

**“A STUDY ON COST VOLUME PROFIT ANALYSIS OF KERALA
FEEDS LIMITED, KALLETTMUKARA”**

PROJECT REPORT

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2020-2022

UNIVERSITY OF CALICUT
BONAFIDE CERTIFICATE

Certified that this project report “A STUDY ON COST VOLUME PROFIT ANALYSIS OF KERALA FEEDS LIMITED, KALLETUMKARA” is the Bonafide work of “Ms. JISHA CYRIL VAZ” (Reg. No: YPAUMBA038) who carried out the project work.

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DECLARATION

I, Jisha Cyril Vaz, hereby declare that the Project Report entitled “A STUDY ON COST VOLUME PROFIT ANALYSIS OF KERALA FEEDS LIMITED, KALLETUMKARA” has been prepared by me and submitted to the University of Calicut in partial fulfillment of requirement for the award of the Master of Business Administration, is a record of original work done by me under the supervision of Dr. Suraj E. S, Associate Professor of Naipunnya Business School, Pongam, Koratty East, Thrissur. I also declare that this Project work has not been submitted by me fully or partly for the award of any Degree, Diploma, Title or recognition before any authority.

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1.1 INTRODUCTION

Every organization needs to calculate future earnings so that managers can run their business effectively. Cost volume profit analysis is that the approach used for this purpose. Cost volume profit analysis helps in identifying the operating activity levels with a purpose to avoid any reasonable losses and achieve profits. Cost volume profit (CVP) analysis is that the foremost fundamental tool because it provides straightforward ways to study the results of changes in costs and volume on a company's profits. It is important in profit planning.

In CVP analysis executives and accountants recognize that there is many interacting variables that affects an organization's profits such as the sales price of a product, the variable costs per unit and thus the quantity of production and sales. CVP analysis evaluates the relationships among these interacting variables and also the effect that make changes in these variables wear an organization's profits. Moreover, it also helps the businesses to plan their future operations and see whether their organizational performance goes on the proper track or not. While conducting a business, the companies even must face various risks then on counter those risks, CVP analysis is an efficient tool.

It is an analytical technique which examines costs and revenue behavioral patterns and their relationships with profits. The analysis separates costs into fixed and variable components and determines the amount of activity where costs and revenues are in equilibrium. Thus, break-even analysis forms often a key component of the total system of CVP analysis which supplies the executives and accountants many insights in profit planning. One in every of the foremost important tools develop by accountants to help management in meeting the challenges is that the worth volume profit analysis otherwise noted because the behavior analysis.

CVP analysis establishes a relationship between revenue and price with relevancy volumes. Cost volume profit analysis can also help the organizations in calculating the breakeven point which is that the aim at which the profits become adequate zero. This could be done by finding the break-even volume and then using it to form graphical representations. The break-even volume can either be expressed in dollars or in units depending upon the character and sort of the organisation.

It indicates the extent of sales at which costs and revenue are in equilibrium. This equilibrium point is thought as break-even point. It's point of sales volume at which total revenues is equal to total costs. It helps to seek out the profitability of a product, department of division to possess better product mix, for profit planning and to maximise the profit of a concern. The study is especially conducted to research the link between cost, volume and profit of the firm. The project aims to analyze the price to be reduced to attain a desired profit. The study analyze the profit structure of Kerala Feeds Limited. It's been done with help of contribution, p/v ratio, break-even point, margin of safety, margin of safety ratio, degree of operating leverage, regression and correlation.

Advantage of cost volume profit (CVP)

- It helps to analyse which products and services are beneficial and how can company use these products and services to come up with the utmost amount of revenue.
- It also explains what sales volume are going to be needed by the corporate so as to achieve a hard and fast level of profits.
- Moreover, it tells what proportion revenue should the corporate target so on confirm that no losses occur.
- It also highlights what would be expected budget of the corporate.
- It also helps to calculate the company's fixed cost and measure the amount of risk related to any investment.

Risk assessment

The business world is changing and since of several internal as well as external threats associated with any industry, businesses must face too many risks. Although the calculation of risk and return through measuring a relentless (beta) could also be a way in finance but managerial is additionally concerned with this. Managing risk is simply too significant for any businesses.

Because it tends to defines all the procedures and practices involved within the corporate. Therefore, CVP might be a tool that helps to calculate risk particularly within the terms of costs and volumes. After analyzing this risk, the companies can come up with a efficient solutions to reduce the risk.

