INVENTORY MANAGEMENT IN KSE LIMITED, IRINJALAKUDA

by

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(2016-31-020)

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COLEGE OF CO-OPERATION BANKING AND MANAGEMENT

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2018

DECLARATION

DECLARATION

I, hereby declare that this project report entitled **"INVENTORY MANAGEMENT IN KSE LIMITED, IRINJALAKUDA"** is a bonafide record of research work done by me during the course of project work and that it has not previously formed the basis for the award to me for any degree, diploma, associateship, fellowship or other similar title, of any other University or society.

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CERTIFICATE

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Certified that this project report entitled **"INVENTORY MANAGEMENT IN KSE LIMITED, IRINJALAKUDA"** is a record of project work done independently by **Ms. Swathi Francis** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship or other similar title to her.

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. SWATHI FRANCIS (Reg No 2016-31-020)** 4th Semester **MBA (ABM)** student of **COLLEGE OF CO-OPERATION, BANKING & MANAGEMENT, KERALA AGRICULTURAL UNIVERSITY, VELLANIKKARA** has successfully completed Project work on **"Inventory Management in KSE Limited"** during the period **from 13.08.2018 to 17.10.2018** as part of the curriculum. She was found to be sincere and enthusiastic in collecting various information and data required for the project work. We wish all success in her future endeavors.

KSE LIMITED KERALA PIN-680121 IRINJALAKUDA

For **KSE** Limited

M.D Johny
Chief Personnel Manager

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Swathi Francis

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DESIGN OF THE STUDY

1.1 Introduction:

Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory. This process usually involves controlling the transfer of units in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of the company into jeopardy. In any business or organization, all functions are interlinked and connected to each other and are often overlapping. Inventory management is a very important function that determines the health of the supply chain as well as the impacts the financial health of the balance sheet. Every organization constantly strives to maintain optimum inventory to be able to meet its requirements and avoid over or under inventory that can impact the financial figures.

Inventories constitute most significant part of assets of large majority of the companies in India. Inventory a double edged sword is usually an asset of an organization, if not used properly it will become liability. It is therefore absolutely very important to manage inventories efficiently and effectively in order to overcome unnecessary investment. The large size of inventories maintained by firms, a considerable amount of funds is required to be committed to them.

The success of a business concern largely depends upon efficient purchasing, storage and consumption of inventory. Uncontrolled inventories are dangerous and at times it is called the graveyard of business. The Inventory Management System and the Inventory Control Process provides information to efficiently manage the flow of materials, effectively utilize people and equipment, coordinate internal activities and communicate with customers. Inventory management and the activities of Inventory Control do not make decisions or manage operations; they provide the information to managers who make more accurate and timely decisions to manage their operations of inventory management is always to strike a balance amongst the contending specifications for attaining ideal inventory ranges. Because the process is continuous, it demands a shift from business wants. So inventory control system should be designed to ensure the provision of the required quantity of materials, of the required quality at the required time to meet the needs of production and sales.

In short, profitability depends largely on the efficient management of inventory control system. The organization selected for the purpose of the study is the KSE Ltd, Irinjalakuda. It is the largest manufacturer of compound cattle feed in private sector. The last three decades have seen KSE emerging as a leader in solvent extraction and ready mixed cattle feed in India.

1.2 Statement of the problem

Inventory management involves the management of stock. The aim of inventory management is to prevent stock outs and have smooth flow of goods. The stock can be classified as working stock; demand based safety/buffer stock; allowing to absorb unexpected fluctuation in demand, speculative stock; anticipates problems with in the supply channel. When dealing with stock all of these come into play. Efficient management of inventory is considered to be one of the challenging problems of any manufacturing unit. A firm neglecting the management of inventories will be jeopardizing its long run profitability and may fail ultimately. It is possible for a company to reduce its levels of inventories to a considerable degree without any adverse effect on production and sales, by using simple inventory planning and control techniques. The reduction in excessive inventory carries a favorable impact on a company's profitability.

Hence an attempt was made to study the Inventory management system of KSE Ltd, Irinjalakuda. Efforts were made to analyse the efficiency of Inventory management system of the company by computing relevant ratios, and comparing the relevant indicators with the data available in the company.

1.3 Objectives

- To study the Inventory management system in KSE Ltd, Irinjalakuda.
- To analyse the efficiency of the inventory management in KSE Ltd.

1.4 Methodology:

1.4.1 Organisation of study: The project was carried out in KSE Ltd, Irinjalakuda.

1.4.2 Period of the study: The study was conducted for the period of 10 years from 2008-09 to 2017-18.

1.4.3 Data collection: The study is based on both primary and secondary data.

a) Primary data: The primary information regarding the inventory management practices of the company has been collected from the officials through an unstructured interview schedule.

b) Secondary data: Data regarding the raw materials, stores, spares and finished goods and their stock value were obtained from the books of accounts of the company. Secondary data regarding the financial parameters was collected from the annual reports and schedules to the accounts of the company for the periods from 2008-09 to 2017-18. Figures of KSE Ltd. were compared with those of Godrej Agrovet Ltd., one of the leading cattle feed company in India.

1.5 Variables:

The purchase procedure, vendor evaluation, receipts and storage of inventory, classification of inventory, issue system of inventory, inventory management techniques and related aspects have been studied as part of the first objective of the study. The efficiency of the inventory management system of KSE Ltd is analysed through computation of ratios and comparing with other company.

Compound growth rate and percentage was also used for drawing inferences from the collected for the study.

1.6 Tools used: The tools used for the study are ratio analysis, percentage analysis and correlation.

- The ratios include:

- Overall inventory turnover ratio

- Overall inventory holding period

- Raw material inventory turnover ratio

- Raw material holding period

- Finished goods inventory turnover ratio

- Finished goods holding period

- Inventory to total assets ratio

- Inventory to working capital ratio

- Inventory to capital employed

- The percentage analysis includes: Growth of inventory
- Correlation includes: correlation between inventory and sales.

1.7 Scope of the study

The study is conducted in KSE Ltd. The study was mainly focused on the inventory management system. Inventory is always dynamic. Inventory management requires constant and careful evaluation of all factors and control through planning and review. The study was limited

to the present inventory management system of KSE Ltd. and assessment of the efficiency of the system through ratio analysis and its comparison with the Godrej Agrovet Ltd.

1.8 Limitation

- The company was reluctant to reveal some of its official documents and reports which are kept confidential.
- Comparison was made with a convenient company, as industry average data was not available.

1.9 Chapter scheme

Chapter I: Design of the study

Chapter II: Literature review

Chapter III: Conceptual framework

Chapter IV: Industry profile & Company profile

Chapter V: Analysis and interpretation

Chapter VI: Summery of findings, suggestion and conclusion

Chapter II

REVIEW OF LITERATURE

CHAPTER II

Review of literature

In the following few paragraphs, an attempt is made to analyse some of the relevant studies made so far in the field of Inventory Management.

Chadda(1964) has dealt with the inventory management practices in Indian companies and has suggested the application of modern scientific inventory control techniques like operations research for the advantage of companies.

Bansal(1976) in his study on Materials Management: A case Study of Bharat Heavy Electricals Limited, Bhopal Unit, (BHEL), has evaluated the existing systems of inventory management. He emphasizes the need for automatic replenishment system in the undertaking offer studying the application of ABC analysis and EOQ technique of inventory control. He also points out the accumulation of surplus stores and non-moving items in the organization and recommends that the surplus and absolute stores which are no longer required should be disposed of as early as possible at the best available price. Further, he suggests the preparation of monthly class wise statements on inventories for effective control over them and the introduction of reconciliation system of stores ledgers with account ledgers to avoid misappropriation of stores, and spares for production and operation are above their actual consumption level. The inventories in general are found to be above their routine requirements. The holdings of stores and spares corresponding to two to three year's requirements should be considered excess.

According to Anil (1978), different departments of an enterprise hold varying views regarding inventory keeping which are often found in conflict with each other. The financial manager justifies limited inventory stocks, because for him, inventory represents tied up capital, which does not earn interest. The production manager on the other hand encourages the maintenance of liberal inventory stocks to safeguard from stocks outs in the face of fluctuating demands and uncertain deliveries. The marketing executive prefers to have reserves of the finished goods inventory. Product designers are interested in getting an inventory, which make up the products with maximum possible accuracy.

Ram Prakash (1979), in his study, incorporates the pattern of inventories of eleven Central Government undertakings engaged in the production of chemical fertilizers, pharmaceuticals and cement. Six tests were applied and these related to inventory turnover ratio, trends in investment of inventories, comparison of level of holding with similar undertakings, regression analysis, analysis of growth rates and corroborative evidence from in depth study at micro level. The study has revealed that the undertakings have taken advantage of economies of scale in holding of inventories, but these were not so significant. As a result, they held about 55 percent of excess stocks as compared to inventories required under ideal conditions. The study showed that a reduction of 25 percent of stock is within easy reach of management through modern inventory techniques. This will release nearly Rs.50 crores of capital for active use apart from saving 10 to 15 percent of carrying cost of stocks.

Lal (1981) while studying the inventory problems of Modi Steels has pointed out that the current practice of inventory management is that the price variable is not taken into account in inventory decision making and all the existing inventory models are based on this practice. He has developed a model, which takes into account the price variable also. He has concluded that a well worked out inventory policy must take care of number of variables both endogenous and exogenous and help management to decide the largest economic order quantity at the most appropriate time.

Narayan (1982) notes that inventories cost good deal by way of interest charges, cost of storage and handling, deterioration and obsolescence costs. Even on conservative estimate, he points out the cost of carrying inventory is estimated at 15 percent of the cost of acquisition per annum. To the extent there are excessive inventories, the cost of production as well as the profitability of a concern is adversely affected.

Ram Prakesh (1982) while examining the inventory usage pattern and unused inventory levels in Central Government medium and light engineering enterprises with the help of various inventory usage models has revealed the dimension of excess inventory holding and the degree of capital lock up. During the period under study the value of produce and the total inventories respectively has grown at 22.19 percent and 18.23 percent. Experience has shown that a reduction of about 20-25 percent of stocks is within easy reach of management through modern inventory

techniques. Even with this standard Rs.70-90 crores of capital can be released for active use apart from saving 10-15 percent of the annual carrying costs of stocks.

Rajeswara Rao (1985) thoroughly examined the managerial aspects of inventories, receivables and advances and cash of certain Central Public Enterprises in India. The study has revealed that inventory formed a major proportion of total current assets investment which recorded 63 per cent in 1976-77 in the public sector. The inventory of finished goods proportion has been increasing year after year.

The case studies of five centrally owned public enterprises functioning in Rajasthan by Swami (1987) covers the various aspects of material management in the enterprise from 1977-78 to 1981-82. It reveals that the inventory represented more than 61 per cent of the total current assets of the concerns. At the same time inventories stood more than 108 per cent of the net working capital of the undertakings taken together. Moreover, the rate of growth of the inventory in the selected enterprise has been very high. Swami was concluded that the existing system of materials management in public undertakings in Rajasthan is not satisfactory and needs improvements in all direction without delay.

Rao(1990) evaluates the management of working capital and degree of efficiency of managing inventories in the manufacturing undertakings of Andhra Pradesh public sector. The analysis of the structure of inventory reveals that there was overstocking with regards to each and every component of inventory in the undertakings selected for study. However the extent of overstocking was more in the case of raw materials and stores and spares than with regard to the other categories of inventory in the undertakings. Measured in terms of months value of raw material inventory varied between two and five months consumption in most of the companies which is considered to be high. It was concluded that the lack of effective system of raw materials inventory control has resulted in excess carrying of inventory items.

Mohan Reddy (1991) concluded that inventory formed the major chunk of current assets of the sample private sector enterprises studied. Bigger enterprises in the private sector carried the larger inventories as compared to the smaller ones. Inventory turnover ratios of all the units recorded improvement over the period under reference. Besides, an analysis of output inventory

and inventory turnover ratios had shown that none of the private sector units had carried on inventory unduly in the aggregate.

A study by Aggarwal (1993) identifies the modern and scientific techniques of inventory management applied to control and reduce the costs in Fertiliser Corporation of India Limited over the period 1979-80 to 1989-90. The study reveals that inventories must be managed efficiently to minimize the investment in current assets as inventory management has significant influence on the profitability of industrial enterprises through keeping down capital investment in inventory and by reducing inventories carrying cost and minimizing idle time caused by the storage of raw materials and stores. A higher volume of inventory may affect economies of production and purchasing and may incur the public enterprises various avoidable costs leading to wastage of scarce funds which might be requires for the operation of the enterprise or for other essential development Programmes. Proper management of inventory therefore assumes considerable importance from the point of view of proper functioning of a public enterprise.

Sambasiva Rao. K(2002) reveals in the study on Materials Management in Public Sector Ship Building Industry evaluates. The performance of materials management and identifies some problems faced by materials management in the heavy engineering industry. The method of investigation involves the documentary evidence and survey of expert opinion. He evaluates the existing purchase systems and lead time involved in procurement of materials and suggests that the long lead time should be reduced. His study points at the excess inventory in terms of number of months cost of production in all the engineering units. He also highlights some of the problems in the area of materials management such as delay on the part of customers in supplying their own materials, existence and disposal of surplus and non-moving items, excessive lead times and excessive dependence on imports. According to him the administrative and procurement lead times of the company are on the higher side due to the peculiar nature of the industry. He suggests liberalized purchase procedures, increased financial powers to the personnel, Opening up of liaison offices in various countries to reduce the lead time.

Phaniswara Raju(2006) has conducted a research study on materials management in Andhra Pradesh State Road Transport Corporation (APSRTC). In his study, he examines the materials management practices and purchasing systems in APSRTC on the basis of various parameters like material consumption per vehicle, material consumption per kilometer, inventory per

vehicle, inventory in terms of number of month's consumption etc. He highlights some major problems in the procurement of materials. The study is primarily based on the secondary data collected from the published annual reports of APSRTC, the records of MIS, the reports on performance of National Road Transport Undertakings of CIRT, Pune etc., In addition to the personal discussions held with various officials of the corporation. The study reveals the increasing levels of materials consumption in APSRTC as compared to other undertakings. The study points to the absence of the use of important analytical techniques like value analysis and network techniques in the purchasing system of APSRTC.

Alexander Mandel (2012) This paper addresses the problem of multi-item inventory control under uncertainty and nonstationary. Under uncertainty and in the absence of credible data on statistics of the demand the real-life management of a multi-item inventory must rely on a multi-stage procedure outlined in the paper. At the first stage trends are identified that incorporate seasonal components of the demand and at later stages a deterministic problem of inventory control is solved. At subsequent stages a solution is analyzed of obtaining additional orders aimed at replenishing stores (safety stocks) in order to offset random deflections of the demand from the trends identified.

F. De Felice et al., (2014) reveals in the study that the success parameters for any company are on time completion, within specific budget and with requisite performance. In particular an efficient and effective inventory management helps a firm maintaining competitive advantage, especially in a time of accelerating globalization. From this point of view several organizations employ the ABC analysis to have an efficient control on a large number of inventory items. With the increasing levels of integration in manufacturing and service systems conventional ABC analysis is limited because it accounts for only one criterion, mostly ''annual dollar usage'', for classifying inventory items. To alleviate this shortcoming, this paper proposes a modified version of ABC analysis and Cross Analysis based on Analytic Network Process, a multicriteria approach that allows considering several criteria all at once for the optimal choice of materials management.

Ogbo,ANN I., Onekanma ifeyinwa Victoria and Wilfred l.Ukpere (2014) states in their study on the relationship between effective system of inventory management and organization performance in the seven-up bottling company, Nile Mile Enugu. The result of the analysis

showed that flexibility in inventory control management is an important approach to achieving organizational performance. It was found that organizations benefits from inventory control management by way of easy storage and retrieval of material, improved sales effectiveness and reduced operational cost. The study also found that there is a relationship between operational feasibility, utility of inventory control management in the customer related issues of the organization and cost effectiveness technique are implemented to enhance the return on investment in the organization. Effective inventory control management is recognized as one of the areas management of any organization should acquire capability. It is recommended that organizations should adopt the inventory keeping method that best suit their operations.

