

**INVENTORY MANAGEMENT PRACTICES AND OPERATIONAL
PERFORMANCE OF KENYA ANIMAL FEEDS INDUSTRY**

BY:

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DECLARATION

I declare that this research project is my original work and it has never been presented to the University of Nairobi or any other institution for any degree or any other academic award.

Signature _____ **Date** _____

Moses Moywaywa Dickson
D61/81295/2015

I confirm that the work reported in this research project has been carried out by the candidate under my supervision.

Signed..... **Date**.....

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DEDICATION

This study is dedicated to my family members in particular and specifically to my dad, Moses Kimaiga and mum, Mellen Moraa for the intense support and prayers they gave me during my study period.

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My attention to detail puts the Senior lecturer, Am just indebted to you Tom Kongere. I would like to express my sincere appreciation to you at most for guidance, advice as well as encouragement.

I will like to thank Mr. Michael Chirchir who was my moderator for all the remarks, guidance and directions during my study.

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Thanks to my classmates, chiefly Diego Wilson and Ondieki Frankline Babu and also friends for invaluable support too.

To sum up all I thank the Lord Almighty for the life and all that is in it during my study period.

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ABBREVIATIONS AND ACRONYMS

EOQ	-	Economic Order Quantity
AKAFEMA	-	Association of Kenya Animal Feed Manufacturers
GAIN	-	Global Agriculture Information Network
JIT	-	Just in Time
MRP	-	Material Requirement Planning
RBV	-	Resource-Based View theory
ROE	-	Return on Equity
ROI	-	Return on Investment
TCT	-	Transaction Cost Theory
VAT	-	Value Added Tax
VMI	-	Vendor Managed Inventory
VRIN	-	Value, Rare, Imperfectly imitable and No substitutes
VRIO	-	Value, Rare, Imperfectly imitable and Organizational processes
WFP	-	World Food Programme

ABSTRACT

The 21st century business environment is highly competitive and extremely volatile. Interference of business norms is not only subjected to externalities but also to internal perspectives. Effectiveness and efficiency have become major sources of success in many areas with every entity struggling to cope with the wave of change and expected quality standards and levels. Duly then, handling and operational costs have increased exponentially putting more pressure on performance. As a one of the means to drive and overturn this rising trend, business entities have unanimously instituted and operationalized inventory management practices. The practices aid in optimizing various operation sections and further reduce resource wastage within inventory and inventory handling, especially in the animal feeds industry. Inventory and inventory handling in this case is viewed as a major determinant of operational performance as well as an easy source of firm failure. It is therefore important for operations managers and the entire animal feeds industry to understand the link between the inventory management practices and operational performance. This research project focuses in proving this information so that feasible decisions are made accordingly. The context, which is the animal feeds producing industry, is inventory intensive to the extent that inventory handling forms 80% of all operations. In addition, all the core operating activities in animal feeds producing industry involves 90% inventory handling. This study therefore sought to determine the inventory management practices used by animal feeds producing companies in Kenya as well as establishing the impacts of the practices on the companies' operational performance. A sample size of twenty four firms was approached using a descriptive research design. A questionnaire and a study guide were used to collect data which was analyzed based on the objectives. To obtain for the first objective, descriptive statistics was used while correlation and regression was used to obtain the second objective. From the statistical means, the practices were found to be intensively applied. From the correlation analysis, a high relationship value was established between operational performance and inventory management practices. The study concludes that inventory management practices significantly determine operational performance. Limitations of the study include the use of four inventory management practices in spite of existence of a large pool and the focus on the manufacturers when operational performance is a function of the entire the supply chain. To deal with these limitations, the study suggests for further research: one involving all the possibly available practices and another on considering the entire supply chain, or a combination of both.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The business environment is drastically changing. Consequently, firms are currently facing progressively increasing competition (De Loecker & Van Biesebroeck, 2015). Gaining a competitive edge has become a core factor for prosperity of these firms. It is also a significant factor that influences the expansion of business territories and their survival (Ogbo, 2014). Companies have implemented strategies that have positively impacted on the lead time, quality output, and other functions to improve their productivity and increase competitiveness (Drexl & Kimms, 2013). Building a long-term competitive advantage is achievable through customer focus and producing improved outputs in terms of service delivery, affordable cost, and good quality (Zairi, 2012).

As the business world becomes more globalized, firms are required to advance their capabilities to remain competitive (Umble & Haft, 2003). Besides, this globalization has attracted new entrants with better innovative and creative operation techniques leading to increased pressure on the existing firms (Inkpen & Ramaswamy, 2005). For companies to stand a chance of controlling their position in the market, it is necessary to make use of more innovative measures and adopt well-structured long-term goals that maximize customer focus, minimize inventory investment, and enhance operational efficiency which will lead to optimum productivity (Wisner, Tan & Leong, 2014).

For business organizations to optimize their performance, they must drastically shorten their throughput times, maintain necessary inventory, improve product choice, enhance the quality of products, give timely delivery dates, and ensure smooth production by

minimizing surplus and shortages of stock to reduce waste (Gregory & Rawling, 2016). Tracking demand, supply and production should be continuously improved and monitored to enhance the competitive advantage of these firms. Realizing competitive edge on these organizations depends on the firm's capacity to manage and control their levels of inventory effectively. Closs and Bowersox (2010), argues that inventory plays a critical role in the supply chain. It accounts for 80% of the final output; hence, it has to be dealt with wisely since it binds up a considerable proportion of the organizational resources.

The major objective of any organization is to optimize productivity using fewer resources along with enhancing quality in their processes (Nsikan, Etim & Ime, 2015). Companies must upgrade their supply chain control mechanisms such as the ordering process, warehousing, selling the output, and supervision of finished products.

1.1.1 Inventory Management Practices

Inventory management practices are techniques that are used to ensure that inventories are operationally optimized (Ngumi, 2015). These inventory management practices are usually used to manage and control the firm's stock through recording, tracking, and reporting (Ross, 2015). These practices are: The Economic Order Quantity (EOQ), Just in Time (JIT), Material Requirement Planning (MRP), and Vendor Managed Inventory (VMI). EOQ refers to the optimal number of goods a firm is supposed to add to its existing stock during re-order to objectively minimize the total cost incurred for holding goods and ordering processes (Drury, 2013). The technique operates under assumptions that the demand is even, and the lead time is constant (Stevenson & Hojati 2007). Suresh, Nallan and Kay (2012) define JIT technique as an all-round waste elimination philosophy

by Toyota Company that focuses on receipt of goods via bill of materials only. According to Burcher (2015), MRP is a computer-based planning technique that uses the master production schedule to control inventory via input and output in manufacturing. On the other hand, ERP helps manage and integrate back office functions (Umble & Haft, 2003) while VMI technique effects information sharing between partners and trading parties (Disney & Towill, 2003).

These inventory management practices result in continuous control and monitoring of both manufacturing and procuring processes, from source-to-end points, ensuring smooth flow of material and value addition activities within the entire supply chain (Gregor & Rawling, 2016). Zairi, (2012) and Christopher (2016) add that planning performance is possible, but only if inventory control is factored in. Drexl and Kimms (2013) argue further that companies employ different inventory practices depending on the nature of inventory at hand. It is also worth noting that inventory management practices guarantee best services to customers as they enable conditions for better coordination of purchasing, manufacturing, and distribution functions (Porter 2008).

1.1.2 Operational Performance

Operational performance has been defined by O'Brian, Formosa, Vrijhorf and London (2009) as the capabilities by organizations to meet their goals and objectives. He further argues that these goals and objectives include organizational set standards. Owiny (2016) defines operational performance as the level of effectiveness and efficiency applied in the process of input transformation into valuable outputs. From these definitions, then, it can be concluded that operational performance is not a departmental oriented performance indicator, but rather an organizational all-round indicator. The 21st century demands that

organizations compete in terms operational aspects that include speed of delivery, operating costs, task accuracy and level of task(s) completeness (Kamau, 2016). Exceptional organization alignment to either one or more of these operational aspects blends-in a culture of differentiated advantage that result in improved operational performance (Salem, 2003). Therefore it is prudent for inventory and logistic manager to be cognizant of operational performance and consequently provide support as required and expected.