Operating leverage

Another benefit that the businesses gained by using the CVP approach is that the operating leverage benefit which explains how the worth or cost structure of an organization is made of charge processes. It will be an infinite benefit because the worth structure is directly related to the quantity of growth and profit of a company has. Operating leverage can vary from one company to a distinct company. within the firms that have a high ratio of fixed costs as compared to the variable costs, the operating leverage is good because it produces a high contribution margin. Similarly, higher fixed sales also mean that the company includes a better breakeven point. an improved breakeven point is directly related to the financial success of the company because at now, the company can claim high profits at a much higher rate.

Future forecasting

By using the above-mentioned models, approaches and graphs, managers can analyze the direction during which their company is moving and this analysis might help them to higher understand the varied operations and activities within the

organizations. By getting beforehand knowledge of profits and costs, the company can manage them during a very more efficient because of increase productivity.

Income tax benefits

Similarly, the easy CVP model could even be extended to other issues a bit like the calculation of incorporate taxes of multiple products within an organization. this could be often done by modifying the profit equation of the chart to incorporate taxes yet. This analysis also can be extended to those firms that provide quite one product or service instead of a simple product. It can be calculated as follows:

$$\text{After tax profit} = [(p-v) \times Q - f] \times (1 - t)$$

Preparation of budgets

Since the worth profit volume analysis helps in determining the amount of sales and thus helps organizations to know their desired targets. This approach would help the managers to prepare their budgets which carries with it the prices additionally because the revenues at any level of production within the organization.

Cost control

CVP analysis is to evaluate the value volume changes within an organization and also the impact of those changes on revenue generation. For instance: there's a dental hospital that wishes to induce a new dental machine so as that the patient's level of satisfaction is additionally increased by reducing the time required for dental treatment. the acquisition of this new machine will tend to extend fixed costs of a corporation. So, at such complex situations, the worth volume analysis could even be the most effective tool to assist in simplifying the company's decision. If this dental hospital uses CVP analysis, it helps to manage the decrease its variable costs by maintain the profit at the same desired level.

Price determination

It is another good thing about using this approach. For example: if any competitor within the dental industry has set the value at Rs.50,000 for a single dental operation and thus the business cannot provide this operation at any cost at lower than Rs.20,000, then the corporate can use the cost profit volume analysis to check the competitor's price with the fixed and variable costs of its own operations and thus it can manage to return copy with a price that's within the best interest of the corporate.

Profit planning

The aim of any business is to make value for the patrons and to urge profits for the company. However, managing all operations and costs in such how which is in a position to maximise profits isn't an easy task. Therefore, organizations must consider many things so as to engage in proper profit planning techniques. The CVP analysis can help the businesses to create the sole and most profitable combination of cost, price and sales volume. Thus, it can help managers to calculate and estimate their profit at different levels and for various range of products

1.2 STATEMENT OF PROBLEM

Profit is important for the survival and growth of each mercantilism. If the business doesn't make profit, it'll not survive within the growing competitive world. So, in every business just in case of realization of profit, the value of each product plays a very important role, this may be determined with the assistance of cost volume profit analysis. Every business should cross the no profit no loss points to appreciate the profit. For this reason, they ought to calculate the break-even point. There exists a detailed relationship between the value, volume and profit. If volume is increased, the value per unit will decrease and profit unit will increase. Thus, there's an on the spot relation between volume and profit but inverse relation between volume and price. Analysis of this relationship has become interesting and useful for the value and

management accountant. This analysis could also be applied for profit-planning, cost control, evaluation of performance and higher cognitive process. It also helps in evaluating the effect of change in price on profitability and helps management to seek out the foremost profitable combination of costs and volume. The analysis helps to see the sales volume at which the profit goal of the firm are achieved and also the sales volume required to avoid losses. It also helps in evaluating performance of a company for the aim of control.

1.3 OBJECTIVES OF THE STUDY

Following are the objectives of this study:

- To study the price volume profit analysis of Kerala Feeds Ltd, Kallettumkara.
- To study the degree of operating leverage
- To find out the break-even point and margin of safety

1.4 SIGNIFICANCE OF THE STUDY

The CVP analysis is incredibly much useful to management because it provides an insight into the consequences and inter-relationship of things, which influence the profits of the firm. The link between cost, volume and profit makes up the profit structure of an enterprise. Hence, the CVP relationship becomes an important for budgeting and profit planning of a firm. As a start line in profit planning, it helps to determine the most sales volume to avoid losses, and also the sales volume at which the profit goal of the firm are achieved. As an ultimate objective it helps management to seek out the most profitable combination of costs and volume.

