EFFECT OF PRODUCTION IMPLEMENTATION PRACTICES ON SUPPLY CHAIN PERFORMANCE OF FOOD AND BEVERAGE MANUFACTURING FIRMS IN KENYA

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A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, FACULTY OF BUSINESS AND MANAGEMENT SCIENCES, UNIVERSITY OF NAIROBI

2023

DECLARATION

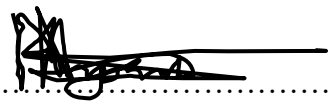
This research project is my original work and to the best of my knowledge has not been presented for the award of a degree in any other university.

Signature:  **Date**: 13/07/2022

Name: JASMINE ABDI OSMAN

Reg. No: D61/22714/2019.

This research project has been presented for examination with my approval as the university supervisor.

Signed …….  ……. **Date** …**07/09/2022**….

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DEDICATION

Special dedication to my beloved family following their support and encouragement in the tiring process but worthwhile academic journey.

ACKNOWLEDGEMENTS

It is with joy that I appreciate God for leading me through. And to my supervisor, Dr. Kingsford Rucha, your special guidance was never in vain, may GOD bless you. Equally, I appreciate the respondents who participated in filling the questionnaires.

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LIST OF ABBREVIATIONS AND ACRONYMS

CP:	Capacity Planning
DV:	Dependent Variable
ERP:	Enterprise Resource Planning
ES:	Employee Scheduling
FBMCs:	Food and Beverage Manufacturing Companies
IC:	Inventory Control
IV:	Independent Variables
KAMs:	Kenya Association of Manufacturers
RBV:	Resource Based View
ROA:	Return On Asset
SDGs:	Sustainable Development Goals
SPSS:	Statistical Package for Social Scientists
TOC:	Theory of Constraints
VIF:	Variation Inflation Factor

ABSTRACT

The general objective for this study was to determine the effect of production implementation practices on how food and beverages manufacturing companies in Kenya perform. Specifically, the research sought to investigate the extent to which production implementation practices have been espoused and to establish the challenges of implementation of production practices by the food and beverage manufacturing companies in Kenya. The research was grounded on resource-based view, theory of constraints and stakeholder theory. The research employed a cross-sectional survey design. The research targeted 135 food and beverage manufacturing firms in Kenya with a sample size of 84. The study found out that there was a moderate adoption of the production implementation practices. The outcome also indicated that production implementation practices and supply chain performance are correlated positively given by R = 0.622. This implied that improved production implementation practices lead to improved supply chain performance. The adjusted R^2 of 0.351 translates to only 35.1% of changes in supply chain performance being because of combined effects of the practices considered in the research. This signifies that 64.9% of the variations in supply chain performance were caused by variables that were not considered in the current study. Further, production implementation practices and supply chain performance were found to be significantly related given by $p<0.05$. Regarding regression coefficients, the study found out that capacity planning, employee scheduling and inventory control do not significantly affect supply chain performance since the p-value is greater than 0.05. Enterprise resource planning significantly affect supply chain performance at p=0.000. This implied that enterprise resource planning significantly contributed to variations in supply chain performance. The findings further established that the greatest challenge was strongly agreed to be high cost of implementation, followed by inadequacy of technology. It was also established that complexity of operations, ineffective organization structure and poor communication during implementation were challenges faced. The study concluded that production implementation practices improved supply chain performance among FBMCs in Kenya. It also concluded that the firms adopted production implementation practices of capacity planning, employee scheduling, enterprise resource planning and inventory control moderately. Finally, the study concluded that the most realized challenges included high cost of implementation and inadequate technology. It was also concluded that complexity of operations, ineffective organization structure and poor communication were also of great challenge. The study's recommendation is that the management of FBMCs should strengthen production implementation practices especially enterprise resource planning that was found to be significant. The managers should also establish other practices that would significantly affect supply chain performance, to ensure they are implemented and adopted. This is based on the finding that they comprise 64.9% of variations in supply chain performance.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Implementing production involves developing a plan to manage inventories, personnel and the physical work environment that supports manufacturing. The goal is to achieve efficiency and effectiveness in utilization of the assets available (Oluyisola et al, 2021). The achievement of this, will involves the implementation of practices that requires on to load, schedule, sequence, monitor, and control the use of resources and materials that would facilitate effective production process. Effective implementation of production practices would help to deal with the variations and extensive manufacturing processes (de Man & Strandhagen, 2018). The reality is that manufacturing difficulties exist and hence the need to implement production planning practices effectively for sustainable supply chain performance (Al-shourah, Al-tarawneh, & Ali, 2018). The COVID-19 pandemic has equally affected implementation of production by breaking most logistical operations including how suppliers link with their customers (Kumar et al, 2020).

This research was grounded on resource-based view (RBV) theory of constraints and stakeholder theory. According to RBV, effective implementation of planning and control activities of the manufacturing process can only be achieved when the firm put into good use, its unique talents, capacity and rare resources (Lahti, Wincent & Parida, 2018). Theory of constraints provides an understanding of the manufacturing limiting factors and posits that effective implementation of planning practices would ensure continued improvement using operational planning tools, techniques for measuring performance and thinking process tools (Gupta 2003). Stakeholder theory

on the other hand posits that when suppliers, consumers and other stakeholders are properly integrated, manufacturing companies achieve operational resilience and eventually improved supply chain performance (Skouloudis et al, 2015).

The Kenyan economy depends highly on firms that manufacture to spur the growth of the economy towards achievement of an industrial economy. The vision 2030 and agenda four initiatives emphasize the function of the manufacturing sector which includes food and beverage manufacturing companies (FBMCs) driving the consumption demand (KAM, 2021). Most of the FBMCs in Kenya have experienced difficulties in operational efficiency arising from increased cost of production and increased competition from other related sector products. This has seen the implementation of programs for improving waste reduction and optimum production planning. The rational of studying FBMCs is because their sustainability helps to fulfill sustainable development goals (SDG) 12 (Schroeder, Anggraeni & Weber, 2018).

1.1.1 Production Implementation Practices

Production implementation practices are considered of essence in the manufacturing process since cost of inventory, energy and sustaining product line activities is very high. These practices would help to optimize production planning practices for a sustainable supply chain performance (Elewa, Afolalu & Fayomi, 2019). It is based on the premise that without proper implementation of production practices, it would be difficult to attain maximum and sustainable effectiveness and efficiency of the manufacturing process. According to Ongbali, Afolalu, and Udo (2018), production implementation practices help to forecast each level of production operations, ensuring proper timing and cost-effectiveness of the process. The reality is that the

manufacturing process cannot be successful without proper planning, because it assists to evaluate the available resources, determination of activities to be done and the time scheduling of the manufacturing activities.

The key production planning practices that would help handle unpredictability in the manufacturing sector include capacity planning, employee scheduling, enterprise resource planning and inventory control. Yao, Almatooq, Askin and Gruber (2022) posit that successful capacity planning relies on ability to comprehend the opportunities in the market and expenses incurred on producing, sourcing, stocks, and distributing aspects. Employee scheduling is handled through machine dispatching rules, putting into consideration a variety of consumer groups with their unique needs to be fulfilled (Gucdemir, & Selim, 2017). ERP systems are software packages providing seamless linkages and flow of information company-wide with respect to all the departments (Al-sabri, & Raju, 2020). The implementation of inventory control helps to develop policy frameworks for justified investment in inventory which further helps to achieve sustainable liquidity levels (Opoku et al, 2020).

1.1.2 Supply Chain Performance

Supply chain performance means how the dispensing networks fulfil consumer requirements by making goods and services available in time without compromising quality and quantity specifications. The emphasis is the need to manage how firms collaborate with the supply chain stakeholders upwards and downwards. The objective focus of effective supply chains is the customer experience. This would be achieved when there is proper combination of organization structural, processing, and resourcing aspects (Genovese et al, 2017). Supply chain activities include manufacturing, transporting, supply and distribution and customer care. The reality is

that firms tend to promote their SCP because of its ability to provide good competition via the minimization of unnecessary resourcing, dissatisfying times of delivery, incompliant quality, and excesses. SCP is therefore based on the assessment and monitoring of the productivity of systems to achieve optimality (Lehyani et al, 2021).

Measurement of supply chain performance is based on how reliable, responsive, flexible, and cost effective the operations are. The realization is achieved through effective planning for acquisition of the input and how to account for them. Supply chain performance would however be measured based on how inbound and outbound logistics operations are synchronized, reduction in quantity of inventory used, sustainable inventory management planning, better capacity planning, stability in production, improved customer care, faster response to customer inquiries, transparency and high profit levels (Asnordin, Sundram, & Noranee, 2021). This study dwells on enhanced capacity planning, inventory reduction, minimal lead time and reliability of system. Enhanced planning capacity is achieved when suppliers and customers collaborate well for optimal service exchange among them while reduction in levels of inventory is realized through proper inventory planning. Shorter lead time is indicated by improved consolidation and collaboration with suppliers to achieve timeliness of deliveries. Finally, system reliability is achieved through all supply chain activities are operating in a team-like manner with effective management of the product life cycle stages and sustainable internal and external stakeholder management (Shabbir, & Kassim, 2018). Recently, organizations experienced disruptions arising from Covid-19. Disruption from the COVID-19 pandemic has caused major effects on the manufacturing process as well as the production and

operational networks (Kapoor et al, 2021). It also affected the demand and supply chains underpinning manufacturing operations.

1.1.3 Production Implementation Practices and Supply Chain Performance

Production implementation practices focus on integrating the needs of stakeholders in the manufacturing process, especially end users. The emphasis is the need to create value to customers by linking their needs and ensuring that suppliers offer value additional inputs (Som, Cobblah, & Anyigba, 2019). The existing challenges that call for implementation of production practices include increased changes in end user preferences with respect to product design, reduction in product life cycle and changing customer expectations as well. There is also the need to optimize production and the entire supply chain. Manufacturing firms therefore ensures that plans of action are in place for achieving efficient and value-additional output to end users and all other stakeholders (Li, et al, 2020).

The emphasis on the need to effectively implement production practices is because supply chains are increasingly exposed to poor planning and operational disturbances as well as the increasing cost of manufacturing. Most manufacturing companies have put in places practices that would enable them to navigate through the increasing cost of doing business including lean production practices and other quality management systems. Production implementation practices would therefore assist in dealing with fragile supply chain networks caused by changing stakeholder expectations and other environmental limitations (Putri, Huda, & Sinulingga, 2019). The recent disruptions of supply chain networks caused by covid-19 pandemic means that there should be implementation of effective production and operational systems to ensure sustainable supply chains.

