc.ucalgary.ac> [Accessed 13/09/2011].
- BSI: Standards, Testing, Assessment and Certification. 2011. *British Standard Institute*. [Online]. Available from: <http://www.bsigroup.com/> [Accessed 10/06/2011]
- Bruhn, CM. Winter, CK. Beall, GA. Brown, S. Harwood, JO. Lamp, CL. Stanford, G. Steinberg, YJ. & Turner, B. 1998. *Consumer response to pesticide / food safety risk statements implications for consumer's education*. Diary, Food and Environmental Sanitation, 18(5):278-287.
- Bruwer, J. 2002. *South Africa's wine routes: some perspectives on the wine tourism industry's structural dimensions and wine tourism product*. Tourism Management, 24 (2003):423-435.
- British Retail Consortium. *Definition of BRC*. [Online]. Available from: <http://www.isoqar.com/uk/standards/BRC/Food> [Accessed 11/04/2011].
- BSI: Standards, Testing, Assessment and Certification. 2011. *Definition of ISO*. [Online]. Available from: <http://www.bsi-emea.com> [Accessed 11/04/2011].
- Business Dictionary. *The Free Business Dictionary*. 2011. [Online]. Available at <http://www.businessdictionary.com/definition/quality-management-system-QMS.html> [Accessed 25/07/2011].
- CERCO Working Group on Quality. *Handbook for implementing a quality management system in a national mapping agency*. [Online]. Available from [http://www.prociq.org/material-inde/policy-other/data%20quality%20handbook\\_cerco.pdf](http://www.prociq.org/material-inde/policy-other/data%20quality%20handbook_cerco.pdf) [Accessed 28/06/2011].

- Cert-id. *Certification Body*. 2011. [Online]. Available from <http://www.cert-id.com> [Accessed 01/09/2011].
- Christaki, T. & Tzia, C. 2002. *Quality and safety assurance in winemaking*. Food Control, 13(2003):503-517.
- Codex Alimentarius. *Recommended international code of practice*. [Online]. Available from: <http://www.codexalimentarius.net> [Accessed 13/05/2011].
- Codex Alimentarius. *Recommended international code of practice*. [Online]. Available from: <http://www.codexalimentarius.net> [Accessed 13/05/2011].
- Cooper, D.R. & Schindle, P.S. 2006. *Business Research Methods*. Boston: McGraw-Hill.
- Corlett, D.A. 1998. *HACCP user's manual*. An Aspen Publication: New York.
- Cross, R. 2011. *What HACCP really means?* [Online]. Available from: <http://haccpalliance.org/alliance/haccp.htm> [Accessed 26/07/2011].
- Distell. *Company profile of Distell*. 2011. [Online]. Available from: <http://www.distell.co.za> [Accessed 01/05/2011].
- Dewanti-Hariyadi, R. 2009. *Implementation of Food Safety Management at Industry level in Developing countries: Is GMP/HACCP confusing?* Paper presented at SEAFast-ICMSF-Borlaug International Seminar and Workshop, Department of Food Science and Technology Bogor Agricultural University, Indonesia, 2-4 December 2009, Bogor.
- Dunlop, I. 2005. *Food Safety Management Systems*. Presented at IRCA Forum, Beijing, China: Dunlop, 9 September 2005.
- Emory, C.W. & Cooper, D.R. 1995. *Business Research Methods*. Boston: Irwin
- Explore South Africa. 2011. *Amount of wine cellars in SA*. [Online]. Available from: <http://www.exploresouthafrica.net/westerncape/stellenbosch/wineroute/index.htm> [Accessed 30/09/2011].
- Færgemand, J. & Jespersen, D. 2004. *ISO 22000 to ensure integrity of food supply chain*. ISO Insider, September – October 2004.
- Food Dictionary. *Free Food Dictionary*. 2011. [Online]. Available from: <http://www.food-dictionary.com/definition/International-Food-Standard.html> [Accessed 12/06/2011].
- Fotopolous, C. Gotzamani, K. & Kafetzopoulos, D. 2011. *Critical Factors for effective implementation of the HACCP system: A Pareto analysis*. British Food Journal, 113(5):578-597.
- Gay, L.R. & Diebl, P.L. 1992. *Research methods for business and management*. New York: MacMillan Publishing Company.
- Global Standard for Food Safety – British Retail Consortium. *Definition of BRC*. 2011. [Online]. Available from: <http://www.brcglobalstandards.com> [Accessed 10/05/2011].
- Gorris, L. 2005. *Food safety objective: An integral part of food chain management*. Food Control, 16(1):801-809.
- Henson, S., & Humphrey, J. 2009. *The Impacts of Private Food Safety Standards on the Food Chain and on Public Standard-Setting Processes*. FAO Headquarters: Rome.
- Hair, F.J., Babin, B., Money, A.H. & Samouel, P. 1999. *Essentials of Business Research*

*Methods*. John Wiley & Sons, Inc.

Higgins, C.L. 2004. *A Systems-Based Food Safety Evaluation: An Experimental Approach*. *Journal of Environmental Health*, 67(4):9-14.

Hoffman, T.J. 2011. *What is ISO 22000:2005?* [Online]. Available from: <http://tjhconsulting.com/iso2200.pdf> [Accessed 26/07/2011].

International Featured Standards. *Definition of IFS*. 2011. [Online]. Available from: <http://www.ifs-certification.com/> [Accessed 27/0/2011].

International Food Standard Version 5. (2007). *IFS for Auditing Retailer and Wholesaler Branded Food Products*. (IFS 2007).

International Organisation for Standardisation. (ISO 2005). *Food Safety Management Systems – Requirements for any organisation in the food chain*. (ISO, 22000).

International Organisation for Standardisation. *Definition of ISO 9001*. 2011. [Online]. Available from: <http://www.iso.org> [Accessed 13/05/2011].

Jacxsens, L., Luning, P. 2010. *Comparing food safety management systems between food processing companies*. Paper presented at International Symposium of the University of Ghent, Faculty of BioScience Engineering, 17<sup>th</sup> November 2010, Brussels.

Jacxsens, L., Luning, P., Marcelis, W., van Boekel, T., Rovira, J., Oses, S., Kousta, M., Drosinos, E., Jasson, V. and Uyttendaele, M. 2011. *Tools for the performance assessment and improvement of food safety management systems*. *Trends in Food Science and Technology* 1(2011):1-11.

Jatib, I. 2003. Food Safety and Quality Awareness Key Drivers of Competitiveness. *International Food and Agribusiness Management Review*. 6(1):1-8.

Karapetrovic, S. and Willborn, W. 2001. *Audit and self-assessment in quality management: comparison and compatibility*. *Managerial Auditing Journal*, 16 (6):366 – 377.

Kuiper, M. Euromonitor International. *Trend and Opportunities Shaping the Global Wine Industry*. 2011. [Online]. Available from <http://www.nomacor.com/assets/Euromonitor.pdf> [Assesed 03/03/2011].

Leedy, P.D. 1993. *Practical research, planning and design*. 5<sup>th</sup> ed. New York: Macmillan.

Leedy, P.D. 1997. *Practical research*. 6<sup>th</sup> ed. Upper Saddle River: Merrill.

Leedy, P.D. & Ormrod, J.E. 2001. *Practical research*. New Jersey: Merrill Prentice Hall.

Levine, D.M. Ramsey, P.P, Smidt, R.K. 2001. *Applied Statistics for Engineers and Scientists*. Pearson Prentice Hall.

Li. Xiaobin, 2009. *An Investigation into the factors in the Chinese market that influence wine imports from South Africa*. A dissertation in fulfilment of the requirements for the degree of Magister Technologiae Entrepreneurship in the Faculty of Business and Economic Science at the Nelson Mandela Metropolitan University.

Louw, A. and van Schoor, L. 2011. *Management systems applicable to the South African Wine Industry*,(Unpublished research material) South African Wine and Spirit Board

Martins, J.H., Loubser, M., Van Wyk, H. de J. 1996. *Marketing Research: a South African approach*. Pretoria. UNISA Press.



- Mensah, L. & Julien, D. 2011. *Implementation of food safety management systems in the UK*. *Food Control*, 22(1):1216-1225.
- Morsal, T. Ismail, M. Osman, M. 2009. *Developing a self assessment model to measure QMS maturity in ISO certified manufacturing companies*. *Journal of Scientific and Industrial Research*, 69(1):349-353.
- Mouton, J. 2001. *How to succeed in your Master's and Doctoral studies*. Van Schaik Publishers.
- Naumann, E. 2005. *The South African Liquor Industry*. Final Report, Consumer and Corporate Regulation Division, Department of Trade and Industry, South Africa.
- Onyancha, O. & Ocholla, D. 2005. *Is HIV/Aids in Africa distinct? What can we learn from the analysis of literature?* *Scientrometrics*, 79 (1):2-20.
- Parasuraman, A. Grewal, D. & Krishnan, R. 2004. *Marketing research*. New York: Houghton Mifflin Company.
- Patience, M. 2008. *Integrated Management Systems – A qualitative study of levels of integration of three Danish companies*. A thesis submitted for the degree of Master of Science in Engineering in Environmental Management at the Aalborg University.
- Platter South African Wine Guide. 2011. [Online]. Available from <http://www.wineonaplatter.com> [Accessed 20/09/2011].
- Quality Digest. 2011. [Online]. Available from <http://www.qualitydigest.com> [Accessed 30/09/2011].
- Quality Management Systems. 2011. *Definition of QMS*. [Online]. Available from <http://www.dti.gov.uk/qualityqms> [Accessed 22/06/2011].
- Rasmussen, J. 2007. *Integrated Management Systems – An Analysis of Best Practice in Danish Companies*. A thesis submitted in fulfilment of the requirements for the degree Master of Science in the Faculty of Engineering, Science and Medicine in Environmental Management at the Aalborg University.
- Ropkins, K., A. Beck. 2000. Evaluation of worldwide approaches to the use of HACCP to control food safety. *Trends in Food Science and Technology*, 11(2000):10-21.
- Saunders, M., Lewis, P., Thornhill, A. 2007. *Research methods for Business Students*. 3<sup>rd</sup> ed. Prentice Hall.
- Savenye, W., Robinson, R. 2001. Qualitative Research Issues and Methods an: Introduction for Educational Techologists. *Qualitative and Research Methods*, 39(2001):1045-1072.
- Schulze, H., Albersmeier, F., Gawron, J., Spiller, A., Theuvsen, L. 2008. *Heterogeniety in the Evaluation of Quality Assurance Systems: The International Food Standard (IFS) in European Agribusiness*. *International Food and Agribusiness Management Review*, 11 (3):99-139.
- SAI Global. 2011. *Definition of Food Safety*. [Online]. Available from: <http://www.saiglobal.com/assurance/food-safety/> [Accessed 18 /10/2011].
- Social Research Dictionary of Research Methods. 2011. *Definition of Interviews*. [Online]. Available from <http://www.srmo.sagepub.com> [Accessed 30/09/2011].
- South African Wine Industry Information & Systems. 2011. *SAWIS*. [Online]. Available

from: <http://www.sawis.co.za/> [Accessed 06/05/2011].

Sekaran, U. 2003. *Research methods for business: A skill building approach*. 4<sup>th</sup> ed. New Jersey. John Wiley & Sons.

South African Wine Information. 2011. Statistics. [Online]. Available from: <http://www.wine.co.za> [Accessed 25/05/2011].

Sokovic, M. 2010. *Quality Improvement Methodologies – PDCA Cycle, RADAR Matrix, DMAIC and DFSS*. Journal of Achievements in Materials and Manufacturing Engineering. 43(1): 476-484.

South African National Standard. (SANS 10049). *Food safety management - Requirements for prerequisite programmes (PRPs)*. (SANS 10049).

South African National Standard. (SANS 2007). *Requirements for a Hazard Analysis and Critical Control Point (HACCP) system*. (ISO 10330).

South African National Standard. (SANS 2003). *Guidelines on the application of ISO 9001:2000 for the food and drink industry*. (SANS 15161).

South African Auditor and Training Certification Association. 2011. SAATCA. [Online]. Available from <http://www.saatca.co.za> [Accessed 26/04/2011].

Sperber, W.H. 1998. *Auditing and verification of food safety*. Food Control, 9(2):157-162.

Stamou, T. 2003. *Integrated Management Systems in Small Medium-Sized Enterprises: Theory and Practice*. A thesis submitted in fulfilment of the requirements for the degree Master of Science in the Faculty of Environmental Science at the University of East Anglia, Norwich.

Surak, J.G. 2011. *HACCP and ISO Development of a Food Safety Management Standard*. [Online]. Available from: <http://www.saferpak.com> Accessed [01/07/2011].

The Western Australian Wine Tourism. 2011. *Definition of wine tourism*. [Online]. Available from <http://www.westernaustralia.com> Accessed [12/08/2011].

Trustin, D.H., Ligthelm, A.A., Martins, J.H. & Van Wyk, H. de J. 2005. *Marketing Research in practice*. Pretoria. Unisa Press.

Tuominen, P. 2009. *Developing Risk-based food safety management*. A dissertation submitted in fulfilment of the requirements for the degree of Doctorate in the Faculty of Veterinary Medicine at the University of Helsinki.

Unnevehr, L. and Jensen, H. 1998. *The economic implications of using HACCP as a Food Safety Regulatory Standard*, (Unpublished research material) Centre for Agricultural and Rural Development, Iowa State University.

Valdimirov, Z. 2001. *Implementation of Food safety management system in Bulgaria*. British Food Journal, 113(1): 50-65.

Van der Spiegel, M. 2004. *Measuring the effectiveness of food quality management*. A thesis submitted in fulfilment of the requirements for the degree of Doctorate at the Wageningen University.

Von Aulock, M. 2003. *Academic Research*. Bellville: Peninsula Technikon.

Wallace, C. & Powell, S. 2005. *Development of methods for standardised HACCP assesment*. British Food Journal, 107(10):723-724.

Watkins, J. 2008. Thesis/Dissertation/Research Reports: *A practical guide for students to the preparation of written presentations of Academic Research*. Cranfield Institute of Management. Content Solutions.

Wegner, T. 2000. *Quantitative methods for marketing decisions*. Cape Town. Juta & Co.

Weiler, B and Hall, C. 1992. *Special interest tourism: in search of an alternative*. Bellhaven press: London.

Welman, J.C & Kruger S.J. 1999. *Research Methodology for the Business and Administrative Sciences*. Oxford: Oxford University Press.

World Health Organization. 2011. *Definition of GMP*. Available from <http://www.who.int> Accessed [30/06/2011].

Yapp, C. & Fairman, R. 2006. *Factors affecting food safety compliance within small and medium-sized enterprises: implications for regulatory and enforcement strategies*. *Food Control*, 17 (2006):42-51.

## APPENDICES

### Appendix A: Consent letter



Department of Industrial Systems &  
Engineering  
Faculty of Engineering  
Cape Peninsula University of Technology  
P. O. Box 1906  
Bellville  
7535

01 July 2011

#### **M-TECH: QUALITY STUDY CONSENT LETTER**

**Principal investigator: Sonja Davids (cell 073 33 91312)**

**Co-investigator: Dr. Bingwen Yan, research supervisor (tel. 021 953 8478)**

Dear Sir / Madam,

I am currently completing my Master's degree in Quality at the Cape Peninsula University of Technology, Bellville campus. My research title is, "***An evaluation on the implementation of food safety management systems within the wine industry in the Western Cape.***".

The purpose of this letter is to request permission to collect data at your organisation. Data will be collected through a structured questionnaire. Information will be collected through a questionnaire. An appointment to complete the questionnaire will be scheduled by the investigator. This letter serves to inform you that all information gathered from a respondent will be used solely for research purposes and the anonymity of the respondent and organisation is guaranteed.

In order for me to conclude my research findings, I need your assistance. Your support and cooperation is highly appreciated.

Thanking you in anticipation.

If you require any further information, please send me an email to [200700289@cput.ac.za](mailto:200700289@cput.ac.za) or alternatively contact me on 073 339 1312.

Yours sincerely,

---

Sonja Davids

**DECLARATION BY THE INVESTIGATOR**

I, Sonja Davids declare that:

1. All information gathered from the respondent will be treated with the strictest confidentiality.
2. All information received through the questionnaire will clearly identified as confidential.
3. All information received will solely be used for academic research purposes.

I, \_\_\_\_\_ (full name and surname) as respondent, accept to complete the research questionnaire in an unbiased and objective manner as far as possible for Ms. S Davids.

**Signed**

\_\_\_\_\_

**Date**

\_\_\_\_\_

## Appendix B: The questionnaire



Department of Industrial Systems &  
Engineering  
Faculty of Engineering  
Cape Peninsula University of Technology  
P. O. Box 1906  
Bellville  
7535

### To whom it may concern:

Dear Sir / Madam,

I am Sonja Davids and I'm currently working on my Master's degree at the Cape Peninsula University of Technology. The title of my research is: "*An evaluation of the implementation of food safety management systems within the wine industry in the Western Cape.*" Dr. Bingwen Yan is my research supervisor. The thesis will be submitted in fulfillment of the requirements for the Master of Technology degree in Quality.

Many wine-manufacturing cellars have successfully implemented Food Safety Management Systems (FSMSs). However, the outcome of these systems is not always easy to measure. Therefore, the primary research objective is to determine which criteria can be used to measure the FSMSs effectively. Thus, the purpose of this survey is to collect information from both employees and management who are responsible for FSMSs. In order to conclude the research findings of this study, your participation will be highly appreciated.

If you require further information about this questionnaire, please feel free to contact us at the following:

Thank you very much for your participation.

Yours sincerely

---

Sonja Davids

**Part 1: Individual information**

Kindly provide your name and contact details:

First name:	
Last name:	
Email address:	
Postal address:	
Phone no. (office):	
Company:	

Please mark the appropriate answer with an "X"

**1. Your gender**

1.	Male	
2.	Female	

**2. Number of years worked at the company**

1.	Less than 1 year	
2.	1-5 years	
3.	6-10 years	
4.	11-15 years	
5.	More than 15 years	

**3. Educational level**

1.	Grade 12	
2.	Technikon National Diploma	
3.	University (B-Tech / Bachelors degree)	
4.	Post-graduate	
5.	Other (please indicate)	

**4. Job title**

1.	Shopfloor worker / Operator / Foreman / Supervisor	
2.	Administrative staff	
3.	Middle management	
4.	Senior management / Director	

5.	Other (please indicate)	
----	-------------------------	--

## Part 2: Company profile

Please mark the appropriate answer with an "X"

### 1. Number of employees

1	Less than 100	
2	100~200	
3	201~300	
4	301~400	
5	401~500	
6	More than 500	

### 2. Main market for product

1.	Local	
2.	Export	

### 3. Main activities on production information

1.	Wine-making	
2.	Bottling wine	
3.	Distribution stores	
4.	Wine marketing	
5.	Other (please indicate)	

### 4. The organisation is certified for

1.	ISO 9001:2008	
2.	ISO 22000:2005	
3.	HACCP	
4.	BRC	
5.	IMS	
6.	Other (please indicate)	

### 5. The organisation's use as an audit criteria

1.	ISO 9001:2008	
2.	ISO 22000:2005	
3.	BRC ver 5	
4.	IFS ver 5	



5.	SANS 10330:2007	
6.	Other (please indicate)	

### Abbreviations

**FSMS** Food Safety Management System

**QMS** Quality Management System

**ISO** International Organisation for Standardisation

**HACCP** Hazard Analysis for Critical Control Points

**BRC** British Retail Consortium

**IFS** International Food Standard

**IMS** Integrated Management System

**GMP** Good Manufacturing Practices

#### 1.1 General questions on food safety management systems

Please mark the appropriate answer with an "X" and give brief comments under each statement to support your response.

1	2	3	4	5
Strongly agree	Agree	Do not know	Disagree	Strongly disagree

No.	Statements	1	2	3	4	5
1.	GMP as a prerequisite for FSMS is implemented at your organisation.					
Comments:						
2.	HACCP is implemented to support FSMS at your organisation.					
Comments:						
3.	Your organisation reviews and improves the FSMS regularly.					
Comments:						
4.	Your organisation measures the effectiveness of the FSMS regularly.					
Comments:						
5.	Your organisation measures the performance of the FSMS regularly.					
Comments:						
6.	Your organisation has training programs on FSMS for staff.					
Comments:						

### Part 3: Decision making

Please mark the appropriate answer with an “X” and give brief comments under each statement to support your response.

1	2	3	4	5		
Strongly agree	Agree	Do not know	Disagree	Strongly disagree		
No.	Statements	1	2	3	4	5
7.	Management is committed to maintain FSMS at your organisation.					
Comments:						
8.	HACCP is used to improve the performance of FSMS at your organisation.					
Comments:						
9.	Customer complaints are used to improve the performance of FSMS at your organisation.					
Comments:						
10.	The volume of returned products is used to measure the performance of FSMS at your organisation.					
Comments:						
11.	Your organisation applies document control to improve the performance of FSMS at your organisation.					
Comments:						
12.	Corrective actions are used to improve the performance of FSMS at your organisation.					
Comments:						
13.	Certification audits are used to measure the performance of FSMS at your organisation.					
Comments:						
14.	Process control is applied to measure the performance of FSMS at your organisation.					
Comments:						
15.	Your organisation provides training programs for employees to improve the performance of FSMS at your organisation.					
Comments:						
16.	The result of accurate laboratory analysis is used to improve the performance of FSMS at your organisation.					
Comments:						
17.	The results of audits are used to improve the performance of FSMS at your organisation.					
Comments:						
18.	Statistical tools are used to measure the performance of FSMS.					
Comments:						
19.	FSMS helped to make your product more food-safe.					
Comments:						
20.	FSMS helped your organisation to improve the quality of products.					
Comments:						
21.	FSMS helped your organisation to reduce waste.					

Comments:					
22.	FSMS helped your organisation to improve customer satisfaction.				
Comments					
23.	Internal audits are used to verify FSMS at your organisation.				
Comments:					
24.	The analytical results of verification activities identified the need for updating or improving the FSMS at your organisation.				
Comments:					

Thank you for your participation. Your feedback is valuable to your organisation.