A dynamic management, therefore uses CVP analysis to predict and evaluate the implications of its short run decisions about fixed costs, marginal costs, sales volume and price for its profit plans on a continuous basis. Cost volume profit analysis are useful for the planning and monitoring operations. Also, the management needs an

understanding of how revenues, costs and volume interact in providing the profits through these analyses and data are provided by the cost volume and profit analysis.

1.5 SCOPE OF THE STUDY

Cost-volume-profit (CVP) analysis could be a tool for planning and decision-making that emphasizes the interrelationship of cost, quantity sold and price. It studies the results of changes in cost and volume on a company's profits. It are often used for analyzing management decisions like setting selling prices, determining product mix, and maximizing the utilization of production facilities. This analysis helps to forecast profit fairly and accurately because it is important to understand the connection between profits and costs on the one hand volume on the opposite. it's also useful in putting in a versatile budget which indicates costs at various levels of activity. we all know that sales and variable costs tend to vary with the quantity of outputs. it's necessary to budget the quantity first for establishing budgets for sales and variable costs. This analysis assists in evaluation of performance for the aim of the control. so as to review profits achieved and costs incurred, it's necessary to judge the effect on costs of changes in volume. It also assists in formulating price policies by showing the results of various price structures on costs and profit. This analysis makes it possible to realize target profit by locating the quantity of sales required for such profit and at last achieving such sales volume.

1.6 LIMITATIONS OF THE STUDY

- Confidential data not published
- The complete data are taken from given annual report only and also the accuracy of the analysis depends upon the accuracy of the available data.
- The study is conducted by considering only last five year's report so it's unattainable to find out the lifetime performance of the firm
- The foremost important limitation of the study is time limit.

1.7 INDUSTRY PROFILE

Worldwide demand for dairy products is rapidly growing and is projected to extend by 58 %. The Indian animal feed market is driven by the rising dairy industry, backed by the white revolution which has resulted within the ascent of the cattle population. Currently, India has the foremost important cattle population within the globe, thereby becoming an oversized marketplace for cattle feed. The demand for commercial cattle feed is projected to increase in India, because the dairy industry structure is becoming more organized and which are aimed toward improving the status of the animal feed industry to provide for future demand. The Indian animal feed market size reached a price of nearly INR 403.5 billion. The market is further expected to grow at a cagar of 15% to understand a price of virtually INR 933.3 billion .

The Indian animal feed market is driven by increasing government support within the country. After the liberalization of the Indian economy, the animal feed industry was presented with new opportunities. The industry continues to possess an substantial growth potential as a results of increasing the domestic consumption of animal-based products, rising livestock population, and growing dependence on imports. Livestock plays a significant role in Indian economy.

About 20.5 million people depend on livestock for his or her livelihood. Livestock contributed 16% to the income of small farm households as against a mean of 14% of all households. It also provides livelihood to two-third of rural community. It contributes approximately 5.1% to the country's GDP and 17.11% to the agricultural GDP. It also provides nutritional security to the poor additionally to offering employment opportunity to legion rural Indians.

The Indian animal feed industry is particularly categorized into poultry, cattle and aqua feed (majorly fish). When the organized sector altogether fairness old, it's still in an exceedingly very nascent stage, supplying only 10 percent of cattle and aqua feed and 50 percent of poultry stick in India. The bulk of the remaining cattle and aqua feed

is being produced by the unorganized sector, which comprises of household industries and custom mixers. The whole production of cattle feed for all livestock stands at 17 million tones.

Animal feed is that the food given to animals which are domestic often refers to fodder in course of care and management of livestock by humans for profit. The quality of cattle feed ensures the health of the animals. Various feeds include poultry feed, sheep husbandry, cat and pet food, pig farming, cattle feeding, equine nutrition and feed. Compound cattle feed is a crucial constituent of ration, considering the actual incontrovertible fact that dairy animals in India have limited access of cultivated green fodder and grasses.