1.1.4 Food and Beverage Manufacturing Firms in Kenya

The sub-sector comprises of several firms that operate from small scale, medium to large scale basis all over the nation (KAM, 2020). Majority are run by Private persons and not the government.in 2017, the sectorial yield to GDP was approximated to 3.5%. This was realized in exports value of Ksh 254,686 million. This makes it a special sector as far as enhancing development and advancement of Kenyan economy is concerned (KAM, 2021). According to Bode, Wagner, Petersen, & Ellram (2011), FBMCs in the country have endeared challenges relating supply chain interferences due escalating prices of materials that has seen a drop in sales of 7 %, reduced operating income of 42 % followed by falling R.O.A of 35 %. This has resulted into a falling shareholder return between 7 and 8 %. KNBS (2020) pointed out the fact that FBMS realized varying yields in 2019 leading to degenerated growth of 1.6% in comparison to 5.1% gain in 2018.

The implementation of production planning practices would lead to many companies changing their direction to improve their performance (Okah, Nduka, & Ugwuegbu, 2018). Increasing or reducing the dispensation of the outurn is thus likely to yield optimism for this sector. FBMCs are also marred with obstacles posed by the need to comply with the environment by ensuring that they adopt green practices. There are also considerable stumbling blocks from retailers continuously pushing the companies to reduce their costs and increase availability of product (Kosgei, & Gitau, 2016). Production planning aspects are likely to facilitated enhanced response to dynamics demands and the consequences of uncertain environment.

1.2 Research Problem

Implementation of production practices helps to develop mechanisms of solving problems caused by demand uncertainty, inadequate plans, and imbalanced capability. They therefore help in the minimization of costs of inputs and optimization of production load rate between production phases (Som, Cobblah, & Anyigba, 2019). The specific concepts of focus include capacity planning, employee scheduling, enterprise resource planning and inventory control. The studies reviewed presented conceptual gaps to be addressed. Muricho and Muli (2021) based their study on the same context but looked at factors influencing supply chain resilience. Irawan et al (2020) on the other hand focused on production capacity planning and control. Further, Ali, Van Groenendaal, and Weigand (2020), focused on the concept of ERP adoption, while Suresh and Sivakumar (2019) focused schedule management planning. These studies present conceptual gaps against the current study, and this presents a conceptual rationale.

FBMCs have been exposed to supply chain susceptibilities leading to unpredictability in aligning demand and supply of their products. Production planning practices would enable FBMCs to deal with disruptions and to optimize supply chain performance (Muricho, & Muli, 2021). Increased international competition and a shift in Kenyan market condition towards free-market economy through aggressive economic reform, has created the need for an effective manufacturing planning and control in Kenyan manufacturing companies (Ongbali, Afolalu, & Babalola, 2019). This would help to deal alignment of supply chain alignment thus yielding considerable impact on productivity of FBMCs in Kenya.

The studies reviewed present contextual gaps in that they have been conducted in other sectors, as well as other countries, with significantly different production environments. The study by Irawan et al (2020) focused on Indonesian firms, while that of Ali, Van Groenendaal, and Weigand (2020) focused on Pakistani manufacturing enterprises. The study by Afolalu et al (2021) was contextualized in Nigeria, focusing on the concept of productivity as the dependent variable. Some of the countries like Indonesia, Pakistan and Nigeria have adopted production implementation practices at different levels, thus representing significant contextual difference.

The reviewed studies equally presented methodological gaps looked at by the current study. Muricho and Muli (2021) conducted their study in the same sector. The study by Sule, Ogbadu and Olukotun (2012) adopted descriptive survey, though used both firsthand and secondhand data, unlike the current study that has used only primary data. The study by Umoh, Wokocha and Amah (2013) used the same methodology but relied on data from the field and publications. The study by Oluyisola et al (2021) on the other hand was a case study, though dealing with the same concept.

From the aforementioned studies, there is emphasis on production planning and how it influence operational performance. The reality is that manufacturing enterprises in Kenya have been experiencing supply chain susceptibilities making it difficult to quantity of products demanded to that of supply hence late delivery, running out of stock, increasing stockholding fees and disappointment of customers. The current study addressed the identified gaps by answering the question ‘What is the effect of production implementation practices on supply chain performance of food and beverage manufacturing companies in Kenya?’

1.3 Research Objectives

The general objective for this study was to determine the effect of production implementation practices on supply chain performance of FBMCs in Kenya. The specific objectives were:

i. To investigate the extent to which production implementation practices have been adopted by the FBMCs in Kenya.
ii. To determine the effect of production implementation practices on supply chain performance of FBMCs in Kenya.
iii. To establish the challenges of implementation of production practices by FBMCs in Kenya.

1.4 Value of the Study

The outcome of this research would be valuable in practice, theory and policy formulation. The research findings would help to guide the FBMCs in Kenya to help understand how production planning practices implementation would influence their supply chain performance. This is likely to aid in implementation production planning activities in countering the obstacles faced by these by cost cutting, improvement of quality and enhancement of faster delivery thus improved client retention and loyalty and meeting enhanced flexibility through promotion of knowledge-sharing. Since production planning enhances corporate productivity performance, FBMCs have to be engaged in proper official planning of production related processes and implementing them despite the number of years of existence of the company. Competent staff must also be sourced, and their skills and knowledge developed in line with technological requirements.

In academia, this study is likely to trigger new investigations among upcoming researchers in varied areas such as different variables of production planning practices. The production planning practices pointed out in the current investigation can be a motivating factor to academicians who are eager to find out the applicability of these aspects in other organizations and sectors. The study results are likely to assist in the formulation of different theoretical arguments that help to build reasoning and develop knowledge concepts around the issue.

The outcomes are also likely to aid in policy setting with respect to the need to adopt these practices as far as FBMCs is concerned and beyond in other organizations. In public institutions the implementation of production planning processes may result in a turn-around on how the resources are used with emphasis on effectiveness particularly on taxpayers' money. Furthermore, the application of production planning in military operations may aid in properly disposing battle-destroyed machinery and recovering financed public- owned property. The rising attentiveness to consumer needs in product processing, and escalating costs of producing goods demands effective polices are formulated to manage orders and choose the right policy for production planning.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The section includes an assessmment of various theories on implementation of production practices and supply chain performance. The section also gives insights on the various production implementation practices relevant to the study. Finally, it also contains a review of other research that is relevant to the variables studied, the identification of the knowledge gaps that the study attempted to address and the conceptual framework that shows how the studied variables are related.

2.2 Theoretical Review

It is the analysis of the applicable theories provided herein, to describe a phenomenon, furthering the literature as well as providing support to the variables under study (Turner, Baker, & Kellner, 2018). The theories under consideration here included: RBV, theory of constraints and stakeholder theory.

2.2.1 Resource Based View

The theory was propounded by Wernerfelt (1984) and Rumelt (1984). It states that companies should capitalize on their key capabilities that makes them different from others, hence providing competitive and strategic advantage in the industry. The argument is that companies need to utilize their unique resources to their advantage, including personnel and physical resources. According to Assensoh-Kodua (2019), companies can deal with their weaknesses by employing their internal capability, based on their resource capacity. Internally, companies rely on resources, operational efficiency and financial position. The significance of the theory is that it enables a

company to position itself and compete effectively in the market (Balashova, & Gromova, 2016).

In its application, the theory emphasizes that production implementation practices would be effective if there is proper deployment of the firm's internal capability, with respect to the available resources and market positioning (Filho, & Moori, 2020). Generally, there is need for deployment of unique bundle of resources and capacity that are rare, and unique to give competitive sustainable advantage. The need to sustain practices such as capacity planning, employee scheduling, enterprise resource planning and inventory control among others would require the use of vital resources, especially expertise for effective supply chain performance.

Resource based view theory (RBV) generally require the mitigation of operational constraints through proper use of the available resources and capability improve the performance of FBMCs. The theory explains the variable of capacity planning and enterprise resource planning, on the emphasis that when companies capitalize on their resources, they can achieve effective capacity planning and optimize resource planning.

2.2.2 Theory of Constraints

It was initiated by Goldratt (1988). A constraint is anything creating limitations on the performance of a system based on the set goals. The existence of constraints imply that organizations must implement strategies of dealing with the constraints for effective performance. The theory emphasizes that constraints are not negative but should be seen to be positive since they determine how the system performs and any attempt to deal with the constraints would lead to improved system performance. In

implementation of production practices, the theory focuses on the possible constraints in the production process, that would best be sorted through effective implementation of production practices (Panizzolo, 2016). TOC therefore helps to achieve sustainable improvement through identification and effective handling of the constraints using the right strategy, evaluation tool and creativity tool.

According to Urban (2019), TOC is applicable to production activities since it facilitates identification and management of constraints in the manufacturing process, as well as the creation of an optimum production schedule for the operations. The reality is that companies meet obstacles from within to generate profit by focusing on how to be efficient, by increasing throughput of an operating system while reducing inventory and operating expenses. Implementation of production practices would help in reduction of operational costs, improvement of customer experience and optimal resource utilization. Wojakowski (2016) assert that TOC helps managers to find a stumbling block of the system and improving the throughput, hence enhancing the productive nature of the manufacturing system. The suggestion of the theory is that there is need to focus on the constraints to help improve operational excellence.

The relevance of the theory is that implementation of production practices such as capacity planning, employee scheduling, enterprise resource planning and inventory control, would assist in managing the constraints to help optimize performance of FBMCs in Kenya. When the limiting factors are adequately managed, it is possible for companies to adopt and implement the practices.

2.2.3 Stakeholder Theory

It was forwarded by Freeman (1984). The theory assumes that the success of companies is based on their ability to deliver value to many of their stakeholders. This theory gives the key reasons that companies exist to attain the requirements of all stakeholders. De Gooyert et al (2016) posit that the theory helps in the management of the company's operations at a time of high complexity and environmental turbulence through effective stakeholder engagement. The emphasis is an interrelationship among the various actors involved in the company, providing alternatives in all operational tasks. The reality is that the nature of environmental uncertainty in the manufacturing sector requires firms to develop an understanding of their various stakeholders, so that they can strategically manage them and meet their requirements.

The reality is that, to develop a sustainable production system, there is need to integrate the interests of all key stakeholders, including suppliers and customers. Equally, supply chain integration leads to enhanced capacity of companies hence leading to resilience. The theory therefore facilitates comprehension of stakeholders by the management of the company, and this enables them to be effectively managed and engaged in production activities for optimum benefit (Skouloudis et al, 2015).

The argument is that, when suppliers, consumers and other stakeholders are properly integrated, companies achieve resilience and eventually realize better supply chain accomplishment. This explains the need for effective supply chain performance, which is a concern for all the relevant stakeholders of the FBMCs.