Naliaka V.W. & G.S. Namusonge (2015) conducts a study assessed the extent to which information technology is used in inventory management in Unga Group Limited, determine how inventory lead time, inventory control and inventory control practices affect competitive advantage of Unga group limited. The study revealed that information technology, inventory control systems, inventory lead time and inventory control practices are important factors in attainment of competitive advantage of manufacturing firms in Kenya. The study recommended that the firm should embrace inventory control systems and information technology so as to improve and enhance competitive advantage. This study also recommended a similar research on other industries to ascertain whether the findings of the study are universal.

Seungjae Shin, Kevin L. Ennis and W. Paul Spurlin (2015) from Mississippi State University states that while manufacturing firms pursue efficient inventory management, there is limited evidence of improved financial performance related to inventory management practices. This paper examines financial statement data for U.S. manufacturing firms to explore the relationship between inventory management efficiency and firm profitability. The results show that a lower ratio of inventory to sales for a firm is associated with higher profit margin for the firm. In addition, small size firms can receive a larger benefit (as measured by profitability) from increased inventory efficiency when compared to medium and large size firms.

M.G. Matsebatlela and K. Mpofu (2015) in their study they found that there is a problem of excessive inventory in a Manufacturing Company, situated in South Africa. In this study an Inventory Management Framework (IMF) was developed. Quantitative content analysis was used to collect data. Statistical tools were used to select the fiscal year with the vast data

variation for data analysis for this study. The results reveal that uncertainties and lot sizing inventory results in excessive inventory and not having a collaborated and integrated Supply chain Management also results in a mismatch of supply and Demand. IMF is proposed in this paper to minimize the impact of the mismatch.

Serhii Ziukov (2015) states in his article that inventories are raw materials, work-in-process goods and completely finished goods that are considered to be the portion of business's assets that are ready or will be ready for sale. Formulating a suitable inventory model is one of the major concerns for an industry. The earliest scientific inventory management researches date back to the second decade of the past century, but the interest in this scientific area is still great. Again considering the reliability of any process is an important feature in the research activities. Values of some factors are very hard to define or almost unreal. In such cases, fuzzy models of inventory management take an important place. This paper analyzes possible parameters of existing models of inventory control. An attempt is made to provide an up-to-date review of existing literature, concentrating on descriptions of the characteristics and types of inventory control models that have been developed.

Jiyas P A et.al. (2015) present a paper on how industry is currently managing the flow of raw materials. And Understanding the techniques and data measurements to meet the actual demand and thereby satisfying the customer requirements. Study on the techniques that can be adopted by the company to come over the present crisis of shortage of products and customer dissatisfaction. The techniques like forecasting demand with the available data of previous year actual demand would be suggested to provide protection against uncertainty. The application of the proposed method in an industry and conducting a comparison based on cost for studying the advantages of proposed method with that of the existing method followed by the company.

P. Sivasankaran (2016) in his article reveals that in any business or organization, all functions area unit interlinked and connected to every alternative and area unit usually overlapping. Some key aspects like offer chain management, supplying and inventory kind the backbone of the business delivery operate. Thus these function area unit very vital to promoting managers still as finance controllers. Inventory management is that to apply overseeing and dominant of the ordering, storage and use of parts that a corporation uses within the production of the things it

sells. Inventory management is additionally to apply of overseeing and dominant of quantities of finished merchandise purchasable.

D.Balu and Bharani Krishnavamsi (2018) conducted a case study at AGI Glaspac, Hyderabad and examine the principles of observance to general distribution in inventory management. Inventory (American English) or stock (British English) is the equipment and fabrics that a business keeps for achieving goals and objective to have a purpose of resale (or repair). Inventory management is a systematic process for identifying the character and location of stored goods. It is needed at various locations within a capability or within many places of a supply network to lead the ordered and arranged course of manufacturing. Inventory consist of the maximum important function of current assets of huge margin of Indian glass manufacturing industries. The important point about stock administration is to control sending raw materials to production department and also control low consumption if items at manufacturing process. Thus, the article helps the manager to designing a frame work and find out the best shock policy so that they can meet the product demand characteristics. The key objectives of the inventory management is to know the financial functioning, elements which influence the inventory, methods of stock administration and techniques for improving stock levels. The study worked Economic Order Quantity (EOQ) model and correlation method. Therefore, advices on the right quantity, quality and scheduling of fabric at the very reasonable price. This study is mainly focused on soda ash, lime stone and cullet white yearly values to find out economic order quantity. Therefore, this article forms a relationship in the form of correlation in between economic order quantity, annual demand and cost elements of the AGI Glaspac company.

B. Sainadh and Sandhya (2018) states that inventory management, is a proper planning of purchasing, handling, storing, and accounting. The term inventory refers to a company that uses the stock of the products for manufacturing of sales and product that made by components. What to purchase, how much to purchase, from where to purchase and where to store. In manufacturing company inventory exist in various forms. They are raw materials, work in progress, finished goods. Inventory management system has an ability to manage sales and availability of stock, tells the owner of stores that how much to purchase and time to record. Inventory management is simple concept that it doesn't maintain neither more stock nor less stock. management is very important for "TSGENCO O&M KTPS". It enables the business to

meet or exceed expectations of the customers by making the products readily available. This study includes the ABC Analysis of Raw Materials, work in progress and finished goods for five financial years.

The studies conducted by various authors have brought to light the significance of an efficient inventory management system. The poor performance of many public sector undertaking due to accumulation of inventory has been highlighted by many authors. Both authors have developed certain models for the determination of an optimum level of inventory.

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Chapter III

CONCEPTUAL FRAMEWORK

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CONCEPTUAL FRAMEWORK

3.1 Introduction

The term "inventory" refers to the stockpile of the products a firm is offering for sale and various components that make up these products. "Inventory is nothing but a stock of goods that we maintain to facilitate the continuous production of goods and services". According to Monks, "An inventory is an idle resource that possesses economic value". In financial parlance, inventory is defined as the sum of the value of raw materials, fuels and lubricants, spare parts, maintenance consumable, semi processed materials and finished goods stock at any point of time. As defined by the Accounting Principle Board, "the term inventory means the aggregate of those items of tangible personal property which are (i) held for sale in the ordinary course of business (ii) in process of production for such sale (iii) to be currently consumed in the production of goods or services to be available for sale".

3.2 Meaning and Nature of inventory

In accounting language it may mean stock of finished goods only. In a manufacturing concern, it may include raw materials, work in process and stores, etc. Inventory includes the following things:

(a) Raw Material: Raw material form a major input into the organisation. They are required to carry out production activities uninterruptedly. The quantity of raw materials required will be determined by the rate of consumption and the time required for replenishing the supplies. The factors like the availability of raw materials and government regulations etc. too affect the stock of raw materials.

(b) Work in Progress: The work-in-progress is that stage of stocks which are in between raw materials and finished goods. The raw materials enter the process of manufacture but they are yet to attain a final shape of finished goods. The quantum of work in progress depends upon the time taken in the manufacturing process. The greater the time taken in manufacturing, the more will be the amount of work in progress.

(c) Consumables: These are the materials which are needed to smoothen the process of production. These materials do not directly enter production but they act as catalysts, etc. Consumables may be classified according to their consumption and criticality.

(d) Finished goods: These are the goods which are ready for the consumers. The stock of finished goods provides a buffer between production and market. The purpose of maintaining inventory is to ensure proper supply of goods to customers.

(e) Spares: Spares also form a part of inventory. The consumption pattern of raw materials, consumables, finished goods are different from that of spares. The stocking policies of spares are different from industry to industry. Some industries like transport will require more spares than the other concerns. The costly spare parts like engines, maintenance spares etc. are not discarded after use, rather they are kept in ready position for further use.

3.3 Functions of Inventories

Inventories serve as lubrication and spring for production-distribution system. The following are the important functions of inventories.

- Gear up production
- Force consumption to adapt itself to the necessities of production.
- Activise the market.
- Help in utilising the existing skilled labour and help in making utilization plan for future.
- Strike a balance between the objectives of the stores department and those of the enterprises as a whole.
- Act as an insurance against errors in demand forecast.

3.4 Purpose/Benefits of Holding Inventors

There are three main purposes or motives of holding inventories

- **The Transaction Motive** which facilitates continuous production and timely execution of sales orders.
- **The Precautionary Motive** which necessitates the holding of inventories for meeting the unpredictable changes in demand and supplies of materials.

- **The Speculative Motive** which induces to keep inventories for taking advantage of price fluctuations, saving in re-ordering costs and quantity discounts, etc.

3.5 Risk and Costs of Holding Inventors

The holding of inventories involves blocking of a firm's funds and incurrence of capital and other costs. It also exposes the firm to certain risks. The various costs and risks involved in holding inventories are as below:

(i) **Capital costs:** Maintaining of inventories results in blocking of the firm's financial resources. The firm has, therefore, to arrange for additional funds to meet the cost of inventories. The funds may be arranged from own resources or from outsiders. But in both cases, the firm incurs a cost. In the former case, there is an opportunity cost of investment while in later case the firm has to pay interest to outsiders.

(ii) **Cost of Ordering:** The costs of ordering include the cost of acquisition of inventories. It is the cost of preparation and execution of an order, including cost of paper work and communicating with supplier. There is always minimum cot involve whenever an order for replenishment of good is placed. The total annual cost of ordering is equal to cost per order multiplied by the number of order placed in a year.

(iii)**Cost of Stock-outs:** A stock out is a situation when the firm is not having units of an item in store but there is demand for that either from the customers or the production department. The stock out refer to demand for an item whose inventory level is reduced to zero and insufficient level. There is always a cost of stock out in the sense that the firm faces a situation of lost sales or back orders. Stock out are quite often expensive.

(iv) **Storage and Handling Costs.** Holding of inventories also involves costs on storage as well as handling of materials. The storage costs include the rental of the godown, insurance charge etc.

(v) **Risk of Price Decline**. There is always a risk of reduction in the prices of inventories by the suppliers in holding inventories. This may be due to increased market supplies, competition or general depression in the market.

(vi) **Risk of Obsolescence.** The inventories may become obsolete due to improved technology, changes in requirements, change in customer's tastes etc.

(vii) **Risk Deterioration in Quality:** The quality of the materials may also deteriorate while the inventories are kept in stores.

3.6 Inventory Management

It is necessary for every management to give proper attention to inventory management. A proper planning of purchasing, handling storing and accounting should form a part of inventory management. An efficient system of inventory management will determine (a) what to purchase (b) how much to purchase (c) from where to purchase (d) where to store, etc.

There are conflicting interests of different departmental heads over the issue of inventory. The finance manager will try to invest less in inventory because for him it is an idle investment, whereas production manager will emphasise to acquire more and more inventory as he does not want any interruption in production due to shortage of inventory. The purpose of inventory management is to keep the stocks in such a way that neither there is over-stocking nor under-stocking. The over-stocking will mean reduction of liquidity and starving of other production processes; under-stocking, on the other hand, will result in stoppage of work. The investments in inventory should be kept in reasonable limits.

3.6.1 Objects of Inventory Management

The main objectives of inventory management are operational and financial. The operational objectives mean that the materials and spares should be available in sufficient quantity so that work is not disrupted for want of inventory. The financial objective means that investments in inventories should not remain idle and minimum working capital should be locked in it. The following are the objectives of inventory management:

- To ensure continuous supply of materials spares and finished goods so that production should not suffer at any time and the customers demand should also be met.
- To avoid both over-stocking and under-stocking of inventory.
- To keep material cost under control so that they contribute in reducing cost of production and overall costs.
- To minimise losses through deterioration, pilferage, wastages and damages.

- To ensure perpetual inventory control so that materials shown in stock ledgers should be actually lying in the stores.
- To ensure right quality goods at reasonable prices.
- To maintain investments in inventories at the optimum level as required by the operational and sales activities.
- To eliminate duplication in ordering or replenishing stocks. This is possible with help of centralising purchases.
- To facilitate furnishing of data for short term and long term planning and control of inventory.
- To design proper organisation of inventory. A clear cut accountability should be fixed at various levels of management.

3.6.2 Successful inventory management

Successful inventory management involves balancing the costs of inventory with the benefits of inventory. The costs associated with inventories not only include direct cost of storage, insurance and taxes but also the cost of money tied up in inventory. Apart from keeping adequate inventory, the success of inventory management depends on

- Maintaining a wide assortment of stock – but not spreading the rapidly moving ones too thin.
- Increasing inventory turnover – but not sacrificing the inventory level.
- Keeping stock low – but not sacrificing service or performance.
- Obtaining lower prices by making volume purchases but not ending up with slow moving inventory.
- Having an adequate inventory on hand but not getting caught with obsolete items.

3.6.3 Tools and Techniques of inventory Management

Effective Inventory management requires an effective control system for inventories. A proper inventory control not only helps in solving the acute problem of liquidity but also

increases profits and causes substantial reduction in the working capital of the concern. The following are the important tools and techniques of inventory management and control:

1. Determination of Stock Levels.
2. Determination of Safety Stocks.
3. Determination of Economic Order Quantity
4. A.B.C. Analysis
5. Inventory Turnover Ratios
6. Just in Time Inventory

3.7 Inventory Control

Inventory control may be called a planned method of maintaining investment in inventories held in stock so as the ensure proper and smooth flow of goods necessary for production operations and sales while keeping the total cost of investment in inventories as its minimum. "Inventory control is concerned with acquisition, storage, handling and use of inventory whenever needed, provide adequate cushion for contingencies and derive maximum economy and minimize wastage and losses." The term inventory control relates to a set of policies and procedures by which an organization determines which material and in what quantity it will hold in stock.

Inventory is more dangerous than cash as it may rapidly become obsolete and valueless. It's safekeeping even in conditions favorable to it would definitely generate substantial cost. L.R. Harard is of the opinion, "The proper management and control of inventory not only solves the acute problem of liquidity but also increases the annual profits and causes substantial reduction in working capital of a firm.

The lesser the efficiency of inventory control, the greater is the inventory required. Excessive investment in inventory results in high costs and low profits. Thus, the effects of inventory control on flexibility and on the level of investment required in inventories represent two sides of a same coin.

Chapter IV

INDUSTRY & COMPANYPROFILE

CHAPTER IV

INDUSTRY PROFILE

Cattle feed industry; a major ingredient of animal feed industry is currently evolving from a fragmented industry into an organized sector. The feed manufactures are increasingly adopting modern and sophisticated methods in an effort to incorporate best global practices. This industry has got high growth potential in India, given India's top position among the world nations in respect of livestock population. The cattle population is expected to grow at compounded annual growth rate of 4 per cent.

4.1 Global Perspective

Increase in meat and dairy product demand is expected to drive the global cattle feed market over the forecast period. On account of cattle health concerns, better and healthy products including milk, milk products, meat and meat products, cattle feed market is playing an important role in improving overall cattle health in the long run. Cattle product includes milk and milk products along with meat and meat products. Growth in cattle population is expected to directly influence the global cattle feed market demand over the forecast period as increasing population is anticipated to increase meat, dairy and other cattle related products. Therefore, cattle feed is helpful in managing nutrient levels in these products. Various cattle feed additives are provided in order to minimize cattle related infection, improve product quality and provide better immune to cattle. Hygienic factor coupled with high nutrients, less time elapsed, convenient handling, and ease in availability are some factors which are expected to propel global cattle feed market growth. Land shrinkages for cattle grazing along with increasing urbanization are the factors which are expected to drive global cattle feed market over the forecast period. To get higher cattle yield on the back of grander feed coupled with nutrition, cattle feed market is gaining concerns. Industrialization in dairy and meat industry is expected to augment the cattle feed market globally in the coming years. Growing Asia Pacific market and Latin America market are the major opportunities for the global cattle feed market demand. Developing economies are expected to attract cattle feed market globally in coming years. Fluctuations in the raw material prices is expected to act as a major limitation for global cattle feed market. Global cattle feed market is segmented by animal type. Animal type segment is sub

segmented into mature ruminants and young ruminants. Mature ruminants further include dairy and meat.