According to Inyo (2013), organizations measure operational performance by use of either financial means or non-financial ones or by use of a combination of both. However, Richards (2000), Wachira (2013) and Muema (2013) argue that financial mean that consist of financial ratios and other indicators get an upper hand due to their preference. The ratios include return on investment (ROI), return of sales and return on equity (ROE). The non-financial means include service satisfactory, quality, lead time, inventory handling capacity, customer satisfactory and perceptions of productivity (Nyauncho, 2016). Although the most predominant measures used are financially-oriented, non-financial ones are equally important when determining on perception aspects (Chin, 2010), and more preference is usually placed on quality, lead time and inventory handling capacity (Kivite, 2015). All the measures mentioned herein evaluate on firms' operational efficiency and effectiveness. Kamau (2016) asserts that effectiveness is the level measure of customer satisfaction while efficiency is the measure of how a firm's resources are economically utilized. It is affirmed by Kimaiyo and Ochiri (2014) that operational performance consciousness improves as organizations implement inventory management. According to Conner (2003) and Kimaku (2010), effective

processes management reduces the cost of lagging behind and operating on an irrelevant platform thereby preventing blind production and process ambiguities. Arguably, economies of scale and survival-cost efficiency make the main drivers of application of an effective inventory management processes and practices: practices assumed to hold significance towards operational performance.

1.1.3 Kenya Animal Feed Industry

The animal feed industry statistics by Association of Kenya Animal Feed Manufacturers (2016) indicate that Kenya has 79 duly registered animal feed millers (appendix III-A). The industry, according to Animal Feed Situation Report (2014), Kenya still remains to be leading in number of registered millers compared to other East African countries, comparatively making it the largest and the most advanced operationally. The report also indicates that the Kenyan animal feeds industry has experienced steady growth in the last ten years. The Global Agriculture Information Network (GAIN) report on Kenya (2015) affirm that the registered members supply 53% of animal feeds demands while unregistered small scale firms contribute to the remaining 47%. The industry is controlled by the Association of Kenya Animal Feed Manufacturers (AKAFEMA) under the Ministry of Agriculture, Livestock and Fisheries. The association is responsible for controlling the activities, registering and authorizing operations of Kenya feed millers

The animal feed industry derives from the interdependency of the livestock farming sub-sector and the feeds manufacturing sub-sectors. The livestock farming involves rearing of goats, sheep, horses, cattle and poultry. The requirement for nutritionally optimized feeds for this livestock sub-sector leads to the Animal Feed Sub-sector. The Animal Feed Situation Report (2014) indicates that feeds and supplements demand went up to 650,000

tons in 2013 from 300,000 tons in the year 2008, while production remained at 400,000 tons. This indicates a significant deficit. However, multiple steps have been taken to counter this deficit and promote sectoral growth. The steps-taken include the Government of Kenya, through the Ministry of Agriculture, maintaining a zero-rated Value Added Tax (VAT) policy for the animal feeds (GAIN report, 2015). The report also indicates that most of the manufacturers use modern and computerized technology, such as the imported continuous flow mixers that ensure fast and high quality (Kingori, Wachira & Tuitoek, 2010) while the small firms use less capital and labor-intensive production techniques (Kihara, 2015).

According to AKAFEMA magazine (2015), most of animal feed millers in Kenya employ mixed feed production that include dairy meal, poultry feeds, fish feeds, rabbit pellets, and pigs feed. The industry has experienced increased volumes of exports to other countries from 12093 tons in 2008 to 81065 tons in the year 2014 (GAIN report, 2015). Unfortunately, these increased volumes have prompted producers to exhibit rush productions that consequently result in poor quality feeds in the market (Chianu et al. 2008), calling for quick, proactive and reactive quality measures from the Kenya Bureau of Statistics (Jonas et al., 2008: Karanja, 2003).

1.2 Statement of the Problem

Inventory management in the animal feeds sector constitutes a number of integrated practices that focus on reducing the cost of handling material and finished products while enhancing service response (Nsikan, Etim & Ime, 2015). The practices define a wide array of cohesive systems (Closs & Browsersox, 2010) that work towards a common aim that fabricate within the performance philosophy. The practices include economic order

quantity, just-in-time, material requirement planning, enterprise resource planning and vendor managed inventory (Vigtil, 2007). These practices reduce quality bugs, lead time and inventory handling costs associated otherwise promoting operational gain (Oballah, Waiganjo & Wachiuri, 2015). Justification of inventory management practices as key firm success factors is also provided in Hervani, Helms and Sarkis, (2005).

In Kenya, a number of animal feeds manufacturers have adopted various inventory management practices that promote cost reduction and efficiency (Karuri, 2010). The 76 duly registered companies produce a range of feed products for various animals that include poultry, dairy, fish and dogs feeds. For these companies, priority is on how to eliminate wastes and costs associated with inventory and consequently attain related economies of scale, inventory management practices mentioned earlier need to be deployed and effectively managed. However, it is also logic to equally and competitively determine their contribution to operational performance.

Many scholars have undertaken studies on inventory management practices and operational performance. Globally, Dimitrios (2008) indicates that over the years, inventory management practices have come out to strongly influence organizational efficiency. In a study by Rajeev (2008), findings show how excessive inventories tie up working capital at the same time increasing the carrying costs. Hirishani (2010) on Sri Lanka food processing supply chain indicates the importance of inventory management practices. He further warns inventory-based firms, which do not practice inventory management, of a threat to poor supply chain partner linkages and unhealthy extra costs.

Locally, Mwangi and Thogori (2015) established that inventory management practices improves the operational performance of a firm through efficiency in capital utilization, increased service level, and reduced lead time. Gakinya (2013), Herrero and Thornton (2013) and Lwiki, Ojera, Mugenda and Wachira (2013) agree more and further establishes a positive correlation between inventory management and return on sales. Focusing on public health institutions, Oballah et al., (2015) equally dealt with inventory management practices and organizational performance, establishing a positive influence. Holding the same opinion also is Munyori, Ofunya and Ithinji (2014). Kamau and Bosire (2015) equally did an assessment of factors influencing financial performance of animal feed and categorically mentioned inventory management as the main factor.

However, they have not linked inventory management practices and operational performance within the context of animal feeds production in Kenya. Hence, this study sought to answer the following research questions: To what extent are inventory management practices applied by animal feeds producing companies in Kenya? What are the impacts of inventory management practices on operational performance of animal feed producing companies in Kenya?

1.3 Research Objectives

The general objective of the study includes establishing the influence of inventory management practices on the operational performance of Kenya animal feed industry.

Specific objectives include:

- I. To establish the inventory management practices used by animal feed producing companies in Kenya.

- II. To establish the impact of inventory management practices on operational performance of animal feed producing companies in Kenya.

1.4 Value of the Study

Animal feed manufacturers in Kenya will find this study essential as it will enable them to improve their services to customers, minimizing the costs of inventory to ensure effectiveness in their operations and to maximize profits through implementation of sound inventory management practices. The study will involve the animal feeds industry retailers in Kenya. It will encourage them to apply inventory management systems into their supply chains to ensure improved service and effectiveness of performance.

To the shareholders, the growth of a company and its good performance will enhance consolidation of their wealth which will give them value for their investment. Shareholders in the animal industry are concerned with increased profits and increased in their return on investments. The study plays a significant role in helping the shareholders to see the importance of application of inventory management systems into their supply chain systems and how this affects the operational performance of animal feeds millers.

To the researchers, inventory management systems and operational performance of animal feeds industry is a critical area of study in operations and materials management. The researchers seek to find out the actual application of inventory management practices and its relationship to operational performance of animal feeds millers. This study will supplement existing knowledge on stock management of feed millers. It will add the knowledge on operations and materials management.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter deals with foundational theories, empirical studies and research gaps, and the conceptual framework.

2.2 Theoretical Background

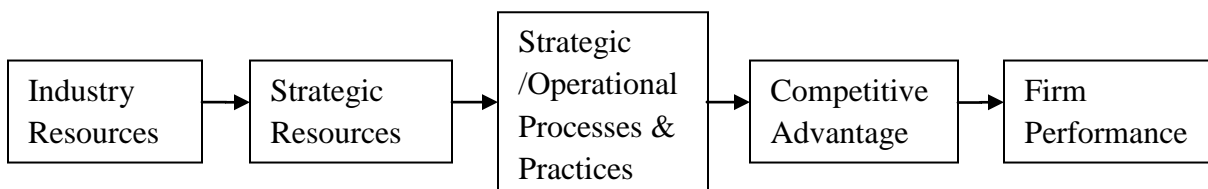
This study utilizes the Resource-Based View Theory and the Transaction Cost Analysis Theory to illustrate how inventory management practices affect operational performance.