2.3 Production Implementation Practices

Production implementation practices include the activities that needs action for smooth production planning and execution in the manufacturing process. The basis is that the practices help to realize the project outcomes (Wickramasinghe, & Wickramasinghe, 2017). Some of the practices are as discussed below:

2.3.1 Capacity Planning

Capacity is the capability of a manufacturing entity including personnel, material resources, available time, processes, equipment, machinery, and technology devoted to achieving the firm's goals. It relates both the input and output analysis as far as the operational excellence is concerned. It is generally, the ability of a given system to produce output over a given period. Capacity planning involves determination of production capacity that enables an organization to meet the fluctuating demand (Irawan et al, 2020). The goal is to utilize each component optimally and to determine optimum resource utilization, hence supporting decision making and effective supply chain performance.

The significance of capacity planning is that when planning for a manufacturing system in an uncertain demand environment, companies are faced with making decisions on how to choose the optimal quantity and portfolio of product-dedicated and flexible capacities (Correia, & Melo, 2021). Flexibility of the system helps to prevent negative effects of demand unpredictability, despite the need for high investment expenses that accompanies such system. Capacity planning decisions can be either short or long term. The later considerations cover overall capacity levels including capacity size while short term considerations deal with fluctuations in capacity requirements caused by fluctuating demand patterns (Heckmann, 2016).

2.3.2 Employee Scheduling

Employee scheduling involves allocating personnel to specific shifts fit them in their areas of competences (Sifaleras, Karakalidis, & Nikolaidis, 2020). The justification is that in today's complexity in businesses, and high-level competition, organizations must make good use of the available personnel to effectively meet the different unique customer demands. Sifaleras and Petridis (2019) posit that this would help manufacturing companies to make better strategic decisions, achieve improved production and become sustainable. The reality is that people are key business operations. Manufacturing firms need a team of work-oriented personnel in areas of production and warehousing staff with back-up support from the operations management.

The implication is that employee scheduling helps to align operations of companies work- oriented personnel. Kiwanuka et al (2021) assert that there are several factors to be considered in allocating employees optimally. These factors include skills of employees and their qualifications, the product/ service mix of the company, capacity of each manufacturing stream, and the days of work. Soriano, Jalao and Martinez (2020) further assert that considering the determinant factors, employee scheduling requires the construction of task timetables for the personnel, assignment of qualified personnel to meet demand for the task, and the satisfaction of working conditions and employee preferences.

2.3.3 Enterprise Resource Planning

This is a software that include encompasses the major units or areas of an organization thus allowing enterprises to plan production and operational tasks easily

(Shen, Chen, & Wang, 2016). The system incorporates stem inform both from within and outside the organization throughout the organization, considering all the relevant departments as well as customers to ensure optimal supply chain performance. In production planning among manufacturing companies, Parhizkar and Comuzzi (2017) point out the need for a low cost, high quality, and efficient ERP systems.

Tarigan and Siagian (2019) posit that implementation of ERP system can bring a beneficial business impact directly, though a careful consideration needs to be done regarding how it can cope with the changing business environment, and the fluctuating demands of employees and customers. Manufacturing firms therefore need ERP solutions to avoid struggling with competition and therefore adopt applications that are functionally efficient, current, and integrated.

2.3.4 Inventory Control

Inventory control includes a series of tasks performed to ensure that the manufacturing process is not starved with the needed input and that customers get the expected output. The need for manufacturing firms to practice inventory control is because they rely heavily on the smooth supply chain system to ensure the smooth manufacturing processes and business processes of the firm (Mukhlis, IndraEfrialdi, & Rimawan, 2019). The implication is that inventory control determines day to day activities with a primary concern with short-term planning and recording of events. It ensures that correct level of inventory and records of their movement are maintained for sustainable supply chain performance.

There are several traditional inventory control practices that would help optimize supply chain performance of a manufacturing process (Atnafu, Balda, & Liu, 2018).

Inventory control equally improves financial performance and competitive ability of manufacturing firms since it affects capital to be utilized, production and customer care services. Generally, the inventory control ensures that there is enough quantity and quality of inventory and ensure minimization of inventory carrying costs (Barasa, & Mukanzi, 2021)

2.4 Empirical Review

The research papers considered focus on practices that affect supply chain performance. The study by Muricho and Muli (2021) looked at on what influence supply chain resilience activities had on how FBMCs in Kenya perform. The outcome established that supply chain risk management, flexibility, and supply chain collaboration affect to a significant extent the performance on FBMCs. The study represents a conceptual gap by focusing on the resilience of supply chain that would require effective production planning practices implementation. The current study would focus on effective implementation of production planning practices and supply chain performance.

Irawan et al (2020) found out in his study that aligning the plans of production plans with those of capacity needs should be to be effected so as to get a considerate production plan. Further, planning and control of production is crucial for companies, as it is key since it is key to the entire process. The study was however contextualized in Indonesia, hence the difference since the environmental uncertainty varies significantly between Kenya and Indonesia.

Ali, Van Groenendaal, and Weigand (2020) conducted on whether Pakistani manufacturing enterprises gained from ERP adoption from a financial perspective.

The study established that ERP provides manufacturing firms with financial benefits. The study was based in Pakistan. Tarigan and Siagian (2019) analyzed the relationship between ERP and its impact on operational performance. The study established that ERP improves operational process integration. The emphasis was that it advances their supply chain performance using ERP, subsequently improving their operational performance. Suresh and Sivakumar (2019) examined schedule management planning on project management effectiveness. The results of the study were not in support of the investigation.

2.5 Summary of Literature Review

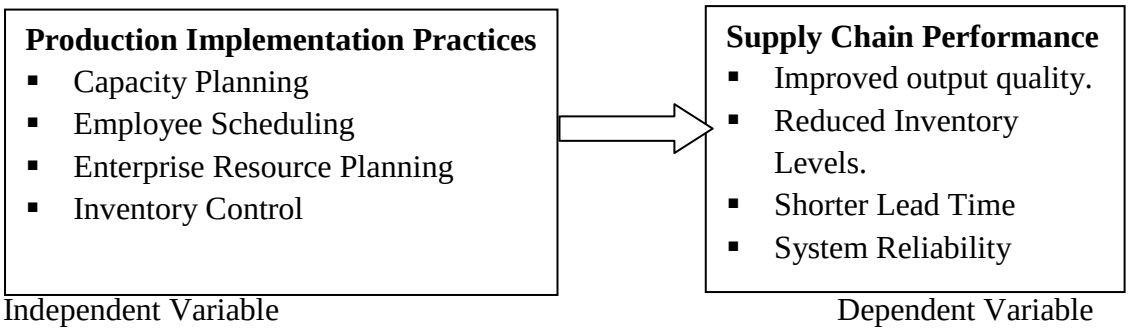
Production implementation practices have increasingly become a strategic operational management function that drives supply chain performance. This is because they help deal with the uncertainties common within the manufacturing sector. The study by Muricho and Muli (2021) found out the significance of supply chain risks, agility, and co-ordination of supply chain on how FBMCS perform in Kenya. Irawan, et al (2020) found out that there is need to align production plans and with those of capacity for purposes of achievable production plan. The study by Kifordu and Odiwo (2017) also established that capacity planning significantly affects the performance of manufacturing firms. Barasa and Mukanzi (2021) on the other hand pointed out that inventory management practices affect procurement performance. Regarding ERP, Ali, Van Groenendaal, and Weigand (2020) established that ERP provides manufacturing firms with financial benefits and operational process integration. The reviewed literature has delved much into assessing the extent to which production implementation practices are critical in how supply chains perform. The reality is that, despite the fluctuations in the manufacturing sector operations, production

implementation practices would smoothen operations, leading to improved performance of supply chains.

2.6 Conceptual Framework

The framework is a depiction of how production planning practices implementation relates to supply chain performance. Production planning practices was IV while supply chain performance was DV. This is provided in figure 2.1.

Figure 2.1: Conceptual Framework



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This part postulates a description of the research proposition utilized for the research. It describes the design and the population of focus. The section equally gave insights into how sampling was done and the sample size. Finally, it gave a description of data gathering process, the technique of data analysis that was used, including diagnostic tests, as well as constructs operationalization.

3.2 Research Design

Cross-sectional survey was applied. It quantitatively gives a description of elements of a population based on their opinions, hence the subjectivity. To succeed using this approach, the informants' answers given as per the survey questions should be in line with their thinking and actions in real sense (Avedian, 2014). A cross-sectional approach is observational research that dwells on gathering data once at a time.

This research design help in the assessment of how the sub variables are related. This would help to assess production implementation practices and how it affects supply chain performance. The design enabled analysis, interpretation, and reporting of the research findings.

3.3 Population of the Study

The informants were the operation managers of the FBMCs in Kenya that are provided by KAM (2022). There are 135 FBMCs and were included as Appendix II. The population was chosen as a focus of the study because they would possibly

employ production implementation practices, due to the nature of their activities and the collaborative activities involved.

3.4 Sample Size and Sampling Technique

The sampling frame included all firms that manufacture food and beverages in Kenya, registered with KAM as they appear in the KAM listing manual (KAM, 2022). Simple random sampling was adopted to avoid bias and to facilitate applicability of the outcome. On this basis, a list of the companies was used, thereafter, a random sample was selected using a random number. The formula below was used to generate the sample units as used by (Brown, 2007).

$$n = \frac{N}{1 + N(e)^2}$$

Where n = size of sample

N = population

e = precision level.

P= 0.05.

To attain the exact sample size, N = 135 and the computation was as follows:

$$n = \frac{135}{1 + 135(0.05)^2}$$

Therefore, the sample size was 101 enterprises.

3.4 Data Collection

Firsthand data was gathered with a questionnaire, whose suitability in generating required responses is pointed out by Aguinis, Hill & Bailey (2022). The structured questionnaire had four (4) parts. The distribution was by e-mailing together with dropping and picking them later approach. The university provided a reference letter

to be used as evidence of genuine academic exercise. This facilitated the data collection. The key informant and respondent were the operations managers, given their practical knowledge and experience on production planning practices. The implication is that data was collected from 84 correspondents, who are the operations managers of each of the companies.

3.5 Reliability and Validity Test

A reliability and validity test would therefore help to assess Whether the tool was accurate and consistent. Reliability estimates how accurate the tool is, as ascertained through Cronbach's alpha coefficient values of between 0 and 1 (Mugenda & Mugenda, 2003). Nunnally (1978) argues for values not less than 0.7 on the other hand, Sekaran (2000) is for a range of 0.5 and 0.8 in terms of appropriateness.