Table 4.1 The top – ten European feed- producing countries and companies

#	Country	Total compound feed production (x1000 tons, 2015)	Company	Total feed volume, ind. Ingredients (X1000 tons, 2015)
1	Germany	23345	ForFarmers(NL)	9100
2	Spain	22273	Agrifirm Group(NL)	7056
3	France	21092	De Heus(NL)	5950
4	UK	15449	Nutreco (NL)	5900
5	The Netherlands	14283	DLG Group(DK)	4140
6	Italy	13685	Agravis Raiffeisen(DE)	4060
7	Poland	9308	AvnL Group (FR)	3400
8	Belgium	6650	Veronesi(TT)	3150
9	Denmark	4190	DTC(DE)	2800
10	Ireland	3986	Neovia(FR)	2650

Source: FEFAC WattAgNet Company reports, Rabobank, 2017

North America and Asia-Pacific were dominating the market globally being largest cattle feed consumer. U.S. was the chief cattle feed market in North America. Emerging economies including China, India, Japan and Vietnam are expected to push global cattle feed market on the constructive side in coming years owing to increasing disposable income, huge milk & milk product and meat demand. Developing regions are expected to witness a significant growth in cattle feed market in coming years. Rise in consumer concerns coupled with huge demand for meat and meat products are expected to positively influence the European cattle feed market over the forecast period. Brazil is projected to be a growing market for cattle feed followed by Mexico and Canada. Asia Pacific is expected to be the fastest growing cattle feed market on account of rising population coupled with highly increasing cattle product demand (milk, meat and others) over the forecast period.

Global cattle feed market players include National Farms, V. H. Group, Royal DSM N.V, Four States Feed., Caprock, BASF SE, ADM, Cargill Inc., ContiBeef LLC, J.R. Simplot, Evonik Industries AG, Charoen Pokphand Foods, Kent Corporation, Friona Industries, Land o Lakes, Cactus Feeders and Godrej Group. Industry participants are expected to implement various strategies including business expansion, adopting new technologies to improve efficiency of cattle production and enhancing cattle feed quality, product differentiation, product line improvement and increase in production capacity by setting up new plants in order to grow their market size and increase their market volume globally. Most of the companies are focusing on their business expansion by setting up new production line in Asia Pacific region on account of economical labor coupled with raw material availability. In addition, rising population along with growing cattle product demand (milk along with milk products and meat along with meat products) is also expected to push major industry participants to set up their plants in Asia Pacific.

4.2 Global Feed Market and the Case of India: An Overview

India has got a prominent place in the global livestock population. Feed industry in India is about 50 years old. It primarily consists of cattle feed and poultry feed segments. Cattle feed industry in India is gradually evolving into an organized sector and the feed manufactures are increasingly using modern and sophisticated methods that seek to incorporate best global practices. Indian cattle feed industry has got high growth potential, given the country's top position among the world nations in respect of livestock population and also the high expected growth rate of about 4 per cent. Compounded Cattle Feed (CCF) products, particularly the branded ones are fast gaining popularity India, including in rural areas. The estimates of livestock population in India are quite commendable.

Table 4.2 Livestock and Poultry Production in India

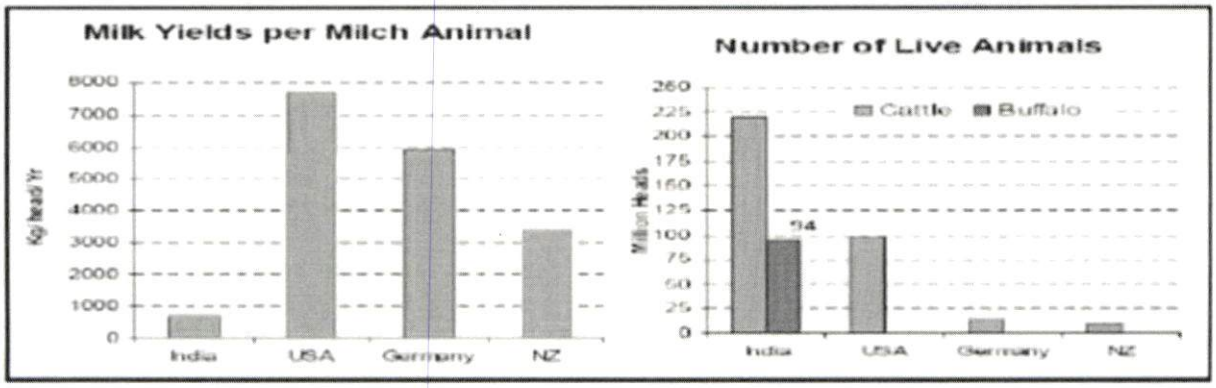
Species	Livestock census 2007 (no in millions)	Livestock census 2012 (no in millions)	growth rate
cattle	199.1	190.9	-4.1
Buffalo	105.3	108.7	3.19
Sheep	71.6	65.1	-9.07
Goat	140.5	135.1	-3.82
Pigs	11.1	10.3	-7.54
Poultry	648.8	729.2	12.39

Source: Krishijagran.com

Indian Cattle – Low Nutritional Content of Feeds and Very Low Productivity

In spite of the constant growth in milk production in India throughout the last 65 years or more and also the cattle is very low and is one of the lowest in the whole world. Likewise, in spite of the largest cattle population in the world, the per-farmer holding of cattle is very low at the level of about 2-3 animals. Traditional feeding and cattle management practices continue in India which affects the productivity and health of cattle. There is vital need for improving the feeding practices by way of providing feeds with enhanced nutrient-content, for the purpose of better productivity and health of cattle, comparable to cattle of advanced countries like the US. It is in this context that the need for providing scientifically designed cattle feed products to cattle assumes crucial significance in the Indian context. It may be noted that the productivity of Indian cattle is just one eighth (1/8) as that of its US counterpart. Though India's total milk production is the largest in the world, the per-cow production is one of the least.

Chart 4.1: Productivity of Indian cattle- An international Comparison



Source: CFLMA, Challenges for Indian dairy sector, 24 Jan 2012, Presentation, Pune, p.6

Branded Cattle Feed Industry in India: The Away Ahead

The concept of branded animal feed as a packaged commodity, though not a very recent concept, is gaining popularity in the rural folks in the recent past. The packaged feed, as a product possesses, various factors such as hygiene, quality, convenience to handle, etc. to its advantage. The age old feeding pattern practiced in India is a mixed variety consisting of green grass, dry grass, cotton seed cake, coconut cake, rice bran etc. From the time immemorial, the cows were fed by grazing in open areas. But, as time elapsed, due to changes both environmental and social, there has been gradual shift from the age-old pattern to Compounded Cattle Feed (CCF). The Indian milk scenario witnessed a total metamorphosis by the advent of Operation Flood; thus greatly increasing the per capita consumption of milk and sparking of high demand for feed.

COMPANY PROFILE

Kerala Solvent Extractions Ltd, now known as KSE Ltd is a company that is engaged in the manufacture of Cattle feed, Oil Cake processing (extraction of oil from copra cake by solvent extraction process and refining the same to edible grade), and Dairy products in Irinjalakuda, Thrissur District, state of Kerala, India. The Company was incorporated on 25 September 1963 and began commercial operations in April, 1972 by setting up Kerala's first solvent extraction plant to extract coconut oil from coconut oil cakes. Subsequently, in 1976 the company set up a plant to manufacture ready mixed cattle feed. In the last three decades, KSE has emerged as a leader in solvent extraction from coconut oil cakes and also the largest cattle feed producer and supplier in Kerala. In 2000, KSE entered the business of procuring, processing and marketing milk and milk products. In 2002, KSE started producing and marketing ice-creams under brand name 'Vesta'.

Business segments

The company operates in three business segments: Cattle Feed Division, Oil Cake Processing Division, and Dairy Division comprising milk and milk products, including ice cream.

Cattle Feed

KSE's cattle feed division is engaged in the production and marketing of cattle feed. KSE's cattle feed is largely made up of de-oiled rice bran cake, maize and de-oiled coconut cake. Some quantities of cottonseeds are added to make a balanced feed mixture. The company produces seven types of cattle feed, three in mash form and four in pellet form. Today, KSE Ltd is predominantly a cattle feed producer with about 75% of its revenues in FY2014-15 coming from the sales of cattle feed. It has five modern cattle-feed factories and reported a sales volume of 440,000 metric tones in FY2014-15.

K.S SUPREME PELLET

K.S Supreme pellet is a bypass protein feed with high percentage of protein and energy. It has ISI certification (IS 2052:1979). K.S Supreme is meant for high yielders and it has Crude protein of 20% and Metabolisable energy of 2450 kcal/kg feed. Supreme pellet should be fed at the rate

of 400 g per litre of milk production and 1.5 - 2 kg for body maintenance per day per animal. K.S Supreme feed is 6mm pellet available in 50 kg HDPE laminated bags and 70 kg gunny bags.

K.S DELUX PLUS PELLET

It is meant for medium yielding cows, Delux pellet should be fed at the rate of 450 g per litre of milk produced and 1.5- 2 kg for body maintenance per day per animal. K.S Deluxe has a Crude protein of 18% and Metabolisable energy of 2250 kcal/kg feed. It is 8 mm pellet packed in 50 kg HDPE laminated bags as K.S Delux plus and in 70 kg gunny bag as K.S Delux pellet.

K.S SUPER

It is a mash feed meant for medium yielding cows. It is available in 60 Kg gunny bags.

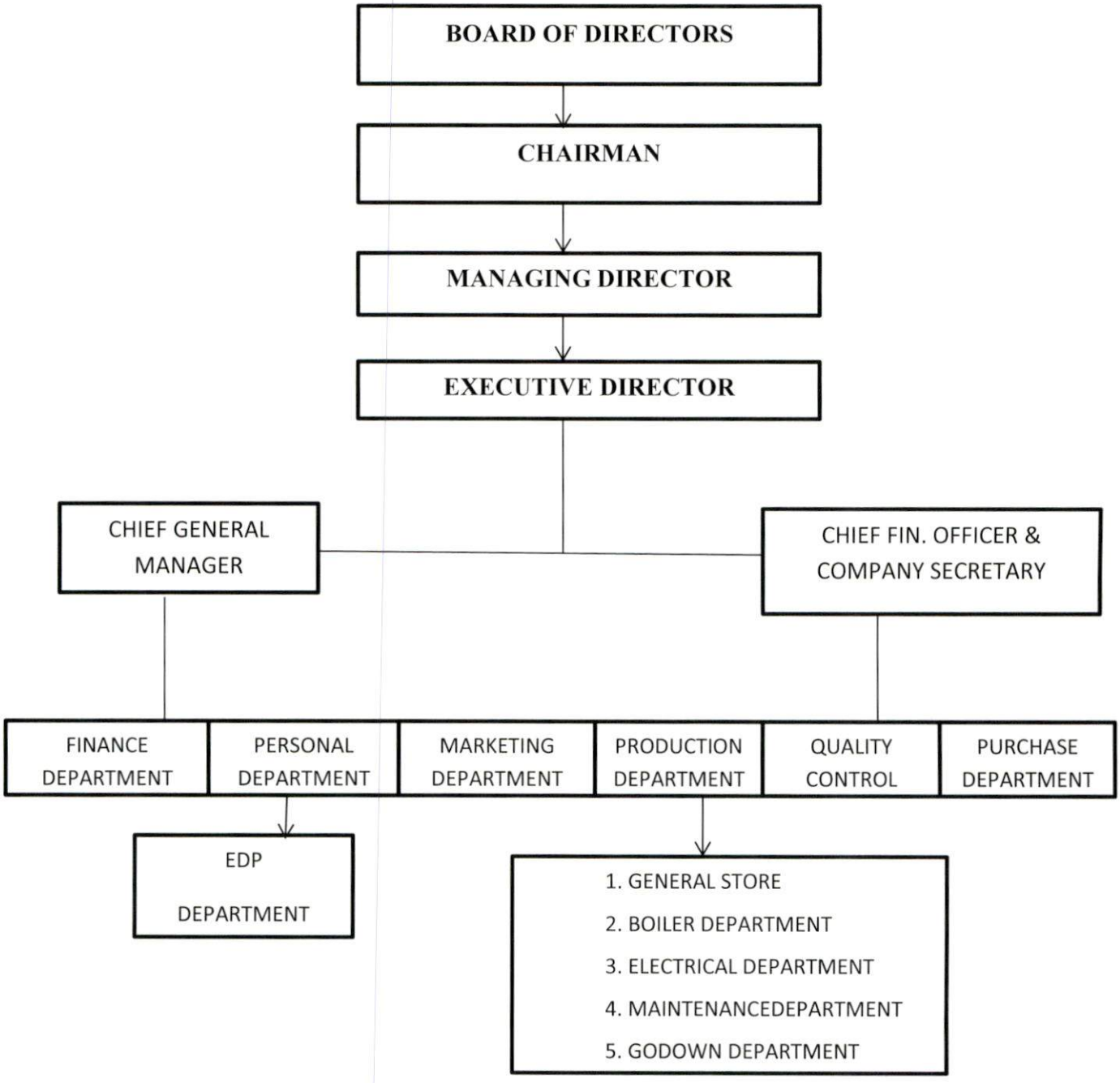
Table 4.3 Board of Directors

Si.No	Name Of Directors	Position
1	Dr.Jose Paul Thaliyath	Chairman
2	Sri A P George	Managing Director
3	Sri M P Jackson	Director
4	Sri P D Anto	Director
5	Dr. K C Vijayaraghavan	Director
6	Sri K Paul Francis	Director
7	Sri T R Reghulal	Director
8	Sri Joseph Xaviour	Independent Director
9	Mrs Sathi A Menon	Independent Director
10	Sri Paul John	Independent Director
11	Smt. Marykutty Varghese	Independent Director

Administrative Managers

1. Sri. M Anil	General Manger in Charge
2. Sri R Sankaranarayanan	Chief Financial Officer & Company Secretary

ORGANIZATIONAL CHART



Milestones

1963 - Registered as a Company named KERALA SOLVENT EXTRACTION LIMITED.

1972 - Company began operations by setting up a 40 MTs per day solvent extraction plant in Irinjalakuda, Kerala

1976 - Company set up a 50 MTs per day ready-mixed cattle feed plant in Irinjalakuda, Kerala

1979 - Production capacity of cattle feed plant in Irinjalakuda increased to 60 MTs per day

1980 - Solvent extraction plant capacity in Irinjalakuda increased to 60 MTs per day

1983 - A fully automatic new cattle feed plant of 120 MTs per day capacity commissioned in Irinjalakuda, Kerala

1984 - Solvent extraction plant capacity in Irinjalakuda increased to 80 MTs per day

1987 - Production capacity of cattle feed plant in Irinjalakuda increased to 180 MTs per day

1989 - Solvent extraction plant capacity in Swaminathapuram increased to 100 MTs per day

1990 - Production capacity of cattle feed plant in Swaminathapuram increased to 150 MTs per day

1996 - A new cattle feed plant of 240 MTs per day capacity commissioned in Vedagiri, Kottayam District, Kerala

1998 - KSE acquired a cattle feed manufacturing unit at Palakkad, Kerala

2002 - 'VESTA' ice-cream launched

2003 - Started production of cattle feed in a leased plant at Edayar, Ernakulam District, Kerala

2006 - 100 MTs per day physical refining plant commissioned. 200 MTs per day solvent extraction plant at Koratty commissioned.

2008 - Ice cream production unit commissioned at Thalayuthu, Dindigul District and Tamil Nadu

2009 - A new cattle feed plant of 500 MTs per day capacity commissioned in Irinjalakuda

2010 - Ice cream production unit commissioned at Vedagiri, Kottayam District, Kerala.

