IMPLEMENTATION OF FOOD SAFETY MANAGEMENT SYSTEM FOR COMPETITIVE ADVANTAGE AT MUMIAS SUGAR COMPANY LIMITED, KENYA

BY

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

NOVEMBER 2018

DECLARATION

I hereby wish to declare that this is my original work and has not been presented for the purpose of examination in any institution.

Signature……. Date…….

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D61/72969/2009

The Report has been presented with my approval as the University Supervisor

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DEDICATION

I thank the Almighty God for giving me the wisdom and strength throughout this project. I dedicate this research to close family who supported and encouraged me through the entire MBA programme. Much dedication goes to my close friend Mr. William Ndagwa and my course mates for the moral support during study.

ACKNOWLEDGEMENT

I would like to show much gratitude to the The University of Nairobi Kisumu Campus staff for the support during the MBA Programme. I would like to extend my gratitude to The University of Nairobi support staff Mr. Mokaya Mariera for his support during the project.

I would like to show much gratitude to my supervisor Dr. Vincent Machuki, The Director, University of Nairobi Kisumu Campus and the moderator Mr. Alex Jaleha for pearls of wisdom shared during the course of this project. May the Lord bless the work of your hands.

ABSTRACT

Implementation of food safety management systems international standards (ISO 22000) has become a major requirement to organization in the food supply chain thereby enabling them to compete globally. This international standard specifies requirement for a system that the organizations in the food chain need to demonstrate their ability to manage food safety hazards and consistently produce quality products. While the demands ISO 22000 is generic and intended to be applicable in all firms in the food supply chain, the organizations approaches in the application of Food Safety Management Systems (FSMS) require an understanding of the interrelationship between all the processes in a system and continuous improvement through measurement and evaluation. The research seeks to establish the implementation of Food Safety Management System for competitive advantage at Mumias Sugar Company Limited (MSC). The research was carried as a case study with the objective to establish the extent of implementation of FSMS and how it has served as a competitive advantage at Mumias Sugar Company Limited. Both primary and secondary data were gathered. Primary data was collected through interviews with five food safety management champions in the company while secondary data acquired from the company quality management department synthesized data, Laboratory Reports, Company Annual Reports and Financial statements, Kenya Sugar Board Reports and Sugar Directorate Reports. Content analysis was used to extract the relationship from the qualitative data collected. The analysis of the data indicates Mumias Sugar Company elaborate commitment to the implementation of Food Safety Management Systems (ISO 22000) and that there exist strong relationship between implementation of Food Safety Management Systems and competitive advantage through improved operational performance but this did not necessarily reflect of the business performance. Interviewees cited product quality, customer satisfaction, reduced production costs, improved production/machines efficiency, innovation, diversification, communication, brand equity and reduced defect rates as the major factors supported by Food Safety Management Systems implementation in achieving competitive advantage. The research provide valuable insight to the researchers, MSC management and competing firms on how implementation of FSMS influences competitive advantage. The research will also support the regulatory authorities to develop policies and guidelines in sugar production. Further research needed on synchronization of Food Safety Management System with other factory activities to acquire the maximum value.

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ABBREVIATIONS AND ACRONYMS

AFFA	Agriculture Fisheries and Food Authority
AMS	Agricultural Management System
AU	African Union
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
FDR	Factory Daily Report
FSMS	Food Safety Management System
GDP	Gross Domestic Product
ISO 22000	Food Safety Management System International Standard
ISO 9001	Quality Management System International Standard
KALRO	Kenya Agricultural and Livestock Research Organization
KSB	Kenya Sugar Board
KSI	Kenya Sugar Industry
MSC	Mumias Sugar Company Limited
MT	Metric Tonnes
MW	Megawatts
PRPs	Prerequisite Programmes
TC/TS	Tonnes on Cane per Tonne of Sugar
TCD	Tonnes of Cane per Day

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Organizations are constantly engaging in continuous business improvement by employing different business strategies to meet and exceed customers expectations thereby creating a competitive edge. This competitive edge defines the competitive advantage over other competing firms. Porter (1985) articulates that competitive advantage is the achievement of organization success with superior performance above competitors in the industry. Thompson and Strickland (2002) assert that companies obtain competitive advantage when they have superiority over the competitors in securing the customers and defending them from competing forces hence generating higher profits and higher returns. Food Safety Management System (FSMS) has been linked with the creation of such competitive advantage for many years. Marden (1995) pointed out that the main function of implementing FSMS is achieving competitive advantage. Food safety certification conveys to the customers and key players in the food business that the entity has successfully achieved required standards in the food industry (Pierson and Corlet, 1992)

This study is anchored on the Resource-Based Theory fronted by (Wenerfelt, 1984;Barney, 1991) and the Institutional Theory by (Meyers and Rowan, 1977; DiMaggio and Powel, 1983; Scott, 1987)in achieving competitive advantage. The Resource-Based Theory stipulates that organization's resources are the core drivers of its performance and that they may be influential in achieving a sustainable competitive

advantage of the firm (Wernerfelt, 1984). Barney (1991) affirms that the organizational possession of unique resources provides it with a chance to successfully achieve a competitive advantage over its rivals. RBV defines the firm's capability to create competitive advantage by managing its resources to produce a unique outcome to the competitors thereby creating a competitive barrier (Mahoney and Pandian, 1992). Corner (1991) further expresses that firms should put more emphasis on the implication of the resources it possesses to performance. While Peteraf (1993) expresses that the resources are heterogeneous and not perfectly mobile. All the proponents of this theory agree that the organizations should assess its internal resources in creating competitive advantage. Institutional theory considers the resilient aspects of the social structure on how schemes, rules, norms and routines become established authoritative guidelines for social structure. Institutional theorists assert that the institutional environment can strongly influence the development of formal structures that improves technical efficiencies in early adopting organizations (Meyer and Rowal, 1977). They further express that the new and existing organizations may adopt the structures ceremoniously even if they do not improve efficiency but to gain or maintain legitimacy in the institutional environment. According to DiMaggio and Powel (1983), institutional rules function as myths which organizations incorporate, gaining legitimacy, resource stability and enhanced service prospects. The proponents of the theory further assert that for the organizations to survive in any environment, they must conform to the rules, beliefs and myths prevailing in that environment.

Mumias Sugar Company Limited embarked on implementation of FSMS in order to benchmark with other top performing manufacturing companies in the world and to

create a sustainable competitive advantage (Mumias Sugar Company, Strategic Plan 2006-2010). This was in line with the company vision to be the world class producer of sugar and other integrated products through strengthening the production system and improving quality (Mumias Sugar Company, 2013). The company operates in a very competitive environment that requires shrewd measures in improvement of operational effectiveness, efficiency, building the brand equity and creating competitive advantage.

1.1.1 Implementation of Food Safety Management System

Food Safety Management System is a network of activities that interact to ensure elimination of hazards in food production (Pierson and Corlet, 1992). Surak (2005) defines FSMS as actions that instills food safety into the products by controlling the processes to ensure satisfactory management and production of safe foods. This provides the platform for ISO 22000 certification. The organizations in food supply chain are demanded to poses an approved and properly documented FSMS aiming to guarantee total safety to their customers (Yiannas, 2009). They must think about the challenges with the food and the need for customers' safety. It's from this concept that ISO 22000 family of international standards was formed to address food safety management. The implementation requirement for this international standard is generic and applicable to all organization in the food chain with the scope specifying the product or product categories, processes and production sites that are encountered by the FSMS (ISO 22000:2005, 2006).

The International Standard Organization 22000:2005 (2006) indicates that ISO 22000 series was developed as internationally recognized/accepted standard and it applies to all firms in the food industry. It has a holistic approach of incorporating interactive

communication, system management, implementation of pre-requisite programs and the progressive review and system improvement. This international standard articulates the demands for a FSMS that incorporates universally specified elements to ensure safety beforehand when dealing with food production. The elements include: System Management, Interactive Communication, Prerequisite Programs and HACC principles (ISO: 22000:2005). Implementation of ISO 22000 provides organizations with frameworks to develop structures for food hygiene in a harmonized way which does not vary with the country or the food product concerned (ISO: 22004:2005).

In linking the FSMS to competitive advantage, Meyers (2014) indicates that implementation of FSMS offers firms ways to leverage supply chain risks and gain competitive advantage. He argues that FSMS has been found to increase revenue by bringing in more business and reducing expenses by making operation efficient. Pierson and Corlet (1992) argued that food safety certification informs the market and major undertakers that the food organization applies the best local and global approach. Evel and Gosh (1997) expressed that the certification is often seen as a competitive weapon in market and not as a vehicle for process value creation and efficiency enhancement. They further expressed that the certification only build buyers confidence that company's products has the fundamental quality system in place and their safety is guaranteed. Jacob and Dorte (2004) also argued that the failure of food supply can be a very suicidal and costly event and FSMS is therefore designed to eliminate weak links emanating in the food supply chain and thus the bigger compatibility to creating competitive advantage.

1.1.2 The Concept of Competitive Advantage

Competitive advantage is the achieving of organizational success with superior performance above competitors in the industry (Porter, 1980). The term competitive advantage refers to the proficiency acquired by a firm through peculiarity or resources to outdo other firms in a given industry or market (Christensen and Fahey, 1984). It is the qualities inherent in a firm that enables it to perform better than the competitors by giving more value to the customers (Porter, 1985). Amaedeo (2017) affirms by expressing that it's what makes you better than your competitor in the customer's mind. The condition allows the organization to make better sales or superior margins compared to the competing firms in the same industry.

Porter (1985) identified generic strategies used by companies to achieve strategic advantage as: Cost Leadership; where the firm produce same product/service at lower cost than the competitor, Differentiation; when a firm offers better product/service than the competitor making the product stand out or unique, Focus; when a firm aims at few target market rather than the entire market considering the customers view or their peculiar demands. Porter (1998) further affirms that competitive advantage emanates from the unique value it creates to the customers in an industry that exceed the firm cost of creating it and that it can be improved by interrelationship with other business units in related industries underpinning diversification for corporate strategy. Bennet (1994) states that the firm's competitive position depends on many variables not limited to its share, brand equity, product quality, corporate identities, distribution arrangement and on its ability to expand or contract its operation on short notice.

Thompson and Strickland (2002) expresses that an organization acquire a competitive advantage by gaining an edge over the competitors in securing the customers and protecting them from competing forces. Organizations with competitive advantage in a specific market tend to be more profitable and are likely to earn higher returns than one competing with no advantage. In Porter's (1985) view, superior performance in the market is significantly guided by acquiring competitive advantage. It provides a better platform to the firms to be ahead of competitors. Johnston (2008) argues that achievement of competitive advantage over others is only sustainable if the entity has capability that the others do not have or have difficulty in achieving. It therefore reflects that success or failure of the organization is highly dependent on the strategies put in place to identify and optimally utilize the capabilities in exploiting the strength and opportunities. According to Ansoff (1993), for an entity to optimize its competitiveness and its profitability, it has to synchronize the strategy with the environment. Only organizations that link strategy to environment succeed. Porter (1985) argued that strategic managers in relatively all the organizations should be concerned in developing platforms to build and sustain competitive advantage.

1.1.3 The Sugar Industry in Kenya

Kenya Sugar industry is a significant sector to the national economy supporting approximately 250,000 farmers and accounting for about 15 % of the Agricultural GDP making it an important cash crop to the economy (KSI strategic plan, 2010-2014). The industry dates back to 1922 when Miwani Sugar Mills was established. Progressively expanding to Ramisi (1927), Muhoroni (1966) Chemelil (1968), Mumias (1973), Nzoia (1978), South Nyanza Sugar Company (1979), as parastatals. Further West Kenya

(1981), Soin (2006), Kibos (2007), Butali (2007), Transmara (2011), Sukari (2012) and Kwale International Sugar Company (2015) were established as private entities (KALRO Report, 2015). The Sugar Directorate is the regulating body of the sugar industry under Agriculture and Food Authority (AFA) established through Crop Act 2013 taking over from the defunct Kenya Sugar Board from 1st, August 2014 with the same mandate of sugar industry development (AFA, 2017). The main mandate is to regulate/promote sugar industry, manage individuals/organization within the sugar industry and to facilitate equitable industrial benefits to all parties hence spurring social economic growth (KSB Report, 2013).

According to AFFA (2017), the industry is facing numerous challenges ranging from underutilization, poor transport infrastructure, regular maintenance, technological lapse, cheap importations and weak corporate governance. The Kenyan government effort to drive a multi-product sugarcane industry that is efficient, diversified and globally competitive is yet provide sufficient sugar in the country (KSB, 2014). The country produces approximately 600000MT of sugar against demand ranging to over 800000MT making the country a net importer of sugar. The net import has grown from 4000MT in 1984 to over 200000MT in 2015 to help bridge the gaps (Sugar Directorate, 2015). The local millers are therefore exposed to high competition from the imported sugar hence the need to streamline their operation and strike a strategic advantage. The millers need to reduce their production costs by at least 40% to compete effectively with the regional players in the sugar industry (Sugar Directorate, 2017).

Kenya membership in the regional bodies such as COMESA, AU and EAC put the industry on the verge of a major shift which requires the local companies to strategically

position themselves in the market. The tariff to protect the sugar makers against foreign import will be dropped and hence members of COMESA will compete with each other in the market. Sugar Directorate Report (2016) indicates the Kenya Government has requested an extension for opening the COMESA market for another two years starting February 2017 to enable it put in place measures to revive the sugar industry, such as privatization and solve problems such as inefficiencies, low production and mismanagement to position the local firms for favorable competition in the market.

The sugar companies in Kenya have given much attention on the implementation of FSMS as they aspire to win the customers confidence resulting from the high standard and assurance of safety of the end product. Most companies have implemented ISO 9001 with major milestone into ISO 22000 but with no certification. The level of adoption of food safety management certification in the country is still very low with Kenchic being the first company to acquire certification in November, 2011 (KBS, 2013). Maiyo (2010) researching on the impact of ISO certification in Kenya reiterated that it improves the organizational performance, productivity, market share, quality, customer satisfaction and profitability with significant reduction in cost of production. The companies invest in the implementation of the system to gain competitive edge and get greater market reach both locally and internationally.

1.1.4 Mumias Sugar Company Limited

Mumias Sugar Company limited was incorporated in 1971 after a feasibility study in 1967by Booker Agriculture and Technical Service. The report indicated the viability of sugarcane farming leading to the initiation of the pilot project (Mumias Sugar Company 2017). The company was started as a body to implement the project aiming to provide

source of income, creating jobs, controlling rural urban migration, reducing dependency on importation and making profits. The government became the major shareholder at 71%, Commonwealth Development Corporation (17%), Kenya Commercial Finance Company (5%), Booker McConell (4%) and East African Development Bank (3%). The company commenced operation in 1973 (Mumias Sugar Company Limited, 2017).