Validity is the capacity of the tool used to approximate the supposed measure (Cooper & Schindler, 2006). The questionnaires were formulated through review of existing relevant literature for assessment of face and content validity. This also involved discussing with the experts and the supervisor – academic expert. Kaiser Meyer-Olkin using values > 0.5 and p-values for Bartlett's Test < 0.5 as desirable was adopted as well.

3.6 Data Analysis

Analysis was done descriptively and inferentially, through SPSS, using measures of averages and dispersion, correlation, and regression analysis. The researcher in this case computed mean and standard deviation to help understand adoption of the practices under study. To ascertain how production implementation practices affect supply chain performance of FBMCs, correlation and regression analysis was

conducted. A bivariate correlational analysis was done to establish this association. The multiple linear regression used was as follows:

$$\mathbf{SCP = a + \beta_1 CP_1 + \beta_2 ES_2 + \beta_3 ERP_3 + \beta_4 IC_4 + \varepsilon}$$

Where:

SCP = Supply Chain Performance

a = Constant

β= Coefficient

CP_1= Capacity Planning

ES_2= Employee Scheduling

ERP_3 = Enterprise Resource Planning

IC_4 = Inventory Control

ε = Error term.

To facilitate the use of SPSS with respect to the model, the data collected cleansed for use. A Shapiro-wilk statistics of < 0.05 ascertained normal distribution of data.

3.7 Diagnostic Tests

Apart from the normality test, Multicollinearity was tested using VIF. The VIF less than 10 was used by Nathans, Oswald, and Nimon (2012) implying the lack of multicollinearity problem. Heteroscedasticity was then tested using the Koenker test that has acceptable values above 0.05. The testing of autocorrelation was done using Durbin-Watson statistic of around 2. Finally, the testing of linearity was done based on values > 0.05.

To test how suitable the model was, F-test and p-values was used. The determination of R^2 and β was undertaken as well. The use of Variance inflation factor (VIF) helped

to test multicollinearity. Here, a VIF lower than 10 for each variable being unacceptable.

3.9 Operationalization of the Study Variables

The constructs under research will be operationalized as per Table 2.1:

Table 2.1: Operationalization of Study Variables

Construct	Sub-Construct	Indicators	Source
Independent Variable Production Implementation Practices	Capacity Planning	▪ Collaborating with suppliers and clients. ▪ Enhanced production planning systems. ▪ Adoption of Enterprise Resource Planning system. ▪ Forecasting of Demand. ▪ Evaluation of existing capacity and facilities to identify gaps.	(Yao, Almatooq, Askin & Gruber, 2022)
	Employee Scheduling	▪ Improved Labor Forecasting. ▪ Responsive Scheduling. ▪ Disruption-proof Operations. ▪ Planning for the unexpected labor in the short-term. ▪ Implementing disruption-Proof operations with a Flexible Workforce.	Gucdemir, and Selim (2017)
	Enterprise Resource Planning	▪ Procurement practices. ▪ Risk management and compliance program. ▪ Project management. ▪ Improvement of interactions and communication with suppliers and customers. ▪ There is ease of upgrading systems.	(Al-sabri, & Raju, 2020)
	Inventory Control	▪ Economic Order Quantity. ▪ Inventory Audit. ▪ Safety Stock Ordering. ▪ Inventory reviews. ▪ Safeguarding inventory.	(Opoku, Fiati, Kaku, Ankomah, & Opoku-Agyemang, 2020).
Dependent Variable	Supply Chain Performance	▪ Quality Goods and Services. ▪ Reduced Inventory Levels. ▪ Shorter Lead Time. ▪ System Reliability. ▪ Minimization of cost	Genovese, Acquaye, Figueroa and Koh (2017)

Source: Research Data (2023)

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This part is an exhaustive exploration of how data analysis was done, the outcomes, interpretation, and what was concluded. It also involves regression interpretations about the data. The section also involved demographics and how production implementation practices have been adopted. Finally, it includes correlation and regression analysis from SPSS output.

4.2 Response Rate

The study focused on 101 respondents from the FBMCs. Feedback was received from 73 informants which represented 72%. A range of percentage ranging 30 - 40% is regarded fit in descriptive cross-sectional research (Saunders, Lewis and Thornhill, 2017). This response rate was therefore considered sufficient.

4.3 Demographics of the Companies and Respondents

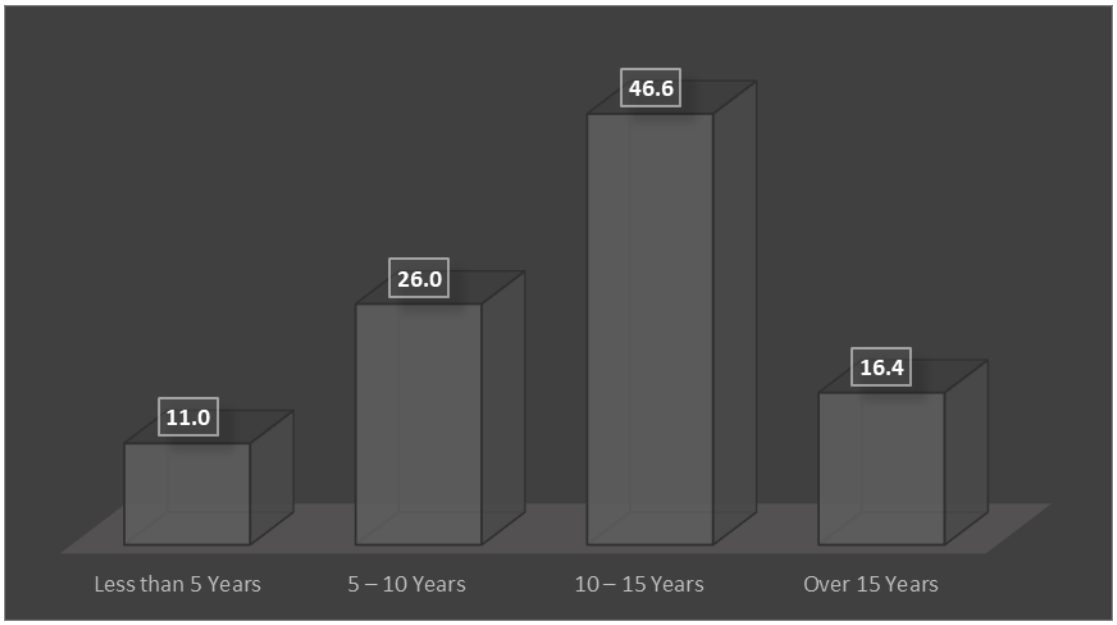
Demographic data is used to help understand the characteristics of the firms under study, as well as the targeted respondents. The information is commonly used as the control variables. In this study, the demographics included length of continued service, the current position of the respondents, firm size, education level and length of firm operation. They were analyzed as follows:

4.3.1 Length of Continuous Service with the Firm

Based on Figure 4.1, 11% of the participants had 5-year service length, 10-15 years had 46.6% indicated 10-15 years, 26% had 5-10 years and 16.4% had 15 years. This was a

sign of credibility and suitability of the data. This is because over 90% of informants had more than 5 years' service length.

Figure 4.1: Length of Continuous Service with the Firm



Source: Research Data (2023)

4.3.2 Current Position in the Firm

Table 4.1 indicate that many participants, making 41.1% were middle level managers, while 38.4% were supervisors and only 20.5% were at the senior level management. The indication is that all the management levels implying that the collected data was reliable enough for generalization. This was good for reliability purposes manager being the targeted party.

Table 4.1: Current Position in the Firm

Category	Frequency	Percent
Senior Management.	15	20.5
Middle Management.	30	41.1
Supervisory Management.	28	38.4
Total	73	100.0

Source: Research Data (2023)

4.3.3 Size of the Firm

Table 4.2 shows that 13.7% of the firms had less than 100 staff. The majority of 34.2% had between 501 and 1000 employees and 27.4% had more than 1,000 employees. Further, 24.7% of the firms had between 101 - 500 employees. This outcome concurs with those of Kidombo (2007). The argument is that large firms are better placed in implementing production implementation practices, due to economies of scale.

Table 4.2: Size of the Firm

Category	Frequency	Percent
Less than 100 personnel	10	13.7
101 – 500 personnel	18	24.7
501 – 1000 personnel	25	34.2
More than 1000 personnel	20	27.4
Total	**73**	**100.0**

Source: Research Data (2023)

4.3.4 Education Level of Respondents

Table 4.3 indicate that many participants, making up 32.9% had post-graduate degrees. 30.1% had degrees while 17.8% were holders of Diploma. A smaller percentage of 9.6% had either secondary education or other qualifications. The findings reflect a more reliable data, since many had a relevant education required to help understand the production implementation practices used by the firms under study.

Table 4.3: Education Level of Respondents

Category	Frequency	Percent
Secondary	7	9.6
Diploma	13	17.8
Degree	22	30.1
Postgraduate	24	32.9
Other Qualification	7	9.6
Total	**73**	**100.0**

Source: Research Data (2023)

4.3.5 Length of Firm Operation

Table 4.4 show that majority of the firms, forming 30.1% had 16-20 years' existence, followed by 27.4% between 11-15 years, 15.1% less than 5 years and between 5-10 whereas 12.3% had more than 20-year period. Effective adoption of production implementation practices requires a significant firm operation period which was achieved in the study. The implication is that the data would be reliable for making inferences and recommendations, especially when dealing with challenges.

Table 4.4: Length of Firm Operation

Category	Frequency	Percent
>5 Yrs	11	15.1
5 – 10 Yrs	11	15.1
11 – 15 Yrs	20	27.4
16 – 20 Yrs	22	30.1
< 20 Yrs	9	12.3
Total	**73**	**100.0**

Source: Research Data (2023)

4.4 Extent of Adoption of Production Implementation Practices

The participants were required to show the degree to which they agree on adoption of production implementation practices in their companies, using the scale:

5 = To a very large extent; 4 = Large extent; 3 = Moderate extent; 2 = Small extent and 1 = Very small extent.

4.4.1 Capacity Planning

Table 4.5 indicates capacity planning practices were adopted to a moderately on average (M=3.6466; SD = 1.1546). The mostly practiced activity was the evaluation of existing capacity and facilities to identify gaps (M=3.8219; SD = 1.20580). The organization has also put in place mechanisms for effective collaboration with suppliers and customers (M=3.7945; SD=1.20138). The firms have also adopted enterprise resource planning system (M=M=3.7671; SD=1.11206). also noted were the firms have implemented demand forecasting techniques (M=3.6027; SD=1.08959).