## Appendix C: Statistics interpretation

### Frequencies – demographic data

Statistics							
		Educational level	Gender	Years of working experience	Job title	Number of employees	Main market
N	Valid	46	46	46	46	46	46
	Missing	0	0	0	0	0	0

### Frequencies

#### Notes

Output created		02-Nov-2011 11:05:23
Comments		
Input	Data	C:\Documents and Settings\Administrator\Desktop\QRP050_2011\Sonia Davids\Untitled2.sav
	Active dataset	DataSet3
	Filter	<none>
	Weight	<none>
	Split file	<none>
	N of rows in working data file	46
Missing value handling	Definition of missing	User-defined missing values are treated as missing.
	Cases used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=Gender V5 V6 V7 Companyprofile V14 V16 V17 V18 V19 V20 V21 V22 /STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM SEMEAN MEAN MEDIAN MODE SUM SKEWNESS SESKEW KURTOSIS SEKURT /ORDER=ANALYSIS.
Resources	Processor time	00 00:00:00.000
	Elapsed time	00 00:00:00.000

### Frequency table

#### Gender

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Male	13	28.3	28.3	28.3
	Female	33	71.7	71.7	100.0
	Total	46	100.0	100.0	

### Years of working experience

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Less than 1 year	4	8.7	8.7	8.7
	1-5 years	21	45.7	45.7	54.3
	6- 10 years	9	19.6	19.6	73.9
	11 to 15 years	7	15.2	15.2	89.1
	More than 15 years	5	10.9	10.9	100.0
	Total	46	100.0	100.0	

### Educational level

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Grade 12	13	28.3	28.3	28.3
	Technikon National Diploma	10	21.7	21.7	50.0
	University (B-Tech/Bachelors degree)	13	28.3	28.3	78.3
	Post-graduate	7	15.2	15.2	93.5
	Other	3	6.5	6.5	100.0
	Total	46	100.0	100.0	

### Job title

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Shopfloor worker / Supervisor	3	6.5	6.5	6.5
	Administrative staff	11	23.9	23.9	30.4
	Middle management	18	39.1	39.1	69.6
	Senior management / Director	7	15.2	15.2	84.8
	Other	7	15.2	15.2	100.0
	Total	46	100.0	100.0	

### Number of employees

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Less than 100	14	30.4	30.4	30.4
	100~200	17	37.0	37.0	67.4
	201~300	6	13.0	13.0	80.4
	301~400	4	8.7	8.7	89.1
	401~500	2	4.3	4.3	93.5
	More than 500	3	6.5	6.5	100.0
	Total	46	100.0	100.0	

### Main market

	Frequency	Percent	Valid percent	Cumulative percent
Valid Local (L)	12	26.1	26.1	26.1
Export (E)	7	15.2	15.2	41.3
Both L&E	25	54.3	54.3	100.0
Total	46	100.0	100.0	

### Frequencies – food safety

```
FREQUENCIES VARIABLES=FS1 FS2 FS3 FS4 FS5 FS6
  /NTILES=4
  /STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM SEMEAN MEAN MEDIAN MODE
SKEWNESS SESKEW KURTOSIS SEKURT
  /ORDER=ANALYSIS.
```

### Notes

Output created		02-Nov-2011 10:31:52
Comments		
Input	Active dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split file	<none>
	N of rows in working data file	46
Missing value handling	Definition of missing	User-defined missing values are treated as missing.
	Cases used	Statistics are based on all cases with valid data.
Syntax		FREQUENCIES VARIABLES=FS1 FS2 FS3 FS4 FS5 FS6 /NTILES=4 /STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM SEMEAN MEAN MEDIAN MODE SKEWNESS SESKEW KURTOSIS SEKURT /ORDER=ANALYSIS.
Resources	Processor time	00 00:00:00.000
	Elapsed time	00 00:00:00.000

[DataSet1]

**Statistics**

		FS1	FS2	FS3	FS4	FS5	FS6
N	Valid	46	46	46	46	46	46
	Missing	0	0	0	0	0	0
Mean		1.37	1.39	1.33	1.39	1.41	1.46
Std. error of mean		.084	.096	.076	.096	.080	.097
Median		1.00	1.00	1.00	1.00	1.00	1.00
Mode		1	1	1	1	1	1
Std. deviation		.572	.649	.519	.649	.541	.657
Variance		.327	.421	.269	.421	.292	.431
Skewness		1.287	1.954	1.258	1.954	.803	1.643
Std. error of skewness		.350	.350	.350	.350	.350	.350
Kurtosis		.769	4.734	.610	4.734	-.483	3.630
Std. Error of Kurtosis		.688	.688	.688	.688	.688	.688
Range		2	3	2	3	2	3
Minimum		1	1	1	1	1	1
Maximum		3	4	3	4	3	4
Percentiles	25	1.00	1.00	1.00	1.00	1.00	1.00
	50	1.00	1.00	1.00	1.00	1.00	1.00
	75	2.00	2.00	2.00	2.00	2.00	2.00

**Frequency table**

**FS1:** GMP as a prerequisite for FSMS is implemented at your organisation.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Strongly agree	31	67.4	67.4	67.4
	Agree	13	28.3	28.3	95.7
	Do not know	2	4.3	4.3	100.0
	Total	46	100.0	100.0	

**FS2:** HACCP is implemented to support FSMS at your organisation.

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Strongly agree	31	67.4	67.4	67.4
	Agree	13	28.3	28.3	95.7
	Do not know	1	2.2	2.2	97.8
	Disagree	1	2.2	2.2	100.0
	Total	46	100.0	100.0	

**FS3: Your organisation reviews and improves the FSMS regularly.**

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Strongly agree	32	69.6	69.6	69.6
	Agree	13	28.3	28.3	97.8
	Do not know	1	2.2	2.2	100.0
	Total	46	100.0	100.0	

**FS4: Your organisation measures the effectiveness of the FSMS regularly.**

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Strongly agree	31	67.4	67.4	67.4
	Agree	13	28.3	28.3	95.7
	Do not know	1	2.2	2.2	97.8
	Disagree	1	2.2	2.2	100.0
	Total	46	100.0	100.0	

**FS5: Your organisation measures the performance of the FSMS regularly.**

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Strongly agree	28	60.9	60.9	60.9
	Agree	17	37.0	37.0	97.8
	Do not know	1	2.2	2.2	100.0
	Total	46	100.0	100.0	

**FS6: Your organisation has training programs on FSMS for staff.**

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Strongly agree	28	60.9	60.9	60.9
	Agree	16	34.8	34.8	95.7
	Do not know	1	2.2	2.2	97.8
	Disagree	1	2.2	2.2	100.0
	Total	46	100.0	100.0	

```

FREQUENCIES VARIABLES=DM7 DM8 DM9 DM10 DM11 DM12 DM13 DM14 DM15 DM16 DM17
DM18 DM19 DM20 DM21 DM22 DM23 DM24
/NTILES=4
/STATISTICS=STDDEV VARIANCE RANGE MINIMUM MAXIMUM SEMEAN MEAN MEDIAN MODE
SKEWNESS SESKEW KURTOSIS SEKURT
/ORDER=ANALYSIS.

```



## Frequencies – decision-making

### Notes

Output created		02-Nov-2011 10:34:31
Comments		
Input	Active dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of rows in working data file	46
Missing value handling	Definition of missing	User-defined missing values are treated as missing.
	Cases used	Statistics are based on all cases with valid data.
Syntax		<pre> FREQUENCIES  VARIABLES=DM7  DM8 DM9 DM10 DM11 DM12 DM13 DM14 DM15 DM16 DM17 DM18 DM19 DM20 DM21 DM22 DM23 DM24 /NTILES=4 /STATISTICS=STDDEV          VARIANCE RANGE  MINIMUM  MAXIMUM  SEMEAN MEAN  MEDIAN  MODE  SKEWNESS SESKEW  KURTOSIS  SEKURT /ORDER=ANALYSIS. </pre>
Resources	Processor Time	00 00:00:00.000
	Elapsed Time	00 00:00:00.000

**Descriptive statistics of decision-making**

**Statistics**

		DM7	DM8	DM9	DM10	DM11	DM12	DM13	DM14	DM15	DM16	DM17	DM18	DM19	DM20	DM21	DM22	DM23	DM24
N	Valid	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.30	1.43	1.48	2.04	1.61	1.48	1.28	1.57	1.28	1.61	1.28	2.02	1.26	1.39	1.76	1.46	1.33	1.48
Std. Error of		.081	.101	.123	.186	.137	.123	.091	.134	.074	.134	.080	.177	.072	.110	.136	.092	.076	.097
Median		1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00
Mode		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Std. Deviation		.553	.688	.836	1.264	.930	.836	.621	.910	.502	.906	.544	1.202	.491	.745	.923	.622	.519	.658
Variance		.305	.473	.700	1.598	.866	.700	.385	.829	.252	.821	.296	1.444	.242	.555	.853	.387	.269	.433
Skewness		1.674	1.742	2.454	1.088	1.399	2.454	2.652	2.107	1.538	1.628	1.826	1.242	1.698	2.922	1.214	1.040	1.258	1.552
Std. Error of		.350	.350	.350	.350	.350	.350	.350	.350	.350	.350	.350	.350	.350	.350	.350	.350	.350	.350
Kurtosis		2.011	3.327	7.280	.078	.890	7.280	8.022	4.810	1.531	2.007	2.582	.696	2.140	11.542	.808	.105	.610	3.359
Std. Error of		.688	.688	.688	.688	.688	.688	.688	.688	.688	.688	.688	.688	.688	.688	.688	.688	.688	.688
Range		2	3	4	4	3	4	3	4	2	3	2	4	2	4	3	2	2	3
Minimum		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Maximum		3	4	5	5	4	5	4	5	3	4	3	5	3	5	4	3	3	4
Percentiles	25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	50	1.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00
	75	2.00	2.00	2.00	3.00	2.00	2.00	1.00	2.00	2.00	2.00	2.00	1.25	2.00	1.25	2.00	2.00	2.00	2.00

## Frequency table

**DM7:** Management is committed to maintain FSMS at your organisation

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	34	73.9	73.9	73.9
Agree	10	21.7	21.7	95.7
Do not know	2	4.3	4.3	100.0
Total	46	100.0	100.0	

**DM8:** HACCP is used to improve the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	30	65.2	65.2	65.2
Agree	13	28.3	28.3	93.5
Do not know	2	4.3	4.3	97.8
Disagree	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM9:** Customer complaints are used to improve the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	30	65.2	65.2	65.2
Agree	13	28.3	28.3	93.5
Do not know	1	2.2	2.2	95.7
Disagree	1	2.2	2.2	97.8
Strongly disagree	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM10:** The volume of returned products is used to measure the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	21	45.7	45.7	45.7
Agree	13	28.3	28.3	73.9
Do not know	4	8.7	8.7	82.6
Disagree	5	10.9	10.9	93.5
Strongly disagree	3	6.5	6.5	100.0
Total	46	100.0	100.0	

**DM11:** Your organisation applies document control to improve the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	29	63.0	63.0	63.0
Agree	9	19.6	19.6	82.6
Do not know	5	10.9	10.9	93.5
Disagree	3	6.5	6.5	100.0
Total	46	100.0	100.0	

**DM12:** Corrective actions are used to improve the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	30	65.2	65.2	65.2
Agree	13	28.3	28.3	93.5
Do not know	1	2.2	2.2	95.7
Disagree	1	2.2	2.2	97.8
Strongly disagree	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM13:** Certification audits are used to measure the performance of FSMS at your organisation

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	36	78.3	78.3	78.3
Agree	8	17.4	17.4	95.7
Do not know	1	2.2	2.2	97.8
Disagree	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM14:** Process control is applied to measure the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	28	60.9	60.9	60.9
Agree	14	30.4	30.4	91.3
Do not know	1	2.2	2.2	93.5
Disagree	2	4.3	4.3	97.8
Strongly disagree	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM15:** Your organisation provides training programs for employees to improve the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	34	73.9	73.9	73.9
Agree	11	23.9	23.9	97.8
Do not know	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM16:** The result of accurate laboratory analysis is used to improve the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	27	58.7	58.7	58.7
Agree	14	30.4	30.4	89.1
Do not know	1	2.2	2.2	91.3
Disagree	4	8.7	8.7	100.0
Total	46	100.0	100.0	

**DM17:** The results of audits are used to improve the performance of FSMS at your organisation.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	35	76.1	76.1	76.1
Agree	9	19.6	19.6	95.7
Do not know	2	4.3	4.3	100.0
Total	46	100.0	100.0	

**DM18:** Statistical tools are used to measure the performance of FSMS.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	19	41.3	41.3	41.3
Agree	17	37.0	37.0	78.3
Do not know	3	6.5	6.5	84.8
Disagree	4	8.7	8.7	93.5
Strongly disagree	3	6.5	6.5	100.0
Total	46	100.0	100.0	

**DM19:** FSMS helped to make your product more food-safe.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	35	76.1	76.1	76.1
Agree	10	21.7	21.7	97.8
Do not know	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM20:** FSMS helped your organisation to improve the quality of products.

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	32	69.6	69.6	69.6
Agree	12	26.1	26.1	95.7
Do not know	1	2.2	2.2	97.8
Strongly disagree	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM21: FSMS helped your organisation to reduce waste.**

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	22	47.8	47.8	47.8
Agree	17	37.0	37.0	84.8
Do not know	3	6.5	6.5	91.3
Disagree	4	8.7	8.7	100.0
Total	46	100.0	100.0	

**DM22: FSMS helped your organisation to improve customer satisfaction.**

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	28	60.9	60.9	60.9
Agree	15	32.6	32.6	93.5
Do not know	3	6.5	6.5	100.0
Total	46	100.0	100.0	

**DM23: Internal audits are used to verify FSMS at your organisation.**

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	32	69.6	69.6	69.6
Agree	13	28.3	28.3	97.8
Do not know	1	2.2	2.2	100.0
Total	46	100.0	100.0	

**DM24 The analytical results of verification activities identified the need for updating or improving the FSMS at your organisation.**

	Frequency	Percent	Valid percent	Cumulative percent
Valid Strongly agree	27	58.7	58.7	58.7
Agree	17	37.0	37.0	95.7
Do not know	1	2.2	2.2	97.8
Disagree	1	2.2	2.2	100.0
Total	46	100.0	100.0	

## Reliability

### Notes

Output created		02-Nov-2011 10:46:47
Comments		
Input	Active dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split file	<none>
	N of rows in working data file	46
	Matrix Input	
Missing value handling	Definition of missing	User-defined missing values are treated as missing.
	Cases used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		<pre> RELIABILITY /VARIABLES=FS1 FS2 FS3 FS4 FS5 FS6 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE      SCALE CORR COV ANOVA FRIEDMAN /SUMMARY=VARIANCE COV CORR /ICC=MODEL(MIXED) TYPE(CONSISTENCY)           CIN=95 TESTVAL=0.                     </pre>
Resources	Processor time	00 00:00:00.000
	Elapsed time	00 00:00:00.031

[DataSet1]

### SCALE: FOOD SAFETY VARIABLES (FS1~6)

#### Case-processing summary

		N	Percent
Cases	Valid	46	100.0
	Excluded <sup>a</sup>	0	.0
	Total	46	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha based on standardised items	N of Items
.872	.880	6

**Item statistics**

	Mean	Std. Deviation	N
FS1	1.37	.572	46
FS2	1.39	.649	46
FS3	1.33	.519	46
FS4	1.39	.649	46
FS5	1.41	.541	46
FS6	1.46	.657	46

**Inter-item correlation matrix**

	FS1	FS2	FS3	FS4	FS5	FS6
FS1	1.000	.440	.633	.560	.502	.547
FS2	.440	1.000	.537	.261	.479	.458
FS3	.633	.537	1.000	.603	.856	.662
FS4	.560	.261	.603	1.000	.606	.458
FS5	.502	.479	.856	.606	1.000	.646
FS6	.547	.458	.662	.458	.646	1.000

**Inter-item covariance matrix**

	FS1	FS2	FS3	FS4	FS5	FS6
FS1	.327	.163	.188	.208	.155	.205
FS2	.163	.421	.181	.110	.168	.195
FS3	.188	.181	.269	.203	.240	.226
FS4	.208	.110	.203	.421	.213	.195
FS5	.155	.168	.240	.213	.292	.229
FS6	.205	.195	.226	.195	.229	.431

**Summary of item statistics**

	Mean	Min.	Max.	Range	Max. / Min.	Variance	N of Items
Item variances	.360	.269	.431	.162	1.603	.005	6
Inter-item covariances	.192	.110	.240	.130	2.180	.001	6
Inter-item correlations	.550	.261	.856	.595	3.274	.017	6

**Scale statistics**

Mean	Variance	Std. deviation	N of items
8.35	7.921	2.814	6



**ANOVA with Friedman's test**

	Sum of squares	df	Mean square	Friedman's Chi-square	Sig
Between people	59.406	45	1.320		
Within people				2.609	.760
Between items	.435 <sup>a</sup>	5	.087		
Residual	37.899	225	.168		
Total	38.333	230	.167		
Total	97.739	275	.355		

Grand mean = 1.39

a. Kendall's coefficient of concordance  $W = .004$ .

**Intraclass correlation coefficient**

	Intraclass correlation <sup>a</sup>	95% Confidence interval		F test with true value 0			
		Lower bound	Upper bound	Value	df1	df2	Sig
Single measures	.533 <sup>b</sup>	.408	.663	7.837	45	225	.000
Average measures	.872 <sup>c</sup>	.805	.922	7.837	45	225	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.
- b. The estimator is the same, whether the interaction effect is present or not.
- c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

RELIABILITY

```

/VARIABLES=FS1 FS2 FS3 FS4 FS5 FS6
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/STATISTICS=DESCRIPTIVE SCALE CORR COV ANOVA FRIEDMAN
/SUMMARY=VARIANCE COV CORR
/ICC=MODEL(MIXED) TYPE(CONSISTENCY) CIN=95 TESTVAL=0.

```

## Reliability

### Notes

Output created		02-Nov-2011 10:46:47
Comments		
Input	Active dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split file	<none>
	N of rows in working data file	46
	Matrix input	
Missing value handling	Definition of missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		<pre> RELIABILITY /VARIABLES=FS1 FS2 FS3 FS4 FS5 FS6 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE      SCALE CORR COV ANOVA FRIEDMAN /SUMMARY=VARIANCE COV CORR /ICC=MODEL(MIXED) TYPE(CONSISTENCY)           CIN=95 TESTVAL=0.                     </pre>
Resources	Processor Time	00 00:00:00.000
	Elapsed Time	00 00:00:00.031

[DataSet1]

### Scale: VARIABLES OF FOOD SAFETY

#### Case-processing summary

		N	%
Cases	Valid	46	100.0
	Excluded <sup>a</sup>	0	.0
	Total	46	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability statistics

Cronbach's Alpha	Cronbach's Alpha based on standardised items	N of items
.872	.880	6

**Item statistics**

	Mean	Std. Deviation	N
FS1	1.37	.572	46
FS2	1.39	.649	46
FS3	1.33	.519	46
FS4	1.39	.649	46
FS5	1.41	.541	46
FS6	1.46	.657	46

**Inter-item correlation matrix**

	FS1	FS2	FS3	FS4	FS5	FS6
FS1	1.000	.440	.633	.560	.502	.547
FS2	.440	1.000	.537	.261	.479	.458
FS3	.633	.537	1.000	.603	.856	.662
FS4	.560	.261	.603	1.000	.606	.458
FS5	.502	.479	.856	.606	1.000	.646
FS6	.547	.458	.662	.458	.646	1.000

**Inter-item co-variance matrix**

	FS1	FS2	FS3	FS4	FS5	FS6
FS1	.327	.163	.188	.208	.155	.205
FS2	.163	.421	.181	.110	.168	.195
FS3	.188	.181	.269	.203	.240	.226
FS4	.208	.110	.203	.421	.213	.195
FS5	.155	.168	.240	.213	.292	.229
FS6	.205	.195	.226	.195	.229	.431

**Summary of item statistics**

	Mean	Min.	Max.	Range	Max./ Min.	Variance	N of items
Item variances	.360	.269	.431	.162	1.603	.005	6
Inter-item covariances	.192	.110	.240	.130	2.180	.001	6
Inter-item correlations	.550	.261	.856	.595	3.274	.017	6

**Scale statistics**

Mean	Variance	Std. deviation	N of items
8.35	7.921	2.814	6

**ANOVA with Friedman's Test**

	Sum of squares	df	Mean square	Friedman's Chi-square	Sig
Between people	59.406	45	1.320		
Within people					
Between items	.435 <sup>a</sup>	5	.087	2.609	.760
Residual	37.899	225	.168		
Total	38.333	230	.167		
Total	97.739	275	.355		

Grand Mean = 1.39

a. Kendall's coefficient of concordance  $W = .004$ .

**Intraclass correlation coefficient**

	Intraclass correlation <sup>a</sup>	95% Confidence interval		F test with true value 0			
		Lower bound	Upper bound	Value	df1	df2	Sig
Single measures	.533 <sup>b</sup>	.408	.663	7.837	45	225	.000
Average measures	.872 <sup>c</sup>	.805	.922	7.837	45	225	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

a. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.

b. The estimator is the same, whether the interaction effect is present or not.

c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.

RELIABILITY

```

/VARIABLES=DM7 DM8 DM9 DM10 DM11 DM12 DM13 DM14 DM15 DM16 DM17 DM18 DM19
DM20 DM21 DM22 DM23 DM24
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/STATISTICS=DESCRIPTIVE SCALE CORR COV ANOVA FRIEDMAN
/SUMMARY=VARIANCE COV CORR
/ICC=MODEL(MIXED) TYPE(CONSISTENCY) CIN=95 TESTVAL=0.