2012 - Started production in a leased plant at Kochuveli, Trivandrum

2013 - Feed supplement named GORASAM introduced.

2014 - Cattle feed production capacity of old plant at Irinjalakuda unit increased to 225 MTS per day. Production capacity of cattle feed plant in Palakad unit increased to 120 MTS per day.

2015 - Production capacity of cattle feed plant in Swaminathapuram unit increased to 225 MTS per day.

2017 - Wind mill project inaugurated in Tamilnadu & Production started on 25/03/2017.

Awards and Recognitions

- **"Best productivity performance for Cattle feed in India"** Award from National Productivity Council continuously for Eleven Years from 1996-97 to 2005-06.
- **"The Solvent Extractors' Association of India"**-SEA Award for highest processor of coconut cake in India, since institution of the award.
- Kerala state productivity Council award.
- **"Top Cattle feed Award"** for aflatoxin free feed from "The Indian Association of Veterinary Pathologists" (IAVP) and Kerala Agricultural University.
- Tamil Nadu productivity Council Safety Award.
- Animal Nutrition Society of India Award for Company's contributions for propagation of balanced compound livestock feed in India.
- Industry Excellence Award from the Indian Society for the study of Animal Reproduction for the year 2001.
- Entrepreneur Award from the College of Veterinary and Animal Sciences.

KSE Ltd. today....

Industry Structure and Development

In the Animal feed division, the cost of ingredients for animal feed was steady for the first half of 2017-18 and then declined further and remained steady at a lower level for rest of the year. The selling price of feed was also reduced to share the benefit of reduction in the ingredient prices with the farmers. However, in the process, the margins improved and the Animal feed division presented excellent results in terms of profit. The demand for our feed is growing and company was making arrangements to meet the additional demands. Prudent purchase policy, fine-tuning of selling price, trimming of overheads, etc. helped us to improve the performance

Opportunities and Threats

The advantages to KSE Ltd. in cattle feed and cake processing industry are

(1) Its vast experience in those industries for ow44 years

(2) Its leadership in the market

(3) Acceptability of the feed and its quality standards in the market

(4) Prompt after-sales service and good customer relation

(5) A lot of prestigious awards and recognitions to prove consistent quality and leadership

(6) Good network of dealership

(7) Talented technical and marketing personnel

(8) Judicious purchase of materials and

(9) financial strength of the Company leading to better purchasing power helping to build up stock on favourable situations.

The threats to the Company in these two segments are:

(1) Competition from other manufacturers of organised and unorganised sectors

(2) Probable entry of multinational entities

(3) Surge in the fuel prices leading to increase in the price of ingredients

(4) The volatile rupee vs. dollar situation acts as a non-stimulant in import transactions

(5) Granting of subsidy by the Government on animal feed selectively avoiding private manufacturers

(6) Indirect control by Government over price of milk acts as a blockade, at times, to pass on the cost escalation to the consumers

(7) Switching of crop by farmers from oil seeds and grains (from which our ingredients are derived) to other crops

(8) Severe shortage in availability of manual local labour leads to increase in the cost of labour as these two segments are highly labour oriented and

(9) Import of cheaper oils for bulk consumption leading to fall in demand for refined coconut oil. The company is tackling these issues appropriately, by taking timely actions.

Risks and Concerns

The company mainly depending on materials from northern States moved by rail for manufacturing the Animal Feed. Prediction of every monsoon and above average rain lifts our hopes that the price of ingredients to feed will remain at low, supported by good crop. As a result of decontrol in diesel price, railway freight and lorry freight has gone up, in tune with diesel price. The increase in transportation cost may push up the prices of animal feed, in tune with raw material price. At present, there is good demand for animal feed, both in Kerala and Tamil Nadu. The international price of copra cake imports is at reasonable levels and can be depended in case of need. It will be encouraging, i the price of coconut oil is steady above 180/kg. levels. The Dairy division is also expected to perform well by increased volume of ice cream sales with improved margin.

Industrial Relation

The Company has 875 employees on its rolls as on 31.3.2018. The Company is an exception to the adverse labour conditions existing in Kerala. There were no labour issues, in any of the Units of the Company during the year 2017-18. The long term settlements for a period of three years have been signed with the employees of Swaminathapuram, Palakkad and Koratty Units effective from 1st May 2017, from 1t August, 2016 and from 1st January 2017 respectively. Negotiation with Unions for similar long term settlements is an progress in the case of Vedagiri Unit from 1st April, 2017. The management is confident that amicable settlement can be arrived at by negotiations with the Unions of Vedagiri Unit. The management continues to maintain cordial industrial relation with its employees in all Units and is attending to their grievances with an open mind.

Chapter V

Analysis & Interpretation

CHAPTER V
INVENTORY MANAGEMENT PRACTICES OF KSE LIMITED

5.1 Introduction

Inventory management is a science based art of ensuring that enough inventories are held by an enterprise to meet both its internal and external demand commitments economically. It is a subject which merits the attention of the top level management and influences the decision of the planning and execution personnel. The objective of inventory management is to maintain inventory at appropriate level to avoid excess or deficit inventory. The stock can be classifieds working/ cycling stock, safety/ buffer stock and speculative stock. Efficient management of inventory is considered to be one of the challenges facing a manufacturing firm. A firm neglecting managing inventories will be denting its long term profitability and may fail ultimately. The objective of this study was to analyse the inventory management techniques/ practices of KSE Ltd. and to analyse the efficiency of the inventory management system of the company. The data collected from primary and secondary sources were tabulated and analysed in terms of specific objectives of the study. Primary data regarding the inventory management practices of the company were collected from the concerned officials through an unstructured interview schedule. Data regarding the materials consumed, output, sales, raw materials, stores, spares and finished goods and data regarding the financial parameters of the company were collected from the annual reports and schedules to the accounts of the company for 10 years from 2008-09 to 2017-18.

5.2 Inventory Management System of KSE Ltd.

Inventory management is a process that identifies inventory requirements, sets targets, report actual and projected inventory status. It covers all functions related to tracking and management of materials. The primary objective of inventory management is to determine and control stock levels within the physical distribution function to balance the need for product availability against the need for minimizing stock holding costs. An effort is made in this section to analyse the control techniques adopted and the efficiency of inventory management of KSE Ltd., Irinjalakuda as a part of the objective of the study. KSE is a full time production company with 24 x 7 days in a week.

5.2.1 Purchase procedure of materials

The company follows a centralized purchasing system whereby raw materials are purchased from the Irinjalakuda unit as bulk quantity and is delivered to rest of the six units according to the unit requirements.

(a) Purchase department

The first and most important function of inventory management is the purchase of materials, which begins by placing an order for the purchase of materials. KSE has a separate purchase department to carry out the function of purchase management. The responsibility for purchasing of raw materials is entrusted to the purchase department.

The department is headed by a purchase Asst. General Manager and consists of purchase and inventory functions. Purchase department is responsible for the raw materials required for productions, procurement of raw materials, storing the raw materials and issues to various departments as per requirements.

The main functions of department are purchase of raw materials arranging, payment for materials etc. This department has to keep constant contacts with finance and personal departments for sanction and administrative matters in connection with purchase.

The function of purchase department will be to procure raw materials of right quality at right price and at the right time from proper sources for user departments. Normally, purchase of raw materials and services should be made from reliable suppliers. Selection of suppliers is on the basis of quality of product or service, timely delivery, price competitiveness etc.

The company purchases raw materials in two ways; through domestic market purchases and as imports from foreign countries. The raw materials required for cattle feed production are agricultural products, which are available on seasonal basis. The company purchases the raw materials on the basis of availability; thus the components of cattle feed varies according to the availability of raw materials. The components are fixed by the veterinary doctor of KSE Ltd.

Procedure of raw materials from domestic market

A list of suppliers who have been regularly suppling materials to KSE over a period of time is maintained. The list is updated from time to time by adding suitable suppliers who contact the company directly. The company's efforts are directly towards establishing sound vendor relations. The suppliers who were supplying the raw materials must qualify the quality parameters fixed by the company. It will vary according to the seasons and price is fixed on the bases of market price.

Coconut cake is the intermediary product of KSE Ltd. Hence it is shown as 'segment transfer' in books of account. In 2017-18, there is a segment transfer of 6663.95 lakhs from coconut cake to animal feed.

Purchase through import

Raw materials are ordered by the purchase department when inventory reaches the order level. Acid buff, only raw material imported from Ireland is required 330 MT for every quarter. For 5 lakh MT unit of production of feed, 1200 MT unit of acid buff is needed, which is 0.24 percent.

Vendor evaluation

Vendor selection is mainly based price, quality and delivery promptness of raw materials. First preference is given to price, then quality.

(b) Purchase contract:

When the supplier is selected, the purchase manager informs it to the executive officer and instructs him to draft a formal purchase contract which include specifications such as name of the supplier, order number, date, quality, quantity, price, mode of delivery, delivery date, and terms of payment and signature of the competent authority. The executive officer prepares the purchase contract in triplicate. It is further verified and signed by the Purchase manager and General Manager. Original is sent to the concerned supplier. The second copy is sent to the receiving section for checking of materials and last copy is retained in the Purchase department for further reference.

Purchase contract is a written authorization to the supplier to supply the required materials. It is the legal document prepared in the name of the supplier selected on the basis of rates and terms accepted.

(c) Receiving and checking Materials:

Raw materials as per the purchase contract is received in the main gate. The supplier produces a bill to the purchase department showing the details of materials supplied. After getting confirmation from the purchase department, the vehicle is being sent to the weighing bridge where, the total weight of the vehicle is taken and bill is produced to the godown office. Now the bill is entered in the incoming registers by the supervisors in the godown office.

Godown officer then produces a Material Received Report (MRR) showing the vehicle number, no: of bags, quantity, name of supplier etc.

Four copies of MRR is prepared, of which on copy is retained in the godown office, one copy sent to Purchase department, one copy to the accounts section and last copy sent to the supplier.

Each arrival of raw materials is unloaded in the godown at the specific space allotted for it (called lots). After unloading the supervisor notes and takes into record the number of bags received.

After unloading the empty weight of vehicle is checked. This weight is deducted from the total weight taken earlier to get the gross weight of raw materials (including gunny bags). Net weight of the raw materials supplied is obtained by deducting the standard weight of given number of gunny bags. Each receipt of raw material should be entered in the incoming register.

Order is made to the suppliers on the basis of conditions such as the quality parameters.

Table 5.1 Quality parameters of raw materials

Sl.no	Items	Contents (%)		
		Moisture	**Protein**	**Fibre**
1	Rice bran	Max 10	Min 16	-
2	Maize	Max 12	-	-
3	Cotton seed cake	Max 10	Min 36	Min 17
4	Ground nut	Max 10	Min 46	Min 17
5	Rape seed	Max 10	Min 46	Min 17

Source: by interview with KSE officials

Cancellation of an order occurs when the suppliers fail to deliver the goods within stipulated time period. When supplier is provided an extension, a token penalty charges are applied corresponding to the delay in delivery. If the production stops due to inadequacy of availability of raw materials, temporarily new supplier is found. Traders are those farmers or FPOs who occasionally supply to the KSE. Traders are not penalized. Meanwhile penalty charges are levied on suppliers or brokers for extension of delivery period of raw material.

If there is unavailability of raw material or delay in delivery, the production schedule will affect production schedule. The firm cuts down the three shift production to two shifts. Hence the number of days required to meet the same quantity of production is thus extended.

(d) Quality testing

The KSE possess a Quality control laboratory. Samples of raw materials are tested for their quality according to the certification as mentioned in the purchase contract in this lab. The parameters of food analysis include moisture content, crude protein, crude fat, total ash, acid insoluble ash, calcium, phosphorous, crude fiber etc.

A formula is being set and tests are made accordingly. Each lot of raw material received is subjected to testing its quality.

When the order arrives at the gates of KSE ltd. for delivery, before unloading, three samples are collected by the quality control department. From the samples, one is tested and statements on quality of raw materials are prepared. 90 percent of payment and lorry freight are done on the spot.

If any dispute on the quality of materials arises, the second sample stored in the lab is taken for testing to the concerned lab as suggested by the supplier. Considering the variation of the both reports, the balance of the payment is done.

(e) Storage

The Stores Departments/manager has to prepare purchase requisitions. These purchase requests are made available, by the managers of the concerned departments, online in computer to Purchase Section. From the received quotations, purchase department chooses the most beneficial quotation by evaluating the quotation on parameters like the offer price, mode of payment, discount if any, time needed for dispatches etc...

In KSE Limited, the cost of internal transportation of raw materials is low which involves not much delay in the movements to the concerned departments the stores department is situated close to the plant. This type of store is more economical to the company for the physical movement and handling of stock .The chances of loss or theft of materials are minimized due to better control and supervision. However in this company, a sub store is attached to each production department to meet the demand of night shifts and emergencies.

The godown is divided into racks and again subdivided into small spaces called lots. For each item of raw material one separate lot is allotted. All lots are serially numbered. Instructions for issue of materials specify the lot number of the material to be issued. Materials in the stores are classified on the basis of their usage for control purpose.

(f) Issue

Materials are held in the stores for the utilization of the production department as and when necessary. Procedure for issue of raw materials is as follows:

Head of the department who needs the material prepares a requisition (issue order) and submits it to the shift engineer. The shift engineer forwards the requisition to the godown officer. The godown executive scrutinses the details of requisition and sends it to the stores department with his signature. Issue of raw materials to the concerned departments is made on the basis of issue pass (issue pass) provided by the Godown in charge.

Issue order must contain the signature of the department head that needs the material, required quantity, total number of bags, average of each bag etc. After the issue of materials, issue order is passed on to the stores department. The accounting section of the stores department enters the necessary details in the stock ledger. The stores section of the godown also maintains an atti register to show the balance of raw material in each for a given month.

(g) Inventory Accounting:

For the purpose of inventory accounting, the accounts section of the godown office maintains a stores ledger. It records the receipt, issue, and balance of each it of raw material. Records relating to each item of raw material are maintained separately. Entries in this ledger are made on the basis of statement of daily issue of raw materials received from the stores. At present stock records are computerised so that information can be easily obtained. Issue of raw materials are done as per FIFO method, (raw materials received first are issued first) and 'specific price' method is followed. The godown office in charge also prepares a daily stock statement of finished goods to facilitate stock control.

(h) Stock Verification

Stock verification is made at the end of every year. One staff member is deputed for verification purpose. Bank inspectors also inspect and verify the stock in every six months. Supervision of the raw materials stored daily is made by the godown officer. Stocks of raw materials as at the close of the year are physically verified and valued at lower of cost or net realisable value.

(i) Stock Levels

KSE has fixed the maximum and reorder stock level for each item of raw material. Reorder stock level is fifteen days' average requirement and maximum stock is kept at one month's average requirement.

Work in process

KSE Ltd. doesn't have a category of inventory as work in process. As and when the raw materials arrive at the factory floors, it is sent directly to the quality department for analysis. The approved raw materials are then mixed at the pre-fixed proportion (according to the formula fixed by doctor) and packed as final product. Hence there is no any category of work in process.

Waste management

There are no significant wastages in KSE Ltd. Wastes are not formed from mechanical operations as the process is fully automated. If any stock gets spoilt, then veterinary doctor will check whether refeed of the raw material is possible by testing in quality testing lab. If the quality is met it is used for mixing. Otherwise sold outside for preparation of manure.

Inventory Management Techniques

Inventory Management is a practice of tracking and controlling the inventory orders, its usage and storage along with the management of finished goods that are ready for sale. If the inventory in not managed properly, it can lead to increase in storage cost, working capital crunch, wastage of labor resources, increase in idle time, disruption of the supply chain, etc. All this leads to a reduction in sales and unsatisfied customers. Therefore, inventory management is an important aspect of the business which should not be ignored and must be managed properly.