The company gradually expanded the crushing capacity to 7500TCD with the internal capability to produce 1200MT of sugar per day. The company has also diversified in to power (34MW), mineral water and ethanol production which positioned it as a major player in the sugar industry acquiring competitive advantage over the firms in the market (Mumias Sugar Company, 2012). The diversification is geared on efficient utilization of byproducts in an integrated system by adding intermediate high value production line with expected significant impact on profitability (KSB, 2013). Until the year 2013, Mumias Sugar Company LImited produced over 60% of the country total sugar production (KSB, 2014).

Mumias Sugar Company Limited currently operates in a turbulent environment marred with extreme cane poaching, licensing of more cane millers such as West Kenya, Butali and Kibos, drastic subdivision of land, cheap sugar importation, technological changes and mismanagement (Mumias Sugar Company, Strategic Report 2015). The company experience dwindling performance from 2014 falling into deep financial crisis losing the competitive edge over the competing firms despite the implementation of FSMS attributed to superior performance and productivity. Neither has the much researched and publicized diversification salvaged it from the crisis. The farmers in the region are also abandoning cane farming due to high debts owed by the company and delayed payments

putting the company in a more precarious position. The company needs to focus on a serious operation evaluation and review in order to improve performance and reposition itself for the major competition battle.

1.2 Research Problem

The global competitive environment drive organizations to employ different strategies in achieving competitive advantage based on their vision and the sugar industry is not an exception. Competitive advantage is gained when a company is capable of offering greater value to the customers than the competitors (Christensen and Fahey, 1984).All companies must possess at least one competitive advantage for effective competition in the market and if the company doesn't have one, the risk of elimination from the market is quite eminent (Porter, 1985). FSMS is used to create such competitive advantage across the food industry. Aymes (2010) express that the future and prosperity of organization within the food industry will depend on the level of trust that the customers have on the brand based on safety, quality and error tolerance. While Meyers (2014) articulated that implementing FSMS offer companies way to leverage supply chain risks and gain competitive advantage. However Erel and Gosh (1997) and Hutchens (2014) opine that FSMS does not guarantee that one is going to make a quality product but only conveys the existence of management system aiming for quality product. They further point that many of the systems are purely reactively developed to respond to customer requirements or legal regulations.

Mumias Sugar Company Limited operates in a very competitive environment that requires intelligent approach in managing the business portfolio in the face of

globalization and continuous technological change. The company experience serious competition from the local firms magnified by the licensing of other players within its sugarcane growing zones such as West Kenya, Butali, Kibos and Busia. With the lapse of COMESA safeguard, the industry will begin operating under liberalized trade regime in which all the firms will be required to enhance their operations in order to match the EAC partner states and Comesa (Sugar Directorate, 2017). Mumias Sugar embarked on investing in food safety management system in 2008 for its internal management control procedures in order to benchmark with other top performing companies in the world in the face of stiff competition (Mumias Sugar Company, 2010). This was in line with the company vision of becoming the world class producer of sugar and other integrated products. MSC further underwent ISO audits in 2008 and currently certified as 9001:2008 with a major milestone into ISO 22000 (Mumias Sugar Company LTD, 2012).

Many researches have been done regarding food safety systems and competitive advantage. Aymes (2010) and Meyers (2014) studied quality and FSMS as a competitive advantage finding that it leverage supply chain risks and improves customers satisfaction. Charalambos (2010) researched on the implementation of FSMS in the production line of sugar, molasses and Pulp case of Hellenic Sugar Industries S.A highlighting FSMS significantly improves the safety of its products. Fawzia (2016) researched on implementation of HACCP in dairy processing finding that the system positively influences the final product quality. Locally, Kimutai (2009) researched on ISO 9001:2000 certifications in sugar industries in Kenya, Mumias Sugar focusing on the relationship between production and ISO certification pointing improved productivity after certification. Hussein (2011) researched on the strategies employed by Mumias

Sugar to develop competitive advantage. Amisi (2009) also researched on influence of ISO 9001:2000 certification in competitive production in the Kenya Sugar Industry, Mumias Sugar Company exuding positive influence of ISO certification to the overall productivity. The researches show positive results on ISO certification in improving performance, productivity, market share, quality and reducing production cost geared towards achieving competitive advantage. The influence of ISO certification on product quality and productivity was exhibited with recommendations of continuous process improvement.

A review of the literature highlights influence of ISO certification on performance and productivity in achieving competitive advantage. Meyers (2014) focus on how FSMS certification leverage supply chain risks and not the implementation and anchoring of the FSMS in the respective organizations. While FSMS certification is highlighted as a factor towards improving internal business performance and achieving competitive advantage leading to superiority in performance, the level of implementation in MSC as established and documented in the prerequisite manual has never been established. Over the period from the year 2013 after the researches, the company has experienced extremely poor performance going in to deep financial crisis with risk of closure hence the need to defend and sustain its position in the industry or even edge out competition. How has implementation of FSMS served as a tool for Competitive advantage in Mumias Sugar Company Limited?

1.3 Research Objectives

The objectives of the study were:

i. To establish the extent of implementation of FSMS in Mumias Sugar Company Limited
ii. To determine how FSMS serve for competitive advantage in Mumias Sugar Company limited.

1.4 Value of the Study

The research study will contribute to the body of knowledge by establishing how the implementation/ application of food safety management systems influence the company's position in achieving competitive advantage. It will help the researchers understand the ways in which quality management tools, methods and practices help organizations improve performance and increase competitiveness.

The research will provide insight to Mumias Sugar Company top management team in assessment of the extent of implementation of the FSMS as a tool of achieving its competitive advantage while regaining the market position. It will assist the company to constructively improve food safety while championing international trade. The research will also enable Mumias Sugar Company Limited to revise and improve its business processes during the turnaround period based on the identifiable gaps.

The research will support the competing firms in the sugar industry to identify gaps in their manufacturing processes while striving to compete effectively in the market. The report will act as a benchmarking platform in food safety management system application

for the other sugar firms in the region. It will be valuable in eliminating supply chain risks and improving efficiencies.

The research will help the policy makers in the government and other sugar development institutions to come up with policies/procedures best designed in managing the sugar factories being the dynamic environment they operate. The report will help the local industries position themselves strategically in the phase of COMESA market opening.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter focuses on the theoretical framework upon which the study is anchored. The chapters also discuss the FSMS and the concept of competitive advantage coupled with various empirical literature review.

2.2 Theoretical Foundation

The concept on strategic management in this study is anchored on Resource Based View Theory which focuses on the use of internalized organization resources in creating competitive advantage. The research also incorporates The Institutional Theory looking in to the development of the formal organizational structures that establish resilience within organizations as an institutional mandate or survival.

2.2.1 The Resource-Based View Theory

Resource Based View Theory specify that organizations resources are their primary success determinants and that these resources may be harness to successfully position the organization in achieving competitive advantage (Wernerfelt, 1984). There is further assertion that fundamental resources associated with an organization are the key drivers in creating a competitive edge (Barney, 1991). Barney express that by owning a strategic resources the organization gets the golden opportunity to create a sustainable competitive advantage concluding that these resources must be unique, valuable and costly to copy. While Wernefelt (1984) also concur that the model sees resources as the driver to superior performance, Barney (1991) further articulate the existence indicators of the

ability of an organizations resource to create a sustainable competitive advantage as Inimitability, Value, Rareness, and Non-substitutability. In Barney (1991) the resources include all institutional processes, capability, assets, information, attributes and institutional memory controlled by the firm in championing efficiency and effectiveness. Wernerfelt (1984) define these resources as physical and non-physical assets associated semi-permanently to an organization.

The management of these resources creates the uniqueness in the organization in exploiting competitive advantage in the industry. Barney (1991) emphasized that affirm needs to utilize its internal capacity create competitive advantage by exploiting superior value creation. The Resource-Base Theory approaches the competitive environment facing an organization while taking an inside-out perspective in dealing with the issues.

2.2.2 Institutional Theory

Institutional theory attends to the deeper and more resilient aspects of social structure. It looks in to the establishment of foundations of an institution controlling the operations and how they establish as governing principles social behavior. The theory looks in to how structures, norms and rules are created and adopted in organizations and their eventual degeneration into disuse leading to their continuity and discontinuity in use (Scott, 2004). Meyer and Rowal (1977) express that these innovations/actors eventually reach a level of legitimization where they become a mandate and non-adoption is viewed as irrational and therefore to many organizations they are established even if no positive gain is experienced on the efficiency. They assert that the creation of titles, structures and procedures are merely adopted ceremoniously for the legitimization of a firm in a given

institutional environment that eventually helps ensure survival of the organization in that arena. However the formation of these procedures and formal framework can lower the efficiency and thwart the organizations competitive position in their technical environment. All the theorists agree that the environment in which institutions exist can significantly impact the formalization of its operational framework and structures.

Scott (1995) affirms that institutions are social structures that have acquired an exclusive resilience. They are composed of cultural-cognitive, normative, and regulative elements that together with associated activities and resources provide stability and meaning to social life further expressing that these institutions can function at various jurisdiction both locally and internationally thereby developing interpersonal relationships. The institutional influence and durability is dependent on the level of anchorage to the political actors at the individual or organizational level and the level of consolidation of material resources and networks eventually creating an internalized pattern of behavior (Clement and Cook, 1999)

2.3Implementation of Food Safety Management Systems

Management system refers to a way in which organizations plan and control the inter-related parts of the business with the view of achieving specific business objectives through policies, processes and procedures. Myers (2014) define management system as a set of guiding principles designed and implemented to avoid various types of risks and streamline operations in any organization with the aim of achieving specific objectives not limited to quality, environmental management, customer satisfaction, legislative or regulatory conformance, employees management and

safety. A good management system will advocate for better organization performance through more efficient use of resources, improves risk management, improved product and service delivery and improved financial performance thereby building strong ground for achieving competitive advantage in a given business environment (ISO 9000, 2005)

ISO management systems standards guide firms to streamline their operations by specifying defined procedures organizations should progressively implement to achieve their vision and to create an organization culture and reflexibly engages process improvement through high employee awareness and commitment (ISO 9000, 2005).There exist different ISO management systems standards focusing of the various issues affecting the global business such as ISO 9001 quality management, ISO 50001 energy management, ISO 14001 environmental management just to mention a few (ISO, 2017). For the case of the study we shall focus on ISO 22000 food safety management systems as applied in the sugar manufacturing.

Food safety relates to the preparation, handling and storage of food in ways that avoids hazardous contacts. The impact of food safety can be dire and hence FSMS standards help firms to monitor and control food safety hazards in their processes (Jacob and Dorte, 2004). ISO 22000 (2005) indicates that this international standard stipulates the requirements of a FSMS where a firm in food production line needs to show the capability to manage food safety hazards to guarantee the safety of the food before consumption. FSMS is a combination of activities that merge to ensure elimination of hazards in foods (Pierson and Corlet, 1992). Surak (2005) defines FSMS as interrelated activities that instills food safety into a process ensuring production of nontoxic foods. This provides the platform for ISO 22000 certification and is applicable to all players in

the food production line regardless of their magnitude of operation. Tainted food has caused the food industry billions of money in recalls, lost sales and legal expenses draining their potential (Mayers, 2014)

The implementation requirement for ISO22000 is generic and applicable to all organization in the food chain with the scope specifying the product or product categories, processes and production sites that are encountered by the FSMS (ISO 22000:2005, 2006). The document specifies the key control areas not limited to interactive communication, documentation requirements, Management responsibility, Resource Management, Planning and Realization of Safety product, Establishment of HACCP principles and with comprehensive approach on validation, verification and improvement of the management system. The FSMS can be implemented independently in an organization or can be integrated with other management systems so as to give its full value to the organization. ISO 22000 (2005) states that for broader usage, organizations can select befitting auditable method to achieve the mandate of this standard.

Codex Alimentarous Standards (2012) indicates that the hazard control is the key to FSMS and therefore ISO 22000 incorporate HACCP plan by means of auditable requirements and prerequisite programs. While many writers such as Evel and Gosh (1997), Pierson and Corlet (1992) have pointed out the ISO certification only gives more impact on the brand equity and not the actual control of the hazard, food handling organizations have achieved great results from implementing ISO 22000 with exemplary effects on performance. Karkalikova (2017) asserts that implementation of FSMS has become precondition for achieving, sustaining and enhancing the companies

competitiveness and that FSMS has a strong positive effect on economic growth and competitiveness of food business. Elsevier (2007) expressed lack of management commitment, understanding of HACCP and prerequisite programs as the key barriers to full implementation of FSMS. He further argued that documentation, resource allocation, employee turnover and training as some of the factors hindering the full implementation of the FSMS in organization.

2.4 Competitive Advantage

Competitive advantage in the field of management points at the attributes of a firm that allows it to outperform its competitors. It's the leverage that a firm may have over its competitors in a given market arena by offering clients better or greater service. Christensen and Fahey (1984) refer to competitive advantage as skills obtained through attributes or resources to perform better than others in the same industry or market. Barney (1991) articulates that a firm acquires a sustainable competitive advantage by possessing unique value creating strategy that is inimitable by any other competitor and when the other firms have difficulty duplicating the benefits of the strategy.

Porter (1985) identified generic strategies used by companies to achieve strategic advantage as: Cost Leadership, Differentiation and Focus. In Porter's view, the model is generic since it can be applied in all industries either product based or service based. Cost leadership is the aspect of producing same product at relatively low cost compared to the competitor. Porters (1985) recommend finding low cost base such as material, labour and facility which give the firms a lower manufacturing cost compared to the competitors. The pricing must come with acceptable product or service quality which gives more value to the customers. Many organizations achieve the cost leadership by emphasizing

on affectivity and efficiency in all steps along the value chain (Barney, 1991). Charging lower prices and selling higher volume can also enable firms capitalize on economies of scale, expand the market share and maintain profitability.

Porter (1985) affirms the differentiation strategy occur when firms embark on vigorous research, development and designed thinking to create inventive ideas in giving unique high quality product or services to the customers. He further indicates that firms with differentiation strategy can get high profit margins by charging premium prices but must focus on the attributes that a bigger section of the market care about in order to pay such premium prices. Armstromg and Kotler (1999) noted that differentiation can occur when an organization identifies and manipulates many factors including features, performance, characteristics, design, reliability and durability. Product or service differentiation strategy that focus on design and quality may give the market impression that there is no substitute in the market hence the customer view the product as unique.

Focus strategy identifies the market segment within the industry where the company can compete effectively thereby concentrating resources to realize higher sales volume or profit. In Porter (1985) view, by identifying a specific niche, the firms can fulfill the specific unique demands of the clients. The firm can then decide to use cost leadership or differentiation approach. Kokemuller (2007) argued that low cost focus can be a very challenging approach for many organizations because niche markets with limited buying power can inhibit you on ability to capitalize on economies of scale but agrees that organizations that succeed to set lower cost operations can build huge competitive advantage. Kokemuller (2007) further articulates that small organizations often use differentiation focus over large chain competitors my offering specialized and customized

products, offering personalize services, using knowledgeable experts and offering customized customer relationship to leverage and create competitive advantage.