```

**Reliability testing on the decision-making section**

**Notes**

Output created		02-Nov-2011 10:52:51
Comments		
Input	Active dataset	DataSet 1
	Filter	<none>
	Weight	<none>
	Split file	<none>
	N of rows in working data file	46
	Matrix input	
Missing value handling	Definition of missing	User-defined missing values are treated as missing.
	Cases used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=DM7 DM8 DM9 DM10 DM11 DM12 DM13 DM14 DM15 DM16 DM17 DM18 DM19 DM20 DM21 DM22 DM23 DM24 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA /STATISTICS=DESCRIPTIVE SCALE CORR COV ANOVA FRIEDMAN /SUMMARY=VARIANCE COV CORR

		/ICC=MODEL(MIXED)	
		TYPE(CONSISTENCY)	CIN=95
		TESTVAL=0.	
Resources	Processor Time	00 00:00:00.000	
	Elapsed Time	00 00:00:00.014	

## SCALE: DECISION-MAKING VARIABLES

### Case-processing summary

		N	%
Cases	Valid	46	100.0
	Excluded <sup>a</sup>	0	.0
	Total	46	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability statistics

Cronbach's Alpha	Cronbach's Alpha based on standardised items	N of Items
.917	.930	18

### Item statistics

	Mean	Std. Deviation	N
DM7	1.30	.553	46
DM8	1.43	.688	46
DM9	1.48	.836	46
DM10	2.04	1.264	46
DM11	1.61	.930	46
DM12	1.48	.836	46
DM13	1.28	.621	46
DM14	1.57	.910	46
DM15	1.28	.502	46
DM16	1.61	.906	46
DM17	1.28	.544	46
DM18	2.02	1.202	46
DM19	1.26	.491	46
DM20	1.39	.745	46
DM21	1.76	.923	46
DM22	1.46	.622	46
DM23	1.33	.519	46
DM24	1.48	.658	46

**Inter-item correlation matrix**

	DM7	DM8	DM9	DM10	DM11	DM12	DM13	DM14	DM15	DM16	DM17	DM18	DM19	DM20	DM21	DM22	DM23	DM24
DM7	1.000	.346	.447	.267	.366	.495	.327	.622	.645	.421	.594	.425	.438	.676	.494	.621	.576	.752
DM8	.346	1.000	.364	.259	.619	.480	.434	.450	.537	.350	.377	.042	.380	.398	.342	.201	.403	.316
DM9	.447	.364	1.000	.631	.560	.841	.676	.483	.465	.340	.331	.166	.122	.478	.266	.340	.503	.504
DM10	.267	.259	.631	1.000	.506	.610	.551	.403	.190	.481	.369	.307	-.054	.265	.104	.200	.351	.482
DM11	.366	.619	.560	.506	1.000	.731	.465	.739	.623	.526	.267	.326	.277	.611	.509	.200	.316	.458
DM12	.495	.480	.841	.610	.731	1.000	.719	.629	.412	.370	.380	.277	.230	.549	.295	.297	.555	.504
DM13	.327	.434	.676	.551	.465	.719	1.000	.340	.380	.201	.482	.051	.409	.140	.004	.176	.605	.315
DM14	.622	.450	.483	.403	.739	.629	.340	1.000	.616	.624	.388	.456	.160	.650	.455	.437	.354	.689
DM15	.645	.537	.465	.190	.623	.412	.380	.616	1.000	.493	.596	.211	.505	.590	.533	.503	.492	.524
DM16	.421	.350	.340	.481	.526	.370	.201	.624	.493	1.000	.364	.334	.184	.495	.390	.324	.277	.507
DM17	.594	.377	.331	.369	.267	.380	.482	.388	.596	.364	1.000	.160	.549	.434	.182	.595	.768	.607
DM18	.425	.042	.166	.307	.326	.277	.051	.456	.211	.334	.160	1.000	.103	.437	.566	.284	.131	.493
DM19	.438	.380	.122	-.054	.277	.230	.409	.160	.505	.184	.549	.103	1.000	.443	.238	.401	.531	.293
DM20	.676	.398	.478	.265	.611	.549	.140	.650	.590	.495	.434	.437	.443	1.000	.656	.661	.410	.698
DM21	.494	.342	.266	.104	.509	.295	.004	.455	.533	.390	.182	.566	.238	.656	1.000	.426	.166	.448
DM22	.621	.201	.340	.200	.200	.297	.176	.437	.503	.324	.595	.284	.401	.661	.426	1.000	.561	.704
DM23	.576	.403	.503	.351	.316	.555	.605	.354	.492	.277	.768	.131	.531	.410	.166	.561	1.000	.640
DM24	.752	.316	.504	.482	.458	.504	.315	.689	.524	.507	.607	.493	.293	.698	.448	.704	.640	1.000

**Inter-item covariance matrix**

	DM7	DM8	DM9	DM10	DM11	DM12	DM13	DM14	DM15	DM16	DM17	DM18	DM19	DM20	DM21	DM22	DM23	DM24
DM7	.305	.131	.207	.186	.188	.229	.112	.313	.179	.211	.179	.282	.119	.278	.252	.214	.165	.273
DM8	.131	.473	.210	.225	.396	.276	.186	.282	.186	.218	.141	.035	.129	.204	.217	.086	.144	.143
DM9	.207	.210	.700	.668	.436	.588	.351	.368	.195	.258	.151	.167	.050	.298	.206	.177	.218	.277
DM10	.186	.225	.668	1.598	.595	.645	.432	.464	.121	.551	.254	.466	-.034	.249	.122	.157	.230	.401
DM11	.188	.396	.436	.595	.866	.569	.269	.626	.291	.443	.135	.364	.127	.423	.438	.116	.153	.280
DM12	.229	.276	.588	.645	.569	.700	.373	.479	.173	.280	.173	.278	.095	.342	.228	.155	.241	.277
DM13	.112	.186	.351	.432	.269	.373	.385	.192	.118	.113	.163	.038	.125	.065	.002	.068	.195	.129
DM14	.313	.282	.368	.464	.626	.479	.192	.829	.281	.515	.192	.499	.071	.441	.383	.247	.167	.413
DM15	.179	.186	.195	.121	.291	.173	.118	.281	.252	.224	.163	.127	.125	.220	.247	.157	.128	.173
DM16	.211	.218	.258	.551	.443	.280	.113	.515	.224	.821	.180	.364	.082	.334	.327	.183	.130	.302
DM17	.179	.141	.151	.254	.135	.173	.163	.192	.163	.180	.296	.105	.147	.176	.091	.201	.217	.217
DM18	.282	.035	.167	.466	.364	.278	.038	.499	.127	.364	.105	1.444	.061	.391	.628	.212	.082	.389
DM19	.119	.129	.050	-.034	.127	.095	.125	.071	.125	.082	.147	.061	.242	.162	.108	.123	.135	.095
DM20	.278	.204	.298	.249	.423	.342	.065	.441	.220	.334	.176	.391	.162	.555	.451	.306	.158	.342
DM21	.252	.217	.206	.122	.438	.228	.002	.383	.247	.327	.091	.628	.108	.451	.853	.245	.080	.272
DM22	.214	.086	.177	.157	.116	.155	.068	.247	.157	.183	.201	.212	.123	.306	.245	.387	.181	.288
DM23	.165	.144	.218	.230	.153	.241	.195	.167	.128	.130	.217	.082	.135	.158	.080	.181	.269	.218
DM24	.273	.143	.277	.401	.280	.277	.129	.413	.173	.302	.217	.389	.095	.342	.272	.288	.218	.433

**Summary of item statistics**

	Mean	Min.	Max.	Range	Max./ Min.	Variance	N of items
Item variances	.634	.242	1.598	1.357	6.616	.154	18
Inter-item covariances	.242	-.034	.668	.701	-19.743	.020	18
Inter-item correlations	.425	-.054	.841	.896	-15.454	.030	18

**Scale statistics**

Mean	Variance	Std. Deviation	N of Items
27.07	85.307	9.236	18

**ANOVA with Friedman's test**

		Sum of squares	df	Mean square	Friedman's Chi-square	Sig
Between people		213.267	45	4.739	99.436	.000
Within people	Between items	43.707 <sup>a</sup>	17	2.571		
	Residual	300.016	765	.392		
	Total	343.722	782	.440		
Total		556.989	827	.674		

Grand Mean = 1.50

a. Kendall's coefficient of concordance  $W = .078$ .

**Intraclass correlation coefficient**

	Intraclass correlation <sup>a</sup>	95% Confidence interval		F test with true value 0			
		Lower bound	Upper bound	Value	df1	df2	Sig
Single measures	.381 <sup>b</sup>	.286	.505	12.084	45	765	.000
Average measures	.917 <sup>c</sup>	.878	.948	12.084	45	765	.000

Two-way mixed effects model where people effects are random and measures effects are fixed.

- a. Type C intraclass correlation coefficients using a consistency definition. The between-measure variance is excluded from the denominator variance.
- b. The estimator is the same, whether the interaction effect is present or not.
- c. This estimate is computed assuming the interaction effect is absent, because it is not estimable otherwise.



## Appendix C: Statistics interpretation – demographic data

### Frequencies

Statistics		
Educational level		
N	Valid	46
	Missing	0

Statistics							
		Educational level	Gender	Years of working experience	Job title	Number employees of	Main market
N	Valid	46	46	46	46	46	46
	Missing	0	0	0	0	0	0

Educational level					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Grade 12	13	28.3	28.3	28.3
	Technikon National Diploma	10	21.7	21.7	50.0
	University (B-Tech / Bachelors degree)	13	28.3	28.3	78.3
	Post-graduate	7	15.2	15.2	93.5
	Other	3	6.5	6.5	100.0
	Total	46	100.0	100.0	

Gender					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Male	13	28.3	28.3	28.3
	Female	32	69.6	69.6	97.8
	F	1	2.2	2.2	100.0
	Total	46	100.0	100.0	

Years of working experience					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Less than 1 year	4	8.7	8.7	8.7
	1-5 years	21	45.7	45.7	54.3
	6-10 years	9	19.6	19.6	73.9
	11-15 years	7	15.2	15.2	89.1
	More than 15 years	5	10.9	10.9	100.0
	Total	46	100.0	100.0	

Job title					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	1.	3	6.5	6.5	6.5
	2.	11	23.9	23.9	30.4
	3.	18	39.1	39.1	69.6
	4.	7	15.2	15.2	84.8
	5.	7	15.2	15.2	100.0
	Total	46	100.0	100.0	

Number of employees					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	1.	14	30.4	30.4	30.4
	100~200	17	37.0	37.0	67.4
	201~300	6	13.0	13.0	80.4
	301~400	4	8.7	8.7	89.1
	401~500	2	4.3	4.3	93.5
	More than 500	3	6.5	6.5	100.0
	Total	46	100.0	100.0	

Main market					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	Local	1	2.2	2.2	2.2
	1.	13	28.3	28.3	30.4
	2	32	69.6	69.6	100.0
	Total	46	100.0	100.0	

## Appendix D: Interpretation of statistics

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 126  
 An evaluation of the implementation of FSMS within the wine industry in the Western  
 Cape

08:09 Thursday, October

13, 2011

Obs	Judge Nr	Aspect	Question	Score
1	1	2.2 Main Market for Product	Local	1
2	1	2.2 Main Market for Product	Export	0
3	2	2.2 Main Market for Product	Local	1
4	2	2.2 Main Market for Product	Export	0
5	3	2.2 Main Market for Product	Local	0
6	3	2.2 Main Market for Product	Export	1
7	4	2.2 Main Market for Product	Local	0
8	4	2.2 Main Market for Product	Export	1
9	5	2.2 Main Market for Product	Local	1
10	5	2.2 Main Market for Product	Export	0
11	6	2.2 Main Market for Product	Local	1
12	6	2.2 Main Market for Product	Export	1
13	7	2.2 Main Market for Product	Local	1
14	7	2.2 Main Market for Product	Export	1
15	8	2.2 Main Market for Product	Local	1
16	8	2.2 Main Market for Product	Export	1
17	9	2.2 Main Market for Product	Local	1
18	9	2.2 Main Market for Product	Export	1
19	10	2.2 Main Market for Product	Local	0
20	10	2.2 Main Market for Product	Export	1
21	11	2.2 Main Market for Product	Local	0
22	11	2.2 Main Market for Product	Export	1
23	12	2.2 Main Market for Product	Local	1
24	12	2.2 Main Market for Product	Export	1
25	13	2.2 Main Market for Product	Local	0
26	13	2.2 Main Market for Product	Export	1
27	14	2.2 Main Market for Product	Local	1
28	14	2.2 Main Market for Product	Export	0
29	15	2.2 Main Market for Product	Local	1
30	15	2.2 Main Market for Product	Export	0
31	16	2.2 Main Market for Product	Local	1
32	16	2.2 Main Market for Product	Export	1
33	17	2.2 Main Market for Product	Local	1
34	17	2.2 Main Market for Product	Export	1
35	18	2.2 Main Market for Product	Local	0
36	18	2.2 Main Market for Product	Export	1
37	19	2.2 Main Market for Product	Local	1
38	19	2.2 Main Market for Product	Export	1
39	20	2.2 Main Market for Product	Local	1
40	20	2.2 Main Market for Product	Export	1
41	21	2.2 Main Market for Product	Local	1
42	21	2.2 Main Market for Product	Export	1
43	22	2.2 Main Market for Product	Local	1
44	22	2.2 Main Market for Product	Export	0
45	23	2.2 Main Market for Product	Local	1
46	23	2.2 Main Market for Product	Export	0
47	24	2.2 Main Market for Product	Local	1
48	24	2.2 Main Market for Product	Export	1
49	25	2.2 Main Market for Product	Local	1
50	25	2.2 Main Market for Product	Export	1
51	26	2.2 Main Market for Product	Local	1
52	26	2.2 Main Market for Product	Export	1
53	27	2.2 Main Market for Product	Local	1
54	27	2.2 Main Market for Product	Export	1
55	28	2.2 Main Market for Product	Local	1
56	28	2.2 Main Market for Product	Export	1
57	29	2.2 Main Market for Product	Local	1
58	29	2.2 Main Market for Product	Export	1
59	30	2.2 Main Market for Product	Local	1

60	30	2.2 Main Market for Product	Export	0
61	31	2.2 Main Market for Product	Local	1
62	31	2.2 Main Market for Product	Export	0
63	32	2.2 Main Market for Product	Local	1
64	32	2.2 Main Market for Product	Export	0
65	33	2.2 Main Market for Product	Local	1
66	33	2.2 Main Market for Product	Export	0
67	34	2.2 Main Market for Product	Local	1
68	34	2.2 Main Market for Product	Export	0
69	35	2.2 Main Market for Product	Local	1
70	35	2.2 Main Market for Product	Export	0
71	36	2.2 Main Market for Product	Local	1
72	36	2.2 Main Market for Product	Export	1
73	37	2.2 Main Market for Product	Local	1
74	37	2.2 Main Market for Product	Export	1
75	38	2.2 Main Market for Product	Local	0
76	38	2.2 Main Market for Product	Export	1
77	39	2.2 Main Market for Product	Local	1
78	39	2.2 Main Market for Product	Export	1
79	40	2.2 Main Market for Product	Local	1
80	40	2.2 Main Market for Product	Export	1
81	41	2.2 Main Market for Product	Local	1
82	41	2.2 Main Market for Product	Export	1
83	42	2.2 Main Market for Product	Local	1
84	42	2.2 Main Market for Product	Export	0
85	43	2.2 Main Market for Product	Local	1
86	43	2.2 Main Market for Product	Export	1
87	44	2.2 Main Market for Product	Local	1
88	44	2.2 Main Market for Product	Export	1
89	45	2.2 Main Market for Product	Local	1
90	45	2.2 Main Market for Product	Export	1
91	46	2.2 Main Market for Product	Local	1
92	46	2.2 Main Market for Product	Export	1
93	1	2.3 Activities on Product Inf	Wine-making	1
94	1	2.3 Activities on Product Inf	Bottling	1
95	1	2.3 Activities on Product Inf	DistrStores	0
96	1	2.3 Activities on Product Inf	Marketing	0
97	1	2.3 Activities on Product Inf	Other_Act	0
98	2	2.3 Activities on Product Inf	Wine-making	0
99	2	2.3 Activities on Product Inf	Bottling	0
100	2	2.3 Activities on Product Inf	DistrStores	0
101	2	2.3 Activities on Product Inf	Marketing	0
102	2	2.3 Activities on Product Inf	Other_Act	1
103	3	2.3 Activities on Product Inf	Wine-making	1
104	3	2.3 Activities on Product Inf	Bottling	1
105	3	2.3 Activities on Product Inf	DistrStores	0
106	3	2.3 Activities on Product Inf	Marketing	0
107	3	2.3 Activities on Product Inf	Other_Act	0
108	4	2.3 Activities on Product Inf	Wine-making	1
109	4	2.3 Activities on Product Inf	Bottling	1
110	4	2.3 Activities on Product Inf	DistrStores	0
111	4	2.3 Activities on Product Inf	Marketing	0
112	4	2.3 Activities on Product Inf	Other_Act	0
113	5	2.3 Activities on Product Inf	Wine-making	0
114	5	2.3 Activities on Product Inf	Bottling	1
115	5	2.3 Activities on Product Inf	DistrStores	1
116	5	2.3 Activities on Product Inf	Marketing	0
117	5	2.3 Activities on Product Inf	Other_Act	0
118	6	2.3 Activities on Product Inf	Wine-making	1
119	6	2.3 Activities on Product Inf	Bottling	1
120	6	2.3 Activities on Product Inf	DistrStores	1
121	6	2.3 Activities on Product Inf	Marketing	0
122	6	2.3 Activities on Product Inf	Other_Act	0
123	7	2.3 Activities on Product Inf	Wine-making	1
124	7	2.3 Activities on Product Inf	Bottling	1
125	7	2.3 Activities on Product Inf	DistrStores	0
126	7	2.3 Activities on Product Inf	Marketing	0
127	7	2.3 Activities on Product Inf	Other_Act	0
128	8	2.3 Activities on Product Inf	Wine-making	1
129	8	2.3 Activities on Product Inf	Bottling	1
130	8	2.3 Activities on Product Inf	DistrStores	1

131	8	2.3 Activities on Product Inf	Marketing	0
132	8	2.3 Activities on Product Inf	Other_Act	0
133	9	2.3 Activities on Product Inf	Wine-making	1
134	9	2.3 Activities on Product Inf	Bottling	0
135	9	2.3 Activities on Product Inf	DistrStores	0
136	9	2.3 Activities on Product Inf	Marketing	0
137	9	2.3 Activities on Product Inf	Other_Act	0
138	10	2.3 Activities on Product Inf	Wine-making	1
139	10	2.3 Activities on Product Inf	Bottling	1
140	10	2.3 Activities on Product Inf	DistrStores	1
141	10	2.3 Activities on Product Inf	Marketing	1
142	10	2.3 Activities on Product Inf	Other_Act	0
143	11	2.3 Activities on Product Inf	Wine-making	1
144	11	2.3 Activities on Product Inf	Bottling	1
145	11	2.3 Activities on Product Inf	DistrStores	0
146	11	2.3 Activities on Product Inf	Marketing	1
147	11	2.3 Activities on Product Inf	Other_Act	0
148	12	2.3 Activities on Product Inf	Wine-making	1
149	12	2.3 Activities on Product Inf	Bottling	1
150	12	2.3 Activities on Product Inf	DistrStores	1
151	12	2.3 Activities on Product Inf	Marketing	1
152	12	2.3 Activities on Product Inf	Other_Act	1
153	13	2.3 Activities on Product Inf	Wine-making	0
154	13	2.3 Activities on Product Inf	Bottling	1
155	13	2.3 Activities on Product Inf	DistrStores	0
156	13	2.3 Activities on Product Inf	Marketing	0
157	13	2.3 Activities on Product Inf	Other_Act	0
158	14	2.3 Activities on Product Inf	Wine-making	0
159	14	2.3 Activities on Product Inf	Bottling	1
160	14	2.3 Activities on Product Inf	DistrStores	0
161	14	2.3 Activities on Product Inf	Marketing	0
162	14	2.3 Activities on Product Inf	Other_Act	0
163	15	2.3 Activities on Product Inf	Wine-making	0
164	15	2.3 Activities on Product Inf	Bottling	1
165	15	2.3 Activities on Product Inf	DistrStores	0
166	15	2.3 Activities on Product Inf	Marketing	0
167	15	2.3 Activities on Product Inf	Other_Act	0
168	16	2.3 Activities on Product Inf	Wine-making	1
169	16	2.3 Activities on Product Inf	Bottling	1
170	16	2.3 Activities on Product Inf	DistrStores	1
171	16	2.3 Activities on Product Inf	Marketing	1
172	16	2.3 Activities on Product Inf	Other_Act	0
173	17	2.3 Activities on Product Inf	Wine-making	1
174	17	2.3 Activities on Product Inf	Bottling	1
175	17	2.3 Activities on Product Inf	DistrStores	1
176	17	2.3 Activities on Product Inf	Marketing	1
177	17	2.3 Activities on Product Inf	Other_Act	0
178	18	2.3 Activities on Product Inf	Wine-making	1
179	18	2.3 Activities on Product Inf	Bottling	1
180	18	2.3 Activities on Product Inf	DistrStores	1
181	18	2.3 Activities on Product Inf	Marketing	1
182	18	2.3 Activities on Product Inf	Other_Act	0
183	19	2.3 Activities on Product Inf	Wine-making	1
184	19	2.3 Activities on Product Inf	Bottling	1
185	19	2.3 Activities on Product Inf	DistrStores	1
186	19	2.3 Activities on Product Inf	Marketing	1
187	19	2.3 Activities on Product Inf	Other_Act	0
188	20	2.3 Activities on Product Inf	Wine-making	1
189	20	2.3 Activities on Product Inf	Bottling	1
190	20	2.3 Activities on Product Inf	DistrStores	1
191	20	2.3 Activities on Product Inf	Marketing	1
192	20	2.3 Activities on Product Inf	Other_Act	0
193	21	2.3 Activities on Product Inf	Wine-making	1
194	21	2.3 Activities on Product Inf	Bottling	1
195	21	2.3 Activities on Product Inf	DistrStores	1
196	21	2.3 Activities on Product Inf	Marketing	1
197	21	2.3 Activities on Product Inf	Other_Act	0
198	22	2.3 Activities on Product Inf	Wine-making	0
199	22	2.3 Activities on Product Inf	Bottling	0
200	22	2.3 Activities on Product Inf	DistrStores	0
201	22	2.3 Activities on Product Inf	Marketing	0

202	22	2.3 Activities on Product Inf	Other_Act	1
203	23	2.3 Activities on Product Inf	Wine-making	0
204	23	2.3 Activities on Product Inf	Bottling	0
205	23	2.3 Activities on Product Inf	DistrStores	0
206	23	2.3 Activities on Product Inf	Marketing	0
207	23	2.3 Activities on Product Inf	Other_Act	1
208	24	2.3 Activities on Product Inf	Wine-making	0
209	24	2.3 Activities on Product Inf	Bottling	1
210	24	2.3 Activities on Product Inf	DistrStores	0
211	24	2.3 Activities on Product Inf	Marketing	0
212	24	2.3 Activities on Product Inf	Other_Act	0
213	25	2.3 Activities on Product Inf	Wine-making	1
214	25	2.3 Activities on Product Inf	Bottling	0
215	25	2.3 Activities on Product Inf	DistrStores	0
216	25	2.3 Activities on Product Inf	Marketing	0
217	25	2.3 Activities on Product Inf	Other_Act	0
218	26	2.3 Activities on Product Inf	Wine-making	1
219	26	2.3 Activities on Product Inf	Bottling	1
220	26	2.3 Activities on Product Inf	DistrStores	0
221	26	2.3 Activities on Product Inf	Marketing	1
222	26	2.3 Activities on Product Inf	Other_Act	0
223	27	2.3 Activities on Product Inf	Wine-making	1
224	27	2.3 Activities on Product Inf	Bottling	1
225	27	2.3 Activities on Product Inf	DistrStores	1
226	27	2.3 Activities on Product Inf	Marketing	1
227	27	2.3 Activities on Product Inf	Other_Act	0
228	28	2.3 Activities on Product Inf	Wine-making	1
229	28	2.3 Activities on Product Inf	Bottling	0
230	28	2.3 Activities on Product Inf	DistrStores	0
231	28	2.3 Activities on Product Inf	Marketing	0
232	28	2.3 Activities on Product Inf	Other_Act	0
233	29	2.3 Activities on Product Inf	Wine-making	1
234	29	2.3 Activities on Product Inf	Bottling	0
235	29	2.3 Activities on Product Inf	DistrStores	0
236	29	2.3 Activities on Product Inf	Marketing	0
237	29	2.3 Activities on Product Inf	Other_Act	0
238	30	2.3 Activities on Product Inf	Wine-making	1
239	30	2.3 Activities on Product Inf	Bottling	1
240	30	2.3 Activities on Product Inf	DistrStores	1
241	30	2.3 Activities on Product Inf	Marketing	1
242	30	2.3 Activities on Product Inf	Other_Act	0
243	31	2.3 Activities on Product Inf	Wine-making	1
244	31	2.3 Activities on Product Inf	Bottling	1
245	31	2.3 Activities on Product Inf	DistrStores	1
246	31	2.3 Activities on Product Inf	Marketing	1
247	31	2.3 Activities on Product Inf	Other_Act	0
248	32	2.3 Activities on Product Inf	Wine-making	1
249	32	2.3 Activities on Product Inf	Bottling	1
250	32	2.3 Activities on Product Inf	DistrStores	1
251	32	2.3 Activities on Product Inf	Marketing	1
252	32	2.3 Activities on Product Inf	Other_Act	0
253	33	2.3 Activities on Product Inf	Wine-making	1
254	33	2.3 Activities on Product Inf	Bottling	1
255	33	2.3 Activities on Product Inf	DistrStores	1
256	33	2.3 Activities on Product Inf	Marketing	1
257	33	2.3 Activities on Product Inf	Other_Act	1
258	34	2.3 Activities on Product Inf	Wine-making	1
259	34	2.3 Activities on Product Inf	Bottling	1
260	34	2.3 Activities on Product Inf	DistrStores	1
261	34	2.3 Activities on Product Inf	Marketing	1
262	34	2.3 Activities on Product Inf	Other_Act	1
263	35	2.3 Activities on Product Inf	Wine-making	1
264	35	2.3 Activities on Product Inf	Bottling	1
265	35	2.3 Activities on Product Inf	DistrStores	0
266	35	2.3 Activities on Product Inf	Marketing	0
267	35	2.3 Activities on Product Inf	Other_Act	0
268	36	2.3 Activities on Product Inf	Wine-making	0
269	36	2.3 Activities on Product Inf	Bottling	0
270	36	2.3 Activities on Product Inf	DistrStores	0
271	36	2.3 Activities on Product Inf	Marketing	0
272	36	2.3 Activities on Product Inf	Other_Act	1