Most of the macro and micronutrients to satisfy animals' requirements are provided by compound feed, especially on crop residue-based diets. It's possible to formulating balanced rations for growing and lactating animals to providing the feed used conforms to the laid down specifications, for energy, protein, minerals, vitamins, etc. So on supply animals with necessary nutrients to satisfy their requirements for maintenance, growth, pregnancy, and production of milk, to cut back the risks of animal health and to cut back excretions and emissions into the environment, the chemical composition of cattle feed utilized within the diet has to be precisely known.

During this earlier days commercial production of cattle feed was not a vital one. Most of the farmers depended upon the normal feeds like grass, hay coconut cakes, rice bran etc. But the researchers during this area have shown that the cattle get insufficient nutrition from this. Thus, they initiated the first effort for commercialization of cattle feed is by adding more nutritious ingredients. Indian feed industry primarily consists of cattle feed and poultry feed segments. The foremost drivers for the growing demand for cattle feed are the factor like shrinkage of open land for the cattle grazing, urbanization and resultant shortage of conventionally used cattle feeds, and introduction of high yield cattle requires specialized feeds. The feedback from the farmers have revealed that the good growth prospects of the branded cattle

feed industry, the feed consumption pattern and thus the relatively high share of branded feeds, feed consumption pattern supported product types, composition of cattle feed market and also the relative shares of major brands, the foremost important factors influencing the purchasing decisions etc. The Indian animal feed market reached to price of INR 873.7 billion in 2021. Looking forward, expects the market to achieve INR 1493.8 billion and exhibiting at a CAGR of 9.6% .

India currently represents one amongst the foremost important feed producers within the globe. Animal feed include the various raw, processed and semi processed products that are fed to the livestock. variety of the foremost common feeds include pasture grasses, cereal grains, hay and silage crops, and other by-products of food crops, like brewers' grains, pineapple bran and sugar beet pulp. These products are carefully formulate with the help of nutritional additives, like vitamins and minerals, these required to fret of the health of animals and improve the quality of the numerous end products, including eggs, meat and milk. Recently, it had been noted that raw materials employed within the assembly of animal feed, like flour, sorghum and maize are being diverted for the consumption of humans, leading to a shortage within the feed industry.

Kerala Feeds Limited was commissioned a feed mill geared toward improve the lives of small farmers, by developing the countryside and helping to combat the growing depopulation. The plant is situated in 27 acres of land and has sufficient scope for further expansion. variety of the machines were installed, during this plant are imported and these machines have helped the company to produce a quality pellets and by capture the market, which was hitherto within the hands of the private sector companies. Kerala Feeds has been instrumental in not only increasing the quality of the feed available within the market but also has been ready to stall the spiraling tendency of the feed prices. the fabric is checked for its quality, stored within the warehouse, filled into the bins, drawn in fixed proportions, ground to fine particular size, mixed homogeneity, cooked for better digestibility and pelletized keeping the requirement of the cattle in mind.

Problems of the Industry

The Indian animal feed industry completed its 57 time of life. The industry is undergoing an exciting phase of growth, and this trend is anticipated to continue within the coming years furthermore. this may be a sizeable and scalable industry, one which continues to be quite untapped and hence features an excellent potential to be evolved on a world commercial level. This the achievements of this industry further as information about what makes it worth putting resources into for the approaching years while not ignoring the hurdles which can be experienced within the method. This will be a well-known incontrovertible fact that the animal feed market in India is assessed into three broad categories: Aqua Feed, Poultry Feed, and Cattle Feed.

The poultry feed market has been capturing in terms of its share in the animal feed market with almost 44% share globally. But interestingly recently, the aqua feed segment, which has been a late starter, has seen the foremost growth out of the three segments. Though a big portion of the market is unorganized, the whole size of the remaining part of which comprises the organized compound feed industry is INR 306.9billion by values in India, and it was growing for the past few years with a rate of approximately 8%.

Several factors which are especially working towards this growth includes the untapped potential of the market, ever-increasing livestock population, growth of the end-user industries, and also the rise in domestic consumption of the animal products. Also, increase within the purchasing power of the population also a favorable demographics for the country, from rural areas towards the metros, are add to the identical. The increase in disposable incomes within the metro cities is making people consume more animal products, as dairy products likewise as meat, fish and eggs, which successively, requires more feed of upper quality. this can be often a heavy factor which might drive growth within the animal feed sector.