The dynamic environment drives so much emphasis on researches in the sugar industry in the country. Kimutai (2009) researched in the role of ISO certification in Kenya sugar Industry focusing on Mumias Sugar finding strong relationship between production and ISO certification concluding it has strong impact on service/product quality. Anyango (2009) researched on the challenges of implementing product diversification strategies in Mumias Sugar pointing out the essence on managerial analysis on the organizational culture, structure, systems and conflicts before strategy implementation. Jakait (2012) also did a research on strategies adopted by Mumias sugar to achieve strategic advantage focusing on differentiation and diversification in achieving competitive advantage. Murgor (2008) made emphasis on strategic response of the sugar companies in Kenya concluding that the government needs to privatize all the millers in order to remain competitive in the changing environment. Omusula (2014) also studied the level of preparedness of the sugar firms in the face of the end of COMESA safeguard identifying the companies needs serious capital injection and technology upgrade coupled with diversification to maximize profitability and compete globally.

2.5 Implementation of FSMS and Competitive Advantage

Consumers demands on guaranteed food safety has significantly increased across the food value chain over the years requiring verifiable proof that a robust food safety control measures have been effectively implemented to protect the consumers against hazards. Aymes (2010) articulates that the future and prosperity of the organizations depends on how much trust the consumers have on their brands. He further express that it’s not the

competition between the competitors but the competition for the consumer trust which is based on safe and high quality products that will define the destiny of the organizations in the food industry. Dimitrios (2014) affirms that FSMS offers ways to leverage risks along the food supply chain. Pierson and Corlet (1997) asserts that certification impress to the market that the food sector has successfully achieved the national and international best practice approach thereby improving the organizations reach both locally and internationally. While according to Karkalikova and Dominika (2017) is has strong effect positive effect on economic growth and competitiveness hence becoming a precondition for achieving, enhancing and sustaining competitive advantage.

The creation of competitive advantage by sending clear market signal to the consumers through implementation of FSMS have been linked to the improved organization performance, market share, annual sales and profitability through gains made on customer trust and brand equity. Charalambos (2010), Kimutai (2009), Amisi (2009), Maiyo (2010) and Wacheke (2010) researched on ISO certification highlighting improved productivity and performance geared towards achieving competitive advantage. FSMS focus on continuous validation, verification and improvement builds great foundation for reduction of wastes and cost of production thereby improving the overall operational efficiency with the benefits trickled down to the final consumer. Marden (1995) asserts that the main function of implementing FSMS is achieving competitive advantage. Hutchens (2010) indicates that the future of the organizations is closely linked to the institutionalization of voluntary quality standards such as ISO 9001 and ISO 22000. ISO 22000 is recognized throughout in the global food chain and certification

simply demonstrates commitment to food safety positioning organizations to become suppliers of choice.

2.6 Summary of Knowledge Gaps.

Global concern on food safety has elicited a lot of researches both locally and internationally. Aymes (2010), Meyers (2014), Fawzia (2016), Karkalikova (2017),Kimutai (2009) and Amisi (2009) have pointed out influence of food safety certification to organization. Influence of FSMS in enhancing economic growth and competitiveness of food businesses through brand equity, quality, price, and customer satisfaction in achieving competitive advantage have been sighted. Evel and Gosh (1997), Pierson and Corlet (1992) and Hutchens (2014) sees certification just as signal to the market on the organizations commitment to food safety without actualization of quality aspects. While wide documentation has been done on food safety management system and its positive influence to organizations performance and Productivity, the scope of implementation of such food safety systems and the impact to sustained competitive advantage in various organizations remains grey.

Implementation of the food FSMS points to superior performance in many organizations including Mumias Sugar Company. Kimutai (2009), Wacheke (2010) and Aymes (2010) assert the positive influence of FSMS to the consumer decision and the organizations in achieving competitive advantage. There exist strong assertions on performance and productivity linked to the implementation of FSMS whereas the dwindling performance of such organizations years after implementations of FSMS challenges the conception by the researchers in achieving competitive advantage.

Researchers have made inroad into the influence of ISO certification to organizations. Hutchens (2010), Charalambos (2010), Fawzia (2016), Wacheke (2010), Kimutai(2009) and Maiyo, (2010) have majorly focused on the factors of implementation, market share, brand equity and overall organizational performance with the implementation of ISO system. There exist the need to explore the implementation and anchoring of the FSMS in the MSC organizational structures in view of the achievements against the theoretical set target.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the way in which the research is designed, population target, data collection and data analysis approach in an attempt to respond to the research questions on how implementation of food safety management system serve as competitive advantage at Mumias Sugar Company.

3.2Research Design

The research was conducted as a case study of Mumias Sugar Company Limited. Mouton (1996) views a case study as an in-depth empirical investigation of a situation to understand and answer questions pertaining a particular phenomenon. Case study can be used to open complex issues and can extend experience to already known subject (Yin, 1984). This design had been used by previous researchers like Maina (2010), Mutua (2015) Onyango (2009) and Jakait (2012) to uncover issues in Mumias Sugar Company.

Case study was chosen because it gives in-depth analysis of a phenomenon on a particular context. According to Denzil and Licoln (2003) it gives a holistic approach to observe situation and gather valuable insight from the participants in the situation to explore a phenomenon. It is always deemed important in a situation where contextual condition of the event being studied is very critical and the researcher has no control over the unfolding events. The design will be realistic for drawing critical information from MSC records and employees directly engage in the implementation of FSMS.

3.3 Data Collection

Data collection was from both primary and secondary data. Primary data was acquired through structured interview questions administered to the Mumias Sugar Company Limited factory department employees. Secondary data was collected from the Factory Daily Performance Report generated internally by the quality management team, MSC Annual and Financial Reports and Sugar Directorate Reports to give insight on key performance indicators of FSM against productivity. The research relied on the Factory Daily Performance Report for the financial year 2016/2017. The FDR provides Daily, Weekly, Monthly and Yearly achieved/budgeted averages for all auditable quality management aspects in the whole value chain of sugar processing.

Mumias Sugar factory department has five sections mainly; Mechanical, Electrical, Production and Project. The company appoints food safety champions across these sections coordinated by an ISO office. Interviews were conducted to The Factory Manager, The Projects and Planning Manager, Assistant Production Manager and Packaging Plant Manager who are FSMS champions with the view of extracting qualitative information on FSMS based on the ISO generic implementation requirement and Mumias Sugar Company Prerequisite program. The interview seeked to establish the influence of implementing FSMS on competitive advantage based on the primary factors of Food Safety Management System that influence the overall business operations and consumers decisions.

3.4 Data Analysis

The research employed the Content Analysis technique. Content analysis is valuable in organizational researches because it allows researchers to recover and examine the nuances of organizational behavior, stakeholder perceptions and societal trends (Klaus, 2004). Data analysis involves working with the data, organizing them, breaking them into meaningful units, synthesizing and searching for patterns (Bogdan and Bilken, 2003). In Kombo and Tromp (2006) and Yin (2003) view, content analysis examine the intensity with which certain words have been used and systematically describe the form or content of written or spoken material.

The qualitative data collected through the interviews and synthesized secondary records were analyzed through categorization for the purpose of classification and summarization. Findings of the interviews were compared with FSMS international standard generic requirements as described in the MSC prerequisite program for assessment of the achievable against set standards. The factory average performance report for the financial year 2016/2017 was compared against budgeted key performance indicators outlined by the company in streamlining its operational parameters in line with FSMS in achieving competitive advantage.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSION

4.1 Introduction

The chapter involves the data analysis, interpretation and discussion of the findings from various respondents. It focuses on the implementation of Food Safety Management Systems in Mumias Sugar Company for achieving competitive advantage. The analysis looks in to how Food Safety Management System is anchored in the Mumias Sugar management operational systems and the extent of its utilization as prescribed in the company's prerequisite programme for achieving competitiveness in relation to the ISO 22000:2005 global requirements. Interviews with the various managers from Mumias Sugar Company Limited i.e Factory Manager (Mr. Thomas Sika), Production Manager (Mr. Jastus Okwika), Assistant Production Manager (Mr. Ibrahim Wanganya), Packaging Plant Manager (Mrs. Salome Odera) and Projects Manager (Mr. Gerald Luvasi) provided critical information on food safety management system as used by the company in the management of the production processes.

4.2 Mumias Sugar Company Limited.

Mumias Sugar Company is located in Kakamega County, Mumias Town. It's the largest sugar manufacturer in the country based on crushing capacity with the vision to be a leading producer of sugar, energy and related products. Despite being mainly a sugar producing company, the company has diversified into Cogeneration, Ethanol and mineral water production to ensure business and income sustainability. The Factory Manager responded that,

> "The Co-gen plant has increased the power production capacity to 34MW, while the ethanol plant is set to produce 24 Million Litres annually and the water plant to produce 20 Million Litres of bottled water".

The interviewees observed that although they have serious financial challenges, the company is committed to efficiently operationalize its mandate through aggressive pursuit of efficient manufacture of quality sugar and associated products in conformity with the customer expectation and markets the same competitively to ensure a fair return to stakeholders. The Assistant Production Manager further opined that,

> "The company has a very good strategic plan running 2018 to 2022, but to me the top management commitment to the strategic plan is questionable and may affect the turnaround of the company".

The company is in constant review of its policies, guidelines and operation procedures to strengthen frameworks on corporate governance, accountability, performance improvement and effective service delivery. The company envisages regaining optimum operational level to regain its dominance in the sugar manufacturing sector despite experiencing numerous challenges affecting its performance on the recent past moving it into deep financial crisis. The company implemented FSMS in all its production line to ensure high stakeholders value and quality products to the customers. The Factory Manager stated in his response that,

> "Mumias Sugar Company operates in an environment that is characterized by continuous changes, ever-emerging issues and cut-throat competition that requires serious strategy to establish a fit with the environment in which it operates".

The Production Manager and The Projects Manager expressed that despite facing serious challenges affecting the operations leading to intermittent production, the company has a strong foundation to help it compete and regain the previous market position. The Production Manager opined that,

> "To many customers, Mumias Sugar has carved itself to customer satisfaction, right price, right weight, hygiene and quality products helping it stand and compete with other equally great companies".

The interviewees point out that key achievements that have been realized along the implementation of FSMS include diffusion technology, cogeneration plant, introduction of modern distillery, establishment of modern bottling water plant, development of Ultra-modern office complex, enhancement of ICT infrastructure to incorporate SAP and AMS, introduction of man-less weighbridge, introduction of EDMS and establishment of cane buying centers. MSC has employed ISO 22000:2005 procedures in the production lines to streamline the operations and extract maximum value from the activities. The Project manager said,

> "There exist an ISO office in the factory department charged with the responsibility of coordinating and championing the activities across all the section in the factory".

The company is anchored within the state department of agriculture for policy direction and by extension subscribes to objectives and strategies outlined in the ministry of agriculture strategic plans. The interviewees expressed that the sugar industry performance in the country generally experience many challenges that require intervention from the state to implement and restore proper policies to govern the operation of the companies.

4.3 Implementation of Food Safety Management System

4.3.1 The general requirements for food safety management systems

The interviewees corroborated that major food safety hazards in the production lines including the biological, chemical or physical agents that have the potential to cause direct health effects are clearly identified at the different stages of production. The possibility of occurrence of any hazards is defined and communicated at each stage in production. The Assistant Production Manager (APM) pointed out that,

> "Presence of heavy metals such as lead, copper, and arsenic are constantly tested during production to ensure the prescribed limits are not exceeded at the various stages of production and the final product".

Food additives such as Sulphur dioxide and anticaking agents are permitted in sugar production within allowable levels. The interviewees agreed that some of the hazards exist and may not be eliminated completely during productions but controlled to acceptable limits that may not cause adverse effect to the final consumers. According to The Production Manager,

> "Personal hygiene is potential cause of sugar contamination with ability to inject pathogenic micro-organism and foreign bodies in the production line. The individuals working in the production line are subjected to medical examination and certification to reduce the exposure".

The interviewees unanimously confirmed the company identifies and clearly documents list of all chemical, physical, functional and microbiological hazards that may occur and their relative allowable specification for the finished product. The frequencies of tests carried out on the hazards are also commensurate to the risk they possess to the relative products i.e sugar, water and ethanol. The Assistant Production Manager that,

> "The frequency of assessment depends on the weight of risk they expose to the customers, some are not even risk as such but product conformity requirement such as weight which is monitored continuously".

The research established that hazards are clearly documented to the process owners and where possible and for reasons of confirmations and comparison made accessible to other interested parties by way of notice boards and production manuals. Process owners are expected to monitor and record all the critical parameters that may influence the final product quality. The Project Manager indicate that most operational parameters are recorded online through by through automation. The Factory Manager asserts that,

> "All employees directly involved in managing the production processes are privy to the specific safety requirements of the various stations they manage and in most case the achievements are monitored as a key performance indicator".

According to The Production Manager, food safety management system has a holistic approach to improve operations in the factory. It does not focus on the final product alone but also on persons and machinery therefore communication is limitless. This is also supported by the Projects Manager who expressed that communications on FSMS is not only binding to the process owners. The Production Manager said,

> "The ISO requirements define that every individual accessing the factory including guest and visitors must undergo safety orientation. FSMS does not focus on the food hazards alone but cuts across to the general risk exposure in the factory".

The interviewees cited that evaluation of ISO 22000 procedures are done quarterly during continuous productions but in the recent past the company operations have been affected adversely by cane shortage leading to periodic intermittent production. The external audits and evaluations are therefore done periodically on demand basis while the internal audits remain a continuous process facilitated by the risk and compliance department.

4.3.2 Documentation requirements

The research confirmed that MSC possess documented procedures for all operations based on individual production line geared towards the achievement of quality products. The Project Manager stated that the Standard operation procedures are clearly developed, evaluated and continuously reviewed in line with the various developments in the company. The Factory manager in response to the ISO 22000 documentation requirement confirmed that,

> "All the documents and records required by ISO 22000 standards and documents required to ensure effective development, implementation and review of food safety management systems related to sugar, ethanol and mineral water production are properly managed".

The research observed that there exist documented procedures defining how products produced during and after failure of critical parameters are handled to ensure non-conforming product do not access the market thereby causing adverse risks to the customers and the company image

The daily production records and all the product quality related records are readily identifiable and retrievable but with documented procedures on how the documents are retrieved from the various process owners, their storage and the retention period for such documents. According to The Assistant Production Manager,

> "External audits done in MSC focusing on the documentation requirements confirm compliance with the ISO 22000 prerequisite programmes but only with minor admissible gaps which are generally acceptable".

4.3.3 Management Responsibility

All the interviewees confirmed the MSC top management commitment towards the development and implementation of ISO 22000 systems. The company consistently avail resources and develop objectives that support the management of food safety management systems in line with the vision. The Packaging Plant Manager affirmed that,

> "MSC top management fully recognizes the food safety management policy requirement and supports the company mission to efficiently manufacture quality sugar and other associated products in conformity with customers expectation and market the same competitively ensuring a fair return to stakeholders and continuous improvement of stakeholders value".