2.2.1 Resource-Based View Theory (RBV)

The Resource-Based View theory was established by Penrose in the year 1959 (Barney, 1986) with aim of evaluating an organization's competitive edge using a particular resource. The theory indicates that a firm's performance is always attributed to its specific resources and capabilities. Wernerfelt (1984) emphasize on these determinants, further adding that competitive advantage is equally attained alongside performance as a result of the said resources being costly and difficult to replicate among competitors. RBV indicate that resources and capabilities involved must possess special attributes. Attributes that according to Rumelt (1984) and Barney (1991) include value, rare, imperfectly imitable and that lack substitutes, otherwise abbreviated as VRIN. In terms of value the resources should mitigate competitor threat and exploit opportunities; rare means that no competitor will possess the same resources or substitutes; imperfectly imitable means that competitors might not be able to duplicate them; while lack of substitutes mean that similar strategic resources are not common. VRIN was further

improved by Barney (1997) to accommodate strategic processes, replacing lack of substitutes with organizational processes attribute (VRIO). RBV gives possible reasons as to why certain firms consistently perform better than others (Robinson, 2008).

In linking the performance to resource conscious, RBV outlines two assumptions. First, the heterogeneity of firm-to-resources which indicates that there exist systematic variances on resources controlled by individual firms. Secondly, resources are immobile meaning that these resources are fairly stable across firms. Firm resources according to Barney (1991) include physical capital, human capital and organizational capital. Organizational capital includes property rights, organizational culture as well as operational and strategic practices. To experience fast performance, Barney (2002) further asserts that practices and processes adopted must be organized in a manner that can avail exploitation of firms' capabilities and resources. Inventory management practices form part of operational practices. Conclusions can then be drawn, as illustrated in figure 2.1, that RBV provides a framework in which resources that include operational and strategic practices impact firm performance.



Source: Research (2018)

Figure 2.1: Resources and Firm Performance

Resource-Based View theory provides a rational base for organizational networking, leading to the potential of enlarging the accessible resources, information, markets and

technology. The theory provides firms with ability to optimally evaluate the uniqueness of the competitively available resources and knowledge in making informed decisions.

The RBV is relevant in this study as it assists firms in determining the strategic resources and operations that effectively deliver comparative advantage. Inventory management forms part of these comparative advantage delivery operations. The theory then provides an understanding on how inventory, as a resource, can be optimized by animal feeds manufacturers to the realization of operational comparative advantage within the industry.

2.2.2 Transaction Cost Theory (TCT)

This theory was developed by Williamson (1975) with intention of putting forward a generally accepted notion on the collective responsibility of ensuring cost throughout the supply chain is kept at minimum levels. The theory then states that it is on every organization's interest to gain competitive advantage within the total cost analysis curve, by ensuring effectiveness and efficient management of processes and tasks, and keeping resource wastage at low levels. Halldorsson, Kotzab, Mikkola, Skjoett-Larson (2007) argues that when organizations put the theory at play and consciously execute its derivative, cost efficiency is attained as wastage is minimized. The theory argues that there exists a mirrored relationship between operational performance and inventory management, terming hybrid mechanisms of governance and control as the resulting catalyst (Huo, Duan, Li & Tien, 2012). Kinyanjui (2016) asserts that TCT is heavily applicable along the supply chain and more especially in areas that are prone to extensive storing and retrieving operations. This is because costs tend to build and accumulate

along the supply chain due to value addition effects. TCT evaluates on the efficiency of institutions that act as alternatives with respect to the entire notion of cost of conducting transaction.

Transaction Cost Theory provides two different perspectives for handling operational cost along the supply chain as well as within the functional units of firms (Jens & Heike, 2009): outsourcing of operations and implementation of optimal and cheap internal measures that see the cost of inventory deter the outsourcing option (Ghoshal & Moran, 1996; Gitau, 2016). To choose among these two perspectives, major considerations and decisions must be factored, among them including the decision to institute processes of value creation and control. Other considerations include transaction uncertainty, frequency and asset specificity. The choice to outsource or handle internally relies on comparative costs of internal competencies relative to buying prices of outsourced functions. However, if the internal handling option surpasses outsourcing, then the firm holds a further improvement chance due to continuous strategizing of controls that the option offers. Normally, the outsourcing option offers flexibility in directive specifications only.

In inventory management and as far as performance is concerned, internal handling then becomes a relatively better option than outsourcing: meaning that the firm in question only and only then can it deploy various inventory management practices to counter inventory costs. The introduction and implementation of these inventory management practices allows for in-depth evaluation of inventory costs and the associated and available cost minimization options. In conclusion then it can be noted with confidence

that Transaction Cost Theory provides a firm framework for scrutinizing the inventory handling option against sourcing, and of course anchoring on cost optimization.

2.3 Inventory Management Practices and Operational Performance

Operational performance as well as ideal systemization of physical trades and supply-chain transfers usually falls challenge from unpredictable demand and rare constraints. This predicamental situation unfortunately increases complexity in the optimization of operations, more especially when inventory forms the majority combination of one's current assets, calling for a wholesome rethinking on cost-saving practices (Fritz, 2006; Pong & Mitchell, 2012). Inventory is one of the major driving links between internal and external firm customer-hood (Onyango, 2016), and any call for its improvement in terms of handling cost should be appreciated and materialized. Among the calls, we have inventory positioning via inventory management practices, where through various practices we get a robust realization of right inventory at the ideal place within the set times.

Inventory management practices form part of diverse techniques towards stock control in retail operation management (Robinovish & Evers, 2002). Their usage range, as pointed out by Jonsson and Mattsson (2010), varies from one organization to another depending on the type of inventory and cost saving philosophy adopted by the specified organization. As also mentioned by Vollmann, Berry, Whybark and Jacobs (2005), the type of inventory to be controlled and the subjective environment determines, of them, the most appropriate or less appropriate. Among these practices we have; The Economic Order Quantity (EOQ), Just in Time (JIT), Material Requirement Planning (MRP), and

Vendor Managed Inventory (VMI) –all running internally and across organizations’ supply chains.

In order to effectively manage orders and ordering, Beamon and Kotleba (2006) indicate that firms should use EOQ and put more emphasize on re-order levels that reflect on both normal and emergency ordering cases. In support of its functional mechanisms, Schonberger (2008) and Porteus (2008) assert that the logical importance that comes with the practice is its sensational effectiveness in cutting costs, especially when it comes to holding costs and the stock-outs which otherwise contribute highly to operating costs. The practice equally facilitates the provisioning of inventory knowledge. Knowledge that is in turn capitalized by Just-in-Time to ensure that the set orders and re-orders are merged with the demands accordingly (Lazaridis & Dimitrios, 2005). At this point the main aim is to ensure that there is instant response to customer requests whilst demand (Hutchins, 1999; Kinyua, 2016). For firms to adequately provide a working environment for the two practices, demand must be well analyzed and fulfilled through a concrete approach that is systematic and realistic (Bicheno, 2014; Gitau, 2016): an approach that based on material resource planning (Ngumi, 2015). The required parts are anticipated and ordered as per part appropriateness and timings (Onyango, 2017). This minimizes acquisition of untimed and undue production materials (Ballou, 2004) through collaboration established by the notable vendor management practice (Berry, Jacob, Volkmann & Whybark, 2011), which in turn goes a long way to build a partnership systems across the supply chain for timely communication (Frahm, 2003) feedback and supply actions (Brownell, 2005). Together, all these practices apply a performance

enhancement to the final transformed results through reduction of wastes, improvement of quality, timely supplying and provision of packaged services.

Performance in this case involves the cohesiveness and how well the entire sets of processes reflect as a systematic approach (Salem, 2003). An approach that is integrative and one that aims at attain the whole package of strategic objectives (Kamau, 2016). Approaches that make it possible for the firm to adequately fulfill customer requirements at the same time utilize organizational resources in the most economical manner. In Animal Feed manufacturing Industry, such an integrative system that allows the kind of performance is essential, more especially when considering the level of competition and the many available alternatives to customer demand satisfaction. Many animal feed manufacturers therefore require systems that work towards their objectives, ensuring identification of resources and capabilities that are of high value, unique, imitable and that fully accommodate the organizational processes. When realized, such processes and capabilities provide a comparatively better competitive advantage (Gazo, 2007) internally positioning the firm with excellent financial and non-financial array.