Finally, the firms have put in place advanced production planning systems (M=3.2466; SD=1.16405). The interpretation is that a higher mean indicates that the practices were adopted to a larger extent comparatively, while the larger the SD, the wider the variations in answers by the informants. The average skewness statistics of -.6698 is less than +1 meaning that the data was skewed to the left. The data had a negative kurtosis of -.1934 indicating a flatter curved data as in Table 4.5:

Table 4.5: Capacity Planning

Practices	N	Mean	Std Deviation	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
The organization has put in place mechanisms for effective collaboration with suppliers and customers.	73	3.7945	1.20138	-.876	.281	-.048	.555
The company has put in place advanced production planning systems.	73	3.2466	1.16405	-.120	.281	-.801	.555
The company has adopted enterprise resource planning system.	73	3.7671	1.11206	-.767	.281	-.099	.555
The company has implemented demand forecasting techniques.	73	3.6027	1.08959	-.668	.281	-.023	.555
The company practices the evaluation of existing capacity and facilities to identify gaps.	73	3.8219	1.20580	-.918	.281	.004	.555
Average		**3.6466**	**1.1546**	**-.6698**	**.281**	**-.1934**	**.555**

Source: Research Data (2023)

4.4.2 Employee Scheduling

Table 4.6 displays how employee scheduling was adopted by the firms. The outcome is that firms adopted employee scheduling practices to a moderately, having a M=3.4192; SD=1.1365. Specifically, the firms adopted the practice of implementing systems to improve labour forecasting with M=3.9041; SD=1.06932. The firms also implemented a flexible workforce program moderately, with M=3.6164; SD=1.10089, while the companies also practiced responsive scheduling moderately with a M=3.2788; SD=1.16045 as well as putting in place plans for the unexpected labour in the short-term moderately (M=3.2055; SD=1.12988). The least practice was the

moderate implementation of disruption-proof operations to a moderately with M=3.0822; SD=1.22195. The interpretation is that a higher mean indicates that the practices were adopted to a larger extent comparatively, while the larger the standard deviation, the wider the variations in answers by the informants. The average skewness statistics of -.3438 is less than 1 meaning that the data was skewed leftwards. The data equally had a negative kurtosis of -.5734 explaining a flatter curved data. The is illustrated in Table 4.6

Table 4.6: Employee Scheduling

				Skewness		Kurtosis	
Practices	**N**	**Mean**	**Std Deviation**	**Statistic**	**Std. Error**	**Statistic**	**Std. Error**
The organization has implemented systems to improve labour forecasting.	73	3.9041	1.06932	-.856	.281	.085	.555
The company practices responsive scheduling.	73	3.2877	1.16045	-.205	.281	-.764	.555
The organization has implemented disruption-proof operations.	73	3.0822	1.22195	-.067	.281	-.946	.555
The organization has put in place plans for the unexpected labour in the short-term.	73	3.2055	1.12988	-.062	.281	-.862	.555
The company has implemented a flexible workforce program.	73	3.6164	1.10089	-.529	.281	-.380	.555
Total Average		**3.4192**	**1.1365**	**-.3438**	**.281**	**-.5734**	**.555**

Source: Research Data (2023)

4.4.3 Enterprise Resource Planning

Table 4.7 show the degree of usage of enterprise resource planning. The outcomes show that this was done moderately (M=3.5753; SD=1.1221). The mostly adopted practice was the putting in place of a risk management and compliance program (M=3.9041; SD=1.01604). Followed by Putting in place adequate procurement practices and then the improvement of interactions and communication with suppliers and customers with M=3.8904; SD=1.07447 and M=3.8356; SD=1.17867 respectively. The firms also have ease of upgrading systems and have put in place risk management and compliance program, with M= 3.1781; SD=1.17074 and M= 3.0685; SD=1.17057.

Table 4.7: Enterprise Resource Planning

	N	Mean	Std Deviation	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
The organizational have put in place adequate procurement practices.	73	3.8904	1.07447	-.951	.281	.470	.555
The organization has put in place risk management and compliance program.	73	3.9041	1.01604	-.947	.281	.557	.555
There are project management practices implemented by the organization.	73	3.0685	1.17057	-.083	.281	-.695	.555
The organization has improved interactions and communication with suppliers and customers.	73	3.8356	1.17867	-.875	.281	-.065	.555
The organizational has ease of upgrading systems.	73	3.1781	1.17074	-.037	.281	-.903	.555
Total Average		**3.5753**	**1.1221**	**-.5786**	**.281**	**-.1272**	**.555**

Source: Research Data (2023)

Further, the interpretation is that a higher mean indicates that the practices were adopted to a larger extent comparatively, while larger the SD, the wider the variations in answers by the informants. The average skewness statistics of -.5786 is less than 1 meaning that the data was skewed leftwards. The data equally had a negative kurtosis of -.1272 indicating a flatter curved data. The results were as given in Table 4.7.

4.4.4 Inventory Control

Table 4.8 shows the level of implementation of inventory control practices. The finding is that the firms moderately adopted these practices given by an average M= 3.6767; SD=1.1366. The highest practiced activity was the formulation of policies regarding inventory reviews, M= 3.8082; SD=1.10123, followed by putting mechanisms in place to ensure safety of inventory and then the undertaking of inventory audit on a regular basis, M= 3.7808; SD=1.13341 and 3.6849; SD=1.09134 in that order. The firms have also implemented economic order quantity system and ensures that there is safety stock ordering, each M=3.5616; SD=1.16650 and M=3.5479; SD=1.19072 in that order. Further, the interpretation is that a higher mean indicates that the practices were adopted to a larger extent comparatively, while the larger SD, the wider the variations in responses by the informants. The average skewness of -.6848 is less than 1 indicating a leftward skewness. The data equally had a negative kurtosis of -.2534 which indicates a flatter-curved data. This is illustrated in Table 4.8:

Table 4.8: Inventory Control

Practices	N	Mean	Std. Deviation	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
The organization has implemented economic order quantity system.	73	3.5616	1.16650	-.531	.281	-.578	.555
The organization undertakes inventory audit on a regular basis.	73	3.6849	1.09134	-.721	.281	-.123	.555
The organization ensures that there is safety stock ordering.	73	3.5479	1.19072	-.675	.281	-.332	.555
The company has policies regarding inventory reviews.	73	3.8082	1.10123	-.826	.281	.067	.555
The organization has put mechanisms in place to ensure safety of inventory.	73	3.7808	1.13341	-.671	.281	-.301	.555
Total Average		**3.6767**	**1.1366**	**-.6848**	**.281**	**-.2534**	**.555**

Source: Research Data (2023)

4.5 Supply Chain Performance

The informants provided answers as in Table 4.9. There was notably, averagely to a moderate extent improvement in supply chain performance, M=3.9123; SD=1.07395. Specifically, better capacity planning was realized greatly by M=4.0274; SD=1.04047, followed by a moderate achievement of low levels of inventory as given by M= 3.9178; SD=1.06397 and then improved reliability of systems indicated by M=3.8904; SD=1.10002. The firms also realized shorter timeline and minimization of cost moderately as given by M=3.8767; SD=1.02666 and M=3.8493; SD=1.13861. The higher means further indicates that the effect of production implementation practices on supply chain performance were to a greater extent comparatively, while the larger the SD, the wider the variations in responses by the informants. The average

skewness of -.8926 indicates that the data was skewed leftwards, while the negative kurtosis of -.2312 shows a flatter curved data.

Table 4.9: Supply Chain Performance

				Skewness		Kurtosis	
	N	Mean	Std. Deviation	Statistic	Std. Error	Statistic	Std. Error
Better Capacity Planning.	73	4.0274	1.04047	-1.045	.281	.615	.555
Low levels of Inventory.	73	3.9178	1.06397	-.828	.281	.072	.555
Shorter Lead Time	73	3.8767	1.02666	-.855	.281	.324	.555
Reliable systems	73	3.8904	1.10002	-.936	.281	.288	.555
Minimization of Cost	73	3.8493	1.13861	-.799	.281	-.143	.555
Average	**73**	**3.9123**	**1.07395**	**-.8926**	**.281**	**-.2312**	**.555**

Source: Research Data (2023)

4.6 Challenges of Production Implementation Practices

The informants rated the statement that describes challenges on production implementation practices in their firm as shown in Table 4.10. On average, the informants agreed that the challenges enlisted affected implementation of production practices, given mean is 2.5951; SD=1.07049. The greatest challenge was strongly agreed to be high cost of implementation, followed by inadequacy of technology M=1.7808; SD=.74994 and 1.9726; SD=.81603 in that order. They also agreed that complexity of operations, ineffective organization structure and poor communication during implementation are challenges faced, each with M=2.4521; SD=1.13089, 2.6575; SD=1.14527 and 2.7534; SD=1.03790 respectively. They also agreed that high competition among firms, ambiguity of the customers' needs and inadequate Government policies challenges production implementation practices, each having a mean of 2.8219 SD=1.09725, 2.8219; SD=1.13459 and 2.9589; SD=1.20691 respectively.

Finally, the informants moderately agreed that they faced the challenge of inadequate expertise, with M=3.1370; SD=1.31566. The data was averagely positively skewed, while kurtosis was averagely negative indicating a flatter curved data. It can also be noted that higher mean values meant disagreement while lower mean values meant agreement among the informants. Higher values of SD on the other hand indicate that the informants had diverse views on the questions answered. This is in Table 4.10:

Table 4.10: Challenges of Production Implementation Practices

				Skewness		Kurtosis	
	N	M	SD	Statistic	Std. Error	Statistic	Std. Error
High cost of implementation	73	1.7808	.74994	.792	.281	.530	.555
High competition among firms	73	2.8219	1.09725	.105	.281	-.553	.555
Inadequacy of technology	73	1.9726	.81603	.524	.281	-.202	.555
Inadequate Government policies	73	2.9589	1.20691	.129	.281	-.920	.555
Poor communication during implementation	73	2.7534	1.03790	.210	.281	-.349	.555
Challenge of inadequate expertise	73	3.1370	1.31566	.004	.281	-1.176	.555
Ineffective organization structure	73	2.6575	1.14527	.313	.281	-.631	.555
Ambiguity of the customers' needs	73	2.8219	1.13459	.185	.281	-.662	.555
Complexity of operations	73	2.4521	1.13089	.389	.281	-.657	.555
Total Average		**2.5951**	**1.07049**	**.295**	**.281**	**-.5133**	**.555**

Source: Research Data (2023)

4.7 Regression Diagnostics

To help in assessment of the type of the data and its fitness for regression analysis, the data was tested to check whether it is reliable, valid, normal, multicollinear, heteroskedastic, and linear. The tests were done as follows:

4.7.1 Reliability Test

Reliability is an estimation of how accurate the tool is. The ascertainment was through Cronbach's alpha coefficient (Mugenda & Mugenda, 2012). Values of >0.5 were considered as adopted by Sekaran (2000) on the assertion that values ranging between 0.5 and 0.8 is adequate. The outcome as given in Table 4.11 shows that the data were reliable because the alpha coefficient of all the antecedents were higher than 0.5, being the threshold as in Table 4.11:

Table 4.11: Reliability Test

Variables	Cronbach's Alpha
Capacity Planning	.691
Employee Scheduling	.676
Enterprise Resource Planning	.579
Inventory control	.626
Supply Chain Performance	.593

Source: Research Data (2023)

4.7.2 Validity Test

This is the capacity of the tool adopted to approximate the expected measure (Cooper & Schindler, 2006). The questionnaires were formulated through assessment of available literature for face and content validity. There was equally a discourse with the experts and the supervisor – academic expert. Evaluation of Kaiser Meyer-Olkin and p-values for Bartlett's Test were also done. The findings in Table 4.12 indicate that the parameters in the questionnaire had KMO values > 0.5, with all their chi-square in Bartlett's Sphericity values < 0.05.