The Factory Manager stated that the constant transition without proper succession slows some of the gains made in achieving the general organization's continuous improvement objectives which includes food safety management but the overall management commitment remains undisputed. He expressed that,

> "The Company has had four Chief Executive Officers in a span of four years. Some progress we made are slowed by the changes since different individuals have varied level of commitment to processes".

The interviewees elaborated that the food safety management is clearly outlined in the company's 2017-2022 strategic plans. The company continually developed SMART objectives to ensure total compliance to the statutory and regulatory requirements by the sugar producing organizations. While the budget for FSMS is clearly outlined in the strategic plan, the Assistant Production Manager and Packaging Manager highlight funds availability as a factor affecting implementation of some of the activities further impacting on the business performance.

Interviewees stated that changes in the food safety management systems are normally planned and implemented in a structured manner to ensure its integrity is supported by

appointed food safety management champions from the various departments of the company. The Factory Manager pointed out that,

> "The safety champions have the responsibility of nurturing and instilling the various objectives in production processes and communicating the various challenges for review. They may also be tasked with the responsibility to liaise with the external parties through the ISO office to consult on challenges and progress".

The company top management strive to support review of FSMS policies adoption at planned intervals for its adequacy and effectiveness but the interviewees cited that due to the resource demand and the current financial position of the company, its struggle to properly champion for this process leading to some gaps such as on external audits, inspection and follow up on previous management reviews that has somehow lowered the effectivity and efficiency of the process although the interviewees did not admit any food hazard exposure.

The Factory Manager and Assistant Production Manager pointed out that the company avails competent teams to carry out activities with direct impact to food safety through provision of proper training, skills and experience. All personnel responsible for monitoring and carrying out corrective actions on food safety management systems are properly trained and records for such training maintained. The Factory Manager asserts that,

> "Experts are invited to provide refreshers training whenever serious gaps are identified".

The interviewees identify high rate of employee departure as the risk for a sustainable programs leading to loss of institutional memory in certain cases. Finances facilitating implementation of food safety management systems are properly budgeted commensurate to the relevant projects for each financial year. Such budget supports all the

infrastructures for FSMS such as office workspace and associated utilities, process equipments, training, transport, communication and information systems but the current financial position of the company restricts allocation of the funds and therefore some of the planned projects are never completed as scheduled.

The research established that MSC has designated personnel with the responsibility and authority to communicate to the external parties such as suppliers, contractors and customers on matters related to food safety. According to the interviewees, the company also has defined internal communication channels that ensure timely transfer of information to the interested parties on issues related to product, regulation and authority, equipments, customers, packaging and any other issues that impact directly on food safety. The Projects Manager cites that,

> "Records for such communications are documented and maintained for future reference. Communication received from the external bodies such as statutory and regulatory authorities, customers and suppliers is cascaded to the relevant individuals in the organization".

The Packaging Plant Manager expressed that,

> "All customer queries are directed to The Customer Service Office. The office documents and follows up the issues with the relevant managers and its an ISO requirement that each office maintain the customer complain log detailing the complaints and solution provided"

4.3.4 Planning and Realization of Safe Products

The research established that the company has a very elaborate plan for producing safe products controling the entire value chain from raw materials, suppliers, vendors, processing and distributions. The interviewees stated that every production line has well developed and maintained standard operation procedure aimed at realizing safe products. The Assistant Production manager observed that,

> "All the stages of production have developed and maintained prerequisite programmes to control the possibility of introducing food safety hazards to the product through biological, chemical or physical contamination or by cross contamination between products".

The research established that the food safety management champions in the company are a team of multidisciplinary knowledge and experience from Mechanical Engineering, Electrical Engineering, Production, Quality Management and Project Management. Multi-disciplinary team is formed for the elaborate screening of all the steps in performing hazard analysis. Contribution of all the disciplines in the process is assessed to identify potential influences for analysis.

The prerequisite programmes are regularly verified and audited in consultation with the statutory and regulatory authority to ensure efficient utilization. All factors that may lead to contamination such as building lay-out, air, water, energy, waste and sewage disposal, maintenance and preventative maintenance, personal hygiene and pest control are considered when establishing the prerequisite programmes.

The company has clearly prepared and defined flow diagrams for all the product categories indicating interactions at each step in production, inflow of materials in the system, reworking and recycling stages, outsourced processes and product release. The accuracy of these flow diagrams is verified by the food safety team by site checking. This enables the company to identify possible sites for hazard introduction in the production line.

The interviewees indicate that the company monitors suppliers and other vendors to certain their conformity with the food safety requirements. Specifications for raw materials, ingredients and product contact materials are clearly communicated to supplier.

Periodically or during suppliers sourcing, the company recommends supplier compliance audit. The Project Manager stated that,

> "Team of food safety champions is seconded to the suppliers to do process audit to confirm the authenticity of the products specification. Some of the areas of interest are methods of production, packaging, storage and shelf life, composition of the product and conformance with the relevant regulatory institutions".

According to the interviewees, the company considers customers as the foundation and the cornerstone of its undertaking and therefore detailed communication on the product specifications is relayed to the customers. Critical aspects include the product name, composition, manufacture and expiry date, packaging material and usage. The company recommends issuing quality certificates on products released directly from its warehouses for authenticity. The Factory Manager indicated that,

> "The products packaging must always have the full details of the product. We also specify our requirements to the suppliers and do inspection for goods received".

The company performs continuous hazard analysis hourly or daily depending on hazard being monitored. This support the production teams to streamline the processes and employ the control measures to regulate or eliminate the hazards. Established statutory and regulatory requirements are critically considered when determining the acceptable hazard levels. According to the Production Manager,

> "All the hazards expected to occur at any stage as per the flow diagrams are analyzed and recorded. The accepted limits of the hazards are always determined at each stage and often used for comparison with the analysis".

The interviewees indicated that the company evaluates each safety hazard based on the severity to health and the possibility of occurrence. Control measures capable of preventing, eliminating or reducing the hazards are therefore selected to handle specific hazards. The operational prerequisite programmes detail the critical control points for

each process and the monitoring procedures and that when limits are exceeded the products are eliminated before usage or consumption. The Assistant Production Manager observed that,

> "Of course you must always know the critical limits and the critical control points for all the hazards. Appropriate action must be taken when product don't meet the specified limits"

The research established that the company employs traceability on all materials from suppliers and distribution of sugar, water and ethanol to the consumers. The traceability is majorly used for end products identification. For sugar and bottled water the traceability contents include date of manufacture, machine used in production, shift and time of production while the ethanol dispatched are normally moved along with the quality inspection certificate detailing the date, unit carried, transport unit and the product purity. The Packaging Plant Manager said,

> "This forms part of the packaging machine operators key performance indicator. This must always confirm the printers are working and visible".

The Production Manager, Assistant Production Manager and Packaging Manager express that MSC has an established documented procedure for handling non-conforming products. The products produced under conditions where the operational prerequisite programmes have been violated and exceed the critical control points are handled in accordance with the documented procedure on handling non-conforming products. All non-conforming products and information related to non-conformity are recorded and documented for future reference. The company has defined corrective action for all the production lines. The Packaging Plant Manager asserts that,

> "Although we currently have intermittent production, the procedures are always defined for any non-conformity including normal reworks. There are paper work and system documentations for the same with approval levels"

The interviewees while responding to whether the process has loopholes for the contaminated product accessing the market reiterated that chances are very low. The production and the Assistant Production Manager gave example of the sugar currently held in the company warehouse due to non-conformity. The system created a rigorous product release strategy coordinated by the quality section. The quality section release inspection certificates for all production batches and non-conforming products can only be released by consensus to specific customers for define usage. The Packaging Plant Manager assert that,

> "When critical control limits are exceeded and the operational Prerequisite programmes are violated, the corrective action is initiated by designated persons with proper knowledge and experience in the process and therefore a chance of unsafe products accessing the market is very minimal".

Analysis of the secondary data from the Mumias Sugar Company Factory Daily Report and The Laboratory Report for the financial year 2016/2017 generated by the Quality Management Section gives an impression of properly maintained/operated quality parameters but with contradicting information of the business efficiency measures. The sugar quality parameters such as Colour, Insoluble, Moisture, Pol Percentage, Staleness Index, Damages and ENA Purity give impression of a properly managed structure operating within the budget. On the contrary, the efficiency measures for the same such as Rendement, Overall Recovery, Factory Time Efficiency, Pol Extraction, Boiling House Recovery, TC/TS, Undetermined Losses, Baggasse Pol. and Final Mollasses Purity reflects poor performance for the parameters throughout the year (Table.1) generated from the Factory Daily Report (APPENDIX IV). The documentation of these quality parameters provide evidence for the recognition of hazards, existence of critical control limits, monitoring, evaluation and realization of safe products. The Factory Manager and the

Production Manager attributed poor efficiency measures to low cane deliveries resulting from cane poaching, poor cane development and farmers demotivation. This is also supported by the The Company Annual Report and Financial Statement 2017 extract (APPENDIX V) in which the Chief Executive Officer Mr. Nashon Aseka highlights cane development as the major factor affecting performance.

Table 1.Mumias Sugar Company Factory Report, 2016/2017 extracts

Measure	**Source Document**	**Actual/Achieved**	**Limits/Budgeted Quantity**
Colour: White Sugar Brown Sugar	FDR	542 ICUMSA 1446 ICUMSA	<550 ICUMSA 1000-1500 ICUMSA
Insoluble: White Sugar Brown Sugar	FDR	116.15 (mg/Kg) 184.24 (mg/Kg)	<150 (mg/Kg) < 200 (mg/Kg)
Moisture %	FDR	0.07%	< 0.1%
Cane Staleness Index	FDR	1.45	< 2
Cane Extraneous Matter	FDR	0.00%	< 3.00%
Sulphur Dioxide	Laboratory Logbook	0.9mm/Kg	<20mg/Kg
Lead (Pb)	Laboratory Logbook	0.0 mg/kg	<0.5mg/kg
Copper (Cu)	Laboratory Logbook	0.3mg/kg	<2.0mg/kg
Damages	FDR	0.79%	< 1.0%
Extra Neutral Alcohol Purity	FDR	97.42%	>96%
Rendement	FDR	3.83	> 7.00
Overall Recovery	FDR	41.23%	> 69.38%
Factory Time Efficiency	FDR	75.05%	>85.00%
Pol extraction	FDR	85.55%	>87.00%
Boiling House Recovery	FDR	48.19%	>79.75%
TC/TS	FDR	26.09	<14.29
Undetermined Losses	FDR	3984.96T	<1353.85T
Bagasse Pol.	FDR	3.14	<2.0%
Final Molasses Purity	FDR	36.93%	<33.0%

4.4 Implementation of Food Safety Management Systems and Competitive Advantage

The interviewees unanimously pointed that the implementations of food safety management system were both internal and externally driven. Some of the internal issues adversely highlighted include streamlining internal business operation, improvement of the products quality, improved internal communication, improved overall equipment efficiency and innovation aimed at achieving better operating and business performance with the view of improving the competitiveness of Mumias Sugar Brand. The Production Manager cited that,

> "In my own opinion the first key driver was the competitiveness of Mumias Sugar brand. It focused on standardizing the quality management systems to improve quality so that Mumias Sugar Brand is more competitive in the market. The drivers were both internal and external that's why if you look at our vision we talk about world class. It was developed in view of ISO standards because of where we sit as being the leading producer in the country until the company started experiencing financial challenges"

The Factory Manager affirmed that,

> "The push for food safety management system implementation also originated from external customers' demands, corporate customers such as Unilever, Curdbury, East African Breweries, London Distillers, Keroche and Bidco. These companies procurements requirements demand doing business with certified organizations to ensure the suppliers meet the international quality standard".

The need unlock local and international markets that were beyond the reach of the local firms drove the company to implement food safety management system giving it a competitive advantage over other local companies. Through solid quality management, in the year 2011 MSC became the first local company to export sugar to Europe. The Assistant Production Manager asserts that,

> "The implementation of FSMS enabled the company explore external markets with export of sugar to the European Countries such as France".

The Factory Manager said,

> "It's a general requirement for any food company seeking international recognition. The system supports the operations as well building quality requirements for any internationally recognized firm"

Interviewees highlighted that implementation of FSMS acted as a springboard for improving the business operations. It helps establish procedures that govern the relationship with the suppliers and consumers, documentation, equipment handling and calibration, corrective actions and defect products handling, communication both internally and externally, projects management and it acted as a catalyst for change and continuous product quality improvement. The Projects Manager indicated that,

> "Through the implementation of the ISO, auditable standard operations procedures for all the section, processes and equipments are developed, reviewed and properly documented thereby ensuring security of institutional information for operations, training and references".

The Production Manager responded that,

> "If you look at where we sit as a company you may think that ISO 22000 implementation has not impacted much. It's expected that with implementation the company will make changes in environment to improve competitiveness. But this did not happen because we failed in synchronizing our requirements with output. Nonetheless it has improved our way of working because it gave birth to the control systems that the company has in the factory and supply chain module which optimized operations in several fronts".

Through adoption of ISO policies the company continually develops keys performers indicators cascaded from the specific business objectives and the company vision. Employees performance evaluation is done based on these specific objectives further streamlining the activities with the strategic plans. According to The Factory Manager,

> "Performance evaluation is seen to improve the company employees performance by directing the employees behavior towards organizational goals and monitoring the behavior to ensure the goals are met. This has improved the productivity of the employees thereby giving better service to consumers".

The interviewees unanimously cited that there exist strong relation between FSMS and operational performance but this does not reflect on the overall business performance due to other factors as importation, political interference, technology, climatic condition, mismanagement, corruption and unproductive competition that affects the financial aspects of the business. This is clearly evident in the secondary data collected from FDR and Laboratory Reports whereas the information exhibit perfect quality parameters while the efficiency measures portray negative/poor performance throughout the year. The Production Manager said that,

> "While implementation of ISO has serious positive impact on the operational performance, luck of proper synchronization between the cross-sectional activities such as cane development attributed to contribute to poor business performance in the recent past.

The interview responses corroborates with the company annual report and financial statement 2017 (APPENDIX V) which indicate that the major challenge faced by the company throughout the year was acute cane shortage experienced in the region with total cane delivered to the factory 419,147 Tonnes dropping 65% compared to 1,210,164 Tonnes delivered previous year. It indicates the average yield was depressed to 32TCH from 45.03TCH realized previous year while cane development low with only 3619Ha planted against a target of 6000Ha

The organization conducts internal and external audits at planned intervals to determine whether the FSMS conforms with the budgets established by the company and as per requirements of ISO 22000 standards policies and company prerequisite manual. The audit actions are planned taking in to consideration the criticality of the processes and auditable areas, action from previous audits, criteria, scope, frequency and defined

methods thereby strengthening the daily usage of the system. The Assistant Production Manager asserts that,

> "The audits reinforce the system to eliminate any questionable gaps with the customers that may reflect badly on the company image".