2.4 Empirical Studies

Asiima (2012) examined the influence of inventory management practices on organizational performance and established that the practices involved were not fully utilized. He used descriptive survey and stratified random selection approaches with a sample size of 100 respondents. Relevant data was collected by use of a closed ended questionnaire. It was established that Taso Mbarara holds massive stock that adequately serve the demand. However, the massive stocks translate to high costs that is associated with holding and sometimes waste related. It was established that the overall

organizational performance could improve further if inventory management practices were adequately and strictly observed. The study however exhibits a contextual disparity as well as a miss on operational performance.

Tungo (2014) carried out a research on the influence of inventory practices on financial performance of Dar es Salaam-based National Microfinance Bank. He used “ideal role taking” to establish a common and generalized disposition. A total sample size of 20 respondents spread across all departments and managerial levels were engaged and data established. Findings established the existence of inventory practices that lack supportive policies and cost cutting culture, making implementation fall short. The study herein focuses on financial rather than operational performance, hence the research gap.

A study by Mensah (2015) focusing on effects of inventory management practices on hospital service delivery indicate that healthcare equally depends on inventory efficiency. Findings show how the availability of supportive supplies enhances hospital performance. Further analysis established that the hospital highly utilized the VMI practice to ensure effective and reliable strategic supplier partnership. The study concluded that inventory management practices press major contribution towards realization of service delivery. In establishing these findings, a descriptive survey design was used along with a purposive and convenience sample size of 60 respondents. A questionnaire was used to collect primary data. The study however has contextual gap as it focuses on healthcare sector rather than manufacturing sector.

Ngumi (2015) examined the effects of inventory management practices on productivity of more than 50 large manufacturing firms. She utilized a descriptive survey research

design alongside a stratified sampling technique. A well-structured questionnaire was self-administered and findings indicated the neglect of inventory concern vis-à-vis cash management in large firms still exploits productivity. The study concluded that inventory management practices significantly contribute towards realization of firm productivity, coming second after employee algorithms. The study is feasible but fails to show how operational performance is affected by the inventory management practices.

A study by Gitau (2016) analyzed the relationship between inventory and productivity in Kenyan parastatals. The study utilized descriptive research design and census sampling on all 103 listed parastatals as at December, 2015. According to analysis from obtained data, the study established that a unit increase in automatic replenishment translates to .578 increases in organizational productivity. It was also identified that VMI is the most recognized and extensively used practice in ensuring stock integration and management. However, the VMI identified few internal observation challenges due to lack of implementation skills. The study recommended in and on-practice employee training to enhance their facilitation. Research gaps herein include contextual and the focus on productivity rather than operational performance.

Kinyanjui (2016) sought to establish the relationship between inventory management and performance of World Food Programme in Kenya. He used descriptive research design along with census technique to target 19 world food programme partners (WFP) and a questionnaire. Findings show that WFP utilizes quite a number of inventory management practices with an aim of cutting down inventory associated costs and bringing onboard handling efficiency. It was noted that the practices rolled out were many –in that some just played passive roles. It was then recommended that appraisal be made to identify the

most significant and useful practices, and consequently those that are passive eliminated to provide focused concentration. The study provides a contextual research gap that is based on general performance rather than operational performance.

2.5 Summary of Empirical Review and Knowledge Gap

Table 2.1: Summary of Empirical Review and Knowledge Gap

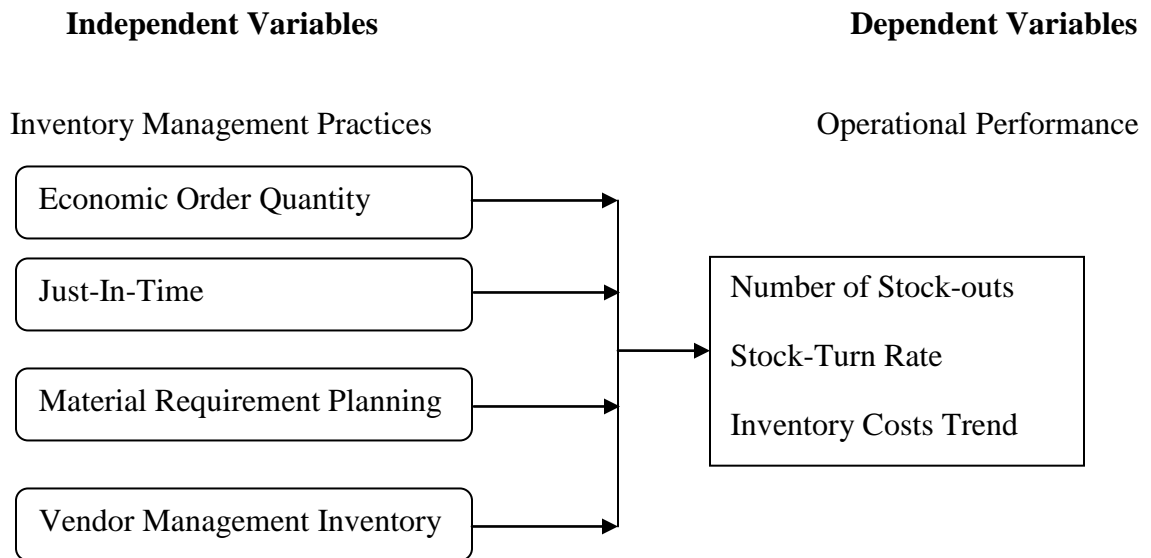
Author	Study	Methodology	Key Variables	Findings	Knowledge gap
Asiima (2012)	Inventory management practices and organizational performance	Descriptive survey, stratified random sample, and questionnaire	-Inventory management and organizational performance	High levels of uncontrolled stock and minimal maintenance of inventory practices	Disparity in Contextual setup and evaluation on organizational performance
Tungo (2014)	the influence of inventory management practices on organizational financial performance	Descriptive survey, ideal role taking technique, random sample, and questionnaire	Inventory management practices (influence) and organizational financial performance	Use of inventory practices but lacks supportive policies and drive	Disparity in Contextual setup and evaluation on organizational financial performance
Mensah (2015)	effects of inventory management practices on service delivery at St. Martin's Hospital	Descriptive survey, purposive and convenience sampling, and questionnaire	Inventory management practices (effects) and service delivery	Extensive utilization of VMI and use of the practice to create supplier partnership	Full Disparity in Contextual setup and focus on service delivery
Ngumi	effects of inventory management practices	Descriptive survey, stratified sampling,	inventory management practices (effects) and	Positive correlation and implementation	Inclined towards

(2015)	on large manufacturing firms' productivity	self-administered questionnaire	firm productivity	negligence	productivity
Gitau (2016)	Inventory management practices and organizational productivity in parastatals in Kenya	Descriptive research, census sampling and convenience sampling	Inventory management (practices) and organizational productivity	Correlation between the practices and overall handling costs	Focused on parastatals
Kinyanjui (2016)	Inventory management practices and performance of World Food Programme partners in Kenya	Descriptive research, census sampling random sampling and questionnaire	Inventory management practices and performance	Resourceful practices though many and some being passive	Focused on World Food Programme partners

Source: Research (2018)

2.6 Conceptual Framework

According to Mugenda and Mugenda (2003), a conceptual framework/model is built of variables which represent a characteristic measure that is subject to various attributes. These variables are sub-divided into independent and dependent ones. Kombo and Tromp (2006) assert that independent variables usually accommodate changes that influence on dependent variables. The variables involved here in this study are as depicted in figure 2.2 below.



Source: Research (2018)

Figure 2.2: Conceptual Framework

As illustrated in the above (figure 2.2), inventory management practices such as economic order quantity, just-in-time, material requirement planning and vendor management inventory captured as independent variables positively enhance operational performance by improving number of stock-out counts, stock-turn rate, inventory costs trend and return on investment captured as dependent variables.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methods that were used in conducting this study. It comprises of research design, study population, sampling technique and sample size, data collection method and data analysis techniques and procedure.