Inventory management is an essential part of every business. With effective inventory management system in place, the business can significantly reduce its various costs like warehousing cost, inventory carrying cost, ordering cost, cost of obsolescence, etc. It improves the supply chain of the business. Managers are able to forecast the level of production at which they need to place new orders for inventory. Hence, organizations should take all the necessary steps to maintain an effective inventory management and control system.

The inventory management techniques followed by the company are following:-

Re-order level

This level is that level of material at which it is necessary to initiate purchase requisition for fresh supplies. This is normally the point lying between the maximum and the minimum levels. Fresh orders must be placed before the actual stocks touch the minimum level. This level is fixed in such a manner that the quantity of materials represented by the difference between the re-order level and the minimum level will be sufficient to meet the requirement of production till such time as the order materializes and materials are delivered.

For example, if the total inventory needed in a month is 10,000 ton units, the KSE Ltd. places a new order when the inventory reaches 50 percent of stock level of each raw material or the 15 days of stock.

In KSE Ltd. there is purchase order system software to arrive at the order level for the purchase department, enabling them to place orders with the supplier.

First-In First-Out (FIFO)

"First-in, first-out" is an important principle of inventory management. It means that your oldest stock (first-in) gets sold first (first-out), not your newest stock. This is particularly important for perishable products so you don't end up with unsellable spoilage.

In KSE Ltd, the raw materials, packing materials, stores & spares and consumables are issued following FIFO method. In stores & spares and consumables, furnace oil, diesel and boiler fuel are valued at lower of cost or net realisable value.

Lean Management

Lean management refers to a technique developed with the aim of minimizing the process waste and maximizing the value of the product or service to the customer, without compromising the quality. "Lean" refers to a systematic approach to enhancing value in a company's inventory by identifying and eliminating waste of materials, effort and time through continuous improvement in pursuit of perfection.

Under the lean manufacturing system, seven wastes are identified: overproduction, inventory, motion, defects, over-processing, waiting, and transport. The result is usually reduction of costs and improvement in quality.

The success on any lean inventory management depends on how a company best implements the principles to achieve its needs. The greatest benefit of the principles comes in identify its key attributes and applying them across functional boundaries.

For example, in KSE Ltd. if the order is placed for 100 ton of raw material, the supplier has to supply the raw material of 20 ton in five days according to the storage capacity.

The company does not follow any specific selective inventory control techniques. The following paragraphs make an attempt to apply selective inventory control tools like SOS, HML and XYZ classification:-

SOS Classification:-

Raw materials, especially agricultural inputs are generally classified by the seasonal, off-seasonal systems since the prices during the season would generally be lower. The seasonal items which are available only for a limited period should be procured and stocked for meeting the needs of the full year. The prices of the seasonal items which are available throughout the year are generally less during the harvest season.

A Buying and stocking strategy for seasonal items depend on a large number of factors and more and more sophistication is taken place in this sphere and operational techniques are used to obtain optimum results. Seasonal, Off Seasonal Report helps you to view seasonal required items.

S- For seasonal Materials OS - For non-seasonal Materials

Purchase planning has to be done if the material is seasonal as material shall be available for a particular time period of the year. Non-seasonal materials are available throughout the year

without any significant price variation. Classification of raw materials based on SOS analysis is given below:-

Table 5.2: Classification of raw materials on SOS Analysis

Seasonal Materials(S)	**Non Seasonal Materials(OS)**
Maize	Cotton Seed Deoiled Cake
Rape Seed Extraction	Groundnut Cake Extraction
Molasses	Acid Buff
Coffee	Rice Bran Oiled 24%(White)
Tippi	Soya bean Deoiled Cake
Wheat Bran	CN Cake Deoiled (Transfer)
Aqua	Vitamin AD3
	Rice Bran Oiled 24%(Red)
	Vitamin E 50% (C F)
	Bioplex High Seven
	Rice Bran Deoiled I
	Trace Mineral Concentrate
	CN Cake Oiled
	Yea Sacc1025
	Turmeric waste
	Nutriferm (active dried yeast)
	Niltox
	Liv.52
	Bentonite Powder
	Lime Stone Powder
	DOB Rose
	Salt

Source: closing stock 10/11/2018.

XYZ Analysis:-

XYZ analysis is based on the value of inventory undertaken during the closing of annual accounts. X items are those having high value, Y items are those whose inventory values are medium and Z items are those whose inventory values are low. This analysis helps find items with heavy stock.

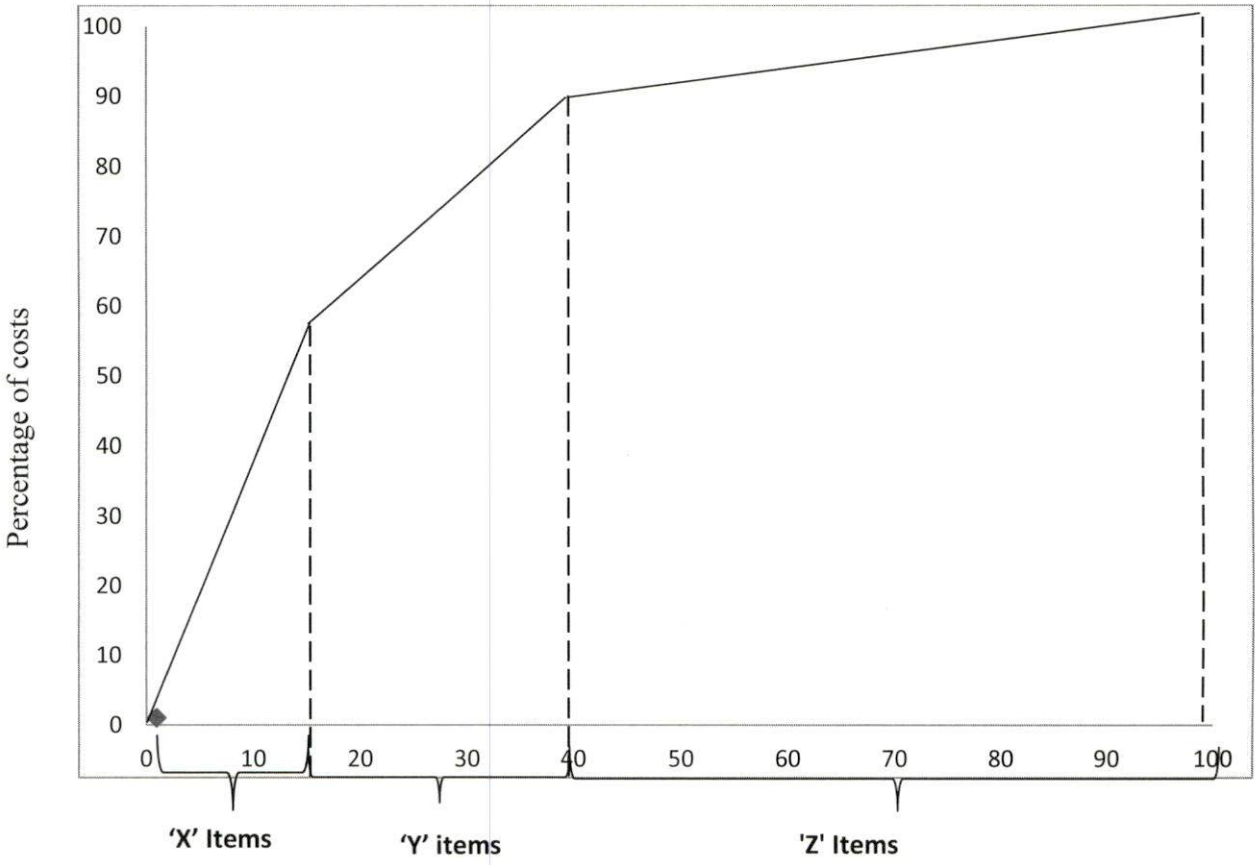
XYZ analysis is calculated by dividing an item's current stock value by the total stock value of the stores. The items are first sorted on descending order of their current stock value. The values are then accumulated till values reach say 60 percent of the total stock value. These items are grouped as 'X'. Similarly, other items are grouped as 'Y' and 'Z' items based on their accumulated value reaching another 30 percent & 10 percent respectively. The XYZ analysis gives, you an immediate view of which items are expensive to hold. Through this analysis, you can reduce your money locked up by keeping as little as possible of these expensive items.

Table 5.3 Classification of raw materials on XYZ Analysis

Rank	Items	Values	Cumulative	Cumulative Percentage	
				Value of Items	Number of Items
1	Maize	32843901.56	32843901.56	28.05	4
2	Cotton Seed Deoiled Cake	19921681.34	52765582.90	45.06	8
3	Groundnut Cake Extraction	9100438.67	61866021.57	52.83	12
4	Acid Buff	8135160.62	70001182.19	59.78	16
5	Rice Bran Oiled 24%(White)	7983925.15	77985107.34	66.60	20
6	Rape Seed Extraction	7314649.14	85299756.48	72.84	24
7	Soya bean Deoiled Cake	7152777.35	92452533.83	78.95	28
8	CN Cake Deoiled (Transfer)	6667989.24	99120523.07	84.65	32
9	Vitamin AD3	4024507.25	103145030.32	88.08	36
10	Rice Bran Oiled 24%(Red)	3828006.66	106973036.98	91.35	40
11	Vitamin E 50% (C F)	2421047.13	109394084.11	93.42	44
12	Bioplex High Seven	1307377.05	110701461.16	94.54	48
13	Molasses	1203304.20	111904765.36	95.56	52
14	Rice Bran Deoiled I	951793.86	112856559.22	96.38	56
15	Trace Mineral Concentrate	939643.59	113796202.81	97.18	60
16	CN Cake Oiled	708180.00	114504382.81	97.78	64
17	Yea Sacc1025	675000.01	115179382.82	98.36	68
18	Niltox	624694.90	115804077.72	98.89	72
19	Liv.52	461303.48	116265381.20	99.29	76
20	Bentonite Powder	301556.05	116566937.25	99.55	80
21	Lime Stone Powder	247010.32	116813947.57	99.76	84
22	DOB Rose	147345.00	116961292.57	99.88	88
23	Salt	98530.30	117059822.87	99.97	92
24	Turmeric Waste	35249.50	117095072.37	100.00	96
25	Nutriferm (Active Dried yeast)	3789.47	117098861.84	100.00	100
	Total		**117098861.84**		

Source: Closing stock of raw materials as on 10/11/2018

Chart. 5.1 Classification of raw materials on XYZ Analysis



- X category – Maize, Cotton seed de oiled cake, Groundnut cake extraction, Acid buff

59.78 percent of the valued items were in X category with 16 percent number of items.

- Y category- Rice bran oiled 24 % (white), Rape seed extraction, soya bean deoiled cake, CN cake deoiled (transfer), vitamin AD3, rice bran oiled 24 % (red).

31.57 percent of the valued items were in Y category with 24 percent number of items

- Z category – others

8.65 percent of valued items were in Z category with 60 percent number of items

The above result of XYZ analysis is from the available closing stock on 10/11/2018. It may be also affected by the seasonality. Hence it may change according to the season.

HML Analysis

This analysis is done for classifying the materials based on their unit prices:
H -High Price Materials

M -Medium Price Materials

L -Low price Materials

HML analysis helps an organization to take decisions on the following:

a) It helps to assess the security requirements and the type of storage for high priced items..

b) The frequency of stock checking is decided on the basis of the cost item. In other words, more expensive the item, more frequent will be its stock-checking.

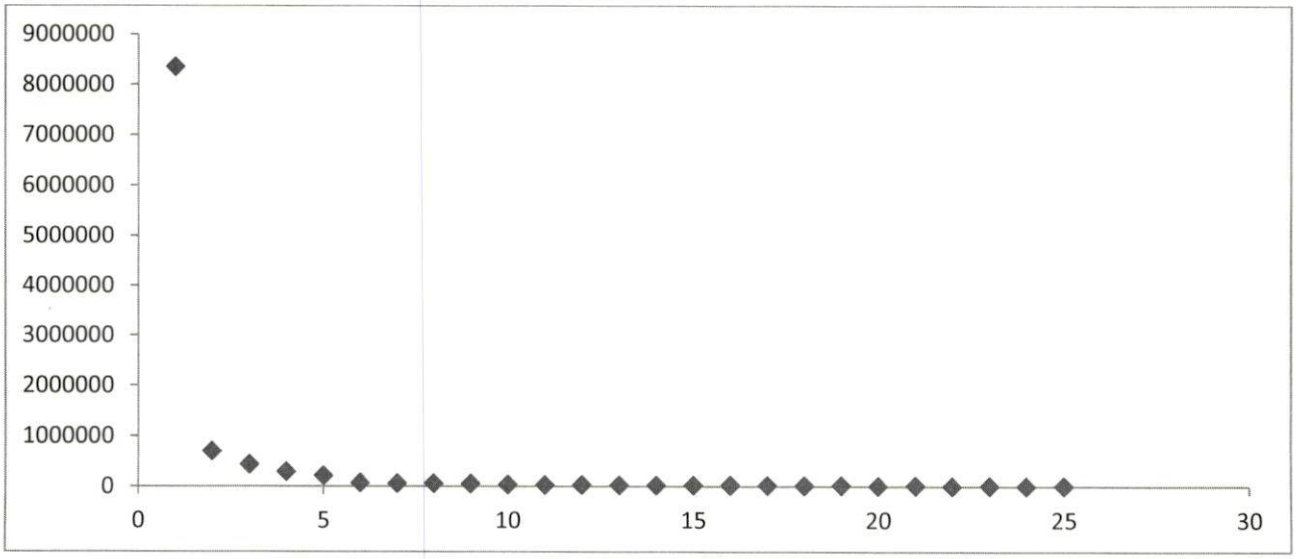
c) A control on purchases and buying policies can be exercised by the company. This means H and M items will not be ordered in excess of the required minimum quantity. However, in the case of L items, they may be purchased in bulk in order to avail the benefits of bulk purchase.

Table 5.4 Classification on raw materials on HML

Sl. No	Items	Price Per Mt
1	Vitamin AD3	8349600.10
2	Vitamin E 50% (C F)	701143.10
3	Bioplex High Seven	432190.76
4	Yea Sacc1025	298804.79
5	Nutriferm(Active Dried yeast)	210526.11
6	Niltox	68897.64
7	Trace Mineral Concentrate	57906.18
8	Liv.52	57333.27
9	Acid Buff	53294.99
10	Soya bean Deoiled Cake	32358.04
11	Groundnut Cake Extraction	27764.20
12	Cotton Seed Deoiled Cake	25745.96
13	Rice Bran Oiled 24%(Red)	24795.65
14	Rice Bran Oiled 24%(White)	22687.31
15	CN Cake Oiled	22234.85
16	Rape Seed Extraction	19676.68
17	Maize	16303.74
18	Rice Bran Deoiled I	15407.43
19	CN Cake Deoiled (Transfer)	15208.79
20	Molasses	11900.00
21	DOB Rose	11816.91
22	Turmeric Waste	5123.47
23	Lime Stone Powder	3832.17
24	Bentonite Powder	3441.95
25	Salt	2358.26

Source: Closing stock of KSE Ltd. on 10/11/2018

Chart 5.2: HML analysis



H items - Vitamin AD3

M items - Vitamin E 50% (C F), Bioplex High Seven, Yea Sacc1025, Nutriferm (Active Dried yeast)

L items – remaining

The HML analysis is the instant "usage value, price" criteria is used. It is based on Pareto principle or the 80/20 rule. The HML analysis is a rational approach for determining the degree of control that should be exercised on each item in inventories. Obviously, the 'H' class items should be subjected to a strict management control under either continuous review or periodic review with short review cycles. The 'L' class items require little attention and can be relegated down the line for periodic review say, just once a year. The control over 'B' class items should be somewhere in between.