273	37	2.3 Activities on Product Inf	Wine-making	1
274	37	2.3 Activities on Product Inf	Bottling	1
275	37	2.3 Activities on Product Inf	DistrStores	1
276	37	2.3 Activities on Product Inf	Marketing	1
277	37	2.3 Activities on Product Inf	Other_Act	0
278	38	2.3 Activities on Product Inf	Wine-making	0
279	38	2.3 Activities on Product Inf	Bottling	1
280	38	2.3 Activities on Product Inf	DistrStores	1
281	38	2.3 Activities on Product Inf	Marketing	0
282	38	2.3 Activities on Product Inf	Other_Act	0
283	39	2.3 Activities on Product Inf	Wine-making	1
284	39	2.3 Activities on Product Inf	Bottling	1
285	39	2.3 Activities on Product Inf	DistrStores	1
286	39	2.3 Activities on Product Inf	Marketing	0
287	39	2.3 Activities on Product Inf	Other_Act	0
288	40	2.3 Activities on Product Inf	Wine-making	1
289	40	2.3 Activities on Product Inf	Bottling	1
290	40	2.3 Activities on Product Inf	DistrStores	1
291	40	2.3 Activities on Product Inf	Marketing	1
292	40	2.3 Activities on Product Inf	Other_Act	0
293	41	2.3 Activities on Product Inf	Wine-making	1
294	41	2.3 Activities on Product Inf	Bottling	1
295	41	2.3 Activities on Product Inf	DistrStores	1
296	41	2.3 Activities on Product Inf	Marketing	1
297	41	2.3 Activities on Product Inf	Other_Act	1
298	42	2.3 Activities on Product Inf	Wine-making	1
299	42	2.3 Activities on Product Inf	Bottling	1
300	42	2.3 Activities on Product Inf	DistrStores	0
301	42	2.3 Activities on Product Inf	Marketing	0
302	42	2.3 Activities on Product Inf	Other_Act	0
303	43	2.3 Activities on Product Inf	Wine-making	1
304	43	2.3 Activities on Product Inf	Bottling	1
305	43	2.3 Activities on Product Inf	DistrStores	1
306	43	2.3 Activities on Product Inf	Marketing	1
307	43	2.3 Activities on Product Inf	Other_Act	0
308	44	2.3 Activities on Product Inf	Wine-making	0
309	44	2.3 Activities on Product Inf	Bottling	0
310	44	2.3 Activities on Product Inf	DistrStores	0
311	44	2.3 Activities on Product Inf	Marketing	0
312	44	2.3 Activities on Product Inf	Other_Act	1
313	45	2.3 Activities on Product Inf	Wine-making	1
314	45	2.3 Activities on Product Inf	Bottling	0
315	45	2.3 Activities on Product Inf	DistrStores	0
316	45	2.3 Activities on Product Inf	Marketing	0
317	45	2.3 Activities on Product Inf	Other_Act	0
318	46	2.3 Activities on Product Inf	Wine-making	1
319	46	2.3 Activities on Product Inf	Bottling	1
320	46	2.3 Activities on Product Inf	DistrStores	1
321	46	2.3 Activities on Product Inf	Marketing	1
322	46	2.3 Activities on Product Inf	Other_Act	0
323	1	2.4 Organisation Certified fo	ISO_9001_2008	1
324	1	2.4 Organisation Certified fo	ISO_22000_2005	0
325	1	2.4 Organisation Certified fo	HACCP	1
326	1	2.4 Organisation Certified fo	BRC	1
327	1	2.4 Organisation Certified fo	IMS	0
328	1	2.4 Organisation Certified fo	Other_Cert	1
329	2	2.4 Organisation Certified fo	ISO_9001_2008	1
330	2	2.4 Organisation Certified fo	ISO_22000_2005	0
331	2	2.4 Organisation Certified fo	HACCP	0
332	2	2.4 Organisation Certified fo	BRC	1
333	2	2.4 Organisation Certified fo	IMS	0
334	2	2.4 Organisation Certified fo	Other_Cert	1
335	3	2.4 Organisation Certified fo	ISO_9001_2008	1
336	3	2.4 Organisation Certified fo	ISO_22000_2005	0
337	3	2.4 Organisation Certified fo	HACCP	1
338	3	2.4 Organisation Certified fo	BRC	1
339	3	2.4 Organisation Certified fo	IMS	0
340	3	2.4 Organisation Certified fo	Other_Cert	1
341	4	2.4 Organisation Certified fo	ISO_9001_2008	0
342	4	2.4 Organisation Certified fo	ISO_22000_2005	0
343	4	2.4 Organisation Certified fo	HACCP	1

344	4	2.4 Organisation Certified fo	BRC	1
345	4	2.4 Organisation Certified fo	IMS	0
346	4	2.4 Organisation Certified fo	Other_Cert	0
347	5	2.4 Organisation Certified fo	ISO_9001_2008	0
348	5	2.4 Organisation Certified fo	ISO_22000_2005	0
349	5	2.4 Organisation Certified fo	HACCP	0
350	5	2.4 Organisation Certified fo	BRC	1
351	5	2.4 Organisation Certified fo	IMS	0
352	5	2.4 Organisation Certified fo	Other_Cert	0
353	6	2.4 Organisation Certified fo	ISO_9001_2008	1
354	6	2.4 Organisation Certified fo	ISO_22000_2005	0
355	6	2.4 Organisation Certified fo	HACCP	1
356	6	2.4 Organisation Certified fo	BRC	1
357	6	2.4 Organisation Certified fo	IMS	0
358	6	2.4 Organisation Certified fo	Other_Cert	0
359	7	2.4 Organisation Certified fo	ISO_9001_2008	1
360	7	2.4 Organisation Certified fo	ISO_22000_2005	0
361	7	2.4 Organisation Certified fo	HACCP	1
362	7	2.4 Organisation Certified fo	BRC	1
363	7	2.4 Organisation Certified fo	IMS	0
364	7	2.4 Organisation Certified fo	Other_Cert	0
365	8	2.4 Organisation Certified fo	ISO_9001_2008	0
366	8	2.4 Organisation Certified fo	ISO_22000_2005	0
367	8	2.4 Organisation Certified fo	HACCP	1
368	8	2.4 Organisation Certified fo	BRC	0
369	8	2.4 Organisation Certified fo	IMS	0
370	8	2.4 Organisation Certified fo	Other_Cert	0
371	9	2.4 Organisation Certified fo	ISO_9001_2008	1
372	9	2.4 Organisation Certified fo	ISO_22000_2005	0
373	9	2.4 Organisation Certified fo	HACCP	1
374	9	2.4 Organisation Certified fo	BRC	1
375	9	2.4 Organisation Certified fo	IMS	0
376	9	2.4 Organisation Certified fo	Other_Cert	0
377	10	2.4 Organisation Certified fo	ISO_9001_2008	1
378	10	2.4 Organisation Certified fo	ISO_22000_2005	1
379	10	2.4 Organisation Certified fo	HACCP	0
380	10	2.4 Organisation Certified fo	BRC	1
381	10	2.4 Organisation Certified fo	IMS	1
382	10	2.4 Organisation Certified fo	Other_Cert	1
383	11	2.4 Organisation Certified fo	ISO_9001_2008	1
384	11	2.4 Organisation Certified fo	ISO_22000_2005	1
385	11	2.4 Organisation Certified fo	HACCP	0
386	11	2.4 Organisation Certified fo	BRC	1
387	11	2.4 Organisation Certified fo	IMS	1
388	11	2.4 Organisation Certified fo	Other_Cert	1
389	12	2.4 Organisation Certified fo	ISO_9001_2008	1
390	12	2.4 Organisation Certified fo	ISO_22000_2005	1
391	12	2.4 Organisation Certified fo	HACCP	1
392	12	2.4 Organisation Certified fo	BRC	1
393	12	2.4 Organisation Certified fo	IMS	1
394	12	2.4 Organisation Certified fo	Other_Cert	1
395	13	2.4 Organisation Certified fo	ISO_9001_2008	0
396	13	2.4 Organisation Certified fo	ISO_22000_2005	0
397	13	2.4 Organisation Certified fo	HACCP	0
398	13	2.4 Organisation Certified fo	BRC	1
399	13	2.4 Organisation Certified fo	IMS	0
400	13	2.4 Organisation Certified fo	Other_Cert	0
401	14	2.4 Organisation Certified fo	ISO_9001_2008	0
402	14	2.4 Organisation Certified fo	ISO_22000_2005	0
403	14	2.4 Organisation Certified fo	HACCP	0
404	14	2.4 Organisation Certified fo	BRC	1
405	14	2.4 Organisation Certified fo	IMS	0
406	14	2.4 Organisation Certified fo	Other_Cert	0
407	15	2.4 Organisation Certified fo	ISO_9001_2008	0
408	15	2.4 Organisation Certified fo	ISO_22000_2005	0
409	15	2.4 Organisation Certified fo	HACCP	1
410	15	2.4 Organisation Certified fo	BRC	0
411	15	2.4 Organisation Certified fo	IMS	0
412	15	2.4 Organisation Certified fo	Other_Cert	0
413	16	2.4 Organisation Certified fo	ISO_9001_2008	1
414	16	2.4 Organisation Certified fo	ISO_22000_2005	0



415	16	2.4 Organisation Certified fo	HACCP	0
416	16	2.4 Organisation Certified fo	BRC	1
417	16	2.4 Organisation Certified fo	IMS	0
418	16	2.4 Organisation Certified fo	Other_Cert	0
419	17	2.4 Organisation Certified fo	ISO_9001_2008	1
420	17	2.4 Organisation Certified fo	ISO_22000_2005	0
421	17	2.4 Organisation Certified fo	HACCP	0
422	17	2.4 Organisation Certified fo	BRC	1
423	17	2.4 Organisation Certified fo	IMS	0
424	17	2.4 Organisation Certified fo	Other_Cert	1
425	18	2.4 Organisation Certified fo	ISO_9001_2008	1
426	18	2.4 Organisation Certified fo	ISO_22000_2005	0
427	18	2.4 Organisation Certified fo	HACCP	0
428	18	2.4 Organisation Certified fo	BRC	1
429	18	2.4 Organisation Certified fo	IMS	0
430	18	2.4 Organisation Certified fo	Other_Cert	0
431	19	2.4 Organisation Certified fo	ISO_9001_2008	1
432	19	2.4 Organisation Certified fo	ISO_22000_2005	0
433	19	2.4 Organisation Certified fo	HACCP	0
434	19	2.4 Organisation Certified fo	BRC	1
435	19	2.4 Organisation Certified fo	IMS	0
436	19	2.4 Organisation Certified fo	Other_Cert	0
437	20	2.4 Organisation Certified fo	ISO_9001_2008	1
438	20	2.4 Organisation Certified fo	ISO_22000_2005	0
439	20	2.4 Organisation Certified fo	HACCP	1
440	20	2.4 Organisation Certified fo	BRC	0
441	20	2.4 Organisation Certified fo	IMS	0
442	20	2.4 Organisation Certified fo	Other_Cert	0
443	21	2.4 Organisation Certified fo	ISO_9001_2008	1
444	21	2.4 Organisation Certified fo	ISO_22000_2005	0
445	21	2.4 Organisation Certified fo	HACCP	0
446	21	2.4 Organisation Certified fo	BRC	1
447	21	2.4 Organisation Certified fo	IMS	0
448	21	2.4 Organisation Certified fo	Other_Cert	1
449	22	2.4 Organisation Certified fo	ISO_9001_2008	1
450	22	2.4 Organisation Certified fo	ISO_22000_2005	0
451	22	2.4 Organisation Certified fo	HACCP	1
452	22	2.4 Organisation Certified fo	BRC	1
453	22	2.4 Organisation Certified fo	IMS	0
454	22	2.4 Organisation Certified fo	Other_Cert	1
455	23	2.4 Organisation Certified fo	ISO_9001_2008	1
456	23	2.4 Organisation Certified fo	ISO_22000_2005	0
457	23	2.4 Organisation Certified fo	HACCP	1
458	23	2.4 Organisation Certified fo	BRC	1
459	23	2.4 Organisation Certified fo	IMS	0
460	23	2.4 Organisation Certified fo	Other_Cert	1
461	24	2.4 Organisation Certified fo	ISO_9001_2008	0
462	24	2.4 Organisation Certified fo	ISO_22000_2005	1
463	24	2.4 Organisation Certified fo	HACCP	0
464	24	2.4 Organisation Certified fo	BRC	1
465	24	2.4 Organisation Certified fo	IMS	0
466	24	2.4 Organisation Certified fo	Other_Cert	0
467	25	2.4 Organisation Certified fo	ISO_9001_2008	0
468	25	2.4 Organisation Certified fo	ISO_22000_2005	1
469	25	2.4 Organisation Certified fo	HACCP	0
470	25	2.4 Organisation Certified fo	BRC	0
471	25	2.4 Organisation Certified fo	IMS	0
472	25	2.4 Organisation Certified fo	Other_Cert	0
473	26	2.4 Organisation Certified fo	ISO_9001_2008	0
474	26	2.4 Organisation Certified fo	ISO_22000_2005	1
475	26	2.4 Organisation Certified fo	HACCP	0
476	26	2.4 Organisation Certified fo	BRC	0
477	26	2.4 Organisation Certified fo	IMS	0
478	26	2.4 Organisation Certified fo	Other_Cert	1
479	27	2.4 Organisation Certified fo	ISO_9001_2008	0
480	27	2.4 Organisation Certified fo	ISO_22000_2005	0
481	27	2.4 Organisation Certified fo	HACCP	0
482	27	2.4 Organisation Certified fo	BRC	0
483	27	2.4 Organisation Certified fo	IMS	0
484	27	2.4 Organisation Certified fo	Other_Cert	1
485	28	2.4 Organisation Certified fo	ISO_9001_2008	1

486	28	2.4 Organisation Certified fo	ISO_22000_2005	0
487	28	2.4 Organisation Certified fo	HACCP	0
488	28	2.4 Organisation Certified fo	BRC	0
489	28	2.4 Organisation Certified fo	IMS	0
490	28	2.4 Organisation Certified fo	Other_Cert	1
491	29	2.4 Organisation Certified fo	ISO_9001_2008	1
492	29	2.4 Organisation Certified fo	ISO_22000_2005	0
493	29	2.4 Organisation Certified fo	HACCP	0
494	29	2.4 Organisation Certified fo	BRC	0
495	29	2.4 Organisation Certified fo	IMS	0
496	29	2.4 Organisation Certified fo	Other_Cert	0
497	30	2.4 Organisation Certified fo	ISO_9001_2008	0
498	30	2.4 Organisation Certified fo	ISO_22000_2005	0
499	30	2.4 Organisation Certified fo	HACCP	1
500	30	2.4 Organisation Certified fo	BRC	1
501	30	2.4 Organisation Certified fo	IMS	0
502	30	2.4 Organisation Certified fo	Other_Cert	0
503	31	2.4 Organisation Certified fo	ISO_9001_2008	1
504	31	2.4 Organisation Certified fo	ISO_22000_2005	0
505	31	2.4 Organisation Certified fo	HACCP	1
506	31	2.4 Organisation Certified fo	BRC	1
507	31	2.4 Organisation Certified fo	IMS	1
508	31	2.4 Organisation Certified fo	Other_Cert	1
509	32	2.4 Organisation Certified fo	ISO_9001_2008	1
510	32	2.4 Organisation Certified fo	ISO_22000_2005	0
511	32	2.4 Organisation Certified fo	HACCP	1
512	32	2.4 Organisation Certified fo	BRC	0
513	32	2.4 Organisation Certified fo	IMS	0
514	32	2.4 Organisation Certified fo	Other_Cert	0
515	33	2.4 Organisation Certified fo	ISO_9001_2008	0
516	33	2.4 Organisation Certified fo	ISO_22000_2005	0
517	33	2.4 Organisation Certified fo	HACCP	1
518	33	2.4 Organisation Certified fo	BRC	1
519	33	2.4 Organisation Certified fo	IMS	0
520	33	2.4 Organisation Certified fo	Other_Cert	0
521	34	2.4 Organisation Certified fo	ISO_9001_2008	0
522	34	2.4 Organisation Certified fo	ISO_22000_2005	1
523	34	2.4 Organisation Certified fo	HACCP	0
524	34	2.4 Organisation Certified fo	BRC	1
525	34	2.4 Organisation Certified fo	IMS	0
526	34	2.4 Organisation Certified fo	Other_Cert	0
527	35	2.4 Organisation Certified fo	ISO_9001_2008	1
528	35	2.4 Organisation Certified fo	ISO_22000_2005	0
529	35	2.4 Organisation Certified fo	HACCP	0
530	35	2.4 Organisation Certified fo	BRC	0
531	35	2.4 Organisation Certified fo	IMS	0
532	35	2.4 Organisation Certified fo	Other_Cert	0
533	36	2.4 Organisation Certified fo	ISO_9001_2008	0
534	36	2.4 Organisation Certified fo	ISO_22000_2005	0
535	36	2.4 Organisation Certified fo	HACCP	0
536	36	2.4 Organisation Certified fo	BRC	1
537	36	2.4 Organisation Certified fo	IMS	0
538	36	2.4 Organisation Certified fo	Other_Cert	0
539	37	2.4 Organisation Certified fo	ISO_9001_2008	0
540	37	2.4 Organisation Certified fo	ISO_22000_2005	0
541	37	2.4 Organisation Certified fo	HACCP	0
542	37	2.4 Organisation Certified fo	BRC	1
543	37	2.4 Organisation Certified fo	IMS	0
544	37	2.4 Organisation Certified fo	Other_Cert	0
545	38	2.4 Organisation Certified fo	ISO_9001_2008	1
546	38	2.4 Organisation Certified fo	ISO_22000_2005	0
547	38	2.4 Organisation Certified fo	HACCP	1
548	38	2.4 Organisation Certified fo	BRC	1
549	38	2.4 Organisation Certified fo	IMS	0
550	38	2.4 Organisation Certified fo	Other_Cert	1
551	39	2.4 Organisation Certified fo	ISO_9001_2008	1
552	39	2.4 Organisation Certified fo	ISO_22000_2005	0
553	39	2.4 Organisation Certified fo	HACCP	1
554	39	2.4 Organisation Certified fo	BRC	1
555	39	2.4 Organisation Certified fo	IMS	0
556	39	2.4 Organisation Certified fo	Other_Cert	1

557	40	2.4 Organisation Certified fo	ISO_9001_2008	1
558	40	2.4 Organisation Certified fo	ISO_22000_2005	0
559	40	2.4 Organisation Certified fo	HACCP	0
560	40	2.4 Organisation Certified fo	BRC	1
561	40	2.4 Organisation Certified fo	IMS	0
562	40	2.4 Organisation Certified fo	Other_Cert	1
563	41	2.4 Organisation Certified fo	ISO_9001_2008	1
564	41	2.4 Organisation Certified fo	ISO_22000_2005	0
565	41	2.4 Organisation Certified fo	HACCP	1
566	41	2.4 Organisation Certified fo	BRC	1
567	41	2.4 Organisation Certified fo	IMS	0
568	41	2.4 Organisation Certified fo	Other_Cert	1
569	42	2.4 Organisation Certified fo	ISO_9001_2008	1
570	42	2.4 Organisation Certified fo	ISO_22000_2005	0
571	42	2.4 Organisation Certified fo	HACCP	1
572	42	2.4 Organisation Certified fo	BRC	1
573	42	2.4 Organisation Certified fo	IMS	0
574	42	2.4 Organisation Certified fo	Other_Cert	1
575	43	2.4 Organisation Certified fo	ISO_9001_2008	1
576	43	2.4 Organisation Certified fo	ISO_22000_2005	0
577	43	2.4 Organisation Certified fo	HACCP	0
578	43	2.4 Organisation Certified fo	BRC	1
579	43	2.4 Organisation Certified fo	IMS	0
580	43	2.4 Organisation Certified fo	Other_Cert	1
581	44	2.4 Organisation Certified fo	ISO_9001_2008	1
582	44	2.4 Organisation Certified fo	ISO_22000_2005	0
583	44	2.4 Organisation Certified fo	HACCP	0
584	44	2.4 Organisation Certified fo	BRC	1
585	44	2.4 Organisation Certified fo	IMS	0
586	44	2.4 Organisation Certified fo	Other_Cert	1
587	45	2.4 Organisation Certified fo	ISO_9001_2008	0
588	45	2.4 Organisation Certified fo	ISO_22000_2005	0
589	45	2.4 Organisation Certified fo	HACCP	0
590	45	2.4 Organisation Certified fo	BRC	1
591	45	2.4 Organisation Certified fo	IMS	0
592	45	2.4 Organisation Certified fo	Other_Cert	1
593	46	2.4 Organisation Certified fo	ISO_9001_2008	1
594	46	2.4 Organisation Certified fo	ISO_22000_2005	0
595	46	2.4 Organisation Certified fo	HACCP	1
596	46	2.4 Organisation Certified fo	BRC	1
597	46	2.4 Organisation Certified fo	IMS	0
598	46	2.4 Organisation Certified fo	Other_Cert	0
599	1	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
600	1	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
601	1	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
602	1	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
603	1	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
604	1	2.5 Audit Criteria Used by Or	Other_AC	1
605	2	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
606	2	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
607	2	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
608	2	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
609	2	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
610	2	2.5 Audit Criteria Used by Or	Other_AC	0
611	3	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
612	3	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
613	3	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
614	3	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
615	3	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
616	3	2.5 Audit Criteria Used by Or	Other_AC	1
617	4	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
618	4	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
619	4	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
620	4	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
621	4	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
622	4	2.5 Audit Criteria Used by Or	Other_AC	0
623	5	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
624	5	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
625	5	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
626	5	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
627	5	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0