India currently has the absolute best buffalo population, the second-highest goat and cow population, and thus the third-highest sheep population which might be a transparent indicator of how important employment feed market must play in meeting the demand for feed products. Even the government has now realized that the need for implement policies and schemes under its 12th five year plan within the hassle to spice up the status of our animal feed industry and support the long term demand.

Different Feed Industry Sectors:

The expansion within the poultry industry and increasing demand for chicken per person which is already high in urban areas of country and now having its effects in rural areas likewise. The cheaper availability of chickens going to push the poultry feed industry at a faster rate. India's consumption of eggs per person is lower on the typical than many other developing countries despite India being the third-largest egg producer within the planet. There's an immense scope for increase in domestic consumption of eggs with better awareness for its health benefits, through designer eggs and hence a scope for improvement within the poultry feed sector. Also, stable feed prices, entry of more organized players and better integration within the poultry feed industry will drive its growth.

Cattle Feed

The cattle feed business is currently already growing at 30% since the milk producers have now started replacing the conventional feed with more nutritionally balanced compound feed, having realized that tangible benefits in terms of yield improvement. With one among the easiest livestock population, India's cattle feed industry isn't tapping the entire potential of manufacturing feed for its animals. India is thus, a beautiful destination for international cattle feed manufacturers because it help to enter and meet the growing feed demand clearly indicating that the globe has high potential for further growth and replacing the large segment of unorganized players from this market.

Aqua Feed

The aquaculture industry in India is suddenly developing with an improved demand within the shrimp market which is leading to a sudden shooting up of growth within the aqua feed industry. There's also an increase within the demand for fish from India both domestically and internationally which needs more effort from the aqua feed market to require care of the demand for high quality fish available in India. The demand for fish is rising, especially globally, because of its high protein value, and comparatively considered to be a safer. Fish production is yet another huge initiative towards ensuring food security. The only major concern currently is that majority of aquaculture practitioners in India still depend on traditional feed because of its low price and easy availability. This will be accountable for a slow transition towards commercial feed our country. Hence, this can be often the opportune moment for international aqua feed industries or perhaps new domestic players to return and establish themselves within the market.

Commercial production of fodder was not important in this early period. Most of the farmers relied on traditional feeds such as grass, hay coconut cake, and rice bran. However, researchers in this field show that this causes malnutrition in cattle. They initiated the first attempt to commercialize cattle feed by adding more nutritious ingredients. The Indian feed industry is about 50 years old and mainly consists of cattle feed and poultry. It consists of the feed segment. The main drivers of the increasing demand for cattle feed are factors such as reduction of cattle pasture, urbanization and consequent shortage of traditionally used cattle feed, leading to a shortage of high-yielding cattle. Requires special feed for introduction. A previous research study by the authors based on farmer feedback identified good growth prospects for the branded cattle feed industry, feed consumption patterns and a relatively high proportion of branded feeds, feed consumption patterns based on product type .

Factors Affecting the Domestic Feed Market and Scope of New Companies

The increasing purchasing power of the Indian population, the accompanying changes in eating habits and the increasing exposure to international cuisines are the main factors behind the positive growth of the Indian feed industry, with poultry and dairy consumption share currently increasing. It's getting higher. Healthy GDP growth and increasing urbanization complement each other. The domestic poultry industry has matured from backyard operations to large-scale integrated poultry farming with the acceptance of modern technology. This is now an ongoing process with a transformation from a fragmented sector to a more organized one, continuing to drive growth across the industry. Since most of the carbohydrate sources in feed are cereals, these price fluctuations have a significant impact on feed prices and thus on the domestic feed market. Feed prices have trended upward in recent years, supported by high corn prices, continued strong demand from the poultry sector, and limited supply.

Prices are currently stable and a key growth driver. In addition, poultry meat is preferred over other meats because it is hygienic, nutritious and relatively inexpensive to obtain. In recent years, the processed chicken products segment has also evolved, and further growth is expected in the future. Although India's annual poultry meat consumption is on the rise, it is still one of the lowest in the world. This is a great opportunity for further industry consolidation and growth, as well as a chance for new companies to enter the market. Similarly, the livestock and fish feed industry is largely unorganized or uses traditional feed as its main product. This clearly shows that new companies are entering to better organize the market and create a transition from traditional to better commercial feeds. Price, convenience, availability and feed quality are key factors influencing farmers' purchasing decisions and thus the domestic feed market.

- **Forces Analyses for the Animal Feed Industry:**

Bargaining Power of Buyers: Bargaining power of buyers. Because animal feed accounts for the majority of costs, accounting for almost 70% of production costs, and is one of the most important inputs required by the industry for efficient operations and profitability.

- **Bargaining Power of Suppliers:**

Suppliers in this industry are feed mills and large companies that purchase from feed mills and deliver processed end products to the general public. These companies have high bargaining power because they determine the selling price according to the price of grain, which is the main ingredient of feed. But when you look at the feed mills, their bargaining power is stifled because big companies set the prices, so they have to accept the prices they sell to those companies.

- **Threat of New Entrants:**

The animal feed industry has very strict regulatory issues. As such, the barriers to entry are very low and the threat of new entrants is high. There is a lot of room for the industry to become more organized, absorb better technology and utilize commercial feed. This is why the threat from new entrants is so high.

- **Threat of Substitutes:**

The only current threat in the industry is the replacement of conventional feeds by compound feeds, thus the unorganized market may be replaced by the organized market and the threat of substitution. It can be said that it is expensive.

- **Competitive Rivalry:**

As many incumbent players recognize the need to consolidate and purchase more commercial feeds, they are forced to compete against rivals who seek to

reduce costs while providing higher quality feeds through the implementation of better technology offerings. Competition between them is expected to intensify.

Animal Feed Market in the developed world:

Over the years, the five countries with the highest share of manufactured or industrially produced feed account for nearly half of all feed produced worldwide, with the United States and China topping the charts. standing in Feed spending is one of the largest expenditures on agricultural production in the United States, with nearly 20% of total production expenditure being spent on feed. The value of compound feed produced annually in the US ranges from approximately INR 179.8 to 217 billion. The poultry and aquatic feed markets are all developing well, and the global industry is benefiting from the improvement of the global market. Countries like the United States have balanced supply and demand conditions in their markets, and companies operating in these markets will benefit from positive developments. The US livestock feed market has grown at a compound annual growth rate of 3.7% over the past five years and is expected to continue growing as consumer demand for meat increases.

China's feed industry seems to have consolidated faster than other parts of the world in terms of consolidation and acquisitions. Due to increasing demand for meat and meat products, especially pork, China's pet feed market is expected to grow at a CAGR of almost 16% over the next five years, almost twice as fast as India. Although the number of feed mills in China is declining, overall production capacity is expected to increase to meet increasing demand.

Challenges

The recent changes in the industry can alter how livestock producers and feed manufacturers operate in the market. Feed quality optimization and handling more feed material with expansion in the feed market need to be looked at immediately. Food contamination due to pathogens is one of the main concerns for consumers and ensuring

good quality requires commitment and transparency by all the parties involved in food production. Misuse and overuse of antibiotics are creating resistance among consumers toward meat, and hence this needs to be looked into. Where evolution of science and technology on one hand has made tasks for us easier giving us improved results, on the other hand, they are also leading to biodiversity loss and climate change. To curb this, researchers say that global agriculture must be transformed from a source of emission of greenhouse gases to a net carbon sink which can help reduce the risk of climate change. Limited access to water resources and increasing competition especially from the energy sector, to gain access to the same is another major challenge to the industry. Another major concern is that of animal welfare since animals reared in poor living conditions will not be able to provide maximum genetic potential which will result in a lower quality of output for human consumption too. The increasing costs of raw materials and hence the pressure to reduce feed costs need to be checked. Increased use of enzymes in this regard to improve nutrient absorption and ingredient digestibility will allow higher flexibility in using feedstuffs and also reduce feed costs while also keeping a check on the quality.

Overall looking at the industry in India, a few things that need to be looked out for include the ability to adopt the global technology to suit the local environment and getting access to the right kind of human resources in order to support the farmer who is currently burdened with the task of handling everything without proper awareness and transparency about the potential of the industry.

Kerala Takes Steps to Decrease Prices of Cattle Feed & Increase Its Availability to Dairy Farmers

Feed costs for dairy cattle operations have skyrocketed in recent years. With this in mind, the Kerala government has taken steps to ensure that dairy farmers have access to affordable and plentiful feed as part of its efforts to reduce input costs in the dairy sector.

Feed costs for the cattle business have skyrocketed in recent years. With this in mind, the Kerala government has taken steps to ensure that dairy farmers have access to abundant feed at affordable prices. This is part of an effort to reduce operating costs in the dairy sector. Ensuring profitable prices for dairy producers and reducing the burden of periodic increases in cattle feed prices.

The lack of components to create cattle feed is a major issue for the state. As a result, cow feed prices are skyrocketing. The administration is working on solutions to this problem. The cultivation of feeding grass is one of them. She went on to say that milk cooperative organizations will be encouraged to start growing grass on land available in their communities.

The minister further said Kerala is not only on the verge of self-sufficiency in milk but is poised to become the country's leading milk producer. Donated 100 crore to support dairy farmers in Plum, Kollam, Pattanamtitta and Alleppey.

Kerala is not alone in suffering from high feed prices. Certainly it is due to the essential nature of feed and forage for cattle productivity. The growing imbalance between supply and demand is a cause for concern.

Raising livestock is an important source of income and a way of reducing risk for smallholder and marginal farmers in rain-drained areas of the country. According to the 20th livestock population census released last year, India's total livestock population is 535.78 million, an increase of 4.6% from the previous census in 2012. Cattle, buffalo, mitun and yaks account for his 302.79 million cattle. Forage and feed availability affect cattle growth and development, playing a key role in India overtaking the United States as the world's largest milk producer (her 187.7 million tonnes in 2018-19). So this decision by the Kerala government to reduce the price of cattle feed may be something other Indians have to follow.

1.8 COMPANY PROFILE

Kerala Feeds Limited, established in 1995, is a public company of the Kerala State Government Animal Breeding Authority. Kerala Feed Ltd was established under the Companies Act of 1956 to provide affordable feed supplements to dairy farmers. The company started its activities with the production of pelleted cattle feed in Kalettumkara, Thrissur province, then expanded to other feeds such as poultry feed, goat feed, keramine and other supplements such as milk booster. We have 6 operating production units equipped with the latest production technology and machinery to manufacture and supply high quality feed to dairy farmers and other consumers. The company meets most of the state's cattle feed needs by supplying feeds and supplements in a timely manner through a strong and established network of private dealers and companies.

As a public sector company, Kerala Feeds Limited has a dual responsibility of generating profits and a social responsibility of supporting dairy farmers in crisis. Therefore, unlike the private sector, KFL has not increased the price of feed to match rising raw material costs, and its presence in the market has largely shielded dairy farmers from exorbitant feed price increases. The Kerala government is committed to ensuring that this social responsibility is met, and in line with government policies and directives governing animal feed pricing, the company's board of directors also prioritizes this aspect. The 500 TPD capacity cattle feed plant was commissioned in late 1998 and in January 1999 he began commercial production with only one shift. The 2nd and 3rd shifts were commissioned in June 1999 and in July 2000 respectively. Now production increased to 650 TPD in June 2000.

The organization has procured and developed material handling systems in line with requirements to reduce employee exposure. The plant and mmcp technology were brokered from Holland, Holland. And the machines helped the company produce high-quality pellets and conquer markets that were previously in the hands of private companies. Kerala Feeds contributed to improving the quality of feed available on the

market. Not only that, but they also succeeded in stemming the rise in feed prices. Raw materials are checked for quality, stored manually, packed in containers, drawn to a certain proportion, crushed to appropriate size, mixed evenly, boiled for easy digestion, and pelleted in a manner suitable for livestock. become Human help is only needed to store raw materials and store feed-filled bags, and the computer does the rest. This unit produces 500 tons of feed per day. Apart from Kerala, the supply Karnataka and Lakshadweep Islands. In manufacturing its products, KFL follows its standards. 20 kinds of raw materials such as deoiled rice bran, rice bran, corn, chickpeas, rice and wheat are tested in the bio lab. Karnataka, Andhra Pradesh and Tamil Nadu are raw material suppliers. The raw material sample is first ground in a zero-degree mill so that the wet part can be properly analyzed. High fiber, wet material is sorted out. Maintaining quality and taste is very important for keeping cows healthy and producing more milk. Molasses from Tamil Nadu to add flavor to the feed.

Kerala Feed Co., Ltd. has become a blessing for farmers. It has created forward-thinking, innovative and original concepts that build customer expectations. The product met expectations and was in high demand. Prior to the company's involvement, there were no brand names for animal feed. However, the company's entry has forced private feed manufacturers to maintain standards in order to remain competitive. Feed costs have increased by 450% over the last 20 years. Farmers thus achieve maximum yields and better health for their cattle. KFL personnel conduct courses on scientific feeding methods. The unit is located in Kellattumkara Village, Mukundapuram Taluk, Thrissur District, Kerala, India, next to the Pargat-Ernakulam Railway Line. The facility is located on 27 acres of land. Kerala Feeds Ltd was also named the Most Results Oriented Energy Talk Campaign by the State Government in 2002-2003.

Land Use

Due to high population density and high agricultural displacement, the land available for agricultural purposes is rather limited. Nearly 1.7 million hectares remain

undeveloped for various reasons. Some food crops such as peanuts and cashews have lost cover through special programs despite government efforts.

Livestock

Animal husbandry provides an opportunity to increase income and employment for rural households in Kerala. With regard to its combinability with arable agriculture and its sustainability as a domestic business with the active involvement of women farmers, it has developed into a very popular side business in the smallholder segment. Backyard systems have a very long tradition in Kerala. Today, however, rapid changes on farms face new challenges. Livestock-friendly seasonal crops have been replaced by perennial cash crops. It is estimated that about 32,000 out of 55,000 households in Kerala engage in livestock farming to supplement their income. Homestead settlement pattern, relatively high female literacy rate, highly favorable Agro-climatic conditions conducive to biomass production and long tradition of cattle grazing are inherent strengths of Kerala economy favoring cattle grazing. In fact, Kerala produces more milk than its staple rice. The total deficit of actual sales exceeds the actual procurement. Dairy cow productivity in Kerala was only about 5.26 kg. This needs to be increased through scientific feeding and better management.

Purchase of Raw Material

Raw material is purchased through agents and by direct purchases. Majority of raw materials are from other States. Coconut extracted cake is raw material that is available in Kerala in plenty. Even for rice brans the units are depending on other States. The rice bran available here has oil content which has to be extracted. Otherwise, the oil content present in the bran will decay the cattle feed produced. As there is no solvent extraction plant in Kerala all the units have to depend on other States. Most of the unit shave their agents in other States through whom they purchase raw material. Sometimes, the company purchases directly from producers and eliminates the agents so that the cost of raw material can be reduced.

Company policy

To improve dairy farming in Kerala by providing quality feeds and supplements at reasonable cost.

Features

- First animal feed manufacturer in Kerala to adopt M.M.C.P technology.
- Cooking food to 80 degrees Celsius removes water from the food, extends the food's shelf life, and makes the food easier to digest.
- Raw material quality is checked in a well-equipped laboratory. This minimizes feed loss and ensures cleanliness.
- Our compound feed contains ingredients such as coconut cake, cottonseed cake and rice. Therefore, it is not necessary to feed cows with the above items individually.
- Contains adequate levels of protein, fat, vitamins and minerals to increase milk yield.
- Kerala Feed Ltd., Registrant. The company is committed to continuous improvement of its products.
- M.R.P Consistency

Vision and mission

Vision

“Kerala feeds is committed to provide quality livestock feed and services to farmers at a lower cost”.

Mission

- Increased production of pelleted balanced cattle formula (BCCF) from 650 mt to 950 mt per day.

- Produce 300 tons per day of other cattle feed and poultry feed.
- Production of types of feed and supplementary feed suitable for different stages of animal husbandry.
- Educate and train ranchers to implement scientific feeding practices to optimize productivity
- Assist in developing knowledge-based networks of feed-related activities
- Procurement of feed ingredients which provides advisory services on logistical solutions, feed manufacturing and the establishment of analytical laboratories
- A culture of innovation and creativity among its employees.
- Become an Active Partner in Community Development Programs.

Board of directors

Kerala Feeds Ltd. is subordinated to the Department of Animal Husbandry, Government of Kerala. Chairman K sreekumar, Minister of Livestock J. Chinchurani and Dr. B sreekumar Managing Director These are his three organizational members of Kerala Feeds Limited. The company's board of directors also includes his eight formal directors and his two informal directors.

Kerala Feeds Limited is a limited company incorporated on October 13, 1995. It is classified as a state government. Company and Ernakulam's company registrar. The authorized share capital is Rs.700 million and the paid-up capital is Rs.526.55 million. It is engaged in the production of milled products, starches, starch products and prepared feeds.

Competitors

- Agro Tech India Ltd