TABLE 5.5: Overall classification on XYZ, HML and SOS analysis

Sl.no	Items	Analysis		
		XYZ	HML	SOS
1	Maize	X	L	S
2	Cotton Seed Deoiled Cake	X	L	OS
3	Groundnut Cake Extraction	X	L	OS
4	Acid Buff	X	L	OS
5	Rice Bran Oiled 24%(White)	X	L	OS
6	Rape Seed Extraction	X	L	S
7	Soya bean Deoiled Cake	Y	L	OS
8	CN Cake Deoiled (Transfer)	Y	L	OS
9	Vitamin AD3	Y	H	OS
10	Rice Bran Oiled 24%(Red)	Y	L	OS
11	Vitamin E 50% (C F)	Z	M	OS
12	Bioplex High Seven	Z	M	OS
13	Molasses	Z	L	S
14	Rice Bran Deoiled I	Z	L	OS
15	Trace Mineral Concentrate	Z	L	OS
16	CN Cake Oiled	Z	L	OS
17	Yea Sacc1025	Z	M	OS
18	Niltox	Z	L	OS
19	Liv.52	Z	L	OS
20	Bentonite Powder	Z	L	OS
21	Lime Stone Powder	Z	L	OS
22	DOB Rose	Z	L	OS
23	Salt	Z	L	OS
24	Turmeric Waste	Z	L	OS
25	Nutriferm(Active Dried yeast)	Z	M	OS

Source: Closing stock on 10/11/2018

There is a scope for reduction in the stock of the items which are in the category of X, L and OS. The company should examine ways to reduce the stock level of OS items which are of low value. As they are not affected with the seasonality. Eg. Cotton seed deoiled cake, Groundnut cake extraction, acid buff, rice bran etc.

Company must give utmost importance for the items of X and S like Rape seed Extraction and Maize. The items which are in the category of Z and OS may be given less attention which is of low value.

All these above findings are made with the closing stock on 10/11/2018, which may be affected by seasonality. If ABC technique is followed by the company, further stock reduction is possible.

Efficiency of inventory management in KSE Ltd.

Introduction

The efficiency of any manufacturing organization depends on the availability of raw materials and component parts in the proper quantity, quality, price range, and time. Failure in any of these areas, increases cost and decreases profit as certainty as outmoded production methods or ineffective selling techniques.

The basic objective of inventory management is to optimize the size of inventory in a firm so that the smooth performance of production and sales functions may be possible at minimum cost. The holding of surplus and slow moving inventories involves extra cost. To what extent the KSE Ltd. with comparison to Godrej Agrovet Ltd. have been successful in optimizing their inventory holdings during the period under study is evaluated in this chapter. Godrej Agrovet Limited is a diversified, Research & Development focused agri-business company, dedicated to improving the productivity of Indian farmers by innovating products and services that sustainably increase crop and livestock yields. They hold leading market positions in the different businesses in which they operate - Animal Feed, Crop Protection, Oil Palm, Dairy and Poultry and Processed Foods.

Size and growth of inventory

The size of inventory and the progressive base year percentage growth index of inventory from 2008-09 to 2017-18 is portrayed in the following table.

Table 5.6 Comparison of size of inventory based on growth index **(Rs. in lakhs)**

Years	KSE Ltd.		Godrej Agrovet Ltd.	
	Size of inventory	Progressive base year % growth	Size of inventories	Progressive base year % growth
2008 -09	2469.86	100.00	11986	100.00
2009 -10	2082.62	84.32	13350	111.38
2010 -11	3261.20	132.04	14563	121.50
2011 -12	4183.33	169.38	19363-	161.55
2012 -13	4737.15	191.80	26348	219.82
2013 -14	4969.90	201.22	31871	265.90
2014 -15	6600.66	267.25	38700	322.88
2015 -16	7299.00	295.52	52284	436.21
2016 -17	7432.00	300.91	57304	478.09
2017 -18	9051.89	366.49	55119	459.86

Source: Computed from the Annual Reports of Respective companies for the Period 2008-09 to 2017-18

The table reveals that the size of inventory in KSE Ltd. and Godrej Agrovet Ltd. from the year 2008-09 to 2017-18. There is 266.49 percent in KSE Ltd. and 360 percent in Godrej Agrovet increase in the size of inventory. Except during the year 2009-10, the size of inventory of KSE Ltd. has been increasing; the increase has been almost regular throughout the remaining year. In Godrej Agrovet Ltd. the increase in inventory was moving upward steadily compared with the previous year 2008-09. Among the companies, the highest increase in the size of inventory has been observed in Godrej Agrovet Ltd with 55119 lakh which is 6 times of KSE Ltd. in the size of inventory. It may be due to the fact that Godrej Agrovet Ltd. is a pan-national agribusiness company and KSE Ltd. is concentrating on sales in Kerala and Tamil Nadu.

The size of inventory in these companies taken together during the period covered by the study shows an increasing trend. The increasing trend is shown in the following chart:

Chart 5.3 Progressive Percentage growth index

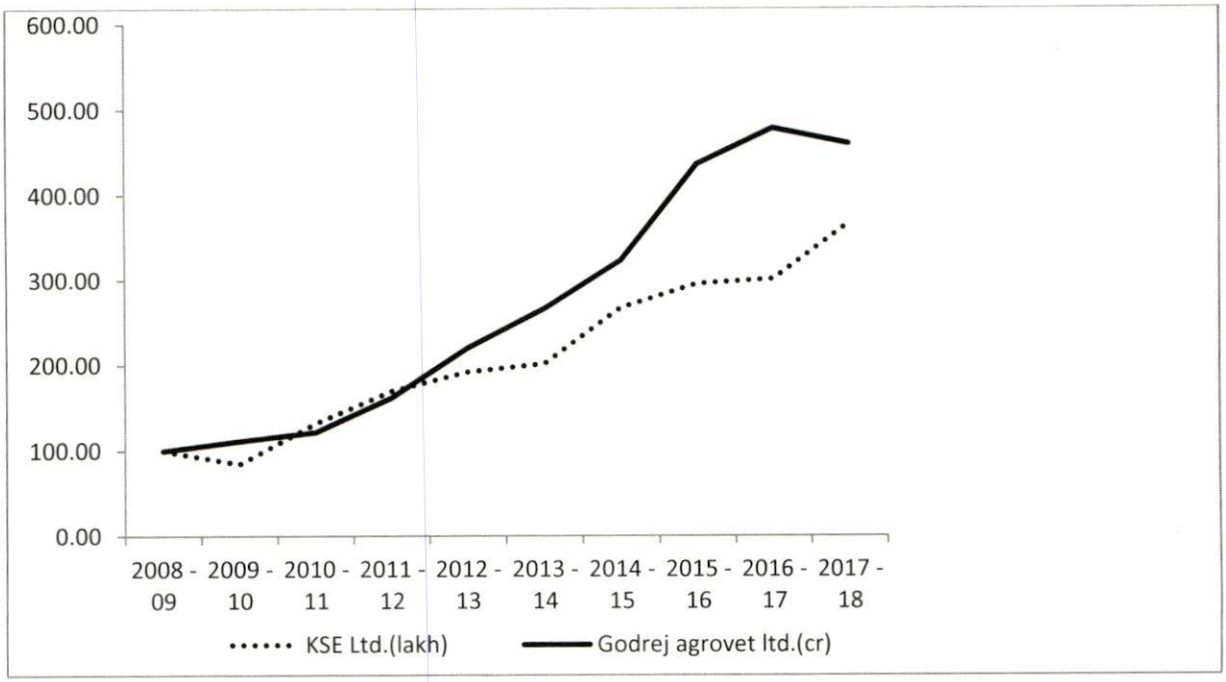


Table 5.7 Correlation of inventories to sales **(Rs. in lakhs)**

Years	KSE Ltd.		Godrej Agrovet Ltd.	
	Size of inventory	Sales	Size of inventory	Sales
2008 - 09	2469.86	35007.87	11986.0	NA*
2009 -10	2082.62	37094.19	13350.0	NA
2010 -11	3261.20	45368.03	14563.0	NA
2011 -12	4183.33	54222.00	19363.0	NA
2012 -13	4737.15	69717.71	26348.0	276090.00
2013 -14	4969.90	80630.33	31871.0	309924.10
2014 -15	6600.66	89970.05	38700.0	330671.50
2015 -16	7299.00	92493.46	52284.0	336598.90
2016 -17	7432.00	104724.53	57304.0	361785.10
2017 -18	9051.89	130417.33	55119.0	369172.70
Average	**5208.76**	**73964.55**	**32089**	**330707.05**

Source: Annual reports of both companies *NA: Not Available*

Table 5.8 Results of correlation

	KSE Ltd.	Godrej Agrovet Ltd.
Correlation (r)	0.98	0.94
Coefficient of determination($R^{2)}$	96.66	88.01

Inventory has a positive relationship with the sales. The correlation between inventory and sales reveals that the value of 'r' for KSE Ltd. is +.98, a positive correlation with 96.66 percent of the variation in the inventories explained by the sales and only the remaining 3.34 percent of the variation due to other factor. It reveals that there is major share for inventory in the changes of sales.

During the same period for the Godrej Agrovet Ltd. the correlation between inventory and sales reveals that the value of 'r' is +.94, a positive correlation with 88.01 percent of the variation in the inventories explained by the sales and the only the remaining 12 percent of the variation due to other factor.

From above results we can reveals that majority sales changes due to changes in inventories. But comparing both companies, there is more relation of inventories to sales is in KSE Ltd. than Godrej Agrovet Ltd.

Structure of inventory

Due to non-availability of breakup details of inventory of Godrej Agrovet Ltd. comparison between two firms are not taken. The major components of inventory in KSE Ltd are raw materials, finished goods, packing materials and stores & spares. The structure of inventory and the percentage share of each component appear in the table 5.9

This will throw light on the segment where the inventory is concentrated.

Table: 5.9 Components of inventory in KSE Ltd. **(Rs. in lakhs)**

Years	Raw materials	Finished goods	Packing materials	Stores and spares	Total inventory
2008 - 09	1606.50 (65.04)	419.46 (16.98)	253.05 (10.25)	190.85 (7.73)	2469.86 (100)
2009 -10	1219.44 (58.55)	468.04 (22.47)	186.93 (8.98)	208.21 (10.00)	2082.62 (100)
2010 -11	2191.81 (67.21)	555.52 (17.03)	295.75 (9.07)	218.12 (6.69)	3261.20 (100)
2011 -12	2795.16 (67.38)	893.52 (21.54)	217.07 (5.23)	242.58 (5.85)	4148.33 (100)
2012 -13	3202.16 (67.60)	891.32 (18.82)	386.65 (8.16)	257.02 (5.43)	4737.15 (100)
2013 -14	3440.64 (69.23)	949.93 (19.11)	309.96 (6.24)	269.37 (5.42)	4969.90 (100)
2014 -15	5023.66 (76.11)	1007.62 (15.27)	257.11 (3.90)	312.27 (4.73)	6600.66 (4.73)
2015 -16	5503.40 (75.39)	1177.80 (16.13)	300.06 (4.11)	318.46 (4.36)	7299.72 (100)
2016 -17	5261.18 (70.79)	1530.80 (20.60)	312.02 (4.20)	328.00 (4.41)	7432.00 (100)
2017 -18	7038.65 (77.76)	1264.25 (13.97)	400.52 (4.42)	348.47 (3.85)	9051.59 (100)
Average	**3728.26** **(71.62)**	**915.83** **(17.9)**	**291.91** **(5.61)**	**269.34** **(5.17)**	**5205.30** **(100)**

Source: Computed from the Annual report of KSE Ltd.

Figures in brackets denotes percentage of components to total inventory

Table 5.9 shows the extent and percentage of components of inventory to total inventory of KSE Ltd. The raw materials inventory shows an increasing trend. It increased from 65 percent of total inventory in 2008-09 to 77.76 percent in 2017-18. Except in 2009-10, raw materials have been increasing. Finished goods to total inventory are showing increase trend in the initial years and it reduced to 14 percent in 2017-18. This reveals there is high demand in the market for the product. Both the packing materials and stores and spares also show a reducing trend.

Table 5.10 Growth in components of inventory and sales in KSE Ltd.

Years	Raw materials	Finished goods	Packing materials	Stores and spares	Sales
2008 -09	100.00	100.00	100.00	100.00	100.00
2009 -10	75.91	111.58	73.87	109.10	105.96
2010 -11	136.43	132.44	116.87	114.29	129.59
2011 -12	173.99	213.02	85.78	127.11	154.89
2012 -13	199.33	212.49	152.80	134.67	199.15
2013 -14	214.17	226.46	122.49	141.14	230.32
2014 -15	312.71	240.22	101.60	163.62	257.00
2015 -16	342.57	280.79	118.58	166.86	264.21
2016 -17	327.49	364.95	123.30	171.86	299.15
2017 -18	438.14	301.40	158.28	182.59	372.54
Average	**232.07**	**218.34**	**115.36**	**141.13**	**141.13**

Source: computed from the annual report of KSE Ltd

Every component of inventory shows an increasing trend. This is due to during the study period KSE Ltd. had increased their turnover by starting new production unit and increasing their production capacities. In 2014 Cattle feed production capacity of old plant at Irinjalakuda unit increased to 225 MTS per day and also production capacity of cattle feed plant in Palakad unit increased to 120 MTS per day. This leads to increase in raw material inventory from 214.17 lakh to 312.71 lakh. In 2015 production capacity of cattle feed plant in Swaminathapuram unit increased to 225 MTS per day. Hence in that year ending there is 342.57 lakh raw material inventories.

From the table 5.8, it already evident that there is a positive correlation between inventory and sales. The table 5.9 reveals that 'raw material to total inventory' shows an increasing trend thorough the study period. Table 5.10 also reveals that there is a growth in both the raw materials and sales. This reveals that increase in raw materials leads to increase total inventory, which in turn will lead to increase in sales.

The study of mere structure of inventory is inadequate to assess whether the inventory kept by the company has been sufficient, insufficient or excessive in relation to their

requirements. The calculation of turnover ratio of each component of inventory will give a better insight into this.

Inventory turnover ratio

Circulation of inventory directly affects profitability of a firm. Other things remaining the same, the faster the circulation, the larger is the profits. Each turnover adds to the volume of profits. A high inventory turnover means that the firm has conducted more business with less amount of inventory.

Table 5.11 Inventory turnover ratio (ITR) **(Rs. in lakhs)**

Years	KSE Ltd.			Godrej Agrovet Ltd.		
	Cost of goods sold	Average stock	Inventory turnover ratio	Cost of goods sold	Average stock	Inventory turnover ratio
2008 -09	28834.77	1778.79	16.21	NA	NA	NA
2009 -10	30123.14	1851.68	16.27	NA	NA	NA
2010 -11	38060.08	2217.41	17.16	NA	NA	NA
2011 -12	45026.54	3218.01	13.99	NA	NA	NA
2012 -13	60474.34	3891.08	15.54	2129519.00	232094.00	9.18
2013 -14	69121.63	4242.03	16.29	2305509.00	303483.00	7.60
2014 -15	74019.27	5210.93	14.20	2470497.00	358146.50	6.90
2015 -16	80150.20	6356.24	12.61	2832323.70	436590.05	6.49
2016 -17	90184.66	6736.59	13.39	3622937.20	540772.45	6.70
2017 -18	96366.66	7476.86	12.89	2626166.10	483702.50	5.43

Source: Computed from annual report of both companies

Inventory turnover ratio in both companies shows decreasing trend. It is not a good trend. May be it will be the trend in the industry. But in terms of inventory turnover ratio KSE Ltd. is better compared to Godrej Agrovet Ltd. KSE Ltd. is doing business with each rupee invested in it. Above conclusions is made without considering the regional seasonality in North India and Kerala where Godrej Agrovet and KSE are situated.

Inventory conversion period

In order to judge the velocity with which inventory and its components have circulated in the companies during the period under study, the ratio of holding period of aggregate inventory

is to be calculated. The holding period of aggregate inventory for the companies is calculated in terms of days by dividing the number of days in a year by the inventory turnover ratio. The holding period of aggregate inventory is exhibited in the following table.