Interviewees highlight that high quality products achieved through properly implemented FSMS enables the company to sell its products at prime price as some of the milestones achieved. Mumias Sugar Company received recognition by the Superbrands East Africa an affiliation of London-based Centre for brand Analysis (Superbrand UK) as one of the leading brands in the country and the first sugar company to have acquired the status. In The Production Manager's view,

> "The system supports production of quality products based on weight, color, purity, packaging and taste through proper controls".

Improved equipment availability and production efficiency was also registered with the implementation of FSMS within the operations. Cost reduction and reduced product defects are evidently contributing to profitability. The interviewees expressed that the implementation of food safety management systems enabled the company to penetrate the markets that were initially beyond its reach. Cooperate organizations such as Unilever, Curdbury, London Distillers, East African Breweries and Bidco were attracted by the adoption of the system opening up business opportunities with Mumias Sugar Company. The Packaging Plant Manager Asserts that,

> "Implementation of FSMS Opened up local and international markets since the implementation justified the company meets the market requirements, complies with legislative and regulative authority beyond demonstrating that the company complies with the internationally recognized quality standards".

The interviewees cited customer satisfaction and brand equity as some of the achievements with the implementation of FSMS. The Factory Manager indicated that the

customer survey done by the company in 2014 exhibited high demand on Mumias Sugar Company products compared to the other competing firms in the market, this demand was attributed to the implementation of FSMS with many customer citing consistent quality and distinct taste of the products. The Sugar Directorate Report 2015 (APPENDIX VI) indicates that until the year 2014, MSC exhibited strong performance in the sugar industry as the dominant player controlling 19.93% of the market share followed by West Kenya Company Limited at 12.45% with other millers hot on the heels.

Major innovations on machinery and product were also realized. Through the building of prerequisite programmes major operational gaps with huge cost implications on machinery and products were identified and corrective action initiated on all the root causes thereby improving consistency in production processes and product quality. The Assistant Production Manager states that,

> "Innovative product/performance improvement measures such us introduction of fortified sugar was the first of its kind in the market built on FSMS foundation".

The Production Manager mentioned that there were major improvements in the operations efficiency with the implementation of ISO. The maintenance regime for the machines improved and there were clear accountability. He asserts that,

> "It made it easier to have accountability along the production line. It made it easier to know who does what. Key accountabilities could clearly stand out on who supposed to do What, How and When".

The Production Manager and Assistant Production Manager highlighted the diversification of the company into power generation, ethanol and water production as results of much researched projects driven by the implementation of the ISO policies. The Project Manager expressed that,

> "Through diversification the company opened alternative revenue streams, positioning itself and provided a competitive edge in the market".

Interviewees corroborated that Implementation of HACCP policies further strengthen the customer endpoint with lower defects rates, just in time delivery, improved quality and more attention to customer feedback thereby improving customer satisfaction and brand equity. Variation and extension in implementation of FSMS to the distributors ensured streamlined and coordinated product flow to the final consumers with much attention to cross contamination especially during the shipping and storage that were major sources of registered customer complaints. The Packaging Plant Manager commented that,

> "Adoption of FSMS and technology has greatly improved the operations. Workflow has been made efficient by incorporating SAP in FSMS with real time transfer of information".

The Mumias Sugar Annual Report and Financial Statement 2014 extracts (APPENDIX VII) supports the interviewees' sentiments. From the year 2009 after introduction of FSMS the company profits before tax increased significantly before starting to slump in the financial year 2012. The period also registered introduction of alternative revenue streams from the diversification into Ethanol, Water and Power with significant impact on the sales revenue. The company net turnover also improved significantly before slumping in the year 2012. The financial year 2012 reflect decreased tonnage of sugarcane processed from 2,245,000T to 1,917,000T which affected the overall company performance as cited by the interviewees. The Annual Report and Financial Statement 2015 (APPENDIX IX) shows further drop in profitability in the subsequent years with slight improvement in the year 2016 (APPENDIX VIII). The statements dig into cane shortage as major contributor to the deteriorating performance cutting down the gains made in the creation of competitive advantage.

The Sugar Directorate Report for the period 2015 (APPENDIX VI) also indicates that until December 2014, Mumias Sugar Company registered the highest output and market share at 117966T and 19.93 % respectively followed closely by West Kenya Company.

4.5 Discussion

According to ISO 22000(2005), implementation FSMS means establishing policies and standards that combines interactive communication, system management, prerequisite programmes and HACCP pricinciples to govern the food safety to global standards. Jacob and Dorte (2005) and Surak (2005) articulate that it is a network of interrelated activities that ensure production of safe foods. Implementation according to Nutt (1989) refers to establishing rules and regulation that allow the organization to effectively comply with ISO standards as resident in the quality policies and manual. While ISO 22000:2005 is generic and applicable to all organizations in the chain, Nutt (1986) and Klien and Sorra (1996) opine that implementation failures is some of the reasons organization never benefit from such ISO systems. The research shows Mumias sugar Company has fully implemented FSMS in its production lines based on the interview responses. The company plans, operate, maintain and update FSMS geared to products that satisfy the intended use beyond complying with the applicable statutory and regulatory food safety requirements. Domenech et al. (2008) and Wallace (2005) claim that when organization adopt FSMS, the performance must be measured to ensure implementations is effectively done and synchronized with the business units to achieve its maximum value.

Interviewees showed strong relationship between FSMS and the creation of competitive advantage in the company through improved operational performance after

implementation. Customer satisfaction, product quality, efficiency, distribution, better working environment, lower production cost, diversification and reduced product defects are some of the factors highlighted to create such competitive advantage. The company received recognition both locally and internationally as a leading brand acquiring the Superbrand status after implementing FSMS. The findings are consistent with Karkalikova and Nosekova (2017) findings that implementing FSMS enhance the companies competitiveness and is a precondition for achieving a sustainable competitive advantage in the food industry. This also confirms Evel and Gosh (1997), Pierson and Corlet (1992) and Hutchens (2014) argument that certification send market signal on the organizations' commitment to food safety. Kafetzapoulos (2013) and Cao (2004) confirm that by implementation and sending signal to the consumers establishes marketing advantage with consequential competitive advantage. The findings also corroborate with Collis and Montegometry (1997) suggestion that implementing ISO practices raise organization operational performance that results in competitive advantage. Further Kofetzopoulos et al. (2013 and Cao (2004) point that by implementing FSMS and sending market signal to the consumers, a firm gains marketing advantage with consequent competitive advantage. The respondents cited that the operational performance don't reflect on the overall business performance due to inadequate synchronization of FSMS with other cross-sectional activities like cane development.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the findings, conclusions, recommendations and suggestions for further studies. It presents the research findings on the extent of implementation of food safety management systems at Mumias Sugar Company based on the respondents interviewed and interpretation of the synthesized secondary data as provided by the company quality management team.

5.2 Summary of Findings

The research shows that Mumias Sugar Company has fully implemented FSMS as recommended by the ISO 22000:2005 international standard generic requirements for food organization. Implementation refers to establishing rules and regulation that allow the organization to effectively comply with ISO standards as resident in the quality policies and manual. The company has an elaborate operational prerequisite programmes for all the production lines with clearly defined hazard analysis and critical control policy program. Biological, chemical and physical agents including personal hygiene identified as potential contaminants are clearly evaluated and communicated to the process owners. The company has clearly defined documentation procedure for all the production processes mmmmmmm to provide evidence for conformity. Planning and implementation of FSMS is done in a structured manner, review and audit of the system periodically done by competent teams with proper training and expert opinion. Mumias Sugar Company top management continually support the implementation of FSMS

through the business objectives, resource availability, structure, communication and review although the current financial constraints within the company and high employee flight rate cited as some of the risk in implementation. Food safety hazards reasonably expected to occur in any of the production lines are identified and recorded, assessment conducted, control measures established and managed through operational prerequisite programs or HACCP plan.

Mumias Sugar Company achieved a distinct operational performance with the implementation of FSMS but this doesn't reflect on the overall business performance due other factors as cane shortage, political influence, importation, technological, management and corruption not necessarily linked with FSMS implementation. Better machinery efficiency, improved product quality, low defect rate, on time delivery, innovation, brand equity, customers satisfaction, reduce production cost and staff motivation cited by the various respondents as some of the factors supported by FSMS in achieving competitiveness.

The implementation of FSMS improves the overall company image demonstrating that it complies with the internationally recognized quality standards attracted corporate clients such as Unilever, Curdbury, East African Breweries and Keroche thereby opening new business opportunities and creating competitive advantage. By justification of product quality through FSMS the company was able to export sugar to the European markets which is very sensitive to product quality. Innovation and product quality attributed to FSMS improved the customer satisfaction and brand equity enabling the company to sell products at prime prices to date giving it a competitive advantage. The company recognition by Superbrands East Africa and being the first local sugar company to have

achieved the status is a major signal to both local and global markets. Diversification focusing on factory waste utilization provided the company with alternative revenue streams further strengthening its business portfolio.

5.3 Conclusion

There is a clear indicator from the findings that Mumias Sugar Company has fully implemented Food Safety Management System in its production lines adhering to the ISO 22000 prerequisite programmes while ensuring greater control of hazards in its final products. The company embraces the FSMS key elements as interactive communication, system management, prerequisite programmes and HACCP principles. The research findings also indicate the company is proactively and consistently in control of its processes, product and services. This is to consciously prevent non-conforming products from accessing the various market and consumers pointing to the full utilization of FSMS parameters.

FSMS has served as a competitive advantage at Mumias Sugar Company through improvement of operational performance. Major milestones have been received on diversification, product quality, customer satisfaction, brand equity, cost of production, rate of rework, communication and product returns. FSMS implementation has a positive influence on operational performance giving the company a clear competitive advantage over other organizations. While FSMS has a clear relationship with the operational performance in the creation and enhancing a sustainable competitive advantage, operational performance did not have direct positive independent influence to the overall business performance due to other factors not necessarily linked to FSMS implementation.

5.4 Recommendations for Policy and Practice

Implementation of Food Safety management System has given Mumias Sugar Company a good corporate image based its products quality giving it a competitive advantage. This competitive advantage provides a perfect platform for the company to streamline other interrelated business activities and improve its business performance riding on the shoulder of the competitor as a leading producer of sugar and other related products. The company top management should utilize the foundation to synchronize its activities and turnaround the financial performance.

In the face of unscrupulous sugar business practice in the country on importation of substandard sugar in the market for direct human consumption, the legislative and the regulatory authorities in the country should employ strong Food Safety Management Systems across the entire supply chain to ensure elimination of hazards and full protection of the consumers. Locally produced and import sugar should be subjected to rigorous food safety assessment to guarantee consumer full protection.

5.5 Limitations of the Study

Numerous researches have been conducted on Implementation of food safety management system in the creation of competitive advantage. However, in many occasions contradictory results have always been received. While some studies link food safety management system application to the improvement of the overall business performance, this study findings only relates food safety management system to the improvement of operational performance in creating of competitive advantage. The study did not focus on the synchronization of these systems with the other external business

activities in the company to improve the overall business performance and create competitive advantage.

The study focused on Food Safety Management Systems as an internal company business process. While only company employees were engaged in the research, interviewees adversely cited the influence of Food Safety Management Systems on product quality, customer satisfaction and brand equity. The research did not engage the external customers to justify their opinion on food safety systems implementation in relation to customer satisfaction, quality and brand equity.

Mumais Sugar Company has faced numerous challenges leading to intermittent operations in the recent past. The trend also spreads to the other sugar companies with most factories operating below their rated capacity. As to time of study, Mumias Sugar Company had stopped operations due to cane shortage with no clear restart schedule. This could likely influence the decision of the interviewees in their responses.

5.6 Suggestion for Further Research.

Food Safety Management Systems implements is seen to have positive influence in the creation of sustainable competitive advantage through improved operational performance. Interviewees cite lack of proper synchronization with other internal business activities in Mumias Sugar Limited as a major hindrance to improved overall organizational performance. Further research required on the coordination of these activities with Food Safety Management Systems in the company to acquire maximum value in a uniform operation.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION

UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS
KISUMU CAMPUS

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Email: nixono@uonbi.ac.ke

P.O Box 19134-40123
Kisumu, Kenya

Date: 3rd October, 2018

TO WHOM IT MAY CONCERN

The bearer of this DAVID ACHILLAH
REGISTRATION NO: D61/72969/09

The above named student is in the ~~Bachelor of Commerce degree~~ MBA program. As part of requirements for the course, he is expected to carry out a study on **"Implementation of food safety management system as a competitive advantage at Mumias sugar company limited, Kenya"-**

He has identified your organization for that purpose. This is to kindly request your assistance to enable him complete the study. The exercise is strictly for academic purposes and your assistance will be greatly appreciated.

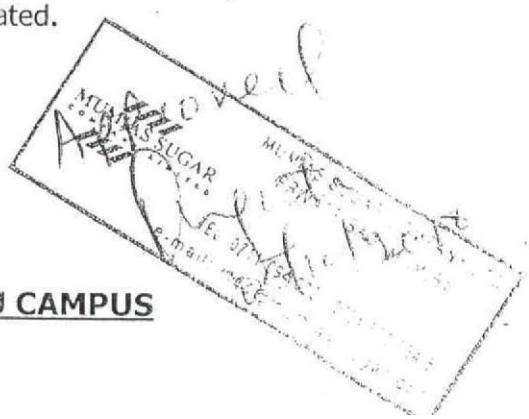
Thanking you in advance.

Sincerely,

CO-ORDINATOR
03 OCT 2018
KISUMU CAMPUS
UNIVERSITY OF NAIROBI

DR NIXON OMORO
ASSISTANT CO ORDINAOTR, SOB, KISUMU CAMPUS

Cc File Copy



APPENDIX II: INTERVIEW GUIDE

SECTION A: The research questions revolve around ISO 22000:2005 generic requirements established for the implementation of Food Safety Management Systems for all the organizations in food business. The questions examine the adoption and use of the generic ISO requirement at MSC in collaboration with the company prerequisite programmes to examine the extent of implementation.

1. **Introduction.**

    a) Kindly give brief introduction of Mumias Sugar Company Limited highlighting some of the achievements from inception.

2. **The general requirements for a food safety management system.**

    a) Are the food hazards reasonably expected to occur during sugar production clearly identified? What is the focus of identification?

    b) To what extent are the hazards communicated? To which people?

    c) How often is the ISO evaluation done? Are there any specific timelines?

3. **Documentation Requirements.**

    a) Does Mumias Sugar Company have established documentation procedure for the ISO documents? To what extent is the documentation ignored?

4. **Management Responsibility.**

    a) To your opinion, do you think Mumias Sugar Company top management is committed towards the development and implementation of food safety management systems? How?

    b) To what extent does the company management define, document and communicate the food safety policy?

c) Does MSC have proper plans in relation to food safety management systems? Are there appointed teams to spearhead the process

d) Are there established channels for external/internal communication on food safety management issues? What are the major issues on communication?

e) Are there any planned review/Audit of Food Safety Management Systems by the company top management? At What interval? What is the focus?