628	5	2.5 Audit Criteria Used by Or	Other AC	0
629	6	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
630	6	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
631	6	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
632	6	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
633	6	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
634	6	2.5 Audit Criteria Used by Or	Other AC	0
635	7	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
636	7	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
637	7	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
638	7	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
639	7	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
640	7	2.5 Audit Criteria Used by Or	Other AC	0
641	8	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
642	8	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
643	8	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
644	8	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
645	8	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
646	8	2.5 Audit Criteria Used by Or	Other AC	1
647	9	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
648	9	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
649	9	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
650	9	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
651	9	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
652	9	2.5 Audit Criteria Used by Or	Other AC	0
653	10	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
654	10	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	1
655	10	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
656	10	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
657	10	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
658	10	2.5 Audit Criteria Used by Or	Other AC	1
659	11	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
660	11	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	1
661	11	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
662	11	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
663	11	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
664	11	2.5 Audit Criteria Used by Or	Other AC	0
665	12	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
666	12	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	1
667	12	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
668	12	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
669	12	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
670	12	2.5 Audit Criteria Used by Or	Other AC	1
671	13	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
672	13	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
673	13	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
674	13	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
675	13	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
676	13	2.5 Audit Criteria Used by Or	Other AC	0
677	14	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
678	14	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
679	14	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
680	14	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
681	14	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
682	14	2.5 Audit Criteria Used by Or	Other AC	0
683	15	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
684	15	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
685	15	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0
686	15	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
687	15	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
688	15	2.5 Audit Criteria Used by Or	Other AC	0
689	16	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
690	16	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
691	16	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
692	16	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
693	16	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
694	16	2.5 Audit Criteria Used by Or	Other AC	1
695	17	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
696	17	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
697	17	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
698	17	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0

699	17	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
700	17	2.5 Audit Criteria Used by Or	Other AC	0
701	18	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
702	18	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
703	18	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
704	18	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
705	18	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
706	18	2.5 Audit Criteria Used by Or	Other AC	0
707	19	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
708	19	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
709	19	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
710	19	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
711	19	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
712	19	2.5 Audit Criteria Used by Or	Other AC	0
713	20	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
714	20	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
715	20	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
716	20	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
717	20	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
718	20	2.5 Audit Criteria Used by Or	Other AC	0
719	21	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
720	21	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
721	21	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
722	21	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
723	21	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
724	21	2.5 Audit Criteria Used by Or	Other AC	0
725	22	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
726	22	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
727	22	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
728	22	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
729	22	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
730	22	2.5 Audit Criteria Used by Or	Other AC	1
731	23	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
732	23	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
733	23	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
734	23	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
735	23	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
736	23	2.5 Audit Criteria Used by Or	Other AC	0
737	24	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
738	24	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	1
739	24	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
740	24	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
741	24	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
742	24	2.5 Audit Criteria Used by Or	Other AC	0
743	25	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
744	25	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	1
745	25	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0
746	25	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
747	25	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
748	25	2.5 Audit Criteria Used by Or	Other AC	0
749	26	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
750	26	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	1
751	26	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0
752	26	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
753	26	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
754	26	2.5 Audit Criteria Used by Or	Other AC	0
755	27	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
756	27	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
757	27	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0
758	27	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
759	27	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
760	27	2.5 Audit Criteria Used by Or	Other AC	1
761	28	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
762	28	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
763	28	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0
764	28	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
765	28	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
766	28	2.5 Audit Criteria Used by Or	Other AC	1
767	29	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
768	29	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
769	29	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0

770	29	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
771	29	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
772	29	2.5 Audit Criteria Used by Or	Other AC	0
773	30	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
774	30	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
775	30	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
776	30	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
777	30	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
778	30	2.5 Audit Criteria Used by Or	Other AC	0
779	31	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
780	31	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	1
781	31	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
782	31	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
783	31	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
784	31	2.5 Audit Criteria Used by Or	Other AC	1
785	32	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
786	32	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
787	32	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
788	32	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
789	32	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
790	32	2.5 Audit Criteria Used by Or	Other AC	0
791	33	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
792	33	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
793	33	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
794	33	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
795	33	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
796	33	2.5 Audit Criteria Used by Or	Other AC	0
797	34	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
798	34	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
799	34	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
800	34	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
801	34	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
802	34	2.5 Audit Criteria Used by Or	Other AC	0
803	35	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
804	35	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
805	35	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0
806	35	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
807	35	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
808	35	2.5 Audit Criteria Used by Or	Other AC	0
809	36	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
810	36	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
811	36	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
812	36	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
813	36	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
814	36	2.5 Audit Criteria Used by Or	Other AC	0
815	37	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
816	37	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
817	37	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
818	37	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
819	37	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
820	37	2.5 Audit Criteria Used by Or	Other AC	0
821	38	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
822	38	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
823	38	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
824	38	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
825	38	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
826	38	2.5 Audit Criteria Used by Or	Other AC	1
827	39	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
828	39	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
829	39	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0
830	39	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
831	39	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
832	39	2.5 Audit Criteria Used by Or	Other AC	0
833	40	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
834	40	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
835	40	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
836	40	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
837	40	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
838	40	2.5 Audit Criteria Used by Or	Other AC	0
839	41	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
840	41	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	1

841	41	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
842	41	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
843	41	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
844	41	2.5 Audit Criteria Used by Or	Other_AC	1
845	42	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
846	42	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
847	42	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
848	42	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
849	42	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
850	42	2.5 Audit Criteria Used by Or	Other_AC	0
851	43	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
852	43	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
853	43	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
854	43	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
855	43	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
856	43	2.5 Audit Criteria Used by Or	Other_AC	0
857	44	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
858	44	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
859	44	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
860	44	2.5 Audit Criteria Used by Or	IFS_VER5_AC	1
861	44	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
862	44	2.5 Audit Criteria Used by Or	Other_AC	0
863	45	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	0
864	45	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
865	45	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	1
866	45	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
867	45	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	1
868	45	2.5 Audit Criteria Used by Or	Other_AC	0
869	46	2.5 Audit Criteria Used by Or	ISO_9001_2008_AC	1
870	46	2.5 Audit Criteria Used by Or	ISO_22000_2005_AC	0
871	46	2.5 Audit Criteria Used by Or	BRC_VER_5_AC	0
872	46	2.5 Audit Criteria Used by Or	IFS_VER5_AC	0
873	46	2.5 Audit Criteria Used by Or	SANS_10330_2007_A	0
874	46	2.5 Audit Criteria Used by Or	Other_AC	0
875	1	3.1 Food Safety management Sy	FSMGen1	1
876	1	3.1 Food Safety management Sy	FSMGen2	1
877	1	3.1 Food Safety management Sy	FSMGen3	1
878	1	3.1 Food Safety management Sy	FSMGen4	1
879	1	3.1 Food Safety management Sy	FSMGen5	1
880	1	3.1 Food Safety management Sy	FSMGen6	1
881	2	3.1 Food Safety management Sy	FSMGen1	2
882	2	3.1 Food Safety management Sy	FSMGen2	2
883	2	3.1 Food Safety management Sy	FSMGen3	2
884	2	3.1 Food Safety management Sy	FSMGen4	2
885	2	3.1 Food Safety management Sy	FSMGen5	2
886	2	3.1 Food Safety management Sy	FSMGen6	2
887	3	3.1 Food Safety management Sy	FSMGen1	2
888	3	3.1 Food Safety management Sy	FSMGen2	2
889	3	3.1 Food Safety management Sy	FSMGen3	2
890	3	3.1 Food Safety management Sy	FSMGen4	2
891	3	3.1 Food Safety management Sy	FSMGen5	2
892	3	3.1 Food Safety management Sy	FSMGen6	2
893	4	3.1 Food Safety management Sy	FSMGen1	1
894	4	3.1 Food Safety management Sy	FSMGen2	4
895	4	3.1 Food Safety management Sy	FSMGen3	1
896	4	3.1 Food Safety management Sy	FSMGen4	1
897	4	3.1 Food Safety management Sy	FSMGen5	1
898	4	3.1 Food Safety management Sy	FSMGen6	1
899	5	3.1 Food Safety management Sy	FSMGen1	2
900	5	3.1 Food Safety management Sy	FSMGen2	2
901	5	3.1 Food Safety management Sy	FSMGen3	2
902	5	3.1 Food Safety management Sy	FSMGen4	2
903	5	3.1 Food Safety management Sy	FSMGen5	2
904	5	3.1 Food Safety management Sy	FSMGen6	2
905	6	3.1 Food Safety management Sy	FSMGen1	1
906	6	3.1 Food Safety management Sy	FSMGen2	1
907	6	3.1 Food Safety management Sy	FSMGen3	1
908	6	3.1 Food Safety management Sy	FSMGen4	1
909	6	3.1 Food Safety management Sy	FSMGen5	1
910	6	3.1 Food Safety management Sy	FSMGen6	1
911	7	3.1 Food Safety management Sy	FSMGen1	1

912	7	3.1	Food	Safety	management	Sy	FSMGen2	1
913	7	3.1	Food	Safety	management	Sy	FSMGen3	1
914	7	3.1	Food	Safety	management	Sy	FSMGen4	1
915	7	3.1	Food	Safety	management	Sy	FSMGen5	1
916	7	3.1	Food	Safety	management	Sy	FSMGen6	1
917	8	3.1	Food	Safety	management	Sy	FSMGen1	2
918	8	3.1	Food	Safety	management	Sy	FSMGen2	1
919	8	3.1	Food	Safety	management	Sy	FSMGen3	2
920	8	3.1	Food	Safety	management	Sy	FSMGen4	2
921	8	3.1	Food	Safety	management	Sy	FSMGen5	2
922	8	3.1	Food	Safety	management	Sy	FSMGen6	1
923	9	3.1	Food	Safety	management	Sy	FSMGen1	3
924	9	3.1	Food	Safety	management	Sy	FSMGen2	1
925	9	3.1	Food	Safety	management	Sy	FSMGen3	1
926	9	3.1	Food	Safety	management	Sy	FSMGen4	1
927	9	3.1	Food	Safety	management	Sy	FSMGen5	1
928	9	3.1	Food	Safety	management	Sy	FSMGen6	1
929	10	3.1	Food	Safety	management	Sy	FSMGen1	1
930	10	3.1	Food	Safety	management	Sy	FSMGen2	1
931	10	3.1	Food	Safety	management	Sy	FSMGen3	1
932	10	3.1	Food	Safety	management	Sy	FSMGen4	1
933	10	3.1	Food	Safety	management	Sy	FSMGen5	1
934	10	3.1	Food	Safety	management	Sy	FSMGen6	1
935	11	3.1	Food	Safety	management	Sy	FSMGen1	1
936	11	3.1	Food	Safety	management	Sy	FSMGen2	1
937	11	3.1	Food	Safety	management	Sy	FSMGen3	1
938	11	3.1	Food	Safety	management	Sy	FSMGen4	1
939	11	3.1	Food	Safety	management	Sy	FSMGen5	1
940	11	3.1	Food	Safety	management	Sy	FSMGen6	1
941	12	3.1	Food	Safety	management	Sy	FSMGen1	1
942	12	3.1	Food	Safety	management	Sy	FSMGen2	1
943	12	3.1	Food	Safety	management	Sy	FSMGen3	1
944	12	3.1	Food	Safety	management	Sy	FSMGen4	1
945	12	3.1	Food	Safety	management	Sy	FSMGen5	1
946	12	3.1	Food	Safety	management	Sy	FSMGen6	2
947	13	3.1	Food	Safety	management	Sy	FSMGen1	1
948	13	3.1	Food	Safety	management	Sy	FSMGen2	1
949	13	3.1	Food	Safety	management	Sy	FSMGen3	1
950	13	3.1	Food	Safety	management	Sy	FSMGen4	1
951	13	3.1	Food	Safety	management	Sy	FSMGen5	1
952	13	3.1	Food	Safety	management	Sy	FSMGen6	1
953	14	3.1	Food	Safety	management	Sy	FSMGen1	2
954	14	3.1	Food	Safety	management	Sy	FSMGen2	2
955	14	3.1	Food	Safety	management	Sy	FSMGen3	2
956	14	3.1	Food	Safety	management	Sy	FSMGen4	2
957	14	3.1	Food	Safety	management	Sy	FSMGen5	2
958	14	3.1	Food	Safety	management	Sy	FSMGen6	2
959	15	3.1	Food	Safety	management	Sy	FSMGen1	2
960	15	3.1	Food	Safety	management	Sy	FSMGen2	2
961	15	3.1	Food	Safety	management	Sy	FSMGen3	2
962	15	3.1	Food	Safety	management	Sy	FSMGen4	2
963	15	3.1	Food	Safety	management	Sy	FSMGen5	2
964	15	3.1	Food	Safety	management	Sy	FSMGen6	2
965	16	3.1	Food	Safety	management	Sy	FSMGen1	2
966	16	3.1	Food	Safety	management	Sy	FSMGen2	2
967	16	3.1	Food	Safety	management	Sy	FSMGen3	2
968	16	3.1	Food	Safety	management	Sy	FSMGen4	2
969	16	3.1	Food	Safety	management	Sy	FSMGen5	2
970	16	3.1	Food	Safety	management	Sy	FSMGen6	2
971	17	3.1	Food	Safety	management	Sy	FSMGen1	1
972	17	3.1	Food	Safety	management	Sy	FSMGen2	1
973	17	3.1	Food	Safety	management	Sy	FSMGen3	1
974	17	3.1	Food	Safety	management	Sy	FSMGen4	1
975	17	3.1	Food	Safety	management	Sy	FSMGen5	2
976	17	3.1	Food	Safety	management	Sy	FSMGen6	2
977	18	3.1	Food	Safety	management	Sy	FSMGen1	2
978	18	3.1	Food	Safety	management	Sy	FSMGen2	2
979	18	3.1	Food	Safety	management	Sy	FSMGen3	2
980	18	3.1	Food	Safety	management	Sy	FSMGen4	2
981	18	3.1	Food	Safety	management	Sy	FSMGen5	2
982	18	3.1	Food	Safety	management	Sy	FSMGen6	2



983	19	3.1	Food	Safety	management	Sy	FSMGen1	2
984	19	3.1	Food	Safety	management	Sy	FSMGen2	2
985	19	3.1	Food	Safety	management	Sy	FSMGen3	2
986	19	3.1	Food	Safety	management	Sy	FSMGen4	2
987	19	3.1	Food	Safety	management	Sy	FSMGen5	2
988	19	3.1	Food	Safety	management	Sy	FSMGen6	2
989	20	3.1	Food	Safety	management	Sy	FSMGen1	2
990	20	3.1	Food	Safety	management	Sy	FSMGen2	2
991	20	3.1	Food	Safety	management	Sy	FSMGen3	1
992	20	3.1	Food	Safety	management	Sy	FSMGen4	1
993	20	3.1	Food	Safety	management	Sy	FSMGen5	1
994	20	3.1	Food	Safety	management	Sy	FSMGen6	2
995	21	3.1	Food	Safety	management	Sy	FSMGen1	1
996	21	3.1	Food	Safety	management	Sy	FSMGen2	2
997	21	3.1	Food	Safety	management	Sy	FSMGen3	2
998	21	3.1	Food	Safety	management	Sy	FSMGen4	1
999	21	3.1	Food	Safety	management	Sy	FSMGen5	2
1000	21	3.1	Food	Safety	management	Sy	FSMGen6	1
1001	22	3.1	Food	Safety	management	Sy	FSMGen1	1
1002	22	3.1	Food	Safety	management	Sy	FSMGen2	1
1003	22	3.1	Food	Safety	management	Sy	FSMGen3	1
1004	22	3.1	Food	Safety	management	Sy	FSMGen4	1
1005	22	3.1	Food	Safety	management	Sy	FSMGen5	1
1006	22	3.1	Food	Safety	management	Sy	FSMGen6	1
1007	23	3.1	Food	Safety	management	Sy	FSMGen1	1
1008	23	3.1	Food	Safety	management	Sy	FSMGen2	2
1009	23	3.1	Food	Safety	management	Sy	FSMGen3	1
1010	23	3.1	Food	Safety	management	Sy	FSMGen4	1
1011	23	3.1	Food	Safety	management	Sy	FSMGen5	1
1012	23	3.1	Food	Safety	management	Sy	FSMGen6	1
1013	24	3.1	Food	Safety	management	Sy	FSMGen1	1
1014	24	3.1	Food	Safety	management	Sy	FSMGen2	1
1015	24	3.1	Food	Safety	management	Sy	FSMGen3	1
1016	24	3.1	Food	Safety	management	Sy	FSMGen4	1
1017	24	3.1	Food	Safety	management	Sy	FSMGen5	1
1018	24	3.1	Food	Safety	management	Sy	FSMGen6	1
1019	25	3.1	Food	Safety	management	Sy	FSMGen1	1
1020	25	3.1	Food	Safety	management	Sy	FSMGen2	1
1021	25	3.1	Food	Safety	management	Sy	FSMGen3	1
1022	25	3.1	Food	Safety	management	Sy	FSMGen4	1
1023	25	3.1	Food	Safety	management	Sy	FSMGen5	1
1024	25	3.1	Food	Safety	management	Sy	FSMGen6	1
1025	26	3.1	Food	Safety	management	Sy	FSMGen1	1
1026	26	3.1	Food	Safety	management	Sy	FSMGen2	1
1027	26	3.1	Food	Safety	management	Sy	FSMGen3	1
1028	26	3.1	Food	Safety	management	Sy	FSMGen4	1
1029	26	3.1	Food	Safety	management	Sy	FSMGen5	1
1030	26	3.1	Food	Safety	management	Sy	FSMGen6	1
1031	27	3.1	Food	Safety	management	Sy	FSMGen1	2
1032	27	3.1	Food	Safety	management	Sy	FSMGen2	2
1033	27	3.1	Food	Safety	management	Sy	FSMGen3	2
1034	27	3.1	Food	Safety	management	Sy	FSMGen4	1
1035	27	3.1	Food	Safety	management	Sy	FSMGen5	2
1036	27	3.1	Food	Safety	management	Sy	FSMGen6	4
1037	28	3.1	Food	Safety	management	Sy	FSMGen1	1
1038	28	3.1	Food	Safety	management	Sy	FSMGen2	1
1039	28	3.1	Food	Safety	management	Sy	FSMGen3	2
1040	28	3.1	Food	Safety	management	Sy	FSMGen4	2
1041	28	3.1	Food	Safety	management	Sy	FSMGen5	2
1042	28	3.1	Food	Safety	management	Sy	FSMGen6	2
1043	29	3.1	Food	Safety	management	Sy	FSMGen1	3
1044	29	3.1	Food	Safety	management	Sy	FSMGen2	3
1045	29	3.1	Food	Safety	management	Sy	FSMGen3	3
1046	29	3.1	Food	Safety	management	Sy	FSMGen4	3
1047	29	3.1	Food	Safety	management	Sy	FSMGen5	3
1048	29	3.1	Food	Safety	management	Sy	FSMGen6	3
1049	30	3.1	Food	Safety	management	Sy	FSMGen1	1
1050	30	3.1	Food	Safety	management	Sy	FSMGen2	1
1051	30	3.1	Food	Safety	management	Sy	FSMGen3	1
1052	30	3.1	Food	Safety	management	Sy	FSMGen4	2
1053	30	3.1	Food	Safety	management	Sy	FSMGen5	2

1054	30	3.1	Food	Safety	management	Sy	FSMGen6	1
1055	31	3.1	Food	Safety	management	Sy	FSMGen1	1
1056	31	3.1	Food	Safety	management	Sy	FSMGen2	1
1057	31	3.1	Food	Safety	management	Sy	FSMGen3	1
1058	31	3.1	Food	Safety	management	Sy	FSMGen4	2
1059	31	3.1	Food	Safety	management	Sy	FSMGen5	2
1060	31	3.1	Food	Safety	management	Sy	FSMGen6	1
1061	32	3.1	Food	Safety	management	Sy	FSMGen1	1
1062	32	3.1	Food	Safety	management	Sy	FSMGen2	1
1063	32	3.1	Food	Safety	management	Sy	FSMGen3	1
1064	32	3.1	Food	Safety	management	Sy	FSMGen4	1
1065	32	3.1	Food	Safety	management	Sy	FSMGen5	1
1066	32	3.1	Food	Safety	management	Sy	FSMGen6	1
1067	33	3.1	Food	Safety	management	Sy	FSMGen1	1
1068	33	3.1	Food	Safety	management	Sy	FSMGen2	1
1069	33	3.1	Food	Safety	management	Sy	FSMGen3	1
1070	33	3.1	Food	Safety	management	Sy	FSMGen4	1
1071	33	3.1	Food	Safety	management	Sy	FSMGen5	1
1072	33	3.1	Food	Safety	management	Sy	FSMGen6	1
1073	34	3.1	Food	Safety	management	Sy	FSMGen1	1
1074	34	3.1	Food	Safety	management	Sy	FSMGen2	2
1075	34	3.1	Food	Safety	management	Sy	FSMGen3	1
1076	34	3.1	Food	Safety	management	Sy	FSMGen4	1
1077	34	3.1	Food	Safety	management	Sy	FSMGen5	2
1078	34	3.1	Food	Safety	management	Sy	FSMGen6	2
1079	35	3.1	Food	Safety	management	Sy	FSMGen1	1
1080	35	3.1	Food	Safety	management	Sy	FSMGen2	1
1081	35	3.1	Food	Safety	management	Sy	FSMGen3	1
1082	35	3.1	Food	Safety	management	Sy	FSMGen4	1
1083	35	3.1	Food	Safety	management	Sy	FSMGen5	1
1084	35	3.1	Food	Safety	management	Sy	FSMGen6	1
1085	36	3.1	Food	Safety	management	Sy	FSMGen1	1
1086	36	3.1	Food	Safety	management	Sy	FSMGen2	1
1087	36	3.1	Food	Safety	management	Sy	FSMGen3	1
1088	36	3.1	Food	Safety	management	Sy	FSMGen4	1
1089	36	3.1	Food	Safety	management	Sy	FSMGen5	1
1090	36	3.1	Food	Safety	management	Sy	FSMGen6	2
1091	37	3.1	Food	Safety	management	Sy	FSMGen1	2
1092	37	3.1	Food	Safety	management	Sy	FSMGen2	1
1093	37	3.1	Food	Safety	management	Sy	FSMGen3	1
1094	37	3.1	Food	Safety	management	Sy	FSMGen4	1
1095	37	3.1	Food	Safety	management	Sy	FSMGen5	1
1096	37	3.1	Food	Safety	management	Sy	FSMGen6	1
1097	38	3.1	Food	Safety	management	Sy	FSMGen1	1
1098	38	3.1	Food	Safety	management	Sy	FSMGen2	1
1099	38	3.1	Food	Safety	management	Sy	FSMGen3	1
1100	38	3.1	Food	Safety	management	Sy	FSMGen4	1
1101	38	3.1	Food	Safety	management	Sy	FSMGen5	1
1102	38	3.1	Food	Safety	management	Sy	FSMGen6	1
1103	39	3.1	Food	Safety	management	Sy	FSMGen1	1
1104	39	3.1	Food	Safety	management	Sy	FSMGen2	1
1105	39	3.1	Food	Safety	management	Sy	FSMGen3	1
1106	39	3.1	Food	Safety	management	Sy	FSMGen4	1
1107	39	3.1	Food	Safety	management	Sy	FSMGen5	1
1108	39	3.1	Food	Safety	management	Sy	FSMGen6	1
1109	40	3.1	Food	Safety	management	Sy	FSMGen1	1
1110	40	3.1	Food	Safety	management	Sy	FSMGen2	1
1111	40	3.1	Food	Safety	management	Sy	FSMGen3	1
1112	40	3.1	Food	Safety	management	Sy	FSMGen4	1
1113	40	3.1	Food	Safety	management	Sy	FSMGen5	1
1114	40	3.1	Food	Safety	management	Sy	FSMGen6	1
1115	41	3.1	Food	Safety	management	Sy	FSMGen1	1
1116	41	3.1	Food	Safety	management	Sy	FSMGen2	1
1117	41	3.1	Food	Safety	management	Sy	FSMGen3	1
1118	41	3.1	Food	Safety	management	Sy	FSMGen4	1
1119	41	3.1	Food	Safety	management	Sy	FSMGen5	1
1120	41	3.1	Food	Safety	management	Sy	FSMGen6	1
1121	42	3.1	Food	Safety	management	Sy	FSMGen1	1
1122	42	3.1	Food	Safety	management	Sy	FSMGen2	1
1123	42	3.1	Food	Safety	management	Sy	FSMGen3	2
1124	42	3.1	Food	Safety	management	Sy	FSMGen4	2