3.2 Research design

This study used a descriptive research design. The design is ideal for this study as it is used to answer the what, who/which and how of the involved variables. Descriptive design, according to Mugenda and Mugenda (2003), is most appropriate when seeking to find out about the phenomenon status.

3.3 Target Population

The study took a target population of 79 animal feeds manufacturing companies. Cooper and Schindler (2008) define target population as a collection of all elements about which reference is based upon. The entire target population for this study is based on appendix III-A which include subscribed members to the Association of Kenya Feeds Manufacturers (AKEFEMA). The 79 animal feeds manufacturers then form the sample frame.

3.4 Sample Size and Sampling Technique

Sampling technique is defined by Descombe (2014) as the criterion of sieving the population and selecting approachable subjects for purposes of studying and inferencing. Sampling technique is appropriate when it is not feasible to approach the entire

population that is characterized with some extent of homogeneity. This study used random selection and a 30% sampling technique recommended by Mugenda and Mugenda (2003). From the provided sample frame and sampling technique, this study used a sample size of 24 randomly selected animal feeds manufacturers.

3.5 Data Collection

This study used secondary and primary data. Collection of data was carried out using a questionnaire and study guide. Primary data was obtained by use of open and closed-ended questionnaire. In obtaining secondary data, operations and financial records were used. The questionnaire contained preliminary section, section A and B, with section A & B covering instituted practices and employee perception on the practices' involvement in operational performance. The study guide covered related operational measures and trends of each sample unit. Questionnaire administration was done via self-administration and drop-and-pick processes. Each company was served with one questionnaire.

3.6 Data Analysis

Obtained responses and data were coded and statistically analyzed. A non-parametric F-test at 0.05 significance level was performed on analysis tools accordingly. Analysis for study objectives was attained as indicated in table below.

Table 3.2: Objective Analysis Criteria

Objective	Data Collection Point	Data Analysis Type
To establish the inventory management practices used by animal feeds manufacturers	Section A of the questionnaire	Descriptive statistics
To establish the impact of inventory management practices on operational performance of animal feeds manufacturers	Section B of the questionnaire and Study Guide	Correlation and regression analysis

Source: Research, 2018

The regression model below was used;

$$Y = W_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \epsilon$$

Key:

Y = Operational Performance

W_0 = Intercept (Constant).

X_1 = Economic Order Quantity

$\beta_1 \dots \beta_4$ = Coefficient of variable $X_1 \dots X$

X_2 = Just-In-Time

X_3 = Material Requirement Planning

X_4 = Vendor Management Inventory

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

The chapter focuses the analysis and discussion of responses and findings obtained from the field. Data responses and findings exhibited quantitative features as well as qualitative ones. Standard deviation, frequencies, means and percentages were used to explain the responses pertaining the first objective. Correlation and regression analysis were used to explain the relationship among the variable in the effort to provide for the second objective. Conclusions and recommendations were made based on the analyzed data. This survey was carried out in Kenya Animal Feeds Industry.

4.2 Response Rate

From the 24 administered questionnaires, one (1) was not returned; accounting to 23 duly filled and reverted. The 23 gives a response rate of 95%. This response rate sufficient and excellent and conclusions made upon can be considered feasible. This justification on response rate is informed by Mugenda and Mugenda (2003) who argues that a response rate of 50%-59% is adequate, 60%-69% is good, 70%-79 is very good while 80% and above is rated as excellent. Appendix III-B shows a total of 23 respondents from Kenya Animal Feeds Industry who satisfied the criteria of sufficient feedback for this study.

4.3 Response Distribution

This section indicates the position hold by respondents in their respective company.

Table 4.1: Position held by the respondents

Position	Frequency	Valid Percent
Operations Manager	8	34.8
Clerk officer	7	30.4
operations Ass.Manager	5	21.7
Store officer	3	13.0
Total	23	100.0

Source: Research (2018)

From table 4.1, the number of operations manager interviewed were 8 (34.8%), Clerk officer were 7 (30.4%), operation assistant manager were 5 (21.7%) while store officer were 3 (13%). This is a clear indication that the data were obtained from qualified persons who were familiar with the industry operations.

4.4 Inventory Management Practices in Use

From the responses, it was established that inventory management practices play a very important role in the animal feeds industry. However, they are not used on equal proportions but on a varying statistic. This means that some are commonly and frequently used than others. Most of the practices are put into action towards stock control in retail operation management. The four practices under study were found to occupy inventory management systems as follows.

Table 4.2: Inventory Management Practices Used

Practices Variables	Freq.	Valid Percentage
Economic Order Quantity	17	26.6
Just-In-Time	18	28.1
Material Requirement Planning	14	21.9
Vendor Management Inventory	15	23.4
Total	64	100.0

Source: Research (2018)

From the responses on received from the respondents on inventory management practices used in their respective companies. 17 (26.6%) indicated economic Order Quantity as the major inventory management practices commonly used, 18 (28.1%) indicated just-In – Time, 14 (21.9%) indicated material requirement planning while 15 (23.4%) indicated Vendor Management Inventory. This clearly indicates that most of the Kenya Animal Feeds companies already adopted inventory management practices in their operations. It also indicates that increase in importance was attached to Just-In-Time, Economic Order Quantity, Vendor Management Inventory and Material Requirement Planning respectively.

4.5 Distribution of Inventory Management Practices

The respondents were also asked if the practices in table 4.3 cut across all the company branches. Responses were provided as table 4.3 depicts.

Table 4.3: Inventory Management Practices cutting across all company branches

Practices	N	Sum	Yes		No		Mean	Std. Deviation
			Frq	%	Frq	%		
Economic Order Quantity	23	23.00	23	100	0	0	1.000	.000
Vendor Management Inventory	23	25.00	21	91.3	2	8.7	1.087	.288
Just-In-Time	23	26.00	20	87	3	13	1.130	.344
Material Requirement Planning	23	30.00	16	69.6	7	8.7	1.304	.470
Overall Mean= 1.130								

Source: Research (2018)

Table 4.3 above illustrates the responses from respondents pertaining the question on if the Inventory Management Practices they are using in their respective companies cut across all company branches. 23 (100%) of the respondents agreed that Economic Order Quantity is a major inventory management and cost-oriented practices cutting across all the company branches at 1.00 degree mean and standard deviation of zero (0), 21 (91.3%) agreed that vendor Management Inventory cut across all the company branches with 1.08 mean and 0.288 as standard deviation. Two (2) of them, making 8.7%, indicated No, meaning that the vender management Inventory does not cut across all the company branches. 20 (87%) indicated Yes, that Just-In-Time inventory management practice cut across all the company branches at 1.13 as mean and 0.344 as standard

deviation while 3 (13%) indicated No, that Just-In-Time does not cut across all of their company branches. While 16 (69.6%) of the respondents indicated Yes, that Material Requirement Planning cut across all the company branches at a mean of 1.304 and standard deviation of 0.477, 7 (30.4%) indicated No, that Material Requirement Planning does not apply in all the company branches. This is a clear depiction that most of the Kenya Animal Feeds companies rolled out inventory management practices across all their branches.

4.6 Impact of Inventory Management Practices

Guided by the questions on establishing the impact of inventory management practices on operational performance of animal feeds manufacturers, the study's analyzed findings were as stipulated in table 4.4 below. This is anchored in the second objective. The variables of the objective were converted into statements for rating and respondents were required to rate the extent to which they agreed with them using Likert scale of 1 to 5 as follows: very great extent, great extent, Moderate extent, little extent and No extent for 5,4,3,2,1 respectively. The ratings were then analyzed to provide means and standard deviation.