5. Resource Management

a) What is the level of resource availability for food safety systems establishment, implementation, maintenance and review?

6. Planning and Realization of Safe Products

a) Does Mumias Sugar Company Limited have a developed/planned process for the realization of safety products?

b) Are there prerequisite programmes for all the production processes? Are the prerequisite Programmes regularly verified and audited?

c) Does the company have predesigned steps for the hazard analysis?

d) To what extent is the FSMS coordinated to the suppliers and customers?

e) To what extent are hazards defined? Are there acceptable hazard levels and the critical control limits?

f) Are there predefined hazard critical control points?

g) Does the company have any traceability system for its raw material and the final products? What are the contents and reason for traceability?

h) Is there any defined control procedure for handling non-conformity during production?

i) Does the company provide guidelines for corrective action and handling of the potentially unsafe product?

j) To your opinion, do you think the process has loopholes for unsafe product accessing the customers in the market?

SECTION B: Focus on implementation of Food safety Management Systems and Competitive Advantage

1. Implementation of Food Safety Management Systems is key to achieving competitive advantage. What are the factors of implementation in the context of Mumias Sugar Company Limited?

2. How do you assess the performance of Food Safety management Systems at Mumias Sugar Company limited in achieving competitive advantage?

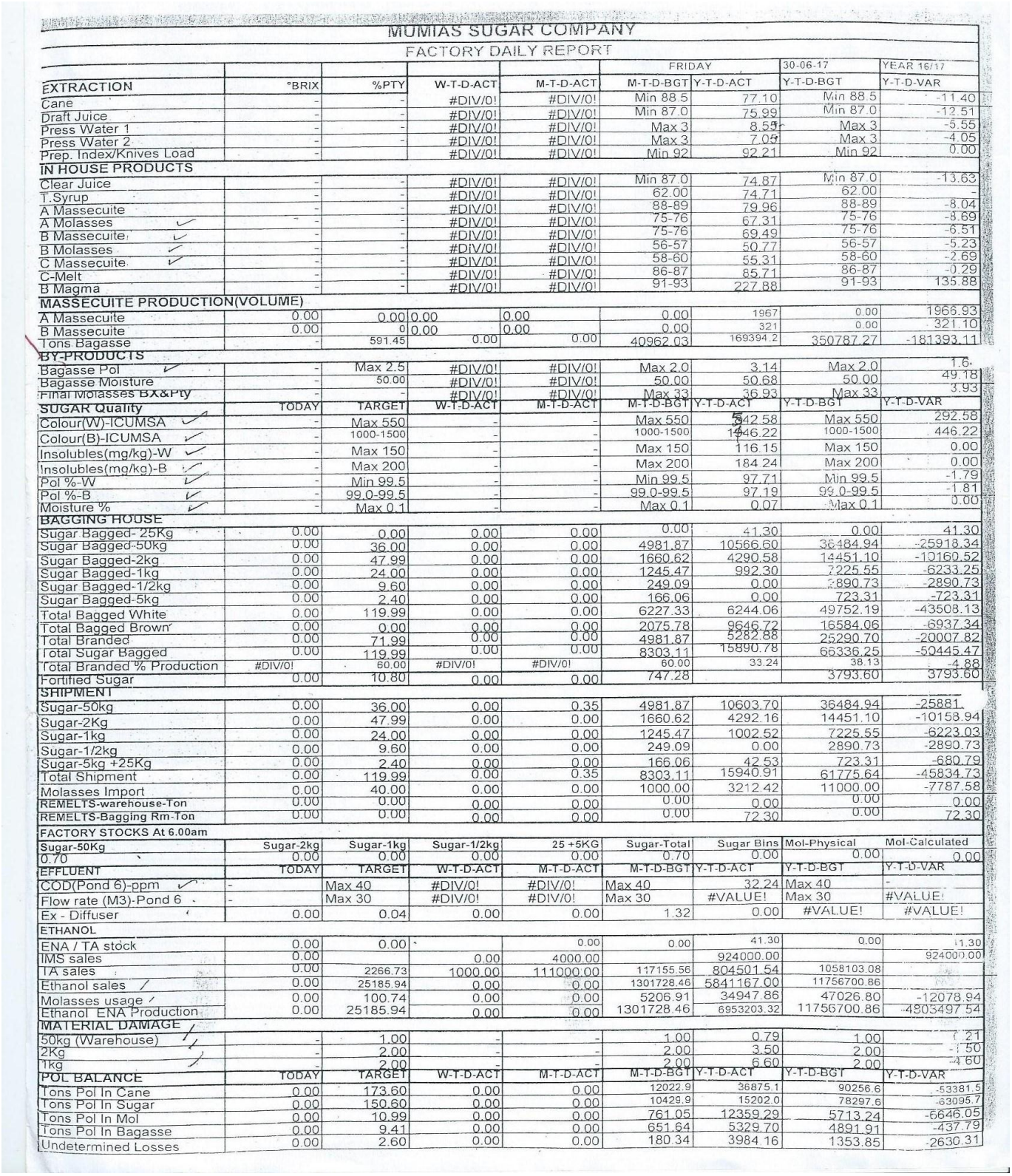
3. What are the specific milestones realized by the implementation of ISO systems at Mumias Sugar Company Limited?

4. In what ways do the FSMS functions help Mumias Sugar Company Limited gain competitive edge above the other players in the market?

APPENDIX III: SECONDARY DATA CAPTURE FORM

Measure	**Source Document**	**Actual/Achieved**	**Limits/Budgeted Quantity**
Colour: White Sugar Brown Sugar	FDR		
Insoluble: White Sugar Brown Sugar	FDR		
Moisture %	FDR		
Cane Staleness Index	FDR		
Cane Extraneous Matter	FDR		
Sulphur Dioxide	Laboratory Logbook		
Lead (Pb)	Laboratory Logbook		
Copper (Cu)	Laboratory Logbook		
Damages	FDR		
Extra Neutral Alcohol Purity	FDR		
Rendement	FDR		
Overall Recovery	FDR		
Factory Time Efficiency	FDR		
Pol extraction	FDR		
Boiling House Recovery	FDR		
TC/TS	FDR		
Undetermined Losses	FDR		
Bagasse Pol.	FDR		
Final Molasses Purity	FDR		

APPENDIX IV: MUMIAS SUGAR COMPANY FACTORY DAILY PERFORMANCE REPORT 2016/2017



MUMIAS SUGAR COMPANY

FACTORY DAILY REPORT

					FRIDAY		30-06-17	YEAR 16/17
EXTRACTION	°BRIX	%PTY	W-T-D-ACT	M-T-D-ACT	M-T-D-BGT	Y-T-D-ACT	Y-T-D-BGT	Y-T-D-VAR
Cane	-	-	#DIV/0!	#DIV/0!	Min 88.5	77.10	Min 88.5	-11.40
Draft Juice	-	-	#DIV/0!	#DIV/0!	Min 87.0	75.99	Min 87.0	-12.51
Press Water 1	-	-	#DIV/0!	#DIV/0!	Max 3	8.55	Max 3	-5.55
Press Water 2	-	-	#DIV/0!	#DIV/0!	Max 3	7.05	Max 3	-4.05
Prep. Index/Knives Load	-		#DIV/0!	#DIV/0!	Min 92	92.21	Min 92	0.00
IN HOUSE PRODUCTS								
Clear Juice	-	-	#DIV/0!	#DIV/0!	Min 87.0	74.87	Min 87.0	-13.63
T.Syrup	-	-	#DIV/0!	#DIV/0!	62.00	74.71	62.00	-
A Massecuite	-	-	#DIV/0!	#DIV/0!	88-89	79.96	88-89	-8.04
A Molasses	-	-	#DIV/0!	#DIV/0!	75-76	67.31	75-76	-8.69
B Massecuite	-	-	#DIV/0!	#DIV/0!	75-76	69.49	75-76	-6.51
B Molasses	-	-	#DIV/0!	#DIV/0!	56-57	50.77	56-57	-5.23
C Massecuite	-	-	#DIV/0!	#DIV/0!	58-60	55.31	58-60	-2.69
C-Melt	-	-	#DIV/0!	#DIV/0!	86-87	85.71	86-87	-0.29
B Magma	-	-	#DIV/0!	#DIV/0!	91-93	227.88	91-93	135.88
MASSECUITE PRODUCTION(VOLUME)								
A Massecuite	0.00	0.00	0.00	0.00	0.00	1967	0.00	1966.93
B Massecuite	0.00	0	0.00	0.00	0.00	321	0.00	321.10
Tons Bagasse	-	591.45	0.00	0.00	40962.03	169394.2	350787.27	-181393.11
BY-PRODUCTS								
Bagasse Pol	-	Max 2.5	#DIV/0!	#DIV/0!	Max 2.0	3.14	Max 2.0	1.6
Bagasse Moisture	-	50.00	#DIV/0!	#DIV/0!	50.00	50.68	50.00	49.18
Final Molasses BX&Pty	-	-	#DIV/0!	#DIV/0!	Max 33	36.93	Max 33	3.93
SUGAR Quality	TODAY	TARGET	W-T-D-ACT	M-T-D-ACT	M-T-D-BGT	Y-T-D-ACT	Y-T-D-BGT	Y-T-D-VAR
Colour(W)-ICUMSA	-	Max 550	-	-	Max 550	542.58	Max 550	292.58
Colour(B)-ICUMSA	-	1000-1500	-	-	1000-1500	1446.22	1000-1500	446.22
Insolubles(mg/kg)-W	-	Max 150	-	-	Max 150	116.15	Max 150	0.00
Insolubles(mg/kg)-B	-	Max 200	-	-	Max 200	184.24	Max 200	0.00
Pol %-W	-	Min 99.5	-	-	Min 99.5	97.71	Min 99.5	-1.79
Pol %-B	-	99.0-99.5	-	-	99.0-99.5	97.19	99.0-99.5	-1.81
Moisture %	-	Max 0.1	-	-	Max 0.1	0.07	Max 0.1	0.00
BAGGING HOUSE								
Sugar Bagged- 25Kg	0.00	0.00	0.00	0.00	0.00	41.30	0.00	41.30
Sugar Bagged-50kg	0.00	36.00	0.00	0.00	4981.87	10566.60	36484.94	-25918.34
Sugar Bagged-2kg	0.00	47.99	0.00	0.00	1660.62	4290.58	14451.10	-10160.52
Sugar Bagged-1kg	0.00	24.00	0.00	0.00	1245.47	992.30	7225.55	-6233.25
Sugar Bagged-1/2kg	0.00	9.60	0.00	0.00	249.09	0.00	2890.73	-2890.73
Sugar Bagged-5kg	0.00	2.40	0.00	0.00	166.06	0.00	723.31	-723.31
Total Bagged White	0.00	119.99	0.00	0.00	6227.33	6244.06	49752.19	-43508.13
Total Bagged Brown	0.00	0.00	0.00	0.00	2075.78	9646.72	16584.06	-6937.34
Total Branded	0.00	71.99	0.00	0.00	4981.87	5282.88	25290.70	-20007.82
Total Sugar Bagged	0.00	119.99	0.00	0.00	8303.11	15890.78	66336.25	-50445.47
Total Branded % Production	#DIV/0!	60.00	#DIV/0!	#DIV/0!	60.00	33.24	38.13	-4.88
Fortified Sugar	0.00	10.80	0.00	0.00	747.28		3793.60	3793.60
SHIPMENT								
Sugar-50kg	0.00	36.00	0.00	0.35	4981.87	10603.70	36484.94	-25881.
Sugar-2Kg	0.00	47.99	0.00	0.00	1660.62	4292.16	14451.10	-10158.94
Sugar-1kg	0.00	24.00	0.00	0.00	1245.47	1002.52	7225.55	-6223.03
Sugar-1/2kg	0.00	9.60	0.00	0.00	249.09	0.00	2890.73	-2890.73
Sugar-5kg +25Kg	0.00	2.40	0.00	0.00	166.06	42.53	723.31	-680.79
Total Shipment	0.00	119.99	0.00	0.35	8303.11	15940.91	61775.64	-45834.73
Molasses Import	0.00	40.00	0.00	0.00	1000.00	3212.42	11000.00	-7787.58
REMELTS-warehouse-Ton	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
REMELTS-Bagging Rm-Ton	0.00	0.00	0.00	0.00	0.00	72.30	0.00	72.30

FACTORY STOCKS At 6.00am

Sugar-50Kg	Sugar-2kg	Sugar-1kg	Sugar-1/2kg	25 +5KG	Sugar-Total	Sugar Bins	Mol-Physical	Mol-Calculated
0.70	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00

EFFLUENT	TODAY	TARGET	W-T-D-ACT	M-T-D-ACT	M-T-D-BGT	Y-T-D-ACT	Y-T-D-BGT	Y-T-D-VAR
COD(Pond 6)-ppm	-	Max 40	#DIV/0!	#DIV/0!	Max 40	32.24	Max 40	-
Flow rate (M3)-Pond 6	-	Max 30	#DIV/0!	#DIV/0!	Max 30	#VALUE!	Max 30	#VALUE!
Ex - Diffuser	0.00	0.04	0.00	0.00	1.32	0.00	#VALUE!	#VALUE!
ETHANOL								
ENA / TA stock	0.00	0.00		0.00	0.00	41.30	0.00	41.30
IMS sales	0.00		0.00	4000.00		924000.00		924000.00
TA sales	0.00	2266.73	1000.00	111000.00	117155.56	804501.54	1058103.08	
Ethanol sales	0.00	25185.94	0.00	0.00	1301728.46	5841167.00	11756700.86	
Molasses usage	0.00	100.74	0.00	0.00	5206.91	34947.86	47026.80	-12078.94
Ethanol ENA Production	0.00	25185.94	0.00	0.00	1301728.46	6953203.32	11756700.86	-4803497.54
MATERIAL DAMAGE								
50kg (Warehouse)	-	1.00	-	-	1.00	0.79	1.00	-0.21
2Kg	-	2.00	-	-	2.00	3.50	2.00	1.50
1kg	-	2.00	-	-	2.00	6.60	2.00	4.60

POL BALANCE	TODAY	TARGET	W-T-D-ACT	M-T-D-ACT	M-T-D-BGT	Y-T-D-ACT	Y-T-D-BGT	Y-T-D-VAR
Tons Pol In Cane	0.00	173.60	0.00	0.00	12022.9	36875.1	90256.6	-53381.5
Tons Pol In Sugar	0.00	150.60	0.00	0.00	10429.9	15202.0	78297.6	-63095.7
Tons Pol In Mol	0.00	10.99	0.00	0.00	761.05	12359.29	5713.24	-6646.05
Tons Pol In Bagasse	0.00	9.41	0.00	0.00	651.64	5329.70	4891.91	-437.79
Undetermined Losses	0.00	2.60	0.00	0.00	180.34	3984.16	1353.85	-2630.31