Table 4.12: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.693
Bartlett's Test of Sphericity	Approx. Chi-Square	62.288
	Df	10
	Sig.	.000

Source: Research Data (2023)

4.7.3 Normality Test

Data must be normally distributed for the purpose of regression analysis (Kwak, & Park, 2019). To ascertain these Shapiro-Wilk values Test > 0.05, attest to a normal data, whereas < 0.05, is a deviation from the same. Table 4.12 indicate that data on capacity planning and employee scheduling have significant value of the Shapiro-Wilk < 0.05 while data on ERP, inventory control and supply chain performance were normally distributed with the significance values being more than 0.05. On average, the significance value is 0.109, which indicate normally distributed data.

Table 4.13: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Variables	**Statistic**	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Capacity Planning	.149	73	.000	.961	73	.024
Employee Scheduling	.122	73	.009	.961	73	.023
Enterprise Resource Planning	.108	73	.033	.975	73	.152
Inventory Control	.103	73	.051	.979	73	.252
Supply Chain Performance	.099	73	.074	.971	73	.095

a. Lilliefors Significance Correction

Source: Research Data (2023)

4.7.4 Multicollinearity Test

This is a case of high association among the parameters studied. Shrestha (2020) posits that association among parameters ensure possible statistical insignificance of some parameters. In this research, the evaluation of multicollinearity used VIF and tolerance values, where the VIF values should be between 1 and 10. A tolerance value

of less than 0.20 shows an issue with collinearity. Table 4.14 indicates that VIF values fall between 1 and 10 with tolerance values above 0.20. This is a sign of no high association between the variables.

Table 4.14: Multicollinearity Test

	Collinearity Statistics	
Variables	**Tolerance**	**VIF**
Capacity Planning	.921	1.086
Employee Scheduling	.879	1.138
Enterprise Resource Planning	.774	1.292
Inventory Control	.767	1.303

a. Dependent Variable: Supply Chain Performance

Source: Research Data (2023)

4.7.5 Heteroscedasticity Test

It refers to a phenomenon where the data violates statistical assumption of homoscedasticity (Rosopa, Schaffer, & Schroeder, 2013). Heteroscedasticity can arise if the data is not well transformed and is incorrectly functional form. In this research, Breusch-Pagan and Koenker test was employed to ascertain this. Table 4.15 depicts that the data was homoscedastic since the p-Value > 0.05.

Table 4.15: Breusch-Pagan and Koenker Test

	LM	**Sig.**
Breusch-Pagan	5.220	.265
Koenker	3.325	.505

Source: Research Data (2023)

4.7.6 Linearity Test

Linearity implies a straight-line association between IV and DV. Linearity means deviation from linearity is more than 0.05. Table 4.16 indicates that linkage between the parameters were linear, since the values were>0.05.

Table 4.16: Linearity Test

Variables	Deviation from Linearity	Significance Level
Supply chain performance and capacity planning	.424	0.020
Supply chain performance and employee scheduling	.382	0.027
Supply chain performance and ERP	.742	0.008
Supply chain performance and inventory control	.967	0.002

Source: Research Data (2023)

4.7.7 Autocorrelation Test

Autocorrelation estimates association between present value of a construct and its previous one (Cui, Li, Li, Liu, Huang, & Chen, 2019). The rationale of the test ensues from if the model errors do not depend on each other. Durbin Watson was employed to test for serial correlation between the parameters. Table 4.17 indicated a value of 1.645, falling within desirable figures of $1.5 < d < 2.5$. Considering that outcome there was non-existence of autocorrelation.

Table 4.17: Autocorrelation Test

Model	Durbin Watson Test
Capacity planning, Employee scheduling, Enterprise resource planning, Inventory control and Supply chain performance	1.645

Source: Research Data (2023)

4.8 Production Implementation Practices and Supply Chain Performance

The IV included capacity planning, employee scheduling, enterprise resource planning and inventory control while the DV was SCP. The examination relied on raw data as shown in Appendix III.

4.8.1 Correlational Analysis

Table 4.18 indicate that capacity planning and employee scheduling is significantly weakly correlated with supply chains perform, r= .273, p<0.05 and r= .257, p<0.05 in that order. Enterprise resource planning and inventory control have a significant moderate correlation with supply chain performance, r= .594, p<0.05 and r= .323, p<0.05. These suggest that when capacity planning, employee scheduling, enterprise resource planning and inventory control improves supply chain performance improves as well.

Table 4.18: Correlation Matrix

		Capacity Planning	Employee Scheduling	Enterprise Resource Planning	Inventory Control	Supply Chain Performance
Capacity Planning	Pearson Correlation	1	.158	.171	.261*	.273*
	Sig. (2-tailed)		.181	.147	.026	.020
	N		73	73	73	73
Employee Scheduling	Pearson Correlation		1	.307**	.261*	.257*
	Sig. (2-tailed)			.008	.026	.028
	N			73	73	73
Enterprise Resource Planning	Pearson Correlation			1	.428**	.594**
	Sig. (2-tailed)				.000	.000
	N				73	73
Inventory Control	Pearson Correlation				1	.323**
	Sig. (2-tailed)					.005
	N					73
Supply Chain Performance	Pearson Correlation					1
	Sig. (2-tailed)					
	N					

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research Data (2023)

4.8.2 Overall Model Summary

Table 4.19 show that R = 0.622 implying that production implementation activities and supply chain performance are positively associated among food and beverage manufacturing firms. The adjusted R^2 of 0.351 means that only 35.1% of changes in SCP were due to synergy of the practices. This meant that 64.9% of changes in supply chain performance was due to other practices, not focused on.

Table 4.19: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.622[a]	.387	.351	.43791

a. Predictors: (Constant), IC, CP, ES, ERP

b. Dependent Variable: SCP

Source: Research Data (2023)

4.8.3 Analysis of Variance

Table 4.20 shows that production implementation activities significantly affect supply chains perform, given $p<0.05$. This implies that when the practices are effectively implemented, SCP of the FBMCs in Kenya would improve. The F statistic of 10.741 significantly exist at $p=0.000$. This suggests that production implementation practices reliably and significantly predict supply chain performance.

Table 4.20: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.239	4	2.060	10.741	.000[b]
	Residual	13.040	68	.192		
	Total	21.279	72			

a. Dependent Variable: SCP

b. Predictors: (Constant), IC, CP, ES, ERP

Source: Research Data (2023)

4.8.4 Regression Coefficient

The non-standardized coefficient of the constant of the model show that 95.1% variation in supply chain performance was related with a unit variation in production implementation activities. The implication is that for every 1-unit improvement in production implementation activities, supply chain performance was enhanced by 95.1%. The outcome reveals that 1-unit increase in capacity planning 17.2% increase in SCP. Further, a 1-unit increase in employee scheduling led to 5.7% increase in

SCP. It was also ascertained that 1-unit increase in enterprise resource planning led to 54.3% improvement in how supply chain performs. Finally, 1-unit improvement in inventory control led to a 3.5% enhancement in SCP. The general implication was that improved production implementation practices would be suitable in enabling improved supply chain performance.

The findings further indicate that capacity planning, employee scheduling and inventory control do not significantly affect SCP because the p> 0.05. Equally, enterprise resource planning significantly affects SCP at p=0.000. This implies that enterprise resource planning significantly contributes to changes in SCP, comparatively. The model can therefore be substituted as follows:

$$\mathbf{Y_1 = .951 + .162X_1 + .058X_2 + .532X_3 + .038X_4 + \varepsilon}$$

Table 4.21: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.951	.526		1.809	.075
	Capacity Planning	.172	.105	.162	1.641	.105
	Employee Scheduling	.057	.100	.058	.575	.567
	Enterprise Resource Planning	.543	.110	.532	4.928	.000
	Inventory Control	.035	.100	.038	.351	.727

a. Dependent Variable: Supply Chain Performance

Source: Research Data (2023)

4.9 Discussion of Findings

The key objective was to determine how production implementation practices affect supply chain performance of FBMCs in Kenya. Specifically, the research focused on investigating the degree of utilization of production implementation practices by the FBMCs in Kenya and to ascertain the constraints of implementing production practices by FBMCs in Kenya.

Regarding the extent of adoption of production implementation practices, capacity planning practices were adopted moderately on average, M= 3.6466; SD = 1.1546. The mostly practiced activity was the evaluation of existing capacity and facilities to identify gaps, M=3.8219; SD = 1.20580. The organization had also put in place mechanisms for effective collaboration with suppliers and customers M=3.7945; SD=1.20138. The firms have also adopted enterprise resource planning system, M=3.7671; SD=1.11206. It was also ascertained that the firms have implemented demand forecasting techniques, M= 3.6027; SD=1.08959. Finally, the firms have put in place advanced production planning systems, M= 3.2466; SD=1.16405. This implied that the firms initiate capacity planning practices to ensure improved supply chain performance.

The firms also adopted employee scheduling practices moderately, M=3.4192; SD=1.1365. Specifically, the firms adopted the practice of implementing systems to improve labour forecasting with M= 3.9041; SD=1.06932. The firms also implemented a flexible workforce program moderately M= 3.6164; SD=1.10089, while the companies also practiced responsive scheduling moderately with M= 3.2788; SD=1.16045 as well as putting in place plans for the unexpected labour in the short-term moderately with M= 3.2055; SD=1.12988. The least practice was the moderate implementation of disruption-proof operations to a moderate extent, M=3.0822; SD=1.22195.

The study also established that the firms adopted enterprise resource planning moderately M=3.5753; SD=1.1221. The mostly adopted practice was the putting in place of a risk management and compliance program, with M=3.9041; SD=1.01604. This was followed by putting in place adequate procurement practices and then the

improvement of interactions and communication with suppliers and customers, with an average of 3.8904; SD=1.07447 and 3.8356; SD=1.17867 in that order. The firms also have ease of upgrading systems and have put in place risk management and compliance program, each with M= 3.1781; SD=1.17074 and M=3.0685; SD=1.17057.