1125	42	3.1 Food Safety management	Sy	FSMGen5	2
1126	42	3.1 Food Safety management	Sy	FSMGen6	2
1127	43	3.1 Food Safety management	Sy	FSMGen1	2
1128	43	3.1 Food Safety management	Sy	FSMGen2	1
1129	43	3.1 Food Safety management	Sy	FSMGen3	1
1130	43	3.1 Food Safety management	Sy	FSMGen4	4
1131	43	3.1 Food Safety management	Sy	FSMGen5	1
1132	43	3.1 Food Safety management	Sy	FSMGen6	2
1133	44	3.1 Food Safety management	Sy	FSMGen1	1
1134	44	3.1 Food Safety management	Sy	FSMGen2	1
1135	44	3.1 Food Safety management	Sy	FSMGen3	1
1136	44	3.1 Food Safety management	Sy	FSMGen4	1
1137	44	3.1 Food Safety management	Sy	FSMGen5	1
1138	44	3.1 Food Safety management	Sy	FSMGen6	1
1139	45	3.1 Food Safety management	Sy	FSMGen1	1
1140	45	3.1 Food Safety management	Sy	FSMGen2	1
1141	45	3.1 Food Safety management	Sy	FSMGen3	1
1142	45	3.1 Food Safety management	Sy	FSMGen4	1
1143	45	3.1 Food Safety management	Sy	FSMGen5	1
1144	45	3.1 Food Safety management	Sy	FSMGen6	1
1145	46	3.1 Food Safety management	Sy	FSMGen1	1
1146	46	3.1 Food Safety management	Sy	FSMGen2	1
1147	46	3.1 Food Safety management	Sy	FSMGen3	1
1148	46	3.1 Food Safety management	Sy	FSMGen4	1
1149	46	3.1 Food Safety management	Sy	FSMGen5	1
1150	46	3.1 Food Safety management	Sy	FSMGen6	1
1151	1	3.2 Decision-making		Decision7	1
1152	1	3.2 Decision-making		Decision8	1
1153	1	3.2 Decision-making		Decision9	1
1154	1	3.2 Decision-making		Decision10	1
1155	1	3.2 Decision-making		Decision11	1
1156	1	3.2 Decision-making		Decision12	1
1157	1	3.2 Decision-making		Decision13	1
1158	1	3.2 Decision-making		Decision14	2
1159	1	3.2 Decision-making		Decision15	1
1160	1	3.2 Decision-making		Decision16	2
1161	1	3.2 Decision-making		Decision17	1
1162	1	3.2 Decision-making		Decision18	4
1163	1	3.2 Decision-making		Decision19	1
1164	1	3.2 Decision-making		Decision20	1
1165	1	3.2 Decision-making		Decision21	1
1166	1	3.2 Decision-making		Decision22	1
1167	1	3.2 Decision-making		Decision23	1
1168	1	3.2 Decision-making		Decision24	1
1169	2	3.2 Decision-making		Decision7	2
1170	2	3.2 Decision-making		Decision8	2
1171	2	3.2 Decision-making		Decision9	2
1172	2	3.2 Decision-making		Decision10	2
1173	2	3.2 Decision-making		Decision11	2
1174	2	3.2 Decision-making		Decision12	2
1175	2	3.2 Decision-making		Decision13	2
1176	2	3.2 Decision-making		Decision14	2
1177	2	3.2 Decision-making		Decision15	2
1178	2	3.2 Decision-making		Decision16	2
1179	2	3.2 Decision-making		Decision17	2
1180	2	3.2 Decision-making		Decision18	2
1181	2	3.2 Decision-making		Decision19	2
1182	2	3.2 Decision-making		Decision20	2
1183	2	3.2 Decision-making		Decision21	2
1184	2	3.2 Decision-making		Decision22	2
1185	2	3.2 Decision-making		Decision23	2
1186	2	3.2 Decision-making		Decision24	2
1187	3	3.2 Decision-making		Decision7	2
1188	3	3.2 Decision-making		Decision8	2
1189	3	3.2 Decision-making		Decision9	1
1190	3	3.2 Decision-making		Decision10	1
1191	3	3.2 Decision-making		Decision11	3
1192	3	3.2 Decision-making		Decision12	2
1193	3	3.2 Decision-making		Decision13	1
1194	3	3.2 Decision-making		Decision14	4
1195	3	3.2 Decision-making		Decision15	2

1196	3	3.2 Decision-making	Decision16	1
1197	3	3.2 Decision-making	Decision17	1
1198	3	3.2 Decision-making	Decision18	5
1199	3	3.2 Decision-making	Decision19	1
1200	3	3.2 Decision-making	Decision20	2
1201	3	3.2 Decision-making	Decision21	4
1202	3	3.2 Decision-making	Decision22	2
1203	3	3.2 Decision-making	Decision23	1
1204	3	3.2 Decision-making	Decision24	2
1205	4	3.2 Decision-making	Decision7	1
1206	4	3.2 Decision-making	Decision8	3
1207	4	3.2 Decision-making	Decision9	2
1208	4	3.2 Decision-making	Decision10	3
1209	4	3.2 Decision-making	Decision11	4
1210	4	3.2 Decision-making	Decision12	2
1211	4	3.2 Decision-making	Decision13	1
1212	4	3.2 Decision-making	Decision14	2
1213	4	3.2 Decision-making	Decision15	2
1214	4	3.2 Decision-making	Decision16	4
1215	4	3.2 Decision-making	Decision17	1
1216	4	3.2 Decision-making	Decision18	1
1217	4	3.2 Decision-making	Decision19	1
1218	4	3.2 Decision-making	Decision20	2
1219	4	3.2 Decision-making	Decision21	4
1220	4	3.2 Decision-making	Decision22	1
1221	4	3.2 Decision-making	Decision23	1
1222	4	3.2 Decision-making	Decision24	1
1223	5	3.2 Decision-making	Decision7	2
1224	5	3.2 Decision-making	Decision8	2
1225	5	3.2 Decision-making	Decision9	1
1226	5	3.2 Decision-making	Decision10	4
1227	5	3.2 Decision-making	Decision11	2
1228	5	3.2 Decision-making	Decision12	2
1229	5	3.2 Decision-making	Decision13	2
1230	5	3.2 Decision-making	Decision14	2
1231	5	3.2 Decision-making	Decision15	1
1232	5	3.2 Decision-making	Decision16	2
1233	5	3.2 Decision-making	Decision17	2
1234	5	3.2 Decision-making	Decision18	3
1235	5	3.2 Decision-making	Decision19	2
1236	5	3.2 Decision-making	Decision20	1
1237	5	3.2 Decision-making	Decision21	1
1238	5	3.2 Decision-making	Decision22	1
1239	5	3.2 Decision-making	Decision23	2
1240	5	3.2 Decision-making	Decision24	2
1241	6	3.2 Decision-making	Decision7	1
1242	6	3.2 Decision-making	Decision8	1
1243	6	3.2 Decision-making	Decision9	2
1244	6	3.2 Decision-making	Decision10	3
1245	6	3.2 Decision-making	Decision11	1
1246	6	3.2 Decision-making	Decision12	1
1247	6	3.2 Decision-making	Decision13	1
1248	6	3.2 Decision-making	Decision14	1
1249	6	3.2 Decision-making	Decision15	1
1250	6	3.2 Decision-making	Decision16	1
1251	6	3.2 Decision-making	Decision17	1
1252	6	3.2 Decision-making	Decision18	1
1253	6	3.2 Decision-making	Decision19	1
1254	6	3.2 Decision-making	Decision20	1
1255	6	3.2 Decision-making	Decision21	1
1256	6	3.2 Decision-making	Decision22	1
1257	6	3.2 Decision-making	Decision23	1
1258	6	3.2 Decision-making	Decision24	1
1259	7	3.2 Decision-making	Decision7	1
1260	7	3.2 Decision-making	Decision8	1
1261	7	3.2 Decision-making	Decision9	1
1262	7	3.2 Decision-making	Decision10	3
1263	7	3.2 Decision-making	Decision11	1
1264	7	3.2 Decision-making	Decision12	1
1265	7	3.2 Decision-making	Decision13	1
1266	7	3.2 Decision-making	Decision14	1

1267	7	3.2 Decision-making	Decision15	1
1268	7	3.2 Decision-making	Decision16	1
1269	7	3.2 Decision-making	Decision17	1
1270	7	3.2 Decision-making	Decision18	1
1271	7	3.2 Decision-making	Decision19	1
1272	7	3.2 Decision-making	Decision20	1
1273	7	3.2 Decision-making	Decision21	1
1274	7	3.2 Decision-making	Decision22	1
1275	7	3.2 Decision-making	Decision23	1
1276	7	3.2 Decision-making	Decision24	1
1277	8	3.2 Decision-making	Decision7	1
1278	8	3.2 Decision-making	Decision8	1
1279	8	3.2 Decision-making	Decision9	1
1280	8	3.2 Decision-making	Decision10	1
1281	8	3.2 Decision-making	Decision11	1
1282	8	3.2 Decision-making	Decision12	1
1283	8	3.2 Decision-making	Decision13	1
1284	8	3.2 Decision-making	Decision14	1
1285	8	3.2 Decision-making	Decision15	1
1286	8	3.2 Decision-making	Decision16	2
1287	8	3.2 Decision-making	Decision17	2
1288	8	3.2 Decision-making	Decision18	2
1289	8	3.2 Decision-making	Decision19	2
1290	8	3.2 Decision-making	Decision20	2
1291	8	3.2 Decision-making	Decision21	2
1292	8	3.2 Decision-making	Decision22	2
1293	8	3.2 Decision-making	Decision23	2
1294	8	3.2 Decision-making	Decision24	2
1295	9	3.2 Decision-making	Decision7	1
1296	9	3.2 Decision-making	Decision8	1
1297	9	3.2 Decision-making	Decision9	1
1298	9	3.2 Decision-making	Decision10	1
1299	9	3.2 Decision-making	Decision11	1
1300	9	3.2 Decision-making	Decision12	1
1301	9	3.2 Decision-making	Decision13	1
1302	9	3.2 Decision-making	Decision14	1
1303	9	3.2 Decision-making	Decision15	1
1304	9	3.2 Decision-making	Decision16	2
1305	9	3.2 Decision-making	Decision17	1
1306	9	3.2 Decision-making	Decision18	2
1307	9	3.2 Decision-making	Decision19	2
1308	9	3.2 Decision-making	Decision20	2
1309	9	3.2 Decision-making	Decision21	2
1310	9	3.2 Decision-making	Decision22	3
1311	9	3.2 Decision-making	Decision23	1
1312	9	3.2 Decision-making	Decision24	1
1313	10	3.2 Decision-making	Decision7	1
1314	10	3.2 Decision-making	Decision8	2
1315	10	3.2 Decision-making	Decision9	1
1316	10	3.2 Decision-making	Decision10	1
1317	10	3.2 Decision-making	Decision11	3
1318	10	3.2 Decision-making	Decision12	1
1319	10	3.2 Decision-making	Decision13	1
1320	10	3.2 Decision-making	Decision14	1
1321	10	3.2 Decision-making	Decision15	2
1322	10	3.2 Decision-making	Decision16	1
1323	10	3.2 Decision-making	Decision17	1
1324	10	3.2 Decision-making	Decision18	2
1325	10	3.2 Decision-making	Decision19	2
1326	10	3.2 Decision-making	Decision20	2
1327	10	3.2 Decision-making	Decision21	3
1328	10	3.2 Decision-making	Decision22	1
1329	10	3.2 Decision-making	Decision23	1
1330	10	3.2 Decision-making	Decision24	1
1331	11	3.2 Decision-making	Decision7	1
1332	11	3.2 Decision-making	Decision8	2
1333	11	3.2 Decision-making	Decision9	1
1334	11	3.2 Decision-making	Decision10	1
1335	11	3.2 Decision-making	Decision11	3
1336	11	3.2 Decision-making	Decision12	2
1337	11	3.2 Decision-making	Decision13	1

1338	11	3.2 Decision-making	Decision14	2
1339	11	3.2 Decision-making	Decision15	1
1340	11	3.2 Decision-making	Decision16	1
1341	11	3.2 Decision-making	Decision17	1
1342	11	3.2 Decision-making	Decision18	2
1343	11	3.2 Decision-making	Decision19	2
1344	11	3.2 Decision-making	Decision20	2
1345	11	3.2 Decision-making	Decision21	2
1346	11	3.2 Decision-making	Decision22	1
1347	11	3.2 Decision-making	Decision23	1
1348	11	3.2 Decision-making	Decision24	1
1349	12	3.2 Decision-making	Decision7	1
1350	12	3.2 Decision-making	Decision8	1
1351	12	3.2 Decision-making	Decision9	1
1352	12	3.2 Decision-making	Decision10	2
1353	12	3.2 Decision-making	Decision11	1
1354	12	3.2 Decision-making	Decision12	1
1355	12	3.2 Decision-making	Decision13	1
1356	12	3.2 Decision-making	Decision14	1
1357	12	3.2 Decision-making	Decision15	1
1358	12	3.2 Decision-making	Decision16	1
1359	12	3.2 Decision-making	Decision17	1
1360	12	3.2 Decision-making	Decision18	1
1361	12	3.2 Decision-making	Decision19	1
1362	12	3.2 Decision-making	Decision20	1
1363	12	3.2 Decision-making	Decision21	2
1364	12	3.2 Decision-making	Decision22	1
1365	12	3.2 Decision-making	Decision23	1
1366	12	3.2 Decision-making	Decision24	1
1367	13	3.2 Decision-making	Decision7	1
1368	13	3.2 Decision-making	Decision8	1
1369	13	3.2 Decision-making	Decision9	1
1370	13	3.2 Decision-making	Decision10	4
1371	13	3.2 Decision-making	Decision11	1
1372	13	3.2 Decision-making	Decision12	1
1373	13	3.2 Decision-making	Decision13	1
1374	13	3.2 Decision-making	Decision14	1
1375	13	3.2 Decision-making	Decision15	1
1376	13	3.2 Decision-making	Decision16	4
1377	13	3.2 Decision-making	Decision17	1
1378	13	3.2 Decision-making	Decision18	4
1379	13	3.2 Decision-making	Decision19	1
1380	13	3.2 Decision-making	Decision20	1
1381	13	3.2 Decision-making	Decision21	2
1382	13	3.2 Decision-making	Decision22	1
1383	13	3.2 Decision-making	Decision23	1
1384	13	3.2 Decision-making	Decision24	1
1385	14	3.2 Decision-making	Decision7	2
1386	14	3.2 Decision-making	Decision8	2
1387	14	3.2 Decision-making	Decision9	2
1388	14	3.2 Decision-making	Decision10	2
1389	14	3.2 Decision-making	Decision11	2
1390	14	3.2 Decision-making	Decision12	2
1391	14	3.2 Decision-making	Decision13	2
1392	14	3.2 Decision-making	Decision14	2
1393	14	3.2 Decision-making	Decision15	2
1394	14	3.2 Decision-making	Decision16	2
1395	14	3.2 Decision-making	Decision17	2
1396	14	3.2 Decision-making	Decision18	2
1397	14	3.2 Decision-making	Decision19	2
1398	14	3.2 Decision-making	Decision20	2
1399	14	3.2 Decision-making	Decision21	2
1400	14	3.2 Decision-making	Decision22	2
1401	14	3.2 Decision-making	Decision23	2
1402	14	3.2 Decision-making	Decision24	2
1403	15	3.2 Decision-making	Decision7	2
1404	15	3.2 Decision-making	Decision8	2
1405	15	3.2 Decision-making	Decision9	2
1406	15	3.2 Decision-making	Decision10	2
1407	15	3.2 Decision-making	Decision11	2
1408	15	3.2 Decision-making	Decision12	2

1409	15	3.2 Decision-making	Decision13	2
1410	15	3.2 Decision-making	Decision14	2
1411	15	3.2 Decision-making	Decision15	2
1412	15	3.2 Decision-making	Decision16	2
1413	15	3.2 Decision-making	Decision17	2
1414	15	3.2 Decision-making	Decision18	2
1415	15	3.2 Decision-making	Decision19	2
1416	15	3.2 Decision-making	Decision20	2
1417	15	3.2 Decision-making	Decision21	3
1418	15	3.2 Decision-making	Decision22	2
1419	15	3.2 Decision-making	Decision23	2
1420	15	3.2 Decision-making	Decision24	2
1421	16	3.2 Decision-making	Decision7	2
1422	16	3.2 Decision-making	Decision8	2
1423	16	3.2 Decision-making	Decision9	2
1424	16	3.2 Decision-making	Decision10	2
1425	16	3.2 Decision-making	Decision11	2
1426	16	3.2 Decision-making	Decision12	2
1427	16	3.2 Decision-making	Decision13	2
1428	16	3.2 Decision-making	Decision14	2
1429	16	3.2 Decision-making	Decision15	2
1430	16	3.2 Decision-making	Decision16	2
1431	16	3.2 Decision-making	Decision17	2
1432	16	3.2 Decision-making	Decision18	2
1433	16	3.2 Decision-making	Decision19	2
1434	16	3.2 Decision-making	Decision20	2
1435	16	3.2 Decision-making	Decision21	2
1436	16	3.2 Decision-making	Decision22	2
1437	16	3.2 Decision-making	Decision23	2
1438	16	3.2 Decision-making	Decision24	2
1439	17	3.2 Decision-making	Decision7	1
1440	17	3.2 Decision-making	Decision8	1
1441	17	3.2 Decision-making	Decision9	1
1442	17	3.2 Decision-making	Decision10	1
1443	17	3.2 Decision-making	Decision11	1
1444	17	3.2 Decision-making	Decision12	1
1445	17	3.2 Decision-making	Decision13	1
1446	17	3.2 Decision-making	Decision14	1
1447	17	3.2 Decision-making	Decision15	1
1448	17	3.2 Decision-making	Decision16	1
1449	17	3.2 Decision-making	Decision17	1
1450	17	3.2 Decision-making	Decision18	1
1451	17	3.2 Decision-making	Decision19	1
1452	17	3.2 Decision-making	Decision20	1
1453	17	3.2 Decision-making	Decision21	1
1454	17	3.2 Decision-making	Decision22	1
1455	17	3.2 Decision-making	Decision23	1
1456	17	3.2 Decision-making	Decision24	1
1457	18	3.2 Decision-making	Decision7	1
1458	18	3.2 Decision-making	Decision8	1
1459	18	3.2 Decision-making	Decision9	1
1460	18	3.2 Decision-making	Decision10	1
1461	18	3.2 Decision-making	Decision11	1
1462	18	3.2 Decision-making	Decision12	1
1463	18	3.2 Decision-making	Decision13	1
1464	18	3.2 Decision-making	Decision14	1
1465	18	3.2 Decision-making	Decision15	1
1466	18	3.2 Decision-making	Decision16	1
1467	18	3.2 Decision-making	Decision17	1
1468	18	3.2 Decision-making	Decision18	1
1469	18	3.2 Decision-making	Decision19	1
1470	18	3.2 Decision-making	Decision20	1
1471	18	3.2 Decision-making	Decision21	2
1472	18	3.2 Decision-making	Decision22	1
1473	18	3.2 Decision-making	Decision23	1
1474	18	3.2 Decision-making	Decision24	1
1475	19	3.2 Decision-making	Decision7	1
1476	19	3.2 Decision-making	Decision8	2
1477	19	3.2 Decision-making	Decision9	2
1478	19	3.2 Decision-making	Decision10	2
1479	19	3.2 Decision-making	Decision11	1