Table 4.4: Involvement of Inventory Management Practices on Operational Performance

Variable linkage	N	Sum	Mean	Std. Deviation
Ordering of raw material from suppliers and stores replenishment are based on optimal ordering quantity policies	23	105.00	4.5652	.728
Order of manufacturing materials at factory level and store requirements from factory packing are based on clients' requirement mix	23	100.00	4.3478	.647
Stores and clients receive their orders within time specified in order sheet	23	98.00	4.2609	.619
There are systems put in place to ensure dedicated, proper, prioritized and timely integrated communication systems with suppliers	23	94.00	4.0870	.996
Overall Mean=4.316				

Source: Research (2018)

Responses were established from all respondents and analyzed accordingly. An overall mean of 4.316 was obtained, indicates that inventory management practices greatly influence Operation Performance to a greater extent. However majority indicated that ordering material from suppliers and store replenishment are based on optimal ordering quantity policies at a mean of 4.565 and 0.728 as standard deviation. Ordering of manufacturing materials at factory level and store requirements from factory packing are

based on clients requirement mix at a mean of 4.26 and standard deviation of 0.647. Responses for the third statement which indicates that stores and clients receive their orders within time specified in order sheet was established to have 4.261 as mean and 0.619 as standard deviation. Finally, responses on if there are systems put in place to ensure dedicated, proper, prioritized and timely communication integrated system with suppliers indicate a mean of 4.08 and 0.996 as standard deviation. This depicts that the use of economic order quantity, vendor management inventory, just-in-time and material requirement planning affect operational performance respectively in ascending order.

Table 4.5: Inventory Indicators

Variable linkage	N	Sum	Mean	Std. Deviation
Better production schedules, enough components available for manufacturing and better sales plans	23	103.00	4.478	.790
Better relationship with vendors, quality supplies on competitive and integrated vendor management system	23	101.00	4.391	.838
Minimum storage and shortage costs and low variable inventory costs	23	101.00	4.391	.838
Minimum (deliberate) inventory, zero defects, 100% on-time delivery and viewing huge inventory rather as a liability than asset-wise	23	98.00	4.261	.963
				Overall Mean=4.38

Source: Research (2018)

Respondents were also asked to rate the extent at which Inventory management practices is responsible for a number of performance indicators of the industries. It was established that the industry recorded better production schedules and also that there was enough components available for manufacturing and better sales plans at a mean of 4.478 (greater extent) and standard deviation of 0.79. The industry was also found to exhibit a better relationship with vendors hence quality supplies –this indicator predicts the use of competitive and integrated vendor management system at a mean of 4.3 (greater extent) and a standard deviation of 0.838. The study further revealed that the industry recorded minimum storage and shortage costs and low variable inventory costs at a mean of 4.391 (greater extent) and a standard deviation of 0.839. In addition, responses on the indicator about minimum inventory levels, zero defects, 100% on time delivery and viewing huge inventory rather as a liability than asset-wise indicated a mean of 4.261 (greater extent) and standard deviation of 0.963. Collating the responses together provides an understanding that the indicators are positive derivative of the inventory management practices.

4.7 Inferential Analysis

The following regression model was applied to measure variables in regard to Impact of Inventory Management Practices on Operation Performance of Kenya Animal Feeds Companies.

The regression model was as follows:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

X_1 = Economic Order Quantity

Y = Operation Performance

X_2 = Just-In-Time

β_0 = Constant Term

X_3 = Material Requirement Planning

β_1 = Beta coefficients

X_4 = Vendor Management Inventory

Table 4.6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.864	0.746	0.532	.401	.746	1.799	4	18	.161

Source: Research (2018)

a Predictors: (Constant), Material Requirement Planning, Economic Order Quantity, Vendor Management Inventory and Just In Time.

A correlation value of 0.864 was established. The values indicates a high relation between operational performance (dependent variable) and inventory management practices (independent variables). The relation is also supported by the coefficient of

determination which is valued of 0.746. The coefficient indicates that 74.6 % of the total observations are accounted by the regression line.

Table 4.7 ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.236	4	1.059	1.186	.001a
Residual	37.508	18	.893		
Total	41.745	22			

Source: Research (2018)

a Predictors: (Constant), Vendor Management Inventory, Economic Order Quantity, Material Requirement Planning, Just-In-Time.

b Dependent Variable: Operational performance

ANOVA analysis was used to establish the significance attached to usage of the regression model. The results indicate an f-significance value of $p < 0.001$. The value indicates that the regression model is highly effective in getting true results as it indicates a 0.001 chance (probability) of providing inappropriate prediction.

Table 4.8: Regression Coefficients

Practices	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.191	1.367		0.871	0.000
Economic Order Quantity	0.119	0.176	0.109	0.675	0.003
Just-In-Time	0.206	0.182	0.023	0.145	0.046
Material Requirement Planning	0.432	0.273	0.246	1.461	0.041
Vendor Management Inventory	0.372	0.246	0.256	1.601	0.057

Source: Research (2018)

b Dependent Variable: Operation performance

The following regression analysis was obtained:

$$Y = 1.191 + 0.119X_1 + 0.206X_2 + 0.432X_3 + 0.372X_4$$

Whereby Y is Operation Performance, X_1 is Economic Order Quantity, X_2 is Just-In-Time, X_3 is Material Requirement Planning and X_4 is Vendor Management Inventory. The model illustrates that assuming all variables are said to be zero (constant), the value of Operation Performance would be 1.191. However, when other values are kept constant and a unit increment on EOQ would lead to an increase of operations performance by

0.119. An increase of Just in time by one unit would lead to a 0.206 increment in operation performance. An additional unit increment in Material requirement would lead to an increase of operations performance by 0.432, while a unit increase in Vendor Management Inventory would lead to a 0.372 increment on operation performance. This suggests that Just-In-Time, Economic Order Quantity, Material Requirement and Vendor Management Inventory if employed in the organizations would all increase operational performance though at different rates. In addition, the study shows a significant relation between operation performance and Economic Order Quantity ($p=0.003$), Just in time ($p=0.046$) and Material Requirement planning ($P=0.041$).

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter represents a brief compilation of the entire report. It looks at the findings and discussion against objectives and synthesizes them into summary, conclusions and recommendations.

5.2 Summary of Findings

Data was collected, analyzed, discussed and presented based on the two specific objectives in section 1.4. Analysis of data was done using descriptive statistics and inferential statistics.

From the findings, the questionnaires that returned and found to have attained acceptance level were 23 out of 24, representing a response rate of 95.8%. The respondents were operation managers, assistant operation manager, clerk officer and store officer. The largest number of respondents was operation managers, clerk officers, assistant operations managers and store officers respectively.

The analysis from the finding revealed a significant level of embracement of each of the inventory management practices. Economic Order Quantity was the most embraced inventory management practices by most Industries, Secondly followed by Just-In-time.

Under the impact of inventory management practices, the study revealed that the practices have a great impact on ordering material from suppliers. It was also established that store replenishment is based on optimal ordering quantity policies. Ordering of manufacturing materials at factory level and store requirements from factory packing

were also found to be based on clients requirement mix. It was also established that stores and clients receive their orders within time as specified in product order sheets. Finally, it was established that most of the companies have integrated systems in place to ensure dedicated, proper, prioritized and timely communication with suppliers.

The study further revealed that Inventory management practices are responsible for the performance indicators of the industries at a greater extent. The study established that the industry recorded better production schedules and also that there was enough components available for manufacturing and better sales plans. It was also established that there exists a better relationship with vendors, hence the quality supplies. These show that most of the companies invest heavily on the integrated vendor management system. Findings also indicated that the industry operates at minimum storage and shortage costs and low variable inventory costs, all due to the investment in various inventory management practices.

Using a multiple regression model, the data obtained from the respondents was used to regress operational performance against the practices in inventory management. The analysis on the link between this two variables that deal with independent variable (inventory management) and dependent variable (operations performance). The linkage is based on a scientific statistic between inventory management practices and operational performance. The level of the relationship is at $P=0.01$, which is an extreme point of measure outcome. All of the four inventory management practices, were found to be positively related to operational performance. While the model was generally found to be significant; Economic Order Quantity, Just-In-Time, vendor management inventory and Material Requirement Planning were significantly related to operational performance

given a p-value less than 0.05. From the analysis, inventory management practices were regressed against operational performance as a whole. A 0.864 value of correlation was established showing a great relationship between independent variables and the dependent one. This is also confirmed by the 0.746 coefficient of determination. The 0.746 coefficient of determination can be interpreted that out of the total, the 74.6% was only able to be explained by the determination coefficient value, and this indicates that the regression line accounts for 74.6% of the total observations.