Table 5.12 Inventory conversion period

Years	No of days	Inventory turnover ratio		Inventory conversion period (days)	
		KSE Ltd.	Godrej Agrovet Ltd.	KSE Ltd.	Godrej Agrovet Ltd.
2008 -09	365	16.21	NA	23	NA
2009 -10	365	16.27	NA	22	NA
2010 -11	365	17.16	NA	21	NA
2011 -12	365	13.99	NA	26	NA
2012 -13	365	15.54	9.18	23	40
2013 -14	365	16.29	7.60	22	48
2014 -15	365	14.20	6.90	26	53
2015 -16	365	12.61	6.49	29	56
2016 -17	365	13.39	6.70	27	54
2017 -18	365	12.89	5.43	28	67

Source: Computed from the Annual Reports of Respective companies.

When the inventory holding ratio is high, the cause may be that there may be obsolete or at least slow moving stock on hand. Throughout the study period, inventory conversion period of both companies were showing an increase trend. Comparing with Godrej Agrovet Ltd., inventory conversion period of KSE Ltd. has a small variation in between 22 to 29 days during the period 2012-13 to 2017-18. But for Godrej Agrovet there is a drastic variation in the period ranging from 40 to 67 days. The nature the product of both companies is perishable. So it is better to decrease the conversion period. The KSE Ltd. have high inventory turnover ratio with low conversion period when compared to Godrej Agrovet Ltd. It shows KSE Ltd. is better in the management of inventory than Godrej Agrovet Ltd.

Raw material inventory turnover

The raw materials turnover ratio gauges a company's ability to efficiently turn raw materials into finished products. This is valuable information, which the company can use to streamline production processes or compare itself against its competitors.

Table 5.13 Raw material inventory turnover ratio **(Rs. in lakhs)**

Years	KSE Ltd.(lakhs)			Godrej Agrovet Ltd.		
	Raw material consumed	Average stock of raw material	Raw material inventory turnover ratio	Raw material consumed	Average stock of raw material	Raw material inventory turnover ratio
2008 - 09	28885.06	1394.57	20.71	NA	NA	NA
2009 -10	30181.82	1412.97	21.36	NA	NA	NA
2010 -11	38147.56	1705.63	22.37	NA	NA	NA
2011 -12	45364.54	2493.49	18.19	NA	**NA**	NA
2012 -13	60472.14	2998.66	20.17	215502.90	16540.30	13.03
2013 -14	69180.24	3321.40	20.83	233705.60	20826.35	11.22
2014 -15	74076.96	4232.15	17.50	250624.80	22927.80	10.93
2015 -16	80320.38	5263.53	15.26	285714.90	30759.00	9.29
2016 -17	90537.66	5382.29	16.82	361712.40	39571.39	9.14
2017 -18	96090.11	6149.92	15.62	261758.02	34584.36	7.57

Source: Computed from the Annual Reports of Respective companies.

The table 5.11 reveals that raw material inventory turnover ratio is coming down for both the companies. In 2008-09, the raw material inventory turnover ratio for KSE is 20.71 which decreased to 15.62. From the 2012-13, the ratio of KSE and Godrej Agrovet were decreasing trend. This may be the trend in the cattle feed industry. But while comparing both companies, Godrej Agrovet is declining more than that of KSE Ltd. in the last three years. So KSE Ltd. is better than Godrej Agrovet Ltd. in turning raw material into finished products. This may be result of lean production followed by KSE Ltd.

Raw material holding period

In order to judge the velocity with which raw material turn to finished goods in the companies during the period under study, the ratio of holding period of raw material is to be calculated. The holding period of raw material for the companies is calculated in terms of days by dividing the number of days in a year by the raw material turnover ratio. The holding period of raw material is exhibited in the following table:

Table 5.14 Raw material holding period

Years	No of days	Raw material inventory turnover ratio		Raw material holding period (days)	
		KSE Ltd.	Godrej Agrovet Ltd.	KSE Ltd.	Godrej Agrovet Ltd.
2008 -09	365	20.71	NA	18	NA
2009 -10	365	21.36	NA	17	NA
2010 -11	365	22.37	NA	16	NA
2011 -12	365	18.19	NA	20	NA
2012 -13	365	20.17	13.03	18	28
2013 -14	365	20.83	11.22	18	33
2014 -15	365	17.50	10.93	21	33
2015 -16	365	15.26	9.29	24	39
2016 -17	365	16.82	9.14	22	40
2017 -18	365	15.62	7.57	23	48

Source: Computed from the Annual Reports of Respective companies.

The table 5.13 shows the raw material holding period of two companies. Both companies showing an increasing the number of raw material holding period. The high raw material holding period affect the liquidity of the company. The high period leads to increase the expenses like storage, spoilage, damage, obsolescence etc. Godrej Agrovet comparative have high raw material holding period than the KSE, which is ranging from 28-48 days from the year 2012-13 to 2017-18. While in KSE Ltd. the period of holding raw material is less than 23 days. Comparing with the pervious years of the companies KSE Ltd. has slight variation in the holding period but it is in increasing trend. In Godrej Agrovet Ltd. there is high variation and increasing trend. In the case of raw material holding KSE is better than Godrej Agrovet.

Finished goods inventory turnover

The turnover rate of finished goods is the ratio of the cost of goods sold to the average inventory of finished goods of the business. A high turnover rate can mean the business is effectively selling the products it has in its inventory or that its inventory levels are too low whereas, a low turnover rate can mean the inventory levels of your business are too high or that the products in its inventory are outdated.

Table 5.15 Finished goods inventory turnover ratio **(Rs. in lakhs)**

Years	KSE Ltd.			Godrej Agrovet Ltd.		
	Cost of goods sold	Average stock of finished goods	Finished goods inventory ratio	Cost of goods sold	Average stock of finished goods	Finished goods inventory ratio
2008 -09	28885.06	384.23	75.18	NA	NA	NA
2009 -10	30181.82	443.75	68.02	NA	NA	NA
2010 -11	38147.56	511.78	74.54	NA	NA	NA
2011 -12	45364.54	724.52	62.61	NA	NA	NA
2012 -13	60472.14	892.42	67.76	212951.90	2805.40	75.91
2013 -14	69180.24	920.63	75.14	230550.90	3795.05	60.75
2014 -15	74076.96	978.78	75.68	247049.70	5310.15	46.52
2015 -16	80320.38	1092.71	73.51	283232.37	6836.61	41.43
2016 -17	90537.66	1354.30	66.85	362293.72	6980.71	51.90
2017 -18	96090.11	1397.53	68.76	262616.61	6595.30	39.82

Source: Computed from the Annual Reports of Respective companies.

From the above table, it is clear that the finished goods inventory turnover ratio of KSE Ltd. was more than that of Godrej Agrovet Ltd.it shows the efficiency of the inventory management of the KSE Ltd. Comparing to Godrej Agrovet Ltd., KSE Ltd have slight changes in the finished goods turnover ratio during the period. But for Godrej Agrovet Ltd. the ratio shows decreasing trend with drastic changes which are not good for the business. Hence performance of KSE Ltd. is better. The products of both companies are perishable in nature;

hence increasing the finished turnover ratio is better. Converting of finished goods for selling goods must be increased in the cattle feed industry. Because the cattle feed are manufactured on the basis of seasonality for the cattle.

Finished goods holding period

In order to judge the velocity with which finished goods turn to selling sgoods in the companies during the period, the ratio of holding period of finished goods is to be calculated. The holding period of finished goods for the companies is calculated in terms of days by dividing the number of days in a year by the finished good turnover ratio. The holding period of finished goods is exhibited in the following table.

Table 5.16 Finished goods holding period

Years	No of days	Finished goods inventory turnover ratio		Finished goods holding period (days)	
		KSE Ltd.	Godrej Agrovet Ltd.	KSE Ltd.	Godrej Agrovet Ltd.
2008 – 09	365	75.18	NA	5	NA
2009 -10	365	68.02	NA	5	NA
2010 -11	365	74.54	NA	5	NA
2011 -12	365	62.61	NA	6	NA
2012 -13	365	67.76	75.91	5	5
2013 -14	365	75.14	60.75	5	6
2014 -15	365	75.68	46.52	5	8
2015 -16	365	73.51	41.43	5	9
2016 -17	365	66.85	51.90	5	7
2017 -18	365	68.76	39.82	5	9

Source: Computed from the Annual Reports of Respective companies.

From the table 5.15, it is clear that increase in ratio shows a decrease in holding period. The KSE Ltd. shows more or less constant except in the year 2011-12 for the holding period of finished goods. The KSE Ltd. shows stability in holding period of finished goods for last six years. But the Godrej Agrovet Ltd. shows increasing trend during the study period. In 2017-18

Godrej Agrovet Ltd. has 9 days as holding period which is the double the KSE Ltd. Lower storage period of finished goods shows good management of inventory. KSE is better in converting finished goods to sales when compared to Godrej Agrovet Ltd.

Inventory to total assets ratio

Inventory represents an important segment of total assets of most enterprises. It is vital for any company that inventory should be managed efficiently for the overall development of the company. The percentage of inventory to total assets ratio shows the portion of assets tied up in inventory. The goal of effective inventory management is to minimize the total costs that are associated with the holding of inventories. Generally the lower percentage value of this ratio is considered a better index in the inventory management of the companies.

Table 5.17 Inventory to Total assets ratio **(Rs. in lakhs)**

Years	KSE Ltd.			Godrej Agrovet Ltd.		
	Size of inventory	Total Assets	Percentage of inventory to Total Assets	Size of inventory	Total Assets	Percentage of inventory to total Assets
2008 -09	2469.86	7115.82	34.71	11986	50101	23.92
2009 -10	2082.62	7679.14	27.12	13350	38533	34.65
2010 -11	3261.20	7710.46	42.30	14563	42112	34.58
2011 -12	4183.33	8637.49	48.43	19363	36125	53.60
2012 -13	4737.15	9532.30	49.70	26348	89634	29.40
2013 -14	4969.90	9550.29	52.04	31871	111606	28.56
2014 -15	6600.66	13802.54	47.82	38700	128951	30.01
2015 -16	7299.00	11558.79	63.15	52284	194222	26.92
2016 -17	7432.00	15627.83	47.56	57304	140237	40.86
2017 -18	9051.89	22964.73	39.42	55119	152121	36.23

Source: Computed from the Annual Reports of Respective companies.

The ratios for the two companies are 34.71 percent and 23.92 percent respectively for KSE Ltd. and Godrej Agrovet Ltd. There is fluctuating changes in ratio for both companies throughout the study period. The inventory to total asset ratio is high for KSE when compared to Godrej Agrovet. This implies that KSE has less total assets compared to Godrej Agrovet and KSE have more inventories compared with other. When correlation between the ratios of two

companies calculated, the result availed is -0.047. This implies that there is reverse relation between the ratios. So it is not the general trend in the industry. The KSE Ltd. records the highest ratios which is a significant portion of total assets when compared to Godrej Agrovet Ltd. But inventory turnover ratio of KSE Ltd. is also better. So there is good management of inventory in KSE Ltd.

Inventory to working capital ratio

Inventory to working capital ratio is useful for studying the liquid financial position of any business enterprise. Main focus in management of working capital for inventories is to use the inventories most economically. An efficient inventory management will help in minimizing the blocking of capital in inventories. Inventory to working capital ratio can be calculated by dividing the inventory by working capital to measure the liquidity of working capital. A low ratio indicates high liquidity which the creditors prefer. The lower the ratio, the greater is the protection for the current creditors. A lower ratio also indicates a sound working capital position.

Table 5.18 Inventory to working capital ratio **(Rs. in lakhs)**

Years	KSE Ltd.			Godrej Agrovet Ltd.		
	Size of inventory	working capital	Ratio of inventory to working capital	Size of inventory	working capital	Ratio of inventory to working capital
2008 -09	2469.86	1957.5	1.26	11986	27575	0.43
2009 -10	2082.62	1778.93	1.17	13350	11752	1.14
2010 -11	3261.20	2069.23	1.58	14563	33	441.30
2011 -12	4183.33	3005.75	1.39	19363	-938	-20.64
2012 -13	4737.15	3111.79	1.52	26348	2886	9.13
2013 -14	4969.90	2864.28	1.74	31871	40158	0.79
2014 -15	6600.66	6188.19	1.07	387	46583	0.01
2015 -16	7299.00	5787.06	1.26	52284	75038	0.70
2016 -17	7432.00	6187.75	1.20	57304	18845	3.04
2017 -18	9051.89	7693.47	1.18	55119	20954	2.63
Average	**5208.76**	**4064.40**	**1.34**	**28258**	**24289**	**43.85**

Source: Computed from the Annual Reports of Respective companies.

The table 5.18 highlights the ratio of inventory to working capital in the both companies for the period of ten years. In 2010-11, there is very inefficient of working capital for Godrej Agrovet Ltd. so there is drastic low in the ratio of size of inventory to working capital. For KSE Ltd. there is slight variation. From 2012-13 to 2015-16, Godrej Ltd. has more liquidity than KSE Ltd. but in last two years KSE Ltd. has low inventory to working capital ratio compared with Godrej Ltd., hence it has more liquidity.

Ratio of inventory to capital employed

Capital employed, also known as funds employed, is the total amount of capital used for the acquisition of profits. It is the value of all the assets employed in a business, and can be calculated by adding fixed assets to working capital or by subtracting current liabilities from total assets. Capital employed is primarily used by analysts to determine the return on capital employed. Like return on assets, investors use return on capital employed to get an approximation for what their return might be in the future. Return on capital employed is thought of as a profitability ratio.

Table 5.19 Inventory to capital employed ratio **(Rs. in lakhs)**

Years	KSE Ltd.			Godrej Agrovet Ltd.		
	Size of inventory	Capital employed	Ratio of inventory to capital employed	Size of inventory	Capital employed	Ratio of inventory to capital employed
2008 -09	2469.86	5973.21	0.41	246986	696459	0.35
2009 -10	2082.62	6419.57	0.32	208262	741132	0.28
2010 -11	3261.20	4498.23	0.72	326120	735427	0.44
2011 -12	4183.33	4898.67	0.85	418333	809994	0.52
2012 -13	4737.15	4958.21	0.96	473715	924175	0.51
2013 -14	4969.90	5702.41	0.87	496990	916625	0.54
2014 -15	6600.66	7764.13	0.85	660066	1344651	0.49
2015 -16	7299.00	7833.41	0.93	729900	1117037	0.65
2016 -17	7432.00	9411.99	0.79	743200	1470429	0.51
2017 -18	9051.89	15039.43	0.60	905189	2197644	0.41
Average	**5208.76**	**7249.93**	**0.72**	**520876**	**10954**	**0.47**

Source: Computed from the Annual Reports of Respective companies.

The table 5.19 shows that the average ratio of inventory to capital employed was 72 percent for KSE Ltd. and 47 percent for Godrej Agrovet Ltd. In comparison with the base year 2008-09, it shows an overall increasing trend. It was the highest in the year 2012-13 and 2013-14. The ratio shows a decreasing trend in the last three years of the study period. The ratio decreases from 96 percent in 2012-13 to .60 in 2017-18 for KSE Ltd. The ratio decreases from 54 percent in 2013-14 to .41 in 2017-18. From the perception of the KSE Ltd. as a whole, almost .72 of the capital employed is locked up in the inventory. But KSE have greater inventory turnover ratio and finished goods holding period is 5 day and these are better than the Grodrej Agrovet, hence KSE is better in the performance of inventory management.

Chapter VI

SUMMARY OF FINDINGS, SUGGETIONS AND CONCLUSION

CHAPTER VI

Summary of findings, suggestions and conclusion

Effective management of an enterprise is not possible without proper management of its working funds, which in turn, would call for efficient management of inventories as they form a major chunk of the current assets of any firm. In this context, the study attempt to analyse the efficiency of inventory management in KSE Ltd.