1480	19	3.2 Decision-making	Decision12	1
1481	19	3.2 Decision-making	Decision13	1
1482	19	3.2 Decision-making	Decision14	1
1483	19	3.2 Decision-making	Decision15	1
1484	19	3.2 Decision-making	Decision16	1
1485	19	3.2 Decision-making	Decision17	1
1486	19	3.2 Decision-making	Decision18	1
1487	19	3.2 Decision-making	Decision19	1
1488	19	3.2 Decision-making	Decision20	1
1489	19	3.2 Decision-making	Decision21	2
1490	19	3.2 Decision-making	Decision22	2
1491	19	3.2 Decision-making	Decision23	2
1492	19	3.2 Decision-making	Decision24	2
1493	20	3.2 Decision-making	Decision7	1
1494	20	3.2 Decision-making	Decision8	1
1495	20	3.2 Decision-making	Decision9	1
1496	20	3.2 Decision-making	Decision10	1
1497	20	3.2 Decision-making	Decision11	2
1498	20	3.2 Decision-making	Decision12	2
1499	20	3.2 Decision-making	Decision13	1
1500	20	3.2 Decision-making	Decision14	1
1501	20	3.2 Decision-making	Decision15	1
1502	20	3.2 Decision-making	Decision16	1
1503	20	3.2 Decision-making	Decision17	1
1504	20	3.2 Decision-making	Decision18	2
1505	20	3.2 Decision-making	Decision19	1
1506	20	3.2 Decision-making	Decision20	1
1507	20	3.2 Decision-making	Decision21	1
1508	20	3.2 Decision-making	Decision22	1
1509	20	3.2 Decision-making	Decision23	2
1510	20	3.2 Decision-making	Decision24	1
1511	21	3.2 Decision-making	Decision7	1
1512	21	3.2 Decision-making	Decision8	1
1513	21	3.2 Decision-making	Decision9	1
1514	21	3.2 Decision-making	Decision10	2
1515	21	3.2 Decision-making	Decision11	1
1516	21	3.2 Decision-making	Decision12	1
1517	21	3.2 Decision-making	Decision13	1
1518	21	3.2 Decision-making	Decision14	1
1519	21	3.2 Decision-making	Decision15	1
1520	21	3.2 Decision-making	Decision16	1
1521	21	3.2 Decision-making	Decision17	1
1522	21	3.2 Decision-making	Decision18	1
1523	21	3.2 Decision-making	Decision19	1
1524	21	3.2 Decision-making	Decision20	1
1525	21	3.2 Decision-making	Decision21	1
1526	21	3.2 Decision-making	Decision22	1
1527	21	3.2 Decision-making	Decision23	1
1528	21	3.2 Decision-making	Decision24	1
1529	22	3.2 Decision-making	Decision7	1
1530	22	3.2 Decision-making	Decision8	1
1531	22	3.2 Decision-making	Decision9	1
1532	22	3.2 Decision-making	Decision10	1
1533	22	3.2 Decision-making	Decision11	1
1534	22	3.2 Decision-making	Decision12	1
1535	22	3.2 Decision-making	Decision13	1
1536	22	3.2 Decision-making	Decision14	1
1537	22	3.2 Decision-making	Decision15	1
1538	22	3.2 Decision-making	Decision16	1
1539	22	3.2 Decision-making	Decision17	1
1540	22	3.2 Decision-making	Decision18	1
1541	22	3.2 Decision-making	Decision19	1
1542	22	3.2 Decision-making	Decision20	1
1543	22	3.2 Decision-making	Decision21	1
1544	22	3.2 Decision-making	Decision22	1
1545	22	3.2 Decision-making	Decision23	1
1546	22	3.2 Decision-making	Decision24	1
1547	23	3.2 Decision-making	Decision7	1
1548	23	3.2 Decision-making	Decision8	2
1549	23	3.2 Decision-making	Decision9	2
1550	23	3.2 Decision-making	Decision10	4



1551	23	3.2 Decision-making	Decision11	4
1552	23	3.2 Decision-making	Decision12	2
1553	23	3.2 Decision-making	Decision13	2
1554	23	3.2 Decision-making	Decision14	4
1555	23	3.2 Decision-making	Decision15	2
1556	23	3.2 Decision-making	Decision16	4
1557	23	3.2 Decision-making	Decision17	1
1558	23	3.2 Decision-making	Decision18	2
1559	23	3.2 Decision-making	Decision19	1
1560	23	3.2 Decision-making	Decision20	1
1561	23	3.2 Decision-making	Decision21	1
1562	23	3.2 Decision-making	Decision22	1
1563	23	3.2 Decision-making	Decision23	1
1564	23	3.2 Decision-making	Decision24	2
1565	24	3.2 Decision-making	Decision7	1
1566	24	3.2 Decision-making	Decision8	1
1567	24	3.2 Decision-making	Decision9	1
1568	24	3.2 Decision-making	Decision10	1
1569	24	3.2 Decision-making	Decision11	1
1570	24	3.2 Decision-making	Decision12	1
1571	24	3.2 Decision-making	Decision13	1
1572	24	3.2 Decision-making	Decision14	2
1573	24	3.2 Decision-making	Decision15	1
1574	24	3.2 Decision-making	Decision16	2
1575	24	3.2 Decision-making	Decision17	1
1576	24	3.2 Decision-making	Decision18	2
1577	24	3.2 Decision-making	Decision19	1
1578	24	3.2 Decision-making	Decision20	1
1579	24	3.2 Decision-making	Decision21	1
1580	24	3.2 Decision-making	Decision22	1
1581	24	3.2 Decision-making	Decision23	1
1582	24	3.2 Decision-making	Decision24	1
1583	25	3.2 Decision-making	Decision7	2
1584	25	3.2 Decision-making	Decision8	1
1585	25	3.2 Decision-making	Decision9	1
1586	25	3.2 Decision-making	Decision10	2
1587	25	3.2 Decision-making	Decision11	1
1588	25	3.2 Decision-making	Decision12	1
1589	25	3.2 Decision-making	Decision13	1
1590	25	3.2 Decision-making	Decision14	1
1591	25	3.2 Decision-making	Decision15	1
1592	25	3.2 Decision-making	Decision16	1
1593	25	3.2 Decision-making	Decision17	1
1594	25	3.2 Decision-making	Decision18	2
1595	25	3.2 Decision-making	Decision19	1
1596	25	3.2 Decision-making	Decision20	1
1597	25	3.2 Decision-making	Decision21	2
1598	25	3.2 Decision-making	Decision22	2
1599	25	3.2 Decision-making	Decision23	1
1600	25	3.2 Decision-making	Decision24	1
1601	26	3.2 Decision-making	Decision7	1
1602	26	3.2 Decision-making	Decision8	4
1603	26	3.2 Decision-making	Decision9	1
1604	26	3.2 Decision-making	Decision10	1
1605	26	3.2 Decision-making	Decision11	1
1606	26	3.2 Decision-making	Decision12	1
1607	26	3.2 Decision-making	Decision13	1
1608	26	3.2 Decision-making	Decision14	1
1609	26	3.2 Decision-making	Decision15	1
1610	26	3.2 Decision-making	Decision16	1
1611	26	3.2 Decision-making	Decision17	1
1612	26	3.2 Decision-making	Decision18	1
1613	26	3.2 Decision-making	Decision19	1
1614	26	3.2 Decision-making	Decision20	1
1615	26	3.2 Decision-making	Decision21	1
1616	26	3.2 Decision-making	Decision22	1
1617	26	3.2 Decision-making	Decision23	1
1618	26	3.2 Decision-making	Decision24	1
1619	27	3.2 Decision-making	Decision7	1
1620	27	3.2 Decision-making	Decision8	2
1621	27	3.2 Decision-making	Decision9	1

1622	27	3.2 Decision-making	Decision10	5
1623	27	3.2 Decision-making	Decision11	2
1624	27	3.2 Decision-making	Decision12	2
1625	27	3.2 Decision-making	Decision13	2
1626	27	3.2 Decision-making	Decision14	2
1627	27	3.2 Decision-making	Decision15	1
1628	27	3.2 Decision-making	Decision16	2
1629	27	3.2 Decision-making	Decision17	3
1630	27	3.2 Decision-making	Decision18	2
1631	27	3.2 Decision-making	Decision19	1
1632	27	3.2 Decision-making	Decision20	1
1633	27	3.2 Decision-making	Decision21	1
1634	27	3.2 Decision-making	Decision22	2
1635	27	3.2 Decision-making	Decision23	2
1636	27	3.2 Decision-making	Decision24	2
1637	28	3.2 Decision-making	Decision7	1
1638	28	3.2 Decision-making	Decision8	2
1639	28	3.2 Decision-making	Decision9	5
1640	28	3.2 Decision-making	Decision10	5
1641	28	3.2 Decision-making	Decision11	3
1642	28	3.2 Decision-making	Decision12	5
1643	28	3.2 Decision-making	Decision13	4
1644	28	3.2 Decision-making	Decision14	2
1645	28	3.2 Decision-making	Decision15	1
1646	28	3.2 Decision-making	Decision16	1
1647	28	3.2 Decision-making	Decision17	1
1648	28	3.2 Decision-making	Decision18	1
1649	28	3.2 Decision-making	Decision19	1
1650	28	3.2 Decision-making	Decision20	1
1651	28	3.2 Decision-making	Decision21	1
1652	28	3.2 Decision-making	Decision22	1
1653	28	3.2 Decision-making	Decision23	2
1654	28	3.2 Decision-making	Decision24	1
1655	29	3.2 Decision-making	Decision7	3
1656	29	3.2 Decision-making	Decision8	3
1657	29	3.2 Decision-making	Decision9	3
1658	29	3.2 Decision-making	Decision10	3
1659	29	3.2 Decision-making	Decision11	3
1660	29	3.2 Decision-making	Decision12	3
1661	29	3.2 Decision-making	Decision13	3
1662	29	3.2 Decision-making	Decision14	3
1663	29	3.2 Decision-making	Decision15	3
1664	29	3.2 Decision-making	Decision16	3
1665	29	3.2 Decision-making	Decision17	3
1666	29	3.2 Decision-making	Decision18	3
1667	29	3.2 Decision-making	Decision19	3
1668	29	3.2 Decision-making	Decision20	3
1669	29	3.2 Decision-making	Decision21	3
1670	29	3.2 Decision-making	Decision22	3
1671	29	3.2 Decision-making	Decision23	3
1672	29	3.2 Decision-making	Decision24	3
1673	30	3.2 Decision-making	Decision7	1
1674	30	3.2 Decision-making	Decision8	1
1675	30	3.2 Decision-making	Decision9	2
1676	30	3.2 Decision-making	Decision10	4
1677	30	3.2 Decision-making	Decision11	2
1678	30	3.2 Decision-making	Decision12	1
1679	30	3.2 Decision-making	Decision13	2
1680	30	3.2 Decision-making	Decision14	1
1681	30	3.2 Decision-making	Decision15	1
1682	30	3.2 Decision-making	Decision16	1
1683	30	3.2 Decision-making	Decision17	1
1684	30	3.2 Decision-making	Decision18	4
1685	30	3.2 Decision-making	Decision19	1
1686	30	3.2 Decision-making	Decision20	1
1687	30	3.2 Decision-making	Decision21	2
1688	30	3.2 Decision-making	Decision22	1
1689	30	3.2 Decision-making	Decision23	1
1690	30	3.2 Decision-making	Decision24	2
1691	31	3.2 Decision-making	Decision7	1
1692	31	3.2 Decision-making	Decision8	1

1693	31	3.2 Decision-making	Decision9	2
1694	31	3.2 Decision-making	Decision10	4
1695	31	3.2 Decision-making	Decision11	2
1696	31	3.2 Decision-making	Decision12	2
1697	31	3.2 Decision-making	Decision13	1
1698	31	3.2 Decision-making	Decision14	1
1699	31	3.2 Decision-making	Decision15	1
1700	31	3.2 Decision-making	Decision16	1
1701	31	3.2 Decision-making	Decision17	1
1702	31	3.2 Decision-making	Decision18	4
1703	31	3.2 Decision-making	Decision19	1
1704	31	3.2 Decision-making	Decision20	2
1705	31	3.2 Decision-making	Decision21	2
1706	31	3.2 Decision-making	Decision22	2
1707	31	3.2 Decision-making	Decision23	1
1708	31	3.2 Decision-making	Decision24	2
1709	32	3.2 Decision-making	Decision7	1
1710	32	3.2 Decision-making	Decision8	1
1711	32	3.2 Decision-making	Decision9	1
1712	32	3.2 Decision-making	Decision10	1
1713	32	3.2 Decision-making	Decision11	1
1714	32	3.2 Decision-making	Decision12	1
1715	32	3.2 Decision-making	Decision13	1
1716	32	3.2 Decision-making	Decision14	1
1717	32	3.2 Decision-making	Decision15	1
1718	32	3.2 Decision-making	Decision16	1
1719	32	3.2 Decision-making	Decision17	1
1720	32	3.2 Decision-making	Decision18	1
1721	32	3.2 Decision-making	Decision19	1
1722	32	3.2 Decision-making	Decision20	1
1723	32	3.2 Decision-making	Decision21	1
1724	32	3.2 Decision-making	Decision22	1
1725	32	3.2 Decision-making	Decision23	1
1726	32	3.2 Decision-making	Decision24	1
1727	33	3.2 Decision-making	Decision7	1
1728	33	3.2 Decision-making	Decision8	1
1729	33	3.2 Decision-making	Decision9	1
1730	33	3.2 Decision-making	Decision10	1
1731	33	3.2 Decision-making	Decision11	1
1732	33	3.2 Decision-making	Decision12	1
1733	33	3.2 Decision-making	Decision13	1
1734	33	3.2 Decision-making	Decision14	1
1735	33	3.2 Decision-making	Decision15	1
1736	33	3.2 Decision-making	Decision16	1
1737	33	3.2 Decision-making	Decision17	1
1738	33	3.2 Decision-making	Decision18	1
1739	33	3.2 Decision-making	Decision19	1
1740	33	3.2 Decision-making	Decision20	1
1741	33	3.2 Decision-making	Decision21	1
1742	33	3.2 Decision-making	Decision22	1
1743	33	3.2 Decision-making	Decision23	1
1744	33	3.2 Decision-making	Decision24	1
1745	34	3.2 Decision-making	Decision7	1
1746	34	3.2 Decision-making	Decision8	1
1747	34	3.2 Decision-making	Decision9	2
1748	34	3.2 Decision-making	Decision10	2
1749	34	3.2 Decision-making	Decision11	1
1750	34	3.2 Decision-making	Decision12	1
1751	34	3.2 Decision-making	Decision13	1
1752	34	3.2 Decision-making	Decision14	1
1753	34	3.2 Decision-making	Decision15	2
1754	34	3.2 Decision-making	Decision16	1
1755	34	3.2 Decision-making	Decision17	2
1756	34	3.2 Decision-making	Decision18	1
1757	34	3.2 Decision-making	Decision19	1
1758	34	3.2 Decision-making	Decision20	1
1759	34	3.2 Decision-making	Decision21	1
1760	34	3.2 Decision-making	Decision22	2
1761	34	3.2 Decision-making	Decision23	1
1762	34	3.2 Decision-making	Decision24	1
1763	35	3.2 Decision-making	Decision7	1

1764	35	3.2 Decision-making	Decision8	1
1765	35	3.2 Decision-making	Decision9	1
1766	35	3.2 Decision-making	Decision10	2
1767	35	3.2 Decision-making	Decision11	1
1768	35	3.2 Decision-making	Decision12	1
1769	35	3.2 Decision-making	Decision13	1
1770	35	3.2 Decision-making	Decision14	1
1771	35	3.2 Decision-making	Decision15	1
1772	35	3.2 Decision-making	Decision16	1
1773	35	3.2 Decision-making	Decision17	1
1774	35	3.2 Decision-making	Decision18	2
1775	35	3.2 Decision-making	Decision19	1
1776	35	3.2 Decision-making	Decision20	1
1777	35	3.2 Decision-making	Decision21	1
1778	35	3.2 Decision-making	Decision22	2
1779	35	3.2 Decision-making	Decision23	2
1780	35	3.2 Decision-making	Decision24	2
1781	36	3.2 Decision-making	Decision7	1
1782	36	3.2 Decision-making	Decision8	1
1783	36	3.2 Decision-making	Decision9	1
1784	36	3.2 Decision-making	Decision10	1
1785	36	3.2 Decision-making	Decision11	1
1786	36	3.2 Decision-making	Decision12	1
1787	36	3.2 Decision-making	Decision13	1
1788	36	3.2 Decision-making	Decision14	1
1789	36	3.2 Decision-making	Decision15	1
1790	36	3.2 Decision-making	Decision16	1
1791	36	3.2 Decision-making	Decision17	1
1792	36	3.2 Decision-making	Decision18	2
1793	36	3.2 Decision-making	Decision19	2
1794	36	3.2 Decision-making	Decision20	1
1795	36	3.2 Decision-making	Decision21	1
1796	36	3.2 Decision-making	Decision22	1
1797	36	3.2 Decision-making	Decision23	1
1798	36	3.2 Decision-making	Decision24	1
1799	37	3.2 Decision-making	Decision7	1
1800	37	3.2 Decision-making	Decision8	1
1801	37	3.2 Decision-making	Decision9	1
1802	37	3.2 Decision-making	Decision10	1
1803	37	3.2 Decision-making	Decision11	1
1804	37	3.2 Decision-making	Decision12	1
1805	37	3.2 Decision-making	Decision13	1
1806	37	3.2 Decision-making	Decision14	1
1807	37	3.2 Decision-making	Decision15	1
1808	37	3.2 Decision-making	Decision16	1
1809	37	3.2 Decision-making	Decision17	1
1810	37	3.2 Decision-making	Decision18	1
1811	37	3.2 Decision-making	Decision19	1
1812	37	3.2 Decision-making	Decision20	1
1813	37	3.2 Decision-making	Decision21	1
1814	37	3.2 Decision-making	Decision22	1
1815	37	3.2 Decision-making	Decision23	1
1816	37	3.2 Decision-making	Decision24	1
1817	38	3.2 Decision-making	Decision7	1
1818	38	3.2 Decision-making	Decision8	1
1819	38	3.2 Decision-making	Decision9	1
1820	38	3.2 Decision-making	Decision10	1
1821	38	3.2 Decision-making	Decision11	1
1822	38	3.2 Decision-making	Decision12	1
1823	38	3.2 Decision-making	Decision13	1
1824	38	3.2 Decision-making	Decision14	1
1825	38	3.2 Decision-making	Decision15	1
1826	38	3.2 Decision-making	Decision16	1
1827	38	3.2 Decision-making	Decision17	1
1828	38	3.2 Decision-making	Decision18	1
1829	38	3.2 Decision-making	Decision19	1
1830	38	3.2 Decision-making	Decision20	1
1831	38	3.2 Decision-making	Decision21	1
1832	38	3.2 Decision-making	Decision22	1
1833	38	3.2 Decision-making	Decision23	1
1834	38	3.2 Decision-making	Decision24	1

1835	39	3.2 Decision-making	Decision7	1
1836	39	3.2 Decision-making	Decision8	1
1837	39	3.2 Decision-making	Decision9	1
1838	39	3.2 Decision-making	Decision10	1
1839	39	3.2 Decision-making	Decision11	1
1840	39	3.2 Decision-making	Decision12	1
1841	39	3.2 Decision-making	Decision13	1
1842	39	3.2 Decision-making	Decision14	2
1843	39	3.2 Decision-making	Decision15	1
1844	39	3.2 Decision-making	Decision16	2
1845	39	3.2 Decision-making	Decision17	1
1846	39	3.2 Decision-making	Decision18	1
1847	39	3.2 Decision-making	Decision19	1
1848	39	3.2 Decision-making	Decision20	1
1849	39	3.2 Decision-making	Decision21	2
1850	39	3.2 Decision-making	Decision22	2
1851	39	3.2 Decision-making	Decision23	1
1852	39	3.2 Decision-making	Decision24	2
1853	40	3.2 Decision-making	Decision7	2
1854	40	3.2 Decision-making	Decision8	1
1855	40	3.2 Decision-making	Decision9	1
1856	40	3.2 Decision-making	Decision10	2
1857	40	3.2 Decision-making	Decision11	1
1858	40	3.2 Decision-making	Decision12	1
1859	40	3.2 Decision-making	Decision13	1
1860	40	3.2 Decision-making	Decision14	2
1861	40	3.2 Decision-making	Decision15	1
1862	40	3.2 Decision-making	Decision16	2
1863	40	3.2 Decision-making	Decision17	1
1864	40	3.2 Decision-making	Decision18	2
1865	40	3.2 Decision-making	Decision19	1
1866	40	3.2 Decision-making	Decision20	2
1867	40	3.2 Decision-making	Decision21	2
1868	40	3.2 Decision-making	Decision22	2
1869	40	3.2 Decision-making	Decision23	1
1870	40	3.2 Decision-making	Decision24	2
1871	41	3.2 Decision-making	Decision7	1
1872	41	3.2 Decision-making	Decision8	1
1873	41	3.2 Decision-making	Decision9	1
1874	41	3.2 Decision-making	Decision10	1
1875	41	3.2 Decision-making	Decision11	1
1876	41	3.2 Decision-making	Decision12	1
1877	41	3.2 Decision-making	Decision13	1
1878	41	3.2 Decision-making	Decision14	1
1879	41	3.2 Decision-making	Decision15	1
1880	41	3.2 Decision-making	Decision16	1
1881	41	3.2 Decision-making	Decision17	1
1882	41	3.2 Decision-making	Decision18	1
1883	41	3.2 Decision-making	Decision19	1
1884	41	3.2 Decision-making	Decision20	1
1885	41	3.2 Decision-making	Decision21	1
1886	41	3.2 Decision-making	Decision22	1
1887	41	3.2 Decision-making	Decision23	1
1888	41	3.2 Decision-making	Decision24	1
1889	42	3.2 Decision-making	Decision7	2
1890	42	3.2 Decision-making	Decision8	1
1891	42	3.2 Decision-making	Decision9	2
1892	42	3.2 Decision-making	Decision10	2
1893	42	3.2 Decision-making	Decision11	1
1894	42	3.2 Decision-making	Decision12	2
1895	42	3.2 Decision-making	Decision13	1
1896	42	3.2 Decision-making	Decision14	1
1897	42	3.2 Decision-making	Decision15	1
1898	42	3.2 Decision-making	Decision16	2
1899	42	3.2 Decision-making	Decision17	1
1900	42	3.2 Decision-making	Decision18	3
1901	42	3.2 Decision-making	Decision19	1
1902	42	3.2 Decision-making	Decision20	1
1903	42	3.2 Decision-making	Decision21	2
1904	42	3.2 Decision-making	Decision22	1
1905	42	3.2 Decision-making	Decision23	1

1906	42	3.2 Decision-making	Decision24	2
1907	43	3.2 Decision-making	Decision7	3
1908	43	3.2 Decision-making	Decision8	2
1909	43	3.2 Decision-making	Decision9	4
1910	43	3.2 Decision-making	Decision10	5
1911	43	3.2 Decision-making	Decision11	4
1912	43	3.2 Decision-making	Decision12	4
1913	43	3.2 Decision-making	Decision13	1
1914	43	3.2 Decision-making	Decision14	5
1915	43	3.2 Decision-making	Decision15	2
1916	43	3.2 Decision-making	Decision16	4
1917	43	3.2 Decision-making	Decision17	2
1918	43	3.2 Decision-making	Decision18	5
1919	43	3.2 Decision-making	Decision19	1
1920	43	3.2 Decision-making	Decision20	5
1921	43	3.2 Decision-making	Decision21	4
1922	43	3.2 Decision-making	Decision22	3
1923	43	3.2 Decision-making	Decision23	2
1924	43	3.2 Decision-making	Decision24	4
1925	44	3.2 Decision-making	Decision7	2
1926	44	3.2 Decision-making	Decision8	1
1927	44	3.2 Decision-making	Decision9	2
1928	44	3.2 Decision-making	Decision10	2
1929	44	3.2 Decision-making	Decision11	1
1930	44	3.2 Decision-making	Decision12	1
1931	44	3.2 Decision-making	Decision13	1
1932	44	3.2 Decision-making	Decision14	2
1933	44	3.2 Decision-making	Decision15	2
1934	44	3.2 Decision-making	Decision16	2
1935	44	3.2 Decision-making	Decision17	2
1936	44	3.2 Decision-making	Decision18	2
1937	44	3.2 Decision-making	Decision19	1
1938	44	3.2 Decision-making	Decision20	1
1939	44	3.2 Decision-making	Decision21	2
1940	44	3.2 Decision-making	Decision22	2
1941	44	3.2 Decision-making	Decision23	2
1942	44	3.2 Decision-making	Decision24	2
1943	45	3.2 Decision-making	Decision7	1
1944	45	3.2 Decision-making	Decision8	1
1945	45	3.2 Decision-making	Decision9	1
1946	45	3.2 Decision-making	Decision10	1
1947	45	3.2 Decision-making	Decision11	1
1948	45	3.2 Decision-making	Decision12	1
1949	45	3.2 Decision-making	Decision13	1
1950	45	3.2 Decision-making	Decision14	1
1951	45	3.2 Decision-making	Decision15	1
1952	45	3.2 Decision-making	Decision16	1
1953	45	3.2 Decision-making	Decision17	1
1954	45	3.2 Decision-making	Decision18	5
1955	45	3.2 Decision-making	Decision19	1
1956	45	3.2 Decision-making	Decision20	1
1957	45	3.2 Decision-making	Decision21	4
1958	45	3.2 Decision-making	Decision22	1
1959	45	3.2 Decision-making	Decision23	1
1960	45	3.2 Decision-making	Decision24	1
1961	46	3.2 Decision-making	Decision7	1
1962	46	3.2 Decision-making	Decision8	1
1963	46	3.2 Decision-making	Decision9	1
1964	46	3.2 Decision-making	Decision10	1
1965	46	3.2 Decision-making	Decision11	1
1966	46	3.2 Decision-making	Decision12	1
1967	46	3.2 Decision-making	Decision13	1
1968	46	3.2 Decision-making	Decision14	1
1969	46	3.2 Decision-making	Decision15	1
1970	46	3.2 Decision-making	Decision16	1
1971	46	3.2 Decision-making	Decision17	1
1972	46	3.2 Decision-making	Decision18	1
1973	46	3.2 Decision-making	Decision19	1
1974	46	3.2 Decision-making	Decision20	1
1975	46	3.2 Decision-making	Decision21	1
1976	46	3.2 Decision-making	Decision22	1