Finally, it was established that the firms moderately adopted inventory control practices given by an average M= 3.6767; SD=1.1366. The highest practiced activity was the formulation of policies regarding inventory reviews, M= 3.8082; SD=1.10123, followed by putting mechanisms in place to ensure safety of inventory and then the undertaking of inventory audit on a regular basis, each with M= 3.7808; SD=1.13341 and M=3.6849; SD=1.09134 respectively. The firms have also implemented an economic order quantity system and ensures that there is safety stock ordering, each with M= 3.5616; SD=1.16650 and M=3.5479; SD=1.19072 in that order.

The findings were also based on the challenges of production implementation practices. On average, the informants agreed that the challenges enlisted affected implementation of production implementation practices, given M=2.5951; SD=1.07049. The greatest challenge was strongly agreed to be high cost of implementation, followed by inadequacy of technology with M= 1.7808; SD=.74994 and M=1.9726; SD=.81603 in that order. They also agreed that complexity of operations, ineffective organization structure and poor communication during implementation are challenges faced, each with M= 2.4521; SD=1.13089, 2.6575; SD=1.14527 and M=2.7534; SD=1.03790 in that order. They also agreed that high competition among firms, ambiguity of the customers' needs and inadequate

Government policies challenges production implementation practices, each with M=2.8219 SD=1.09725, M=2.8219; SD=1.13459 and M=2.9589; SD=1.20691 respectively. Finally, the informants moderately agreed that they faced the challenge of inadequate expertise, with M= 3.1370; SD=1.31566.

The study outcomes equally focused on the correlation analysis between the study variables. It was found out that capacity planning and employee scheduling weakly and significantly correlate with supply chain perform, given r= .273, $p<0.05$ and r= .257, $p<0.05$ respectively. Enterprise resource planning and inventory control have a significant moderate correlation with supply chain performance given r= .594, $p<0.05$ and r= .323, $p<0.05$ in that order. This implied that when capacity planning, employee scheduling, enterprise resource planning and inventory control improves SCP improves as well.

To establish how production implementation practices affect how supply chain perform, regression analysis was done. The study found out that R = 0.622 which means that, production implementation activities and supply chain performance were positively associated among food and beverage manufacturing firms. The adjusted R^2 of 0.351 mean that only 35.1% of variations in SCP was because of synergy of the practices under study. This meant that there are other variables that cause 64.9% changes in supply chain performance that did not make up part of the research. Additionally, it was established that production implementation practices and supply chain performance are related in a significant way by $p<0.05$. The meaning is that enhanced adoption of the activities has a reliable prediction on SCP of FBMCs in Kenya. The F statistic of 10.741 that is key at p = 0.000. The meaning is that production implementation practices certainly predict SCP and have a key effect.

Regarding regression factors, the non-standardized factor of the constant of the model explains that 95.1% variation in supply chain performance was related with a unit variation in production implementation activities. The meaning is that for each 1-unit enhancement in production implementation activities, supply chain performance increased by 95.1%. The outcome also reveals that 1-unit increase in capacity planning 17.2% increase in SCP. Further, the 1-unit increase in employee scheduling led to a 5.7% increase in supply chain performance. It was also established that a 1 unit increase in enterprise resource planning led to 54.3% improvement in supply chain performance. Finally, a 1-unit increase in inventory control led to a 3.5% improvement in SCP. The general implication was that improved production implementation practices would be suitable in enabling improved supply chain performance. The findings further indicated the importance of the parameters. This indicates that capacity planning, employee scheduling and inventory control do not have significant effect on SCP given P> 0.05. Enterprise resource planning, however, significantly affected SCP at p=0.000. This implies that enterprise resource planning had a key contribution in the construct in SCP, in comparison to the other constructs.

The findings were consistent with the study by Irawan, Nasiatin, Adha, Julyanto, Rani and Dimas (2020) who established that aligning production plans with those of capacity needs should be effected to get a considerate production plan. Further, they concluded that planning and control of production is crucial for companies, as it is key to the entire process. These outcomes concur with those of Ali, Van Groenendaal, and Weigand (2020) who established that ERP provides manufacturing firms with financial benefits. Further, Tarigan and Siagian (2019) established that ERP improves operational process integration, and subsequently SCP.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section is a synopsis of what was established, conclusions and the suggestions. It also involved an analysis of the challenges faced during the research.

5.2 Summary of Findings

It was realized that there was a moderate adoption of the production implementation practices. Capacity planning practices were adopted moderately on average, M=3.6466; SD = 1.1546. The adopted capacity planning practices included evaluation of existing capacity and facilities to identify gaps, putting in place mechanisms for effective collaboration with suppliers and customers, adoption of enterprise resource planning system, implementation of demand forecasting techniques and putting in place advanced production planning systems. Employee scheduling was also adopted moderately at M= 3.4192; SD=1.1365. This included supply implementation of systems to improve labour forecasting, putting in place a flexible workforce program, the use of responsive scheduling, putting in place plans for the unexpected labour in the short-term and implementation of disruption-proof operations.

The firms also implemented enterprise resource planning to a moderately at M=3.5753; SD=1.1221. The practices include putting in place of a risk management and compliance program, putting in place adequate procurement practices, improvement of interactions and communication with suppliers and customers, and ensuring an ease of upgrading systems, as well as putting in place risk management and compliance program. Finally, the firms moderately adopted inventory control practices, having an average mean of 3.6767; SD=1.1366. This included the

formulation of policies regarding inventory reviews, putting mechanisms in place to ensure safety of inventory, undertaking of inventory audit on a regular basis, implementation of economic order quantity system and ensuring that there is safety stock ordering.

The outcome also showed that production implementation practices and SCP are positively correlated given by R = 0.622. The implication was that improved production implementation practices lead to improved SCP. The adjusted R^2 of 0.351 also implies that only 35.1% of variations in how supply chain performs due to the combined effects of the activities. This means that there are other issues leading to 64.9% changes in how supply chain performs, that were not in the study. Further, production implementation practices and supply chain performance were found to be significant in relation given $p<0.05$. The implication that if the implementation process is enhanced, SCP of FBMCs in Kenya would be improved as well. The F statistic of 10.741 significantly at $p = 0.000$, imply that production implementation practices reliably predicted SCP and they are significantly related.

Regarding regression coefficients, the study found out that capacity planning, employee scheduling and inventory control do not significantly affect supply chain performance since the p-value is greater than 0.05. Enterprise resource planning however significantly affect SCP at $p=0.000$. This implies that enterprise resource planning significantly contributes to variations in how supply chain performs. The findings on constraints facing production execution practices established that the greatest challenge was strongly agreed to be high cost of implementation, followed by inadequacy of technology. It was also established that complexity of operations, ineffective organization structure and poor communication during implementation

were challenges faced. It was also found out that high competition among firms, ambiguity of the customers' needs and inadequate Government policies challenges production implementation practices. Finally, the informants moderately agreed that they faced the challenge of inadequate expertise.

5.3 Conclusions of the Study

The study concluded that production implementation practices improved SCP among FBMCs in Kenya. In this study, the practices included capacity planning, employee scheduling, enterprise resource planning and inventory control. This implies that when the firms want to improve supply chain performance, improved investment in these practices would be justified. The conclusion is consistent with that of Muricho and Muli (2021) who concluded that production implementation practices ensure supply chain resilience, and hence improved performance. In addition, the firms adopted production implementation practices of capacity planning, employee scheduling, enterprise resource planning and inventory control moderately.

Finally, the study concluded that the enlisted challenges to production implementation practices were realized by FBMCs. The most realized challenges included high cost of implementation and inadequate technology. It was also concluded that complexity of operations, ineffective organization structure and poor communication were also of great challenge. Further, high competition among firms, ambiguity of the customers' needs and inadequate Government policies challenges production implementation practices. Finally, inadequate expertise was also concluded to of great challenge in implementing the practices.

5.4 Recommendations of the Study

In light of the conclusion, the study advances an argument that the management of FBMCs should strengthen production implementation practices especially enterprise resource planning that was found to significantly affect supply chain performance. Further, those who run these organizations ought to find out the other practices that would cause variations in SCP apart from those dealt with here. This is because 64.9% of variations in SCP was caused by elements not considered here.

The managers should also put plans in place to deal with the constraints identified. The challenges included high cost of implementation, inadequate technology, complexity of operations, ineffective organization structure, poor communication, high competition among firms, ambiguity of the customers' needs, inadequate Government policies and inadequate expertise. The management should therefore establish mechanisms of cost management and acquisition of appropriate technology to improve production implementation.

5.5 Limitations of the Study

A few challenges can be pointed out. The FBMCs were geographically dispersed and the timing for collecting data was not adequate. The researcher therefore had to use several research assistants in collecting the data within the limited period. Further, the researcher issued some questionnaires and after filling them, scanning was done and then sent at the conveniently. Another challenge was that some informants were fearing the provision of answers to key questions, as they touched on key activities. This was resolved through self-introduction by a letter from the institution to inform about the data and research work as used for academic purposes.

5.6 Suggestions for Further Study

The investigation makes it possible to conduct future research. Since this study only focused on only FBMCs in Kenya, future academicians can research the other manufacturing sub-sectors, based on the classification by Kenya Association of Manufacturers. New studies would also consider how production implementation practices were affected by the Covid-19 pandemics, especially about supply chain dynamics.

Finally, there is a need to use longitudinal research design in future to assess the link between production implementation activities and supply chain performance over a period of five years. Besides, the practices must be implemented in the organizations and be used over a period of time for the benefit to be realized.

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APPENDICES

APPENDIX I: STRUCTURED QUESTIONNAIRE

Dear Sir/ Madam,

Kindly aid in this project by giving details on the sections provided. This is meant for completion of this course only and high level of confidentiality is will be regarded.

SECTION A: BIO DATA

Instruction: tick in the spaces provided.

1. Name of the Company		
Variable	**Responding Group**	
2. Length of Continuous Service with the Firm	Less than 5 Yrs	
	5 – 10 Yrs	
	10 – 15 Yrs	
	Over 15 Yrs	
3. Your current position	Senior Management.	
	Middle Management.	
	Supervisory Management.	
4. Size of the firm	Less than 100 personnel	
	101 – 500 personnel	
	501 – 1000 personnel	
	More than 1000 personnel	
5. Education level	Secondary	
	Diploma	
	Degree	
	Post Graduate	
	Other Qualification	
6. Length of firm operation.	Less than 5 yrs	
	From 5 – 10 yrs	
	From 11 – 15 yrs	
	From 16 – 20 yrs	
	More than 20 Yrs	

SECTION B: PRODUCTION IMPLEMENTATION PRACTICES

Please tick as per your opinion where:

5 = To a very large extent; 4 = Large extent; 3 = Moderate extent; 2 = Small extent and 1 = Very small extent.

	Statement	**1**	**2**	**3**	**4**	**5**
	Capacity Planning					
A	The organization has put in place mechanisms for effective collaboration with suppliers and customers.					
B	The company has put in place advanced production planning systems.					
C	The company has adopted enterprise resource planning system.					
D	The company has implemented demand forecasting techniques.					
E	The company practices the evaluation of existing capacity and facilities to identify gaps.					
	Employee Scheduling	**1**	**2**	**3**	**4**	**5**
A	The organization has implemented systems to improve labour forecasting.					
B	The company practices responsive scheduling.					
C	The organization has implemented disruption-proof operations.					
D	The organization has put in place plans for the unexpected labour in the short-term.					
E	The company has implemented a flexible workforce program.					
	Enterprise Resource Planning	**1**	**2**	**3**	**4**	**5**
A	The organizational have put in place adequate procurement practices.					
B	The organization has put in place risk management					

	and compliance program.					
C	There are project management practices implemented by the organization.					
D	The organization has improved interactions and communication with suppliers and customers.					
E	The organizational has ease of upgrading systems.					
	Inventory Control	**1**	**2**	**3**	**4**	**5**
A	The organization has implemented economic order quantity system.					
B	The organization undertakes inventory audit on a regular basis.					
C	The organization ensures that there is safety stock ordering.					
D	The company has policies regarding inventory reviews.					
E	The organization has put mechanisms in place to ensure safety of inventory.					

SECTION C: SUPPLY CHAIN PERFORMANCE

Please indicate the extent of realization SCP based on this key:

1 = Not at all; 2 = Small extent; 3 = Moderate extent; 4 = Great extent; 5 = Very great extent

	Statement	**1**	**2**	**3**	**4**	**5**
1.	Better Capacity Planning.					
2.	Low levels of Inventory.					
3.	Shorter Lead Time					
4.	Reliable systems					
5.	Minimization of Cost					

SECTION D: CHALLENGES OF PRODUCTION IMPLEMENTATION PRACTICES

Following the scale here rate the point that describes challenges on production implementation practices in your firm. 1= strongly agree, 2= agree, 3= moderately agree, 4= disagree, and 5= strongly disagree.

Statement	1	2	3	4	5
There is high cost of implementing operations.					
There is high competition among firms.					
The firm suffers challenges of inadequate technology.					
Some of the Government policies are inadequate and affect the firm.					
There is poor communication during the implementation process.					
There is the challenge of inadequate expertise					
The organization structure is not effective enough to support the process of implementation.					
The needs of clients are sometimes ambiguous and this affects production planning.					
Some operations are complex and this affects the implementation process.					

Other Challenges: Please State

_____

_____

_____

_____

_____

APPENDIX II:

FOOD AND BEVERAGE MANUFACTURING COMPANIES

Food and Beverages (135)	
Company	**Company**

Africa Spirits	Wrigley Co. (E.A.
New KCC	Kuguru Food Complex
Bidco Oil Refineries	C. Dormans
Kenya Tea Growers Association	British American Tobacco
Agriner Agricultural Development	Europack Industries
Kenya Tea Packers	Eastern Produce Kenya
Agro Chemical & Food	Fresh Produce Exporters Association of Kenya
Kenya Wine Agencies	Kenya Seed Company
Alliance One Tobacco Kenya	Deepa Industries
Keroche Industries	Pristine International
Al-Mahra Industries	Kambu Distillers
Kevian Kenya	Trust Flour Mills
Alpha Fine Food	Kenchic
Kibos Sugar and Allied Industries	T.S.S. Green Millers
Alpine Coolers	Kenlab Supplies
Kisii Bottlers	Lari Diaries Alliance
Koba Waters	Kenya Meat Commission
Arkay Industries	Kenya Sweets
Kwality Candies & Sweets	Pembe Flour Mills
Belfast Millers	Farmers Choice
London Distillers (K)	Premier Flour Mills
The Breakfast Cereal Co. (K)	Frigoken
Mafuko Industries	Premier Food Industries
Broadways Bakery	Gil Oil Co.
Manji Food Industries	Proctor & Allan (E.A.)
Brookside Dairy	Glaciers Products
Mastermind Tobacco (K) L	Promasidor Kenya
Bunda Cakes & Feeds	Global Fresh
Melvin Marsh International	Pwani Oil Products
Buzeki Dairy	Global Tea & Commodities (K)
Menegai Oil Refineri	Rafiki Millers

Czarnikow Sugar E.A.	Gold Crown Foods (EPZ
Milly Fruit Processors	Razco
Cadbury Kenya	Gonas Bes
Mini Bakeries (Nbi)	Re-Suns Spices
Candy Kenya	Happy Cow
Miritini Kenya	Rift - Valley Bottler
Capwell Industries	Highlands Canners
Mombasa Maize Millers	Sigma Supplies
Centrofood Industries	Highlands Minerals Water Co.
Mount Kenya Bottlers	Spectre International
Chai Trading Co.	Insta Products (EPZ)
Mumias Sugar Co.	Spice World
Chemelil Sugar Co.	Jambo Biscuits (K)
Mzuri Sweets	Sunny processors
Chirag Kenya	James Finlay Kenya
Nairobi Bottlers	Trufoods
Valuepack Foods	Kenblest
Kenafric Industries	Unga Group
Coca-Cola East & Central	Kabianga Dairy
NAS Airport Services	UDV Kenya
Del Monte Kenya	Kamili Packers
NesFoods Industries	Coastal Bottlers
Diamond Industries	Nairobi Flour Mills
Nestle Foods Kenya	Valley Confectionery
E.A. Breweries	Jetlak Foods
Nicola Farms	W.E. Tilley (Muthaiga)
E.A. Sea Food	Kensalt
Njoro Canning Factory (Kenya)	Wanainchi Marine Products (K)
Eldoret Grains	Kenya Breweries
Palmhouse Diairies	West Kenya Sugar Co.
Equator Bottlers	Pearl Industries
Patco Industries	Excel Chemicals

Erdermann Co. (K)	United Millers
Usafi Services	Kapa Oil Refineries
Karirana Estate	Kenya Nut Co.
Aquamist	

APPENDIX III: RAW DATA

Respondents	Capacity Planning	Employee Scheduling	Enterprise Resource Planning	Inventory Control	Supply Chain Performance
1	3.8	3.6	4	4.4	4.2
2	4.2	3.8	4.4	4.2	4.6
3	4.6	4	4.2	4	4.4

Respondents	Capacity Planning	Employee Scheduling	Enterprise Resource Planning	Inventory Control	Supply Chain Performance
4	4.8	4.4	4.4	4.4	4.6
5	3.8	4.2	4	4.6	4.4
6	4	4.6	4.4	4.6	4.8
7	3.8	4.4	4.2	3.2	4.6
8	3.6	4	4	5	4.2
9	3	4	4	4	4.2
10	3.8	3.8	3.8	3.8	4.2
11	3.6	3.8	4	4	4.2
12	3.4	3.2	3.2	3.4	3.4
13	3.4	4.2	4.2	2.8	4.6
14	3.6	3.2	3.4	2.8	3.8
15	3.8	3	3.2	3.4	3.6
16	2.8	3.8	3.8	3	4
17	3.6	4	4	2.6	4.2
18	2.8	3.4	3.4	3.6	3.6
19	3.2	3.2	3.8	3.2	4
20	3.6	2.6	3.6	3.2	3.8
21	3.2	3	3.8	3.4	4
22	2.6	2.6	3.6	2.8	3.8
23	3.4	4.2	3.6	3.4	3.8
24	3.8	3.6	3.2	2.8	3.4
25	4	3	2.8	3.2	3
26	3.4	3	3.4	2.8	3.6
27	4	4.2	4	3.8	4
28	3.2	3	2.8	2.4	3
29	3.2	2.4	3	3.8	3
30	4	2.8	2.6	2.6	2.8
31	3.6	3.8	3.2	3.2	3.2
32	3.4	3.8	2.8	3.4	3

Respondents	Capacity Planning	Employee Scheduling	Enterprise Resource Planning	Inventory Control	Supply Chain Performance
33	3.6	4.2	3.6	4.2	3.6
34	3.6	4.2	3.2	3.6	3.4
35	4	2.8	3.8	3.8	4
36	4.2	3.4	3	3.8	3.2
37	4.8	3.4	3.6	3.8	3.8
38	4.8	3.2	3.4	3.6	3.6
39	3.8	2.8	3.6	4	3.8
40	3.2	2.8	3.6	3.4	4.6
41	3.4	2.8	4	4.2	3.8
42	3.4	3.4	4.6	4	3.4
43	3.8	3.8	4.6	3.2	4.2
44	3.6	3.2	3.2	4	4.6
45	3.4	4.2	3.6	4	3
46	3	4	3.2	3.8	3
47	2.6	4	2.6	3.4	3.2
48	3.4	3.4	3.2	3.6	3.6
49	3	3.6	3.4	3.2	3.6
50	3.6	3.4	3.2	2.8	3.6
51	3.8	4	4	2.6	4
52	3.6	3	3	3.4	3.2
53	3.6	2.8	4	4	4.2
54	4.2	2.8	3.4	3.8	4.2
55	4.4	3.6	4.2	4	4
56	3.2	4.4	4	5	4.2
57	3.8	3.8	3.6	4.4	4.4
58	3.2	3.6	3.6	3.8	4.6
59	3.2	3	4.4	3.8	3.8
60	3	3	4.6	3.8	4
61	3.6	3.2	3.4	4.4	4.4

Respondents	Capacity Planning	Employee Scheduling	Enterprise Resource Planning	Inventory Control	Supply Chain Performance
62	3.6	2.6	3.6	4.2	4.2
63	4.4	3.4	3.2	3.4	4.2
64	3.8	3.8	4.4	4.4	3.4
65	3.6	3.8	4.2	4.6	3.8
66	3.6	4.4	3.8	4.2	3.2
67	3.8	3.6	4	3.6	4.8
68	4.4	3.6	2.8	3.8	3.8
69	2.6	3	3.8	3.4	4
70	3.8	4.2	3	3.4	5
71	3.6	3.8	4.2	3.4	4.4
72	4.6	4.4	4.8	4.2	5
73	4.6	3.2	4.6	4.6	4.8

Source: Research Data (2023)