MUMIAS SUGAR COMPANY

FACTORY DAILY REPORT

					FRIDAY		30-06-17	YEAR 16/17
EXTRACTION	°BRIX	%PTY	W-T-D-ACT	M-T-D-ACT	M-T-D-BGT	Y-T-D-ACT	Y-T-D-BGT	Y-T-D-VAR
Cane	-	-	#DIV/0!	#DIV/0!	Min 88.5	77.10	Min 88.5	-11.40
Draft Juice	-	-	#DIV/0!	#DIV/0!	Min 87.0	75.99	Min 87.0	-12.51
Press Water 1	-	-	#DIV/0!	#DIV/0!	Max 3	8.55	Max 3	-5.55
Press Water 2	-	-	#DIV/0!	#DIV/0!	Max 3	7.05	Max 3	-4.05
Prep. Index/Knives Load	-		#DIV/0!	#DIV/0!	Min 92	92.21	Min 92	0.00
IN HOUSE PRODUCTS								
Clear Juice	-	-	#DIV/0!	#DIV/0!	Min 87.0	74.87	Min 87.0	-13.63
T.Syrup	-	-	#DIV/0!	#DIV/0!	62.00	74.71	62.00	-
A Massecuite	-	-	#DIV/0!	#DIV/0!	88-89	79.96	88-89	-8.04
A Molasses	-	-	#DIV/0!	#DIV/0!	75-76	67.31	75-76	-8.69
B Massecuite	-	-	#DIV/0!	#DIV/0!	75-76	69.49	75-76	-6.51
B Molasses	-	-	#DIV/0!	#DIV/0!	56-57	50.77	56-57	-5.23
C Massecuite	-	-	#DIV/0!	#DIV/0!	58-60	55.31	58-60	-2.69
C-Melt	-	-	#DIV/0!	#DIV/0!	86-87	85.71	86-87	-0.29
B Magma	-	-	#DIV/0!	#DIV/0!	91-93	227.88	91-93	135.88
MASSECUITE PRODUCTION(VOLUME)								
A Massecuite	0.00	0.00	0.00	0.00	0.00	1967	0.00	1966.93
B Massecuite	0.00	0	0.00	0.00	0.00	321	0.00	321.10
Tons Bagasse	-	591.45	0.00	0.00	40962.03	169394.2	350787.27	-181393.11
BY-PRODUCTS								
Bagasse Pol	-	Max 2.5	#DIV/0!	#DIV/0!	Max 2.0	3.14	Max 2.0	1.6
Bagasse Moisture	-	50.00	#DIV/0!	#DIV/0!	50.00	50.68	50.00	49.18
Final Molasses BX&Pty	-	-	#DIV/0!	#DIV/0!	Max 33	36.93	Max 33	3.93
SUGAR Quality	TODAY	TARGET	W-T-D-ACT	M-T-D-ACT	M-T-D-BGT	Y-T-D-ACT	Y-T-D-BGT	Y-T-D-VAR
Colour(W)-ICUMSA	-	Max 550	-	-	Max 550	842.58	Max 550	292.58
Colour(B)-ICUMSA	-	1000-1500	-	-	1000-1500	1446.22	1000-1500	446.22
Insolubles(mg/kg)-W	-	Max 150	-	-	Max 150	116.15	Max 150	0.00
Insolubles(mg/kg)-B	-	Max 200	-	-	Max 200	184.24	Max 200	0.00
Pol %-W	-	Min 99.5	-	-	Min 99.5	97.71	Min 99.5	-1.79
Pol %-B	-	99.0-99.5	-	-	99.0-99.5	97.19	99.0-99.5	-1.81
Moisture %	-	Max 0.1	-	-	Max 0.1	0.07	Max 0.1	0.00
BAGGING HOUSE								
Sugar Bagged- 25Kg	0.00	0.00	0.00	0.00	0.00	41.30	0.00	41.30
Sugar Bagged-50kg	0.00	36.00	0.00	0.00	4981.87	10566.60	36484.94	-25918.34
Sugar Bagged-2kg	0.00	47.99	0.00	0.00	1660.62	4290.58	14451.10	-10160.52
Sugar Bagged-1kg	0.00	24.00	0.00	0.00	1245.47	992.30	7225.55	-6233.25
Sugar Bagged-1/2kg	0.00	9.60	0.00	0.00	249.09	0.00	2890.73	-2890.73
Sugar Bagged-5kg	0.00	2.40	0.00	0.00	166.06	0.00	723.31	-723.31
Total Bagged White	0.00	119.99	0.00	0.00	6227.33	6244.06	49752.19	-43508.13
Total Bagged Brown	0.00	0.00	0.00	0.00	2075.78	9646.72	16584.06	-6937.34
Total Branded	0.00	71.99	0.00	0.00	4981.87	5282.88	25290.70	-20007.82
Total Sugar Bagged	0.00	119.99	0.00	0.00	8303.11	15890.78	66336.25	-50445.47
Total Branded % Production	#DIV/0!	60.00	#DIV/0!	#DIV/0!	60.00	33.24	38.13	-4.88
Fortified Sugar	0.00	10.80	0.00	0.00	747.28		3793.60	3793.60
SHIPMENT								
Sugar-50kg	0.00	36.00	0.00	0.35	4981.87	10603.70	36484.94	-25881
Sugar-2Kg	0.00	47.99	0.00	0.00	1660.62	4292.16	14451.10	-10158.94
Sugar-1kg	0.00	24.00	0.00	0.00	1245.47	1002.52	7225.55	-6223.03
Sugar-1/2kg	0.00	9.60	0.00	0.00	249.09	0.00	2890.73	-2890.73
Sugar-5kg +25Kg	0.00	2.40	0.00	0.00	166.06	42.53	723.31	-680.79
Total Shipment	0.00	119.99	0.00	0.35	8303.11	15940.91	61775.64	-45834.73
Molasses Import	0.00	40.00	0.00	0.00	1000.00	3212.42	11000.00	-7787.58
REMELTS-warehouse-Ton	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
REMELTS-Bagging Rm-Ton	0.00	0.00	0.00	0.00	0.00	72.30	0.00	72.30

FACTORY STOCKS At 6.00am

Sugar-50Kg	Sugar-2kg	Sugar-1kg	Sugar-1/2kg	25 +5KG	Sugar-Total	Sugar Bins	Mol-Physical	Mol-Calculated
0.70	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00

EFFLUENT	TODAY	TARGET	W-T-D-ACT	M-T-D-ACT	M-T-D-BGT	Y-T-D-ACT	Y-T-D-BGT	Y-T-D-VAR
COD(Pond 6)-ppm	-	Max 40	#DIV/0!	#DIV/0!	Max 40	32.24	Max 40	-
Flow rate (M3)-Pond 6	-	Max 30	#DIV/0!	#DIV/0!	Max 30	#VALUE!	Max 30	#VALUE!
Ex - Diffuser	0.00	0.04	0.00	0.00	1.32	0.00	#VALUE!	#VALUE!
ETHANOL								
ENA / TA stock	0.00	0.00		0.00	0.00	41.30	0.00	41.30
IMS sales	0.00		0.00	4000.00		924000.00		924000.00
TA sales	0.00	2266.73	1000.00	111000.00	117155.56	804501.54	1058103.08	
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MATERIAL DAMAGE								
50kg (Warehouse)	-	1.00	-	-	1.00	0.79	1.00	0.21
2Kg	-	2.00	-	-	2.00	3.50	2.00	-1.50
1kg	-	2.00	-	-	2.00	6.60	2.00	-4.60

POL BALANCE	TODAY	TARGET	W-T-D-ACT	M-T-D-ACT	M-T-D-BGT	Y-T-D-ACT	Y-T-D-BGT	Y-T-D-VAR
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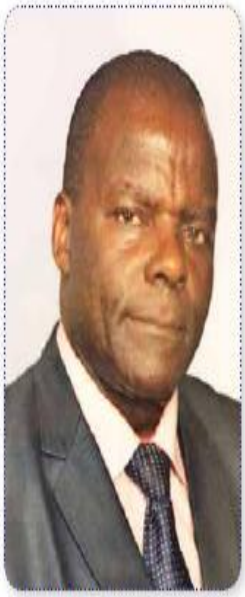
Tons Pol In Sugar	0.00	150.60	0.00	0.00	10429.9	15202.0	78297.6	-63095.7
Tons Pol In Mol	0.00	10.99	0.00	0.00	761.05	12359.29	5713.24	-6646.05
Tons Pol In Bagasse	0.00	9.41	0.00	0.00	651.64	5329.70	4891.91	-437.79
Undetermined Losses	0.00	2.60	0.00	0.00	180.34	3984.16	1353.85	-2630.31

APPENDIX V: MUMIAS SUGAR COMPANY LIMITED ANNUAL REPORT AND FINANCIAL STATEMENT 2017 EXTRACT



NASHON ASEKA
Chief Executive Officer

During the year, the Company suffered a net loss after tax of Shs 6.8 billion against the previous year's loss of Shs 4.8 billion. This represents a 41% increase in the Company's loss position.

Agricultural Operations

The major challenge faced by the Company throughout the year, was the acute sugar cane shortage experienced in the region. Total cane delivered to the factory was 419,147 tonnes, a drop of 65% compared to 1,210,164 tonnes delivered the previous year. The Nucleus estate provided 48,434 tons (12%) of this cane while contracted outgrowers and private farmers supplied 146,837 tons (35%) and 223,876 tons (53%) respectively. Low rainfall received in the area coupled with inadequate fertilizer application depressed the average yields to 32TCH from the 45.03 TCH realised in the previous year.

Cane development operations were low with only 3,619 ha planted against a target of 6,000 ha: 1,185 ha in the Nucleus Estate and 2,434 ha in out-growers fields. The company released a promising new variety FR 95-2345 with a shorter maturation cycle for propagation.

Farmer Engagement

In collaboration with the Sugar Research Institute, management held 52 meetings with farmers to communicate policy, good farm management practices and promote the adoption of early maturing sugarcane varieties.

Management revamped the customer care function domiciled in the Outgrower Development Section as the first point of contact for farmer inquiries. This function handled over 300 farmer related queries per day. To further enhance this engagement a dedicated hotline has been set up in the managing directors office.

Kisoko and Bumula cane buying centres (CBCs) operated throughout the year with 28,261 tons and 9,748 tons of cane received through the CBCs respectively. One additional CBC at Navakholo in Eastern zone is about to be commissioned. The establishment of CBCs is aimed at reducing cane transport costs to farmers, expanding the cane catchment area and hastening delivery of cane to the factory using high payload units (HPUs).

Factory performance

Factory performance was adversely affected by cane shortage during the year. On 10th April 2017 the plant was shut down to undertake annual maintenance and allow maturation of existing crop and revamping of Agriculture. Cane processed dropped by 66% to 407,008.44 MT from 1,215,566 MT done in the previous year. Consequently, a lower production of 15,890.78 MT of sugar was achieved compared to 75,072.86 MT produced the previous year, thereby posting low rendement. Considerable amount of maintenance work was accomplished during the closure but some other critical maintenance activities will be undertaken as finances become available.

The Ethanol plant produced 6.9 million litres of ENA which was a 44% drop compared to 12.4 million litres produced the previous financial year. The distillery capacity utilization was low as it largely relied on raw material supply from the sugar plant but the percentage was slightly better due to some additional molasses imported during the year.

Cogeneration was used only for internal power supplementation. Power export was not undertaken due to the shortage of cane and unresolved dispute with KPLC. Generators rented from AGGREKO were

NOTES (CONTINUED)

4. Segmental information

a) Products and services from which reportable segments derive their revenues

Information reported to the company's chief operating decision maker (the Chief Executive Officer) for the purposes of resource allocation and assessment of segment performance is focused on the principal activities of the company.

The company identifies its reportable operating segments on the basis of products as indicated below;

- Sugar segment which primarily produces and sells sugar and molasses.
- Energy segment which generates electricity from bagasse (a by product of sugar production) for sale to Kenya Power.
- Ethanol segment which primarily produces and sells ethanol.
- Water segment which primarily produces and sells bottled drinking water.

b) Segment revenues and results, assets and liabilities

Year ended 30 June 2017	Sugar Shs'000	Energy Shs'000	Ethanol Shs'000	Water Shs'000	Total Shs'000
Revenue from customers	1,297,346	-	794,029	376	2,091,751
Inter-segment sales	124,060	18,458	(142,518)	-	-
	1,421,406	18,458	651,511	376	2,091,751
Cost of sales	(2,348,143)	(540,417)	(295,110)	(24,710)	(3,208,380)
Factory engineering	(1,138,962)	-	-	-	(1,138,962)
Production overheads	(878,108)	-	(48,155)	-	(926,263)
Change in value of product inventories	54,196	-	(58,944)	(1,544)	(6,292)
	(4,311,017)	(540,417)	(402,209)	(26,254)	(5,279,897)

APPENDIX VI: SUGAR DIRECTORATE REPORT 2015

OUTPUT AND MARKET SHARE

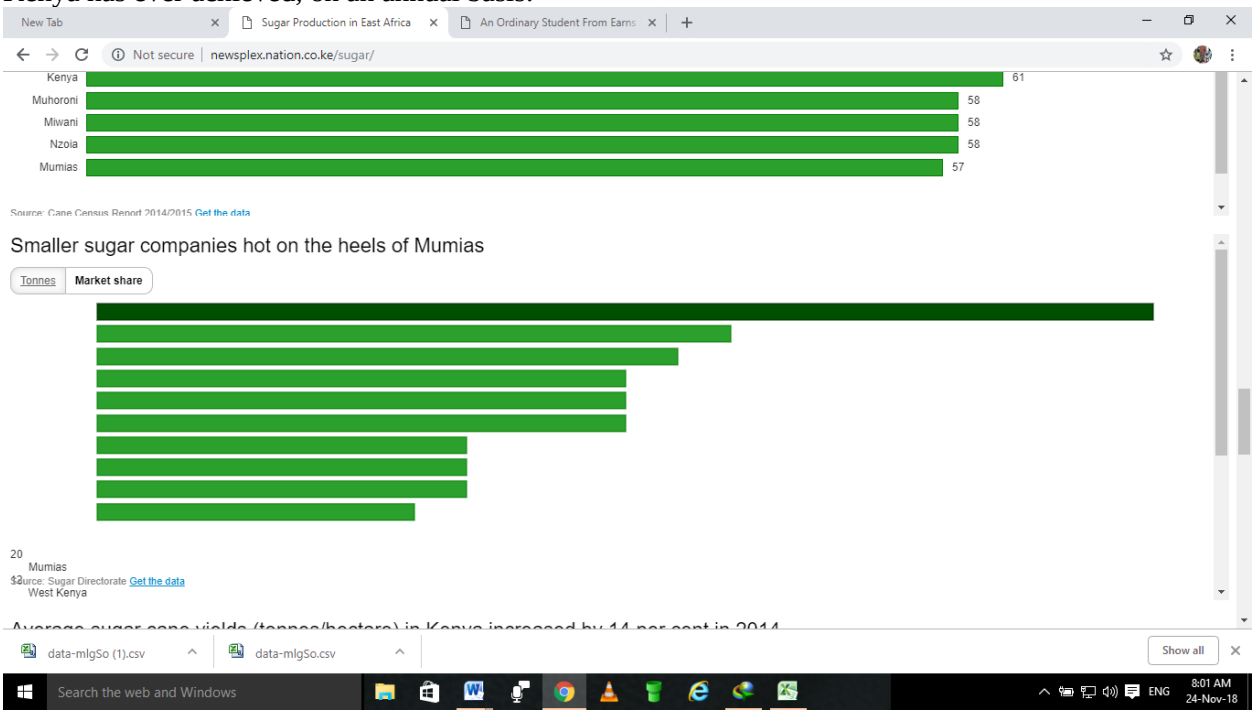
As of December 2014, the output and market share of each manufacturer was as summarized in the table below:

Annual Output & Market Share of Sugar Manufacturers in Kenya

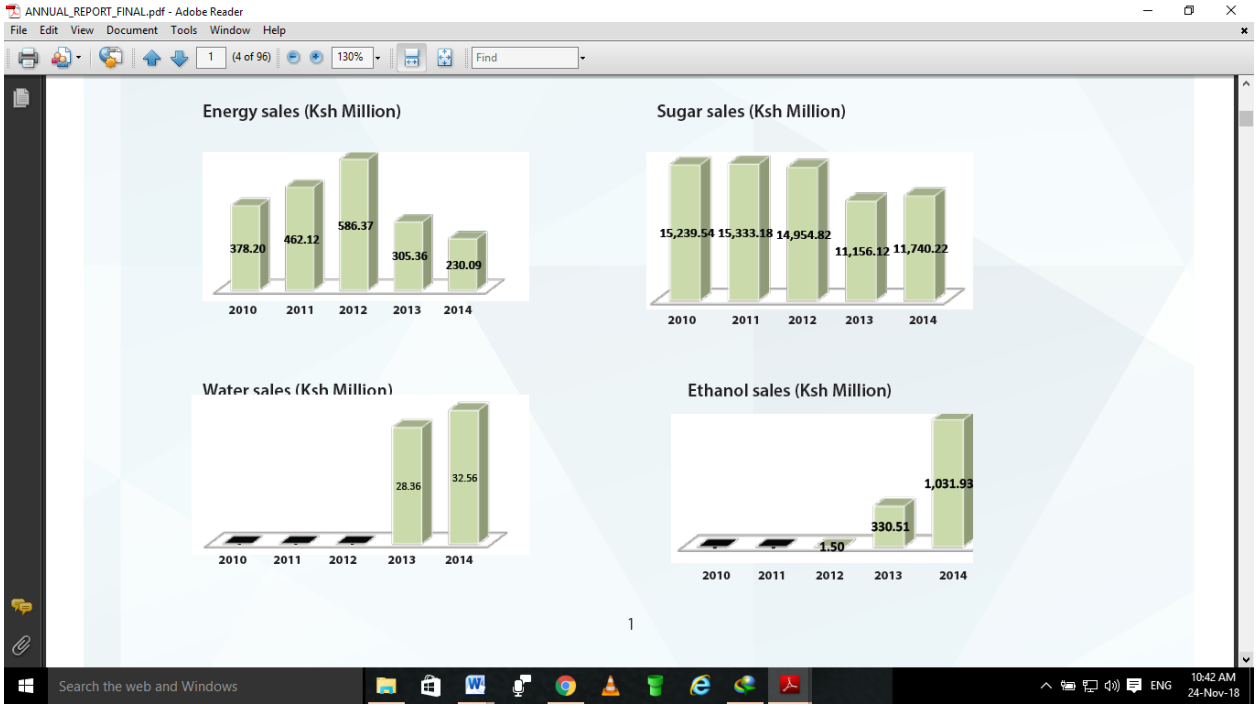
Rank	*Name of Manufacturer*	*Output (Metric tonnes)*	*Market Share (%)*
1	Mumias Sugar Company	117,966	19.93
2	West Kenya Sugar Limited	73,696	12.45
3	Nzoia Sugar Factory	66,462	11.23
4	South Nyanza Sugar Company	60,028	10.14
5	Transmara Sugar Company	58,887	9.95
6	Butali Sugar Mills	56,853	9.60
7	Sukari Industries Limited	42,143	7.12
8	Kibos Sugar and Allied Industries Limited	39,415	6.66
9	Muhoroni Sugar Company	38,864	6.56
10	Chemelil Sugar Factory	37,720	6.37
	Total	**592,034**	**100.00%**

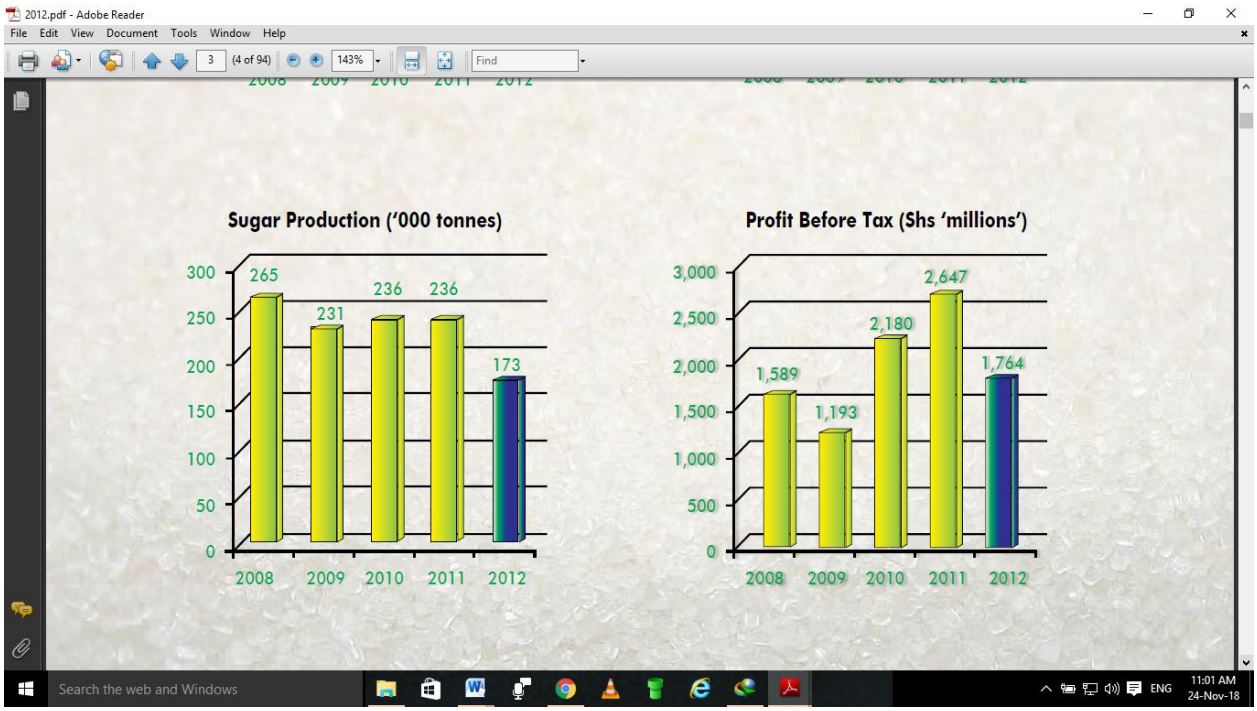
- Totals may be a little off due to rounding.

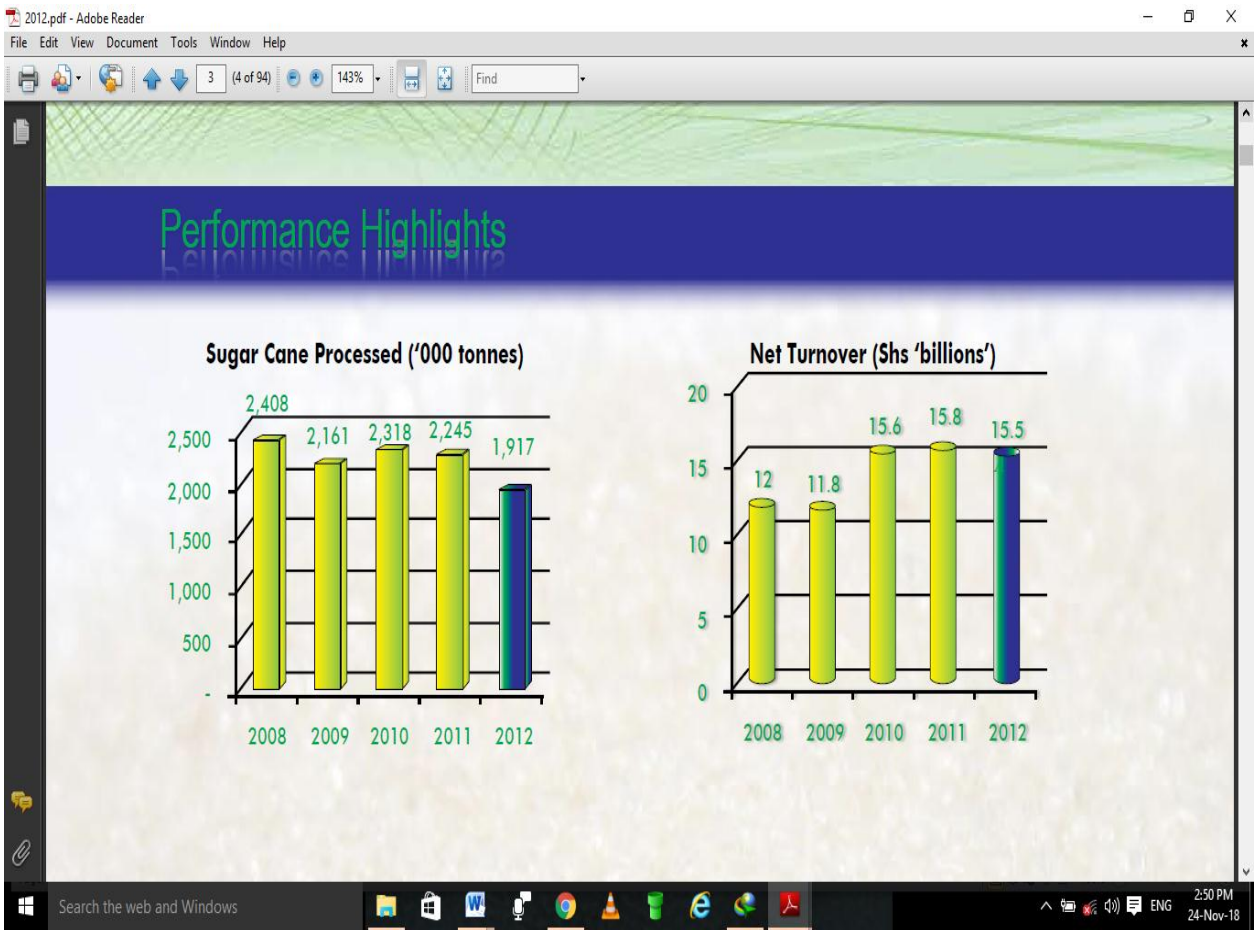
In 2015, national sugar production totaled 632,000 metric tonnes, the highest production quantity Kenya has ever achieved, on an annual basis.



APPENDIX VII: MUMIAS SUGAR COMPANY ANNUAL REPORT AND FINANCIAL STATEMENT JUNE 2014 extracts



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Performance Highlights
Sugar Cane Processed ('000 tonnes)
2,408
2,161
2,318
2,245
1,917
2,500
2,000
1,500
1,000
500
-
2008 2009 2010 2011 2012
Net Turnover (Shs 'billions')
20
15
10
5
0
12
11.8
15.6
15.8
15.5
2008 2009 2010 2011 2012
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APPENDIX VIII: MUMIAS SUGAR COMPANY ANNUAL REPORT AND FINANCIAL STATEMENT JUNE 2016

CY-Current year 2015/16; **PY**-Previous year 2014/15

OPERATIONS

Following receipt of the GOK bailout funds and limited factory maintenance undertaken in July & August 2015, the Company operated relatively smoothly and was on course to realizing the planned cane diffusion targets, factory time efficiencies (FTE), sugar recoveries (Rendement) and all related financial targets.

However, the acute cane shortage experienced in quarter 4 saw the sugar production and recoveries heavily curtailed negating the benefits gained in the earlier quarters of the year. The cane shortage was largely due to widespread cane poaching.

The Company processed 1,215,566 metric tonnes of sugar cane which is 9.4% higher than the previous year (2015 – 1,111,473). Sugar production increased by 6% to 75,073 metric tonnes (2015 – 70,891 MT) at a recovery rate of 6.2% (2015 - 6.38%), while ethanol production increased by 20% to 12,367,072 litres (2015 - 10,311,773 litres). Sugar and ethanol revenues increased by 10% and 37% to Kshs. 5,097 million and Kshs 1,057 million, respectively.

APPENDIX IX: MUMIAS SUGAR COMPANY ANNUAL REPORT AND FINANCIAL STATEMENT JUNE 2015

Mumias Sugar Company Limited
Financial statements
For the year ended 30th June 2015

MANUFACTURING ACCOUNT		2015 Shs'000	2014 Shs'000
Sales			
Gross sugar sales		5,609,942	14,163,407
Gross molasses sales		36,117	47,678
Gross electricity sales		68,606	257,701
Gross ethanol sales		2,037,848	2,889,224
Gross water sales		25,610	42,631
Total gross sales		7,778,123	17,400,641
Value Added Tax		(1,073,130)	(2,392,155)
Sugar Development Levy		(186,006)	(469,609)
Excise Duty		(987,630)	(1,462,965)
NET SALES		5,531,357	13,075,912
COST OF SALES			
Cane purchases	II	(3,359,895)	(6,795,841)
Factory production - sugar	II	(869,200)	(1,333,483)
Factory production - energy	II	(464,193)	(401,307)
Factory production - ethanol	II	(284,896)	(435,589)
Factory production - water	II	(138,325)	(101,940)
Factory engineering	III	(909,496)	(1,008,460)
Production overheads	III	(1,040,332)	(1,197,850)
Decrease in the value of product inventories		(125,232)	(953,238)
		(7,191,569)	(12,227,708)
GROSS (LOSS)/PROFIT		(1,660,212)	848,204
OTHER OPERATING INCOME	III	95,166	376,074
MARKETING AND DISTRIBUTION COSTS	III	(388,354)	(929,128)
ADMINISTRATIVE EXPENSES	IV	(2,408,415)	(3,058,184)
IMPAIRMENT		(870,247)	(213,088)
FINANCE INCOME		143,039	264,020
FINANCE COSTS		(1,243,755)	(601,397)
Loss before tax		(6,332,778)	(3,313,499)
Reconciliation of results at fair valuation of biological			