1977 46 3.2 Decision-making Decision23 1  
 1978 46 3.2 Decision-making Decision24 1

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 127  
 An evaluation of the implementation of FSMS within the wine industry in the Western  
 Cape

08:09 Thursday, October  
 13, 2011

----- Aspect=2.2 Main Market for Product -----

The FREQ Procedure

Table of Question by Score

Question	Score		
Frequency			
Row Pct	0	1	Total
Export	14	32	46
	30.43	69.57	
Local	7	39	46
	15.22	84.78	
Total	21	71	92

Statistics for Table of Question by Score

Statistic	DF	Value	Prob
Chi-Square	1	3.0235	0.0821
Likelihood Ratio Chi-Square	1	3.0698	0.0798
Continuity Adj. Chi-Square	1	2.2213	0.1361
Mantel-Haenszel Chi-Square	1	2.9906	0.0837
Phi Coefficient		0.1813	
Contingency Coefficient		0.1784	
Cramer's V		0.1813	

Fisher's Exact Test

Cell (1,1) Frequency (F)	14
Left-sided Pr <= F	0.9773
Right-sided Pr >= F	0.0675
Table Probability (P)	0.0449
Two-sided Pr <= P	0.1350

Sample Size = 92

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 128  
 An evaluation of the implementation of FSMS within the wine industry in the Western  
 Cape

08:09 Thursday, October  
 13, 2011

----- Aspect=2.3 Activities on Product Inf -----

The FREQ Procedure

Table of Question by Score

Question	Score		
Frequency			
Row Pct	0	1	Total

Bottling	10	36	46
	21.74	78.26	
DistrStores	22	24	46
	47.83	52.17	
Marketing	25	21	46
	54.35	45.65	
Other_Act	37	9	46
	80.43	19.57	
Wine-making	11	35	46
	23.91	76.09	
Total	105	125	230

Statistics for Table of Question by Score

Statistic	DF	Value	Prob
Chi-Square	4	43.2838	<.0001
Likelihood Ratio Chi-Square	4	45.7486	<.0001
Mantel-Haenszel Chi-Square	1	2.5212	0.1123
Phi Coefficient		0.4338	
Contingency Coefficient		0.3980	
Cramer's V		0.4338	

Sample Size = 230

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 129  
 An evaluation of the implementation of FSMS within the wine industry in the Western  
 Cape

13, 2011

08:09 Thursday, October

----- Aspect=2.4 Organisation Certified fo -----

The FREQ Procedure

Table of Question by Score

Question	Score		Total
Frequency	0	1	
Row Pct			
BRC	10	36	46
	21.74	78.26	
HACCP	25	21	46
	54.35	45.65	
IMS	42	4	46
	91.30	8.70	
ISO_22000_2005	39	7	46
	84.78	15.22	
ISO_9001_2008	16	30	46
	34.78	65.22	
Other_Cert	24	22	46
	52.17	47.83	
Total	156	120	276

Statistics for Table of Question by Score



Statistic	DF	Value	Prob
Chi-Square	5	69.5308	<.0001
Likelihood Ratio Chi-Square	5	76.7792	<.0001
Mantel-Haenszel Chi-Square	1	2.0147	0.1558
Phi Coefficient		0.5019	
Contingency Coefficient		0.4486	
Cramer's V		0.5019	

Sample Size = 276

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 130  
 An evaluation of the implementation of FSMS within the wine industry in the Western Cape  
 08:09 Thursday, October 13, 2011

----- Aspect=2.5 Audit Criteria Used by Or -----

The FREQ Procedure

Table of Question by Score

Question	Score		Total
Frequency	0	1	
Row Pct			
BRC_VER_5_AC	9	37	46
	19.57	80.43	
IFS_VER5_AC	36	10	46
	78.26	21.74	
ISO_22000_2005_A C	38	8	46
	82.61	17.39	
ISO_9001_2008_AC	20	26	46
	43.48	56.52	
Other_AC	34	12	46
	73.91	26.09	
SANS_10330_2007_ A	32	14	46
	69.57	30.43	
Total	169	107	276

Statistics for Table of Question by Score

Statistic	DF	Value	Prob
Chi-Square	5	58.6861	<.0001
Likelihood Ratio Chi-Square	5	60.0920	<.0001
Mantel-Haenszel Chi-Square	1	10.7944	0.0010
Phi Coefficient		0.4611	
Contingency Coefficient		0.4187	
Cramer's V		0.4611	

Sample Size = 276

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 131  
 An evaluation of the implementation of FSMS within the wine industry in the Western Cape  
 08:09 Thursday, October 13, 2011

----- Aspect=3.1 Food Safety Management System -----

The FREQ Procedure

Table of Question by Score

Question	Score				
Frequency	1	2	3	4	Total
FSMGen1	31	13	2	0	46
Row Pct	67.39	28.26	4.35	0.00	
FSMGen2	31	13	1	1	46
Row Pct	67.39	28.26	2.17	2.17	
FSMGen3	32	13	1	0	46
Row Pct	69.57	28.26	2.17	0.00	
FSMGen4	31	13	1	1	46
Row Pct	67.39	28.26	2.17	2.17	
FSMGen5	28	17	1	0	46
Row Pct	60.87	36.96	2.17	0.00	
FSMGen6	28	16	1	1	46
Row Pct	60.87	34.78	2.17	2.17	
Total	181	85	7	3	276

Statistics for Table of Question by Score

Statistic	DF	Value	Prob
Chi-Square	15	5.3942	0.9882
Likelihood Ratio Chi-Square	15	6.4252	0.9717
Mantel-Haenszel Chi-Square	1	0.5907	0.4422
Phi Coefficient		0.1398	
Contingency Coefficient		0.1385	
Cramer's V		0.0807	

WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

Sample Size = 276

----- Aspect=3.2 Decision-making -----

Table of Question by Score

Question	Score					
Frequency	1	2	3	4	5	Total
Decision10	21	13	4	5	3	46
Row Pct	45.65	28.26	8.70	10.87	6.52	
Decision11	29	9	5	3	0	46
Row Pct	63.04	19.57	10.87	6.52	0.00	
Decision12	30	13	1	1	1	46
Row Pct	65.22	28.26	2.17	2.17	2.17	
Decision13	36	8	1	1	0	46
Row Pct	78.26	17.39	2.17	2.17	0.00	
Decision14	28	14	1	2	1	46
Row Pct	60.87	30.43	2.17	4.35	2.17	
Decision15	34	11	1	0	0	46
Row Pct	73.91	23.91	2.17	0.00	0.00	

Decision16	27	14	1	4	0	46
	58.70	30.43	2.17	8.70	0.00	
Decision17	35	9	2	0	0	46
	76.09	19.57	4.35	0.00	0.00	
Decision18	19	17	3	4	3	46
	41.30	36.96	6.52	8.70	6.52	
Decision19	35	10	1	0	0	46
	76.09	21.74	2.17	0.00	0.00	
Decision20	32	12	1	0	1	46
	69.57	26.09	2.17	0.00	2.17	
Decision21	22	17	3	4	0	46
	47.83	36.96	6.52	8.70	0.00	
Decision22	28	15	3	0	0	46
	60.87	32.61	6.52	0.00	0.00	
Decision23	32	13	1	0	0	46
	69.57	28.26	2.17	0.00	0.00	
Decision24	27	17	1	1	0	46
	58.70	36.96	2.17	2.17	0.00	
Decision7	34	10	2	0	0	46
	73.91	21.74	4.35	0.00	0.00	
Decision8	30	13	2	1	0	46
	65.22	28.26	4.35	2.17	0.00	
Decision9	30	13	1	1	1	46
	65.22	28.26	2.17	2.17	2.17	
Total	529	228	34	27	10	828

Statistics for Table of Question by Score

Statistic	DF	Value	Prob
Chi-Square	68	101.3631	0.0054
Likelihood Ratio Chi-Square	68	99.0671	0.0083
Mantel-Haenszel Chi-Square	1	5.8963	0.0152
Phi Coefficient		0.3499	
Contingency Coefficient		0.3303	
Cramer's V		0.1749	

WARNING: 60% of the cells have expected counts less than 5. Chi-Square may not be a valid test.  
Sample Size = 828

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 133  
An evaluation of the implementation of FSMS within the wine industry in the Western Cape

08:09 Thursday, October 13, 2011

----- Aspect=2.2 Main Market for Product -----

The GLM Procedure

Class Level Information

Class	Levels	Values
JudgeNr	46	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
	25 26	27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46

Question 2 Export Local

Number of Observations Read 92  
Number of Observations Used 92

----- Aspect=2.2 Main Market for Product -----

The GLM Procedure

Dependent Variable: Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr
Model	46	6.23913043	0.13563327		0.61
Error	45	9.96739130	0.22149758		
Corrected Total	91	16.20652174			

R-Square 0.384977  
Coeff Var 60.98373  
Root MSE 0.470635  
Score Mean 0.771739

Source	DF	Type I SS	Mean Square	F Value	Pr
JudgeNr	45	5.70652174	0.12681159		0.57
Question	1	0.53260870	0.53260870		2.40

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 135  
An evaluation of the implementation of FSMS within the wine industry in the Western Cape  
08:09 Thursday, October 13, 2011

----- Aspect=2.2 Main Market for Product -----

The GLM Procedure

t Tests (LSD) for Score

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05  
Error Degrees of Freedom 45  
Error Mean Square 0.221498  
Critical Value of t 2.01410  
Least Significant Difference 0.1977

Means with the same letter are not significantly different.

t Grouping	Mean	N	Question
A	0.84783	46	Local
A	0.69565	46	Export

----- Aspect=2.2 Main Market for Product -----  
 -----

The GLM Procedure

Level of Question	N	-----Score-----	
		Mean	Std Dev
Export	46	0.69565217	0.46521513
Local	46	0.84782609	0.36315845

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 137  
 An evaluation of the implementation of FSMS within the wine industry in the Western Cape  
 08:09 Thursday, October 13, 2011

----- Aspect=2.3 Activities on Product Inf -----

The GLM Procedure

Class Level Information

Class	Levels	Values
JudgeNr	46	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
Question	5	Bottling DistrStores Marketing Other_Act Wine-making
		Number of Observations Read 230 Number of Observations Used 230

----- Aspect=2.3 Activities on Product Inf -----

The GLM Procedure

Dependent Variable: Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	49	29.00434783	0.59192547		3.80
Error	180	28.06086957	0.15589372		
Corrected Total	229	57.06521739			

R-Square	Coeff Var	Root MSE	Score Mean
0.508267	72.64942	0.394834	0.543478

Source	DF	Type I SS	Mean Square	F Value	Pr > F
JudgeNr	45	18.26521739	0.40589372		2.60
Question	4	10.73913043	2.68478261		17.22

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 139  
 An evaluation of the implementation of FSMS within the wine industry in the Western Cape

----- Aspect=2.3 Activities on Product Inf -----

The GLM Procedure

t Tests (LSD) for Score

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
Error Degrees of Freedom 180
Error Mean Square 0.155894
Critical Value of t 1.97323
Least Significant Difference 0.1625

Means with the same letter are not significantly different.

Table with 4 columns: t Grouping, Mean, N, Question. Rows include Bottling, Wine-making, DistrStores, Marketing, and Other\_Act.

----- Aspect=2.3 Activities on Product Inf -----

The GLM Procedure

Table with 4 columns: Level of Question, N, Mean, Std Dev. Rows include Bottling, DistrStores, Marketing, Other\_Act, and Wine-making.

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 141
An evaluation of the implementation of FSMS within the wine industry in the Western Cape

----- Aspect=2.4 Organisation Certified fo -----

The GLM Procedure

Class Level Information

Table with 3 columns: Class, Levels, Values. Rows include JudgeNr and Question.

Number of Observations Read 276  
Number of Observations Used 276

----- Aspect=2.4 Organisation Certified fo -----  
-----

The GLM Procedure

Dependent Variable: Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr
> F					
Model	50	30.24637681	0.60492754		3.62
<.0001					
Error	225	37.57971014	0.16702093		
Corrected Total	275	67.82608696			

R-Square 0.445940  
Coeff Var 93.99685  
Root MSE 0.408682  
Score Mean 0.434783

Source	DF	Type I SS	Mean Square	F Value	Pr
> F					
JudgeNr	45	13.15942029	0.29243156		1.75
0.0044					
Question	5	17.08695652	3.41739130		20.46
<.0001					

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 143  
An evaluation of the implementation of FSMS within the wine industry in the Western  
Cape

08:09 Thursday, October  
13, 2011

----- Aspect=2.4 Organisation Certified fo -----

The GLM Procedure

t Tests (LSD) for Score

NOTE: This test controls the Type I comparisonwise error rate, not the  
experimentwise

error rate.

Alpha 0.05  
Error Degrees of Freedom 225  
Error Mean Square 0.167021  
Critical Value of t 1.97056  
Least Significant Difference 0.1679

Means with the same letter are not significantly different.

t Grouping	Mean	N	Question
A	0.78261	46	BRC
A	0.65217	46	ISO_9001_2008
B	0.47826	46	Other_Cert

```

B
B      0.45652      46      HACCP

C      0.15217      46      ISO_22000_2005
C
C      0.08696      46      IMS

```

----- Aspect=2.4 Organisation Certified fo -----  
-----

The GLM Procedure

Level of Question	N	-----Score-----	
		Mean	Std Dev
BRC	46	0.78260870	0.41702883
HACCP	46	0.45652174	0.50361016
IMS	46	0.08695652	0.28488492
ISO_22000_2005	46	0.15217391	0.36315845
ISO_9001_2008	46	0.65217391	0.48154341
Other_Cert	46	0.47826087	0.50504699

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 145  
An evaluation of the implementation of FSMS within the wine industry in the Western Cape  
08:09 Thursday, October 13, 2011

----- Aspect=2.5 Audit Criteria Used by Or -----  
-----

The GLM Procedure

Class Level Information

```

Class      Levels  Values
JudgeNr    46  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
25 26
          27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
Question   6  BRC_VER_5_AC IFS_VER5_AC ISO_22000_2005_AC ISO_9001_2008_AC
Other_AC
          SANS_10330_2007_A

```

```

Number of Observations Read      276
Number of Observations Used      276

```

----- Aspect=2.5 Audit Criteria Used by Or -----  
-----

The GLM Procedure

Dependent Variable: Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr
> F					
Model	50	31.28260870	0.62565217	4.11	<.0001
Error	225	34.23550725	0.15215781		
Corrected Total	275	65.51811594			

```

R-Square      Coeff Var      Root MSE      Score Mean

```



0.477465 100.6172 0.390074 0.387681

Source	DF	Type I SS	Mean Square	F Value	Pr
JudgeNr	45	17.35144928	0.38558776		2.53
Question	5	13.93115942	2.78623188		18.31

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 147  
 An evaluation of the implementation of FSMS within the wine industry in the Western Cape  
 08:09 Thursday, October 13, 2011

----- Aspect=2.5 Audit Criteria Used by Or -----

The GLM Procedure

t Tests (LSD) for Score

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05  
 Error Degrees of Freedom 225  
 Error Mean Square 0.152158  
 Critical Value of t 1.97056  
 Least Significant Difference 0.1603

Means with the same letter are not significantly different.

t Grouping	Mean	N	Question
A	0.80435	46	BRC_VER_5_AC
B	0.56522	46	ISO_9001_2008_AC
C	0.30435	46	SANS_10330_2007_A
C	0.26087	46	Other_AC
C	0.21739	46	IFS_VER5_AC
C	0.17391	46	ISO_22000_2005_AC

----- Aspect=2.5 Audit Criteria Used by Or -----

The GLM Procedure

Level of Question	N	Mean	Std Dev
BRC_VER_5_AC	46	0.80434783	0.40108548
IFS_VER5_AC	46	0.21739130	0.41702883
ISO_22000_2005_AC	46	0.17391304	0.38322305
ISO_9001_2008_AC	46	0.56521739	0.50120627
Other_AC	46	0.26086957	0.44396109
SANS_10330_2007_A	46	0.30434783	0.46521513

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 149

----- Aspect=3.1 Food Safety Management System -----

The GLM Procedure

Class Level Information

Class	Levels	Values
JudgeNr	46	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
Question	6	FSMGen1 FSMGen2 FSMGen3 FSMGen4 FSMGen5 FSMGen6

Number of Observations Read 276  
 Number of Observations Used 276

----- Aspect=3.1 Food Safety management Sy -----  
 -----

The GLM Procedure

Dependent Variable: Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	50	59.84057971	1.19681159		7.11
Error	225	37.89855072	0.16843800		
Corrected Total	275	97.73913043			

R-Square 0.612248  
 Coeff Var 29.49836  
 Root MSE 0.410412  
 Score Mean 1.391304

Source	DF	Type I SS	Mean Square	F Value	Pr > F
JudgeNr	45	59.40579710	1.32012882		7.84
Question	5	0.43478261	0.08695652		0.52

----- Aspect=3.1 Food Safety Management System -----

The GLM Procedure

t Tests (LSD) for Score

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05  
 Error Degrees of Freedom 225  
 Error Mean Square 0.168438  
 Critical Value of t 1.97056  
 Least Significant Difference 0.1686

Means with the same letter are not significantly different.

t Grouping	Mean	N	Question
A	1.45652	46	FSMGen6
A	1.41304	46	FSMGen5
A	1.39130	46	FSMGen4
A	1.39130	46	FSMGen2
A	1.36957	46	FSMGen1
A	1.32609	46	FSMGen3

----- Aspect=3.1 Food Safety management Sy -----  
 -----

The GLM Procedure

Level of Question	N	-----Score-----	
		Mean	Std Dev
FSMGen1	46	1.36956522	0.57188560
FSMGen2	46	1.39130435	0.64904240
FSMGen3	46	1.32608696	0.51873127
FSMGen4	46	1.39130435	0.64904240
FSMGen5	46	1.41304348	0.54062051
FSMGen6	46	1.45652174	0.65681121

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 153  
 An evaluation of the implementation of FSMS within the wine industry in the Western Cape

08:09 Thursday, October 13, 2011

----- Aspect=3.2 Decision-making -----

The GLM Procedure

Class Level Information

Class	Levels	Values
JudgeNr	46	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
Question	18	Decision10 Decision11 Decision12 Decision13 Decision14
Decision15		Decision16 Decision17 Decision18 Decision19 Decision20
Decision21		Decision22 Decision23 Decision24 Decision7 Decision8 Decision9

Number of Observations Read 828  
 Number of Observations Used 828

----- Aspect=3.2 Decision-making -----

The GLM Procedure

Dependent Variable: Score

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	62	256.9734300	4.1447327		10.57
Error	765	300.0157005	0.3921774		
Corrected Total	827	556.9891304			

R-Square	Coeff Var	Root MSE	Score Mean
0.461362	41.64878	0.626241	1.503623

Source	DF	Type I SS	Mean Square	F Value	Pr > F
JudgeNr	45	213.2669082	4.7392646		12.08
Question	17	43.7065217	2.5709719		6.56

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 155  
 An evaluation of the implementation of FSMS within the wine industry in the Western Cape  
 08:09 Thursday, October 13, 2011

----- Aspect=3.2 Decision-making -----

The GLM Procedure

t Tests (LSD) for Score

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha	0.05
Error Degrees of Freedom	765
Error Mean Square	0.392177
Critical Value of t	1.96307
Least Significant Difference	0.2563

Means with the same letter are not significantly different.

t Grouping	Mean	N	Question
A	2.0435	46	Decision10
A			
A	2.0217	46	Decision18
B	1.7609	46	Decision21
B			
C	1.6087	46	Decision11
C			
C	1.6087	46	Decision16
C			
C	1.5652	46	Decision14

C		D			
C	E	D	1.4783	46	Decision9
C	E	D			
C	E	D	1.4783	46	Decision12
C	E	D			
C	E	D	1.4783	46	Decision24
C	E	D			
C	E	D	1.4565	46	Decision22
C	E	D			
C	E	D	1.4348	46	Decision8
C	E	D			
C	E	D	1.3913	46	Decision20
	E	D			
	E	D	1.3261	46	Decision23
	E				
	E		1.3043	46	Decision7
	E				
	E		1.2826	46	Decision13
	E				
	E		1.2826	46	Decision15
	E				
	E		1.2826	46	Decision17
	E				
	E		1.2609	46	Decision19

SONJA DAVIDS, DEPARTMENT OF INDUSTRIAL SYSTEMS & ENGINEERING - CPUT 156  
 An evaluation of the implementation of FSMS within the wine industry in the Western  
 Cape

08:09 Thursday, October

13, 2011

----- Aspect=3.2 Decision-making -----

The GLM Procedure

Level of Question	N	-----Score-----	
		Mean	Std Dev
Decision10	46	2.04347826	1.26414700
Decision11	46	1.60869565	0.93043027
Decision12	46	1.47826087	0.83637127
Decision13	46	1.28260870	0.62050315
Decision14	46	1.56521739	0.91048641
Decision15	46	1.28260870	0.50168797
Decision16	46	1.60869565	0.90623178
Decision17	46	1.28260870	0.54418312
Decision18	46	2.02173913	1.20164943
Decision19	46	1.26086957	0.49147319
Decision20	46	1.39130435	0.74470757
Decision21	46	1.76086957	0.92339428
Decision22	46	1.45652174	0.62205829
Decision23	46	1.32608696	0.51873127
Decision24	46	1.47826087	0.65791355
Decision7	46	1.30434783	0.55255227
Decision8	46	1.43478261	0.68806246
Decision9	46	1.47826087	0.83637127