Analysis of efficiency of inventory management system was done in two sections- first section dealt with the inventory management practices of KSE Ltd. whereas the second section studied efficiency using ratios and percentages. Size and growth of inventory, components and their contribution to inventory, inventory turnover ratios and holding period of raw material and finished goods, financial implications of inventory of KSE Ltd. by comparing with Godrej Agrovet Ltd. were studied as part of efficiency analysis. All these aspects have been studied using the data from 2007-08 to 2017-18. The findings of the study are summarized below.

6.1 Findings

6.1.1 Inventory management practices in KSE Ltd. Irinjalakuda

- The company follows a centralized purchasing system whereby raw materials are purchased from the Irinjalakuda unit as bulk quantity and is delivered to rest of the six units according to the unit requirements.
- The purchase section under purchase department is responsible for the purchase of all materials required for production and maintenance.
- The company purchases the raw materials on the basis of availability; thus the components of cattle feed varies according to the availability of raw materials.
- The veterinary doctor of the KSE Ltd. fixes the formula. It may change according to the availability of raw materials, protein content, seasonality, quality parameters and costs.
- The suppliers who were supplying the raw materials must meet the quality parameters fixed by the company. It will vary according to the seasons and price is fixed on the bases of market price.

- Coconut cake is the intermediary product of KSE Ltd. Hence it is shown as 'segment transfer' in books account. In 2017-18, there is a segment transfer of 6663.95 lakhs from coconut cake to animal feed.
- Acid buff, only raw material imported from Ireland is required 330 MT for every quarter. For 5 lakh MT unit of production of feed, 1200 MT unit of acid buff is needed, which is 0.24 percent.
- Vendor selection is mainly based on price, quality and delivery promptness of raw materials. First preference is given to price, then quality.
- Raw materials are ordered by the purchase department when inventory reaches the order level.
- When the supplier is selected, the purchase manager informs it to the executive officer and instructs him to draft a formal purchase contract which includes specifications such as name of the supplier, order number, date, quality, quantity, price, mode of delivery, delivery date, and terms of payment and signature of the competent authority.
- Purchase contract is a written authorization to the supplier to supply the required materials. It is the legal document prepared in the name of the supplier selected on the basis of rates and terms accepted.
- Cancellation of an order occurs when the suppliers fail to deliver the goods within stipulated time period. When supplier is provided an extension, a token penalty charges are applied corresponding to the delay in delivery. If the production stops due to inadequacy of availability of raw materials, temporarily new supplier is found.
- When the order arrives at the gates of KSE ltd. for delivery, before unloading, three samples are collected by the quality control department. From the samples, one is tested and statements on quality of raw materials are prepared. 90 percent of payment and lorry freight are done on the spot.
- Each arrival of raw materials is unloaded in the godown at the specific space allotted for it (called lots). After unloading the supervisor notes and takes into record the number of bags received.
- Godown officer produces a Material Received Report (MRR) showing the vehicle number, no: of bags, quantity, name of supplier etc. Four copies of MRR is prepared, of

which one copy is retained in the godown office, one copy sent to Purchase department, one copy to the accounts section and last copy sent to the supplier.

- The godown office in charge also prepares a daily stock statement of finished goods to facilitate stock control.
- If there is unavailability of raw material or delay in delivery, the production schedule will be affected. The firm cuts down the three shift production to two shifts. Hence the number of days required to meet the same quantity of production is thus extended.
- Issue of raw materials are done as per FIFO method, (raw materials received first are issued first) and 'specific price' method is followed.
- KSE has fixed the maximum and reorder stock level for each item of raw material. Reorder stock level is fifteen days' average requirement and maximum stock is kept at one month's average requirement.
- KSE Ltd. places a new order when the inventory reaches 50 percent of stock level of each raw material or the 15 days of stock.
- There is purchase order system software to arrive at the order level for the purchase department, enabling them to place orders with the supplier.
- In KSE Ltd, the raw materials, packing materials, stores & spares and consumables are issued following FIFO method.
- KSE Ltd. doesn't have a category of inventory as work in process.
- There are no significant wastages in KSE Ltd.
- The inventory management techniques followed by the company are FIFO, Reorder level and Lean management.
- As the raw material used in the production of cattle feed are agricultural products. Seasonality is a major factor affecting the availability of raw materials. Hence SOS analysis can be applied in KSE Ltd.
- 59.78 percent of valued raw material with 16 percent number of items of XYZ analysis is in the category of X items which the management has to give more attention. X items in KSE Ltd. are Maize, Cotton seed de oiled cake, Groundnut cake extraction, Acid buff.
- Vitamin AD3 is the highest valued item in raw materials of KSE Ltd.

- The company must give utmost importance for the items of 'X and S' like Rape seed Extract and Maize. The items which come in the category of Z and OS may be given less amount of attention which is of low value.

6.1.2 Efficiency Analysis

- Both companies witnessed tremendous growth in the size of inventory during the period of study. There is 266.49 percent in KSE Ltd. and 360 percent in Godrej Agrovet growth in the size of inventory. Among the companies, the highest increase in the size of inventory has been observed in Godrej Agrovet Ltd with 55,119 lakh. It may be due to the fact that Godrej Agrovet Ltd. is a pan-national agribusiness company and KSE Ltd. is concentrating on sales in Kerala and Tamil Nadu.
- Inventory has a positive relationship with the sales. The correlation between inventory and sales reveals that the value of 'r' for KSE Ltd. is +.98, a positive correlation with 96.66 percent of the variation in the inventories explained by the sales. For Godrej Agrovet Ltd. it is 88.01 percent of the variation in the inventories explained by the sales. There is more relation of inventories to sales is in KSE Ltd. than Godrej Agrovet Ltd which means the majority sales changes occurs due to changes in inventories.
- The raw materials inventory to total inventory shows an increasing trend. It had increased from 65 percent of total inventory in 2008-09 to 77.76 percent in 2017-18. Except in 2009-10, raw materials have been increasing. Finished goods to total inventory are showing increase trend in the initial years and it reduced to 14 percent in 2017-18. This reveals there is high demand in the market for the product. Both the packing materials and stores and spares also show a reducing trend.
- Every component of inventory shows an increasing trend. This is due to during the study period KSE Ltd. had increased their turnover by starting new production unit and increasing their production capacities. In 2014 Cattle feed production capacity of old plant at Irinjalakuda unit increased to 225 MTS per day and also production capacity of cattle feed plant in Palakad unit increased to 120 MTS per day. This leads to increase in raw material inventory from 214.17 lakh to 312.71 lakh. In 2015 production capacity of cattle feed plant in Swaminathapuram unit increased to 225 MTS per day. Hence in that year ending there is 342.57 lakh raw material inventories.

- There is a positive correlation between inventory and sales. The table 5.9 reveals that 'raw material to total inventory' shows an increasing trend thorough the study period. Table 5.10 also reveals that there is a growth in both the raw materials and sales. This reveals that increase in raw materials leads to increase total inventory, which in turn will lead to increase in sales.
- Inventory turnover ratio in both companies shows decreasing trend. It is not a good trend. May be it will be the trend in the industry. But in terms of inventory turnover ratio KSE Ltd. is better compared to Godrej Agrovet Ltd. KSE Ltd. is doing business with each rupee invested in it. This finding is made without considering the regional seasonality in North India and Kerala where Godrej Agrovet and KSE are situated.
- Throughout the study period, inventory conversion period of both companies were showing an increase trend. Comparing with Godrej Agrovet Ltd., inventory conversion period of KSE Ltd. has a small variation in between 22 to 29 days during the period 2012-13 to 2017-18. But for Godrej Agrovet there is a drastic variation in the period ranging from 40 to 67 days. The nature the product of both companies is perishable. So it is better to decrease the conversion period. The KSE Ltd. have high inventory turnover ratio with low conversion period when compared to Godrej Agrovet Ltd. It shows KSE Ltd. is better in the management of inventory than Godrej Agrovet Ltd.
- The raw material inventory turnover ratio is coming down for both the companies. In 2008-09, the raw material inventory turnover ratio for KSE is 20.71 which decreased to 15.62. From the 2012-13, the ratio of KSE and Godrej Agrovet were decreasing trend. This may be the trend in the cattle feed industry. But while comparing both companies, Godrej Agrovet is declining more than that of KSE Ltd. in the last three years. So KSE Ltd. is better than Godrej Agrovet Ltd. in turning raw material into finished products. This may be result of lean production followed by KSE Ltd.
- Both companies showing an increasing the number of raw material holding period. The high raw material holding period affect the liquidity of the company. Godrej Agrovet comparative have high raw material holding period than the KSE, which is ranging from 28-48 days from the year 2012-13 to 2017-18. While in KSE Ltd. the period of holding raw material is less than 23 days. Comparing with the pervious years of the companies KSE Ltd. has slight variation in the holding period but it is in increasing trend. In Godrej

Agrovet Ltd. there is high variation and increasing trend. In the case of raw material holding KSE is better than Godrej Agrovet.

- The finished goods inventory turnover ratio of KSE Ltd. was more than that of Godrej Agrovet Ltd. It shows the efficiency of the inventory management of the KSE Ltd. Comparing to Godrej Agrovet Ltd., KSE Ltd have slight changes in the finished goods turnover ratio during the period. But for Godrej Agrovet Ltd. the ratio shows decreasing trend with drastic changes which are not good for the business. Hence performance of KSE Ltd. is better. The products of both companies are perishable; hence increasing the finished turnover ratio is better. Converting of finished goods for selling goods must be increased in the cattle feed industry. Because the cattle feed are manufactured on the basis of seasonality for the cattle.
- The increase in finished goods turnover ratio shows a decrease in finished goods holding period. The KSE Ltd. shows more or less constant period except in the year 2011-12 for the holding period of finished goods. The KSE Ltd. shows stability in holding period of finished goods for last six years. But the Godrej Agrovet Ltd. shows increasing trend during the study period. In 2017-18 Godrej Agrovet Ltd. has 9 days as holding period which is the nearly twice the period of KSE Ltd. Lower storage period of finished goods shows good management of inventory. KSE is better in converting finished goods to sales when compared to Godrej Agrovet Ltd.
- The inventory to total assets ratios for the KSE and Godrej Agrovet are 34.71 percent and 23.92 percent respectively. There are fluctuations in ratio for both companies throughout the study period. The inventory to total asset ratio is high for KSE when compared to Godrej Agrovet. This implies that KSE has less total assets compared to Godrej Agrovet and KSE have more inventories compared with other. When correlation between the ratios of two companies calculated, the result availed is -0.047. This implies that there is a reverse relation between the ratios. It may not be the general trend in the industry. The KSE Ltd. records higher ratios which are a significant portion of total assets when compared to Godrej Agrovet Ltd and also inventory turnover ratio of KSE Ltd. is better. So there is good management of inventory in KSE Ltd.
- In 2010-11, there is inefficiency of working capital for Godrej Agrovet Ltd. leading to drastic reduction in the inventory to working capital ratio. For KSE Ltd. there is slight

variation. From 2012-13 to 2015-16, Godrej Ltd. has more liquidity than KSE Ltd. but in last two years KSE Ltd. has low inventory to working capital ratio compared with Godrej Ltd., hence it has more liquidity.

- In comparison with the base year 2008-09, inventory to capital employed shows an overall increasing trend. It was the highest in the year 2012-13 and 2013-14. The ratio shows a decreasing trend in the last three years of the study period. The ratio decreases from 96 percent in 2012-13 to 60 percent in 2017-18 for KSE Ltd. The ratio decreases from 54 percent in 2013-14 to 41 percent in 2017-18. From the perception of the KSE Ltd. as a whole, almost 72 percent of the capital employed is locked up in the inventory. But KSE have greater inventory turnover ratio and finished goods holding period is 5 day and these are better than the Grodrej Agrovet, hence KSE is better in the performance of inventory management.

6.2 Suggestion

- Management may consider a higher re order level or keeping safety stock for 'non-seasonal, low value, Z value' materials as non-availability or non-arrival causes cut in shift.
- In case of other raw materials (X and S items) like Maize, Rape seed extraction etc. reducing stock level should be examined by adopting XYZ, HML and SOS. For further reduction ABC analysis may be considered.
- Company may think of increasing the capacity for further growth/increase the production capacity.

6.3 Conclusion

KSE Ltd. is one of the leading cattle feed company in India. This study was aimed to analyse the management of inventory in the company. In every concern, efficient management of inventory assumes much importance because an optimum level of inventory enables the management to increase the productivity of capital by reducing material cost and preventing blocking up of large working capital for a longer period. It is in this context that the inventory management of KSE Ltd. was studied. The objectives of the study were to analyse the inventory management techniques/ practices of KSE Ltd., Irinjalakuda unit and to analyse the efficiency of

the inventory management system of the company. The system of inventory management was studied by conducting personal interview with the officials of the company and it was found out that a systematic purchasing policy and satisfactory controlling techniques were used by the company.

To analyse the efficiency of inventory management, secondary data were used. For this the data for the past ten years from 2008-09 to 2017-18 of KSE Ltd. were compared with Godrej Agrovet Ltd. ratio analysis was the main tool used for analysing the data. Along with that percentage analysis was also used. From the detailed analysis of the data it was evident that the management of KSE Ltd. has succeeded in managing the inventory efficiently. The Company was managing inventory by smoothly handling the production and maintaining liquidity. A healthy trend in the firm's working capital management was disclosed by the study.

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APPENDIX

A STUDY ON INVENTORY MANAGEMENT IN KSE Limited

Interview Schedule

1. Profile of the Company

1.1. Name of the Company:

1.2. Address:

1.3. Year of Establishment:

1.4. Head office at _____

1.5. Total No. of Plants _____

1.6. No. of Plants in Kerala alone _____

1.8. Specify the no. of varieties produced _____

1.9. Products manufactured by the company

a) Only cattle feed [ ] b) Cattle feed and allied product [ ]

c) Cattle feed and other products [ ]

1.10. If you are producing an allied product, specify that the products produced by your firm.

a) Coconut cake [ ] b) Coconut Oil [ ] c) Dairy products [ ]

d) Any other (Please specify) _____

1.11. Do you have your own captive power plant? Yes / No

Inventory Management Practices

2.1. State the method of the planning for procurement of raw materials is used.

(a) Centralized procurement[ ] (b) Materials Requirement Planning [ ]

(c) Any other method (Please specify) ----------

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2.2. Mention the type of materials budget prepared for the estimation of materials requirement.

(a) Materials Budget [ ] (b) Operating budget [ ]

2.3 Quality parameters of raw materials:

2.4. State the periodicity of budget

(a) Monthly [ ] (c) Half yearly [ ] (b) Quarterly [ ] (d) Yearly [ ]

2.5. State the type of stock level determine for inventory control

(a) Minimum Level Yes [ ] No [ ] (b) Maximum Level Yes [ ] No [ ]

(c) Re-order Level Yes [ ] No [ ] (d) Danger Level Yes [ ] No [ ]

(e) Safety stock Level Yes [ ] No [ ].

2.6. How is the inventory levels fixed?

2.7. Are selective control techniques being used in the units? Yes [ ] No [ ]

2.8. Do you follow ABC analysis as selective control techniques? Yes [ ] No [ ]

2.9. If yes, mention the authority and department, who is the in charge for the different class of inventory? Class of inventory Department Designation

2.10. Mention the range of percentage of consumption value and stock keeping units for ABC classification Class of inventory Range of percentage of consumption value Range of percentage of stock keeping units

2.11. State the method of purchasing followed

(a) Tender method [ ]

(b) Open purchase method [ ]

2.12. Method followed for the fixation of size of order for different class of inventory.

Class of inventory Method followed for determining the size of order

2.13. What other inventory control techniques have been adopted by the units?

(a) Classification [ ] (b) Codification [ ] (c) Standardization [ ]

(d) Simplification [ ] (e) Perpetual inventory system [ ]

2.14. What system is being followed for re-ordering inventory?

2.15. What have been the basic reasons for overstocking /under stocking?

2.16. How can inventory management be further improved?

2.17. Specify the problems in adoption of inventory control techniques