5.3 Conclusions

This research focused on determining the effects of inventory management practices on operational performance of Animal feeds Industries in Kenya. From the findings it was established that three out of four inventory management practices under observation which include Just-In-Time, Economic Order Quantity and Material Requirement Planning were the most embrace practices. But it does not mean vendor management inventory is not involved. These findings conform to that of Womack et al., (2003) who introduced the principle of lean production which was associated with reduced inventories. Womack et al. argues that inventory management requires use of focus practices and that any practice is valuable irrespective of its approach. They also argued that as a way of reducing storage fees, handling and waste, and improvement profit inventory must be managed. Another study that conforms herein is one by Eroglu and Hofer (2011) that shows that the relation between performance and inventory management is highly positive. In this case the Empirical Leanness Indicator (ELI) was used as a measure for inventory management. Eroglu and Hofer further argues that inventory leanness forms one of the most useful and best inventory management tool.

Thus means that inventory management practices have a positive impact on the operational performance of a firm. The study therefore confirms with the conclusions of Womack et al., and Eroglu and Hofer that the use of Inventory management practices goes a long way in informing performance.

5.4 Recommendations of the Study

Kenya animal feeds industry ought to embrace inventory management systems in a balanced manner. The imbalance observed from the 4.34 mean should be improved so that all the four practices can have the same weight. These practices include: Material requirement Planning system, Vendor Managed Inventory (VMI), Economic Order Quantity and Just-In-Time.

Having the highest mean among the four variables, Economic Order Quantity was observed to a great effect on operational performance of animal feeds industries. As an example of how the practices enhance operational performance, EOQ should be used as a guide and rather as a reference point towards making sure that the entire supply chain is inventory conscious. To attain this, the study recommends that regulations be put in place to ensure that every player in the industry incorporates inventory management practices. This argument is based on the level to which the practices explain the operational performance outcome; that shows a gap that might be due to external influence.

In addition to external influence, internal deterministic factor such as readiness to make use of the practices, prices of products, on-practice intensive training and flexibility to overrides equally determine operational performance. Therefore their observation should

also be tied along with the practices. Effecting such approach will ensure multidimensional approach to inventory management and operational performance.

5.5 Limitations of Study

Limitations of the study include: Firstly, in spite of more inventory management practices existing this study managed to look at four of them. Therefore the approach is limited to four practices. From the available pool of practices, the numbers of variable might be increased. Secondly, the research study only focused on Animal feeds manufacturers thus making the research vague for such a broad industry. The remaining part of the supply chain equally contributes to the overall operational performance of these manufacturers.

5.6 Suggestion for Further Studies

Suggestion for further studies can be drawn from the limitations in section 5.5 which provides two broad dimensions. First a study involving more practices should be carried out so as to determine the influence of the other minor practices. This is based on the argument that all practices whether minor or major affect inventory outcomes and operational performance. The second suggestion is that a study should be carried out on the entire animal feeds supply chain, from the supplier to the consumers. Such a study will help apportion the source of operational performance in the most appropriate manner and even help identifying areas of inventory weakness along the supply chain.

REFERENCES

- Akefema (2016). Akefema News, Association of Kenya Feed Manufacturer. *Akefema News Issue* (3).
- Animal Feed Situation Report (2014). Assessment of Commodity and Issues Made by USDA Staff and not Necessarily Statements of Official U.S. Government Policy. Gain Report, USDA Foreign Agricultural Service.
- Asiima, D. (2012). The Inventory Management Practices and Organizational Performance: A Case Study of Taso Mbarara. *Unpublished Bachelors Research Project*, STUART University.
- Barney, J. (1991). Firm resources and sustained competitive advantage, *Journal of Management*, 17, pp. 99-120.
- Barney, J., B. (1986). Organizational Culture: Can it be a Source of Competitive Advantage? *Academy of Management Review* 11 (3): pp. 656-665.
- Barney, J., B. (1997). *Gaining and Sustaining Competitive Advantage*. Reading, MA, 1st Edition, Addison-Wesley.
- Barney, J., B. (2002). *Gaining and Sustaining Competitive Advantage*. Reading, MA, 2st Edition, Upper Saddle River, NJ: Prentice Hall.
- Bicheno, J. (1996). *Supplier partnerships*. London: National Institute for Manufacturing Management.

- Brownell, J. (2005). Strengthening the Purchase Supplier Partnership, a Working Paper Cornell University.
- Burcher, P. (2015). Material requirements planning. Wiley Encyclopedia of Management.
- Chianu, J., N., Vanlauwe, B., Mahasi, J., M., Katungi, E., Aketch, C., Mairura, F.S., Chianu, Justina, N., and Sanginga, N. (2008). Soybean Situation and Outlook Analysis; the Case of Kenya. *TSBF-CIAT, AFNET*. pp. 68.
- Christopher, M. (2016). Logistics & supply chain management. Pearson UK.
- Closs, D. J., & Bowersox, D. J. (2010). Supply chain Logistics management.
- De Loecker, J. & Van Biesebroeck, J. (2015). Effect of International Competition on Firm Productivity and Market Power, *Manuscript prepared for The Oxford Handbook of Productivity Analysis*.
- Dimitrios, P. (2008). The effect of inventory management on firm performance, *International Journal of Productivity and Performance Management*, 57 (5).
- Disney, S. M., & Towill, D. R. (2003). Vendor-managed inventory and bullwhip reduction in a two-level supply chain. *International journal of operations & production Management*, 23(6), pp. 625-651.
- Drexl, A., & Kimms, A. (2013). Beyond Manufacturing Resource Planning (MRP II): advanced models and methods for production planning. Springer Science & Business Media.
- Drury, C. M. (2013). Management and cost accounting. Springer.

- Frahm, S. (2003). Vendor Managed Inventory (VMI): Three Steps in Making it Work, <http://scm.ncsu.edu/scm-articles/article/vendor-managed-Inventory-vmi-three-steps-in-making-it-work>.
- GAIN Report (2015). *Grain and Feed Annual. Assessment of Commodity and Issues Made by USDA Staff and not Necessarily Statements of Official U.S. Government Policy*. Gain Report, USDA Foreign Agricultural Service.
- Ghoshal, S. & Moran, P. (1996). Bad for Practice: A Critique of the Transaction Cost Theory. *Academy of Management Review*, 21(1): pp. 13–47.
- Gitau, N., N. (2016). The Effects of Inventory Management Practices on Operational Performance of Warehousing Firms in Mombasa County. *Unpublished MBA Research Project*, University of Nairobi.
- Gregory, I., C. & Rawling, S., B. (2016). Profit from time: speed up business improvement by implementing time compression. Springer.
- Halldorsson, A., Kotzab, H., Mikkola, J., H. & Skjoett-Larsen, T. (2007), Complementary theories to supply chain management, *Supply Chain Management: An International Journal*, Vol. 12, No. 4, pp. 284-296.
- Herrero, M. & Thornton, P., K. (2013). Livestock and Global Change: Emerging Issues for Sustainable Food Systems. *PNAS* 110(52):20878-20881.
- Herrero, M., Grace, D., Njuki, J., Johnson, N., Enahoro, D., Silvestri, S., & Rufino, M., C. (2013). The roles of livestock in developing countries. *Animal*, 7(s1), pp. 3-18.

- Hervani, A. A., Helms, M. M., & Sarkis, J. (2005). Performance measurement for green supply chain management. *Benchmarking: An international journal*, 12(4), pp. 330-353.
- Huo, J., Duan, Y., Li, G. & Tien, J., M. (2012). Inventory Models for Perishable Items with Inventory Level Dependent Demand Rate. *Applied Mathematical Modelling*, 36(10), pp. 5015-5028.
- Inkpen, A., & Ramaswamy, K. (2005). *Global strategy: creating and sustaining advantage across borders*. Oxford University Press.
- Inyo, D., N. (2013). *Service Quality and Operational Performance of Tour Operators in Kenya. Unpublished MBA Research Project*, University of Nairobi.
- Jacobs, F., R., Berry, W., L., Whybark, D., C. & Vollmann, T., E. (2011). *Manufacturing planning and control for supply chain management*. New York: McGraw.
- Jonas, N., Vanlauwe, B., Mahasi, J. M., Katungi, E., Akech, C., Mairura, F. S., & Sanginga, N. (2008). Soybean situation and outlook analysis: the case of Kenya. TSBF-CIAT, AFNET, pp. 68.
- Jonsson, P. & Mattson, S. (2010). Inventory Management Practices and Their Impacts on Perceived Planning Performance. *International Journal of Production Research*. Taylor & Francis, 2008, 46 (07), pp. 1787-1812.
- Kamau, M., N. & Bosire, D. (2015). Assessment of Factors Influencing Financial Performance of Animal Feed Manufacturing Firms in Nakuru Town, Kenya. *International Journal of Economics, Commerce and Management*, 3 (11), pp. 1237-1255.

