

INFLUENCE OF SUPPLY CHAIN MANAGEMENT PRACTICES ON PERFORMANCE OF FOOD AND BEVERAGE MANUFACTURING FIRMS IN KENYA

Jane Pauline Muthoni

Master of Science in Procurement and Logistics Management, Jomo Kenyatta University of Agriculture and Technology, Kenya

Dr. Thomas Mose

Jomo Kenyatta University of Agriculture and Technology, Kenya

©2020

International Academic Journal of Procurement and Supply Chain Management (IAJPSCM) | ISSN 2518-2404

Received: 14th September 2020

Published: 22nd September 2020

Full Length Research

Available Online at: http://www.iajournals.org/articles/iajpscm_v3_i2_45_62.pdf

Citation: Muthoni, J. P. & Mose, T. (2020). Influence of supply chain management practices on performance of food and beverage manufacturing firms in Kenya. *International Academic Journal of Procurement and Supply Chain Management*, 3(2), 45-62

ABSTRACT

According to the 2018 World Bank economic update, the agricultural and manufacturing sector recorded a significant drop in growth from 4.7% to 1.6% and 2.7% to 0.2% respectively. This is unfortunate as the food and beverage manufacturing sector contribute heavily to the economy having the largest market share in the manufacturing sector as well as providing countless job opportunities to the city residents. This study sort to establish the influence of production management as a supply chain management practice on performance of Food and Beverage manufacturing companies in Kenya. To achieve the study objective, the study utilized descriptive survey research design. This is because this research design helped in collecting quantitative and qualitative data that is required to answer research question. The population of the study was 187 food and beverage manufacturing companies in Kenya where 125 were sampled. A questionnaire was used to collect primary data. Descriptive, correlation and regression analysis were used in the analysis of data. Inferential analysis, correlation coefficient to test for the significance of the association between the variables and regression analysis were carried out to determine the influence of supply chain management practices on performance

of food and beverage manufacturing firms in Kenya. Notably, there exists a strong positive relationship between the independent variables and dependent variable as shown by R-value (0.887). The study findings implied that the four independent variables jointly accounted for 78.70% of the performance of F & B manufacturing firms in Kenya. This implies that these variables are very significant therefore need to be considered in any effort to improve the performance of F & B manufacturing firms in Kenya. The study established that production management positively and significantly influenced the performance of food and beverage manufacturing firms in Kenya. The firms were yet to effectively apply demand forecasting, supplier collaboration and production planning to improve performance of food and beverage manufacturing firms in Kenya. It was established that F & B manufacturing firms did little on the forecasting of materials required. There was minimum usage of Materials Requirement Planning (MRP) and to a small extent, they did prequalification of suppliers. Further, it was established that the firms did not have long term contracts with suppliers and did not efficiently schedule work tasks required in the manufacturing process.

Key Words: *supply chain management practices, performance, food and beverage, manufacturing firms, Kenya*

INTRODUCTION

Supply chain management (SCM) deployed in manufacturing firms promote effective management of its supply chain (Bimha, Hoque & Munapo, 2020). Organizations deploy supply chain management to achieve competitive advantage through fostering supply chain management

effectiveness, improve efficient supply chain and earn a better level of performance. The fundamental purpose for firm supply chain administration is to enhance coordination and harmonize the critical process of the organizations' networks to promote the flow of service, enhance production, material and information with market demands (Daniel, 2016). This view is supported by Warsi, Asim and Manzoor (2020) management of supply chains constitute a strategic partnership, integration of suppliers and deployment of customer relationship management improve suppliers' alliances to customer relationships improving performance.

Organizations in different industrial sectors embrace supply chain management practices in response to changing external and internal environment characterized by globalization, increase in regulations, advancements in technologies that promote innovations and management support to achieve set goals. According to Mathu and Selepe (2018), management of supply chain involves strategic determinants such as formulation of practices, collaboration and customer relationship to realize organizational goals, improve the competitiveness of the firms and increase financial returns. Internationalization and vast global competition along with advancement in technology lead to a competitive and new manufacturing enterprise conditions. At first, firms in the manufacturing sector have achieved huge performance due to the deployment of lean production resulting from high competitions for rivals. Elimination of waste and reduction of costs through the removal of some operations within the supply chain improve manufacturing enterprise productivity.

In recent years, there has been a colossal decline in wasteful aspects caused by the poor outcomes of the suppliers, customer's needs, frequent changing demands and ever-changing environment. Supplier's integration influence firm achieving competitive advantage for manufacturing enterprises. Subsequently, firms are now competing by their supply chain networks rather than individual enterprises. However, in third world countries, enterprise rivalries still do exist (Gumboh, 2017). Manufacturing and food processing companies are dynamic in that they integrate with suppliers, increase customer relationships and form alliances with rivals in the market, share knowledge with a focus on achieving effective supply chain and foster enterprise capability to compete in the manufacturing industry and improve productivity level. Integrated supply chain creates opportunities for leveraging the intelligence embedded in collaborative processes with costs significantly reduced, enhanced value and demand changes detected early enough (Bwari, Getuno & Kiarie, 2016). According to Maina and Mwangangi (2015), supply chain collaboration adopted by manufacturing globally improve timeliness in delivery of goods and services, improve financial returns and improve customer's satisfaction as well as improve supplier relationships.

Successful supply chain management has turned into a possibly significant strategy for anchoring competitive advantage, lowering competition rate and improving procurement performance among supply chains (Gumboh, 2017). It includes bringing the appropriate supply chain of the right item to the opportune place at the perfect time while reducing costs among parties in the supply chain. Chopra and Meindl (2015) state that supply chain management improves values in

the organization, alliance with clients and suppliers to the marketplace to meet the required standards and quality for the customers. The organizations need capable supply chain management to improve relationships, leverage their market orientation by providing a great change in customers' value and influence rivals in the market to improve and achieve better performance (Banjo, 2018).

Management of supply chain as multidimensional constructs focus on improving performance. According to Wisner, Tang and Leong (2016) supply chain management practices such as supplier collaboration, supplier integration, sharing of information, lean production, and guaranteeing convenient conveyance contribute to performance in the manufacturing industry. Food industry and refreshment industry is immense and differentiated, grouped by various segments, for example, fresh nourishment industry, natural sustenance industry, handled food processing and manufacturing industry (Marhamati, Azizi & Marhamati, 2017). Each fragment needs extraordinary production network practices which include a supply chain network, sourcing, stock administration, provider incorporation, bundling and naming framework, and conveyance administration all which contribute to a dynamic food supply chain.

Globally SCM and related approaches are critical in achieving the success of manufacturing companies. This is due to the cost and quality of goods and services purchased. This view is supported by Jasti and Kodali (2015) that supply chain policies, integration and collaboration of supplier's, supplier development and production planning and control play a role in achieving improved productivity in firms in the manufacturing industry. Further, Ndungu, Were and Mwangangi (2020) indicated that lean practices to improve company internal processes and Just-In-Time tenets contribute to quality production of goods, reduction of cost of production and improvement in the company's performance.

STATEMENT OF THE PROBLEM

The manufacturing industry in Kenya has been experiencing a lot of turbulence in the recent past including a drop in the GDP, an increasing imbalance of trade and the exiting of large multinationals (Magutu, Aduda & Nyaoga, 2015). In addition to that, manufacturing companies in Kenya have been experiencing declining profitability in their production and operations management (KAM Directory, 2019). The agricultural and manufacturing sector recorded a significant drop in growth from 4.7% to 1.6% and 2.7% to 0.2% respectively according to the World Bank economic update 2018. Further to this, there was a declining growth of agricultural real value-added from 5.2% in 2016 to 1.6% in 2017 (World Bank economic update, 2018). This reduction in growth has necessitated an increase in imports which has led to a reduction in market share for food and beverage manufacturing firms in Kenya. (Apurva & Conte, 2016). The food and beverage manufacturing sector has also experienced declining customer satisfaction due to supply chain disruptions characterized by food safety scares, shortages and ever-increasing prices (Awino, 2019). This has had ripple effects in the economy whereby there has been increased inflation, competition and imports of substitutes (Khanna, Papadavid, Tyson &

Velde, 2016). Increased competition provides an array of choices for customers to select from hence attracting new clients does not guarantee profits as much as retaining existing customers. According to the African Development Bank (2011), Kenyan middle-class consumers with purchasing power have far wider needs with a different opinion on quality versus price. Their spending habits are mainly influenced by a sum of product quality and service offered at each purchase engagement. These ever-changing customer tastes and preferences are posing a challenge for food and beverage manufacturing firms who have to satisfy this expanding the scope of customer needs. The annual performance reports in Kenya exhibit a decreasing trend in performance for a period 2010- 2016. The highest performance was recorded in the year 2011 with a performance rate of 11.8% and declining to 9.2% in 2016 (KBS, 2018). Only 25% of Kenyans live in the cities as compared to 47.85% and 64.8% in Nigeria and South Africa respectively (Kenya Economic Update, 2014). This drives up distribution costs and lowers consumption. Multinationals such as Nestle and Eveready have exited the Kenyan market citing unsustainable economic conditions in favour of other African countries such as Egypt (Haron & Arul, 2012). It is clear that manufacturing organizations are operating at a less competitive stance. Inefficient supply chain management has been accredited to this poor performance (Mutunga, Magutu & Chirchir, 2015). Evidenced by the performance gap in the manufacturing sector, this study seeks to assess production management as a supply chain management practice and performance of food and beverage manufacturing firms in Kenya.

GENERAL OBJECTIVE

The main objective of the study was to establish the influence of production management as a supply chain management practice on performance of food and beverage manufacturing companies in Kenya.

THEORETICAL REVIEW

Strategic Choice Theory

Theory of strategic choice was developed by Jemison, 1981. The theory assumes that relationship and interaction occur between firms operations and certain occurrence (Kegoro & Anyango, 2020). Strategic choice theory depicts the effect of decisions made by top management on the performance of a firm along with the interaction between the internal and external organization (Addae, Nana, Boohene & Mavis, 2019). A strategic choice model by Campling and Micheson (2015) shows the relationship between an organization, its actions and the resulting performance in as much as this mode emphasizes how organizational structure leads to high performance within a scarce resource environment, it failed to consider the factors such as technology, environment and scale of operation.

SCT views a firm with managers as the staff who make decisions and make changes in organizations (Alshundreh, Alsharari & Al Kurdi, 2019). These decisions include sources of raw materials, quantities to be purchased based on demand, transportation, production scheduling and planning all which affect the achievement of organizational performance. Further, strategic choice theory indicates that a firm deploys practices that will foster success even in complex and vibrant environments (Ensafiari & Yaghoubi, 2017). Changes in the environment can also lead to managers making decisions at the corporate level and garnering support from other business units. The use of technology such as ERP systems that vertically integrate the firm with its suppliers and customers necessitate the making of changes by managers. Strategic choice theory is relevant in this study through understanding production management processes as it shows the relationship between management decisions and organizational performance as well as the interaction between the organization itself and its external environment

Resource Based View

The theory of Resource based view assumes that firm achieves competitive advantage and intended performance by deploying firm unique resources and capabilities as indicated by Barney (1991). The theory also assumes that resources in a firm are different within the industry and that their capabilities are not transferable as they are firm-specific hence ensuring that the firm's source of competitive advantage in the delivery of value to customers remains sustainable over time. (Addae, Nana, Boohene & Mavis, 2019).

The Resource Based View theory concentrates on the internal strengths and weaknesses of a firm rather than external risks and opportunities that exist that are much more difficult to control. (Boopathi & Krishnamoorthi, 2016) provides attempts to explain and forecast how organizations gain competitive advantage through acquisition, monitoring and evaluation of available resources. The theory is grounded on the tenet that attributes of a firm that are capital intensive to imitate, provide a means for the firm to acquire competitive advantage that yields sustained high ranking performance (Daniel, 2016).

The theory suggests that for an organization to achieve expected performance results, it needs to foster unique competencies that will aid in their sustained competitive advantage. This supports the use and integration of information systems as a resource which can be utilized in achieving increased performance in organizations.

EMPIRICAL LITERATURE

Production Management

Sachin and Ahire (2016) examined the relationship between production management and cost efficiency and ultimately the performance of a construction firm. The study deployed a descriptive survey research design. Respondents were chosen from various departments. Primary

data was collected using a questionnaire and analyzed using descriptive and regression analysis. The study brought to light that prudent forecasting early involvement of suppliers in the product design and development process, standard means of communication and clear relationship management policies all provide ample environment which will lead the construction manufacturing company to achieve their set goals.

Similarly, Boopathi and Krishnamoorthi (2016) sought to investigate the effect of managing materials to attain an optimal level of inventory considering turbulence in the construction industry. The study came up with a probabilistic inventory management technique which looked at the process of fabrication of raw materials on-site in a construction firm. The findings of the study revealed that forecasting of materials required at the temporary shop aided the firm to attain stability by applying the pull system to the materials sourcing stage. This reduced the lead times and also inventory carrying costs hence leading to the improvement in firm performance.

A study carried out by Huo, Qi, Wang and Zhao (2014) assesses effects of supply chain integration under two competitive strategies, that is, cost leadership and differentiation on the performance of 604 manufacturers in China. The empirical study intent was to exhibit the effectiveness of supply chain integration under different competitive strategies. The study adopted a survey method to collect data and a hierarchical linear regression model to examine the moderating impact. The finding revealed that process integration improves operational performance while product integration which requires input from suppliers leads to an improvement to the financial performance of the manufacturing firms.

A study by Nyamasege and Biraori (2015) assessed the extent of the supply chain management practices in the national treasury in Kenya's public sector. They employed a descriptive research design case comprising of 60 management employees serving in the ministry. The results revealed that there is a significant lack of supply relationship management that was ailing the sector and impacting negatively on the performance and service levels of the ministry. The study recommended that the ministry needs to employ supplier collaboration to achieve improvement in their performance.

Keitany, Wanyoike and Richu (2014) conducted a study to examine the role of production management on organizational performance of the New Kenya Cooperative Creameries in Eldoret. A descriptive research design was adopted for this study which targeted 56 employees. The respondents were chosen from departments that directly handle materials such as production, purchasing, quality control, stores, human resources finance and transportation. The study found that the implementation of demand forecasting and inventory management systems resulted in the improvement of the performance of the organization. It also found that production planning led to reduced wastage and reduced production costs which also led to shorter lead times hence improving customer satisfaction.

Similarly, Starvluiki and Davis (2014) carried out an empirical study examining the effect of customer focus in the development of supply chain relational capabilities and performance. The

study chose supply chain capabilities operationalized as a multidimensional construct comprised production management, collaborative communication, cross-functional teams and supplier involvement. The study adopted relationship marketing theory as the theory for the development of the study theoretical framework. The study revealed that the input of customers and suppliers in the development of products impact positively on firm performance.

Performance of Food and Beverage Manufacturing Firms

Empirical studies by Molefe, Tauoatsoala, Sifolo, Manavhela and Henama (2018) assessed supply chain measurement framework for the manufacturing industry and define which data should be measured in the case company's supply chain. The descriptive research design was adopted. This research is a qualitative case study research. The result presents a theoretical framework of SC performance measurement. The key performance measurement indicators were found to be as timeliness, profitability, order book analysis and managerial analysis in the manufacturing industry. The measurement framework is tested by measuring case SC performance. Research limitations in the study included a performance measurement framework which was created for the needs of the manufacturing industry.

Mutuerandu and Iravo (2014) investigated the impact of supply chain management practices on the performance of manufacturing companies focusing on HACO industries. The objectives were to assess the level of implementation of SCM practices in HACO Industries Ltd and to study the relationship between SCM practices and performance in the same industries. To study the relationship between supply chain management practices and performance, four key dimensions of SCM practices that is strategic supplier partnership, customer relationship, information sharing and training practices were used as independent variables. Market/business and operational performance variables were used to measure the performance. A sample of 40 employees was taken conveniently. A questionnaire was used as a research tool for the collection of data. Baseline data was gotten from some key informants and also from secondary data. Collected data were analyzed through SPSS 18 by running frequencies and mean score. Main findings of the study revealed that there is a high level of practical implementation of SCM practices in HACO Industries Ltd and that they improved the organization's performance in terms of lowering its operational costs, reduction of lead time, high customer service levels, product quality, fast response to changes in the market and expanding its market share and sales. A combination of all the four practices studied had a stronger effect on organization performance other than the effect of one which further shows the need to embrace a good combination of SCM practices.

Ndubi, Iravo and Ochiri (2016) determined the contributors of lead time variability and the effects of lead time variability on the inbound logistics performance. This study was based on Safaricom Limited a major player of the telecommunication industry in Kenya. The target population was employees in Safaricom Limited who deal with the inbound logistics services and the sample frame was a register from the Human resource department. The technique

adopted in this research was stratified sampling with the desired sample size of 70 respondents. Data collection was both quantitative and qualitative, questionnaires were used to collect data and analysis by use of a linear regression model was used to establish the relationship between the independent and dependent variables. The study found that production lead time, shipping lead time, customs brokerage time and receipt and inspection of goods velocity have a high impact on inbound logistics performance of the organization.

Panayides, Borch and Henk (2018) assessed performance measurement in supply chain entities focusing on the balanced scorecard in manufacturing prefinished products to measure the efficacy of the SC for cost-efficiency. The profit directed at the order describes cost-efficiency best. Based on the theoretical review, this indicator is numbered among cost and economic viewpoint indicators. The indicator is especially important by the fact that the price of steel varies according to markets and therefore updating the prices for products and continuous follow-up on sale prices for these to meet the actual expenses is extremely important. In the steel service business, the sales usually occur based on spot transactions, but additionally, the company operating in the field of prefabricated plate product business has committed to deliver products to its customers according to long-term contracts. Therefore, re-counting of the products according to changes in production schedules is extremely important.

Muhammad, Akhtar and Marr (2018) examine the relationships between supply chain strategy, flexibility and performance in the food supply chain. The results show that there are direct effects of strategy on flexibility and flexibility on performance. Customer-oriented companies show the best results on performance and they should invest in product flexibility and delivery flexibility. Innovating companies should focus on new product flexibility. The results showed that all types of supply chain strategy hurt net profit performance. Comparing the results with the findings, it can be concluded that there are similarities in the relationship between supply chain strategy and supply chain flexibility. There are significant differences in outcomes on the relationships between supply chain flexibility and performance and between supply chain strategy and performance.

Finnsgard, Roso and Woxenius (2019) examine the improvements in variability that had different impacts, depending on the source of the variability and frequency of the shipments, found out that the highest inventory reduction potential arises from a combination of high reliability and improved frequency. This study was based on the assumption that the replenishment system is aligned with the schedules of the transportation system. If this not the case, the benefit of increasing the frequency of shipments will be higher since the mean waiting time for the next shipment will decrease.

RESEARCH METHODOLOGY

According to Mackey and Gass (2015), a research design refers to the overall plan for obtaining answers to the questions being studied for handling some of the difficulties encountered during the research process. The study utilized a descriptive research design. This is because the research design helped in collecting quantitative and qualitative data that is required to answer research questions. Descriptive research design assists in collecting data using different methods and using different instruments (Taylor, Bogdan & Devault, 2015). The target population should suit a certain specification which the research is studying. The population of the study constitutes a list of things, place, organizations and people that have similar characteristics under the study. The study targeted 187 Food and beverage manufacturing companies in Kenya (KAM, 2019). The sampling frame for this study was a list of all the 187 food and beverage manufacturing firms in Kenya. Vaioleti (2016) suggests that a proportion of between 10 per cent and 30 per cent of the target population is an adequate representation. Creswell and Clark (2016) suggest that for a population below 500, the formula adopted by Krejcie and Morgan (1970) can be adopted as below as it uses 95% accuracy level.

$$S = \frac{X^2NP(1 - P)}{d^2 (N - 1) + X^2P(1 - P)}$$

Where: S =Sample size; X =Z value/ standard normal deviation set at 1.96 (95% confidence level); N =Population size; P =Proportion of population (50% expressed as a decimal 0.5); d =Degree of accuracy (it is set at 5% degree of error expressed as a decimal 0.05 that should be accepted as the study will be performed at 95% confidence level)

Substituting the values in the formula yields:

$$S = \frac{1.96^2 \times 187 \times 0.5(1 - 0.5)}{0.05^2 (187 - 1) + 1.96^2 \times 0.5(1 - 0.5)} \quad S = \frac{179.5948}{0.465 + 0.9604} \quad S = 125$$

Data collection refers to a precise and systematic method of collecting information on variables of interest to the research problems. Primary data was collected from procurement managers using a questionnaire whilst Secondary data was obtained from audited financial reports of the firms using a data collection sheet. The questionnaire was used because it helped in collecting a large volume of rich data, easy to administer and save time. The first section was used to collect demographic data about the respondents in the study whilst the second section collected data on the effect of supply chain management practices on the performance of food and beverage manufacturing firms in Kenya. According to Silverman (2016), a questionnaire is the best data collection instrument in the collection of primary data in large volume within a short time. The study utilized a structured questionnaire that limited the respondent's answers to a provided set of options. The questionnaire was administered through drop and pick later method. This

provided the respondents with adequate time to respond to the questionnaire. The researcher made follow up after two weeks to foster response rate. Data analysis refers to the application of reasoning to understand the data that has been gathered to determine consistent patterns and summarize the relevant details revealed in the investigation (Bryman & Bell, 2014). After collection the quantitative data using the questionnaire, the data was thoroughly checked for clarity, legibility, relevance and appropriateness and thereafter coded and analyzed using the statistical package for social sciences (SPSS) version 24.0. Quantitative data from the questionnaire was analyzed by the use of descriptive and inferential statistics. Descriptive statistics include the use of mean, standard deviations, variances, frequencies as measures of central tendency. Descriptive statistics illustrates basic summaries on the measures in the study (Sathianandan, Safeena & Rahman 2017). Inferential statistics such as correlation analysis was done to predict the degree of relationship between variables whilst regression analysis was done to test the strength of the relationship between the independent variables (denoted as X) and dependent variable (denoted as Y). The F-ratio that will be generated in the ANOVA table measured the reliability of the regression model. The study carried out the entire statistical test at 5% level of significance. The following multivariate regression model was used as follows:

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Where: Y = Performance (dependent variable); X_1 = Production management; β_0 = Regression constant; β_i = Variable coefficient; ε = the error term

RESEARCH RESULTS

The study sought to establish the relationship between production management and performance of food and beverage manufacturing companies in Kenya. Production management included materials management, demand forecasting, supplier collaboration and production planning. From descriptive statistics, the study found out that the majority of respondents stated to a great extent that forecasting of materials was required. The study findings indicated that majority of the respondents to a moderate extent used Materials Requirement Planning (MRP). The respondents posited to a great extent that there was a prequalification of suppliers. The respondents stated to a moderate extent that they used long term contracts with suppliers. The respondents indicated to a great extent that they schedule work tasks required in the manufacturing process.

This study objective is founded on the statement that production management influences the performance of food and beverage manufacturing companies in Kenya. From the correlation analysis, the study found that there is a positive relationship between materials management and performance of food and beverage manufacturing companies in Kenya. The regression analysis results also indicated that production management positively and significantly influences the performance of food and beverage manufacturing companies in Kenya. The results indicated that an increase in production management would lead to an improvement in the performance of food

and beverage manufacturing companies in Kenya. This implies that production management positively influences the performance of food and beverage manufacturing companies in Kenya. The study findings, therefore, led to the acceptance of the statement and concluded that there is a positive and significant relationship between production management and performance of food and beverage manufacturing companies in Kenya.

Inferential statistics used in the study included the use of correlation analysis and multiple regression analysis. The use of different tests was driven by the need to establish the relationship between the independent variable and dependent variable. The study sought to establish the relationship between production management and performance of food and beverage manufacturing firms in Kenya and findings showed a correlation ($r = 0.654$; $p < 0.05$) between the production management and performance of food and beverage manufacturing firms in Kenya. This implies that production management is positively correlated to the performance of food and beverage manufacturing firms in Kenya. In addition, the correlation between these two variables was significant, that is $p < 0.5$ implying a linear relationship between the production management and performance of food and beverage manufacturing firms in Kenya. This shows that production management had a significant effect on performance of food and beverage manufacturing firms in Kenya. The study findings by Huo, Qi, Wang and Zhao (2014) finding revealed that process integration improves operational performance while product integration which requires input from suppliers leads to an improvement to financial performance of the manufacturing firms.

CONCLUSION

The study established that production management positively and significantly influenced the performance of food and beverage manufacturing firms in Kenya. The firms were yet to effectively apply demand forecasting, supplier collaboration and production planning to improve performance of food and beverage manufacturing firms in Kenya. It was established that F & B manufacturing firms did little on the forecasting of materials required. There was minimum usage of Materials Requirement Planning (MRP) and to a small extent, they did prequalification of suppliers. Further, it was established that the firms did not have long term contracts with suppliers and did not efficiently schedule work tasks required in the manufacturing process.

RECOMMENDATIONS

The study findings revealed a significant relationship between production management and performance of food and beverage manufacturing firms in Kenya. The study recommends that there is need for the firms to improve demand forecasting, supplier collaboration and production planning to enhance performance of food and beverage manufacturing firms in Kenya. The firms should improve on the forecasting of materials required, adopt Materials Requirement Planning (MRP) and have prequalification of suppliers. It is also recommended that the firms should have

long term contracts with suppliers and schedule work tasks required in the manufacturing process.

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