- Kamau, S., M. (2016). Performance Measurement Practices and Operational Performance of Manufacturing Firms in Kenya. *Unpublished MBA Research Project*, University of Nairobi.
- Karanja, A. M. (2003). The dairy industry in Kenya: The post-liberalization agenda. Tegemeo Institute of Agricultural Policy and Development, Egerton University, Kenya, 60.
- Karuri, J. (2010): Overview of Kenyan Feedstuff Industry. Challenges and the Way Forward. Association of Kenya Feed Manufacturers, Vol. 2, pp. 3
- Kihara, R. W. (2015). Levels of Aflatoxins in Flour Ingredients From Micro, Small And Medium Enterprises In Nairobi County And The Effect On Feeding Rats (Doctoral Dissertation, University of Nairobi).
- Kimaiyo, K., K. & Ochiri, G. (2014). Role of Inventory Management on Performance of Manufacturing Firms in Kenya – A case of new Kenya Cooperative Creameries. *European Journal of Business Management*, 2 (1), pp. 336-341.
- Kimaku, P.M. (2010). Change management practices adopted by Barclays Bank of Kenya limited. *Unpublished MBA Research Project*, University of Nairobi.
- Kingori, A. M., Wachira, A. M., & Tuitoek, J. K. (2010). Indigenous chicken production in Kenya: a review. *International Journal of Poultry Science*, Vol. 9(4), pp. 309-316.
- Kinyanjui, M., W. (2016). Inventory Management Practices and Performance of World Food Programme Partners in Kenya. *Unpublished MBA Research Project*, University of Nairobi.

- Kinyua, M., D. (2016). Inventory Management Practices and Performance of Consumer Manufacturing Firms in Nairobi. *Unpublished MBA Research Project*, University of Nairobi.
- Kivite, J., M. (2015). Supplier Development and Operational Performance of Manufacturing Firms in Nairobi City County. *Unpublished MBA Research Project*, University of Nairobi.
- Kombo, K., D. & Tromp, L., A., D. (2006). *Proposal and Thesis Writing: An Introduction*. Nairobi: Pauline Publications Africa.
- Lwiki, T., Ojera, P., B., Mugenda, N. & Wachira, V. (2013). The impact of Inventory Management Practices on Financial Performance of Sugar Manufacturing Firms in Kenya. *International Journal of Business, Humanities and Technology*, Vol. 3 (5), pp. 75-85.
- Mensah, O. (2015). The Effect of Inventory Management Practices on Service Delivery at St. Martin's Hospital, Agroyesum, Amansie-West. *Unpublished MBA Research Project*, KNUST School of Business.
- Mugenda, O., M. & Mugenda, A., G. (2003). *Research methods: quantitative and qualitative approaches*. Nairobi: Acts Press.
- Munyori, J., W., Ofunya, F., A & Ithinji, G., K. (2014). Factors Affecting the Size of Animal Fees Manufacturing Firms in Nyeri and Kiambu Counties. *European Journal of Business and Social Sciences*, Vol. 3(3), pp. 249–264.

- Mwangi, W. & Thogori, M. N. (2015). The Role of Inventory Management on Performance of Food Processing Companies: A Case Study of Crown Foods Limited Kenya. *European Journal of Business and Social Sciences*, Vol. 4(4), pp. 64 – 78.
- Ngumi, F., N. (2015). Inventory Management Practices and Productivity of Large Manufacturing Firms in Nairobi, Kenya. *Unpublished MBA Research Project*, University of Nairobi.
- Nsikan, Etim, J. J., & Ime, T. U. (2015). Inventory Management Practices and Operational Performance of Flour Milling Firms in Lagos, Nigeria. *International Journal of Supply and Operations Management*, Vol. 1(4), pp. 392.
- Nyauncho, R., M. (2016). Supply Chain Analytics and Operational Performance of Cement Manufacturing Firms in Kenya. *Unpublished MBA Research Project*, University of Nairobi.
- O'Brian, W., J., Formosa, C., T., Vrijhoef, R. and London, K., A. (2009). *Construction Supply Chain Management Handbook*. Boca Raton: CRC Press.
- Oballah, D., Waiganjo, E. & Wachiuri, E., W. (2015). Effects of Inventory Management Practices on Organizational Performance in Public Health Institutions in Kenya: A Case Study of Kenyatta National Hospital. *International Journal of Education and Research*, Vol. 3(3), pp. 703-714.
- Ogbo, A., I. (2014). *Production and Operations Management*. Enugu, De-verge Agencies Ltd.

- Onyango, R., A. (2017). Inventory Management Practices and Supply Chain Performance of Fast Moving Goods Manufacturers in Nairobi. *Unpublished MBA Research Project*, University of Nairobi.
- Owiny, B., O. (2016). Impact of Lean Manufacturing Practices and Operational Performance of Beer Brewing Process: A Case Study of Keya Breweries Limited. *Unpublished MBA Research Project*, University of Nairobi.
- Porter, M. E. (2008). *Competitive Advantage: Creating and Sustaining Superior Performance*. Simon and Schuster.
- Rajeev, N. (2008). *An Evaluation of Inventory Management and Performance in Indian Machine Tool SMEs: An Exploratory Study*, 4th IEEE International Conference on Management of Innovation and Technology, 2008. ICMIT 2008, 21 -24 Sept. 2008, Bangkok, Thailand, pp. 1412-1417.
- Ross, D. F. (2015). *Managing Supply Chain Inventories*. In *Distribution Planning and Control*. Springer U, pp. 309-356
- Rumelt, R. (1984). Toward a strategic theory of the firm. *Competitive Strategic Management*, Lamb R. (Ed.). Prentice-Hall: Englewood Cliffs, NJ, pp. 556-570.
- Salem, H. (2003). *Organizational performance Management and measurement: The Lebanese Experience*, Economic and social commission of Western Asia, United Nations Department of Economic and social affairs.

- Stevenson, W. J., & Hojati, M. (2007). *Operations management* (Vol. 8). Boston: McGraw-Hill/Irwin.
- Suresh, N., C. & Kay, J., M. (2012). *Group technology and cellular manufacturing: a state-of-the-art synthesis of research and practice*. Springer Science & Business Media.
- Tungo, E., M. (2014). *The Influence of Inventory Management Practices on Organizational Financial Performance: Case study: National Microfinance Bank Headquarters Dar es Salaam. Unpublished MBA Research Project, Mzumbe University.*
- Umble, E., J. & Haft, R., R. (2003). Enterprise resource planning: Implementation procedures and critical success factors. *European journal of operational research*, Vol. 146(2), pp. 241-257.
- Vigtil, A. (2007). Information Exchange in Vendor Managed Inventory. *International Journal of Physical Distribution & Logistics Management*, Vol. 37(2), pp. 131-147.
- Wachira, J. M. (2013). *Relationship between Employee Engagement and Commitment in Barclays Bank of Kenya. Unpublished MBA Research Project, University of Nairobi.*
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, Vol. 5(2), pp. 171–180.
- Williamson (1981). The market for corporate control: The scientific evidence. *Journal of Financial economics*, Vol. 11(1), pp. 5-50.

- Williamson, O. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications*, New York, Free Press
- Wisner, J., D., Tan, K., C., & Leong, G., K. (2014). *Principles of supply chain management: balanced approach*. Cengage Learning.
- Zairi, M. (2012). *Measuring performance for business results*. Springer Science & Business Media.
- Gazo, R. (2007). Best manufacturing practices and their linkage to top performing companies in the US furniture industry, *Benchmarking*, 14(2), pp. 211-221.
- Beamon, B., M. & Kotleba, S., A. (2006). Inventory Modelling for Complex Emergencies in Humanitarian Relief Operations. *International Journal of Logistics: Research and Applications*, Vol. 9, pp. 1-18.
- Onyango, M., S. (2016). *Inventory Management Practices and Service Delivery in Health Humanitarian Organizations in Kenya*. *Unpublished MBA Research Project*, University of Nairobi.
- Pong & Mitchell. (2012). Inventory investment & control: How have UK companies been doing? *British Accounting Review*, pp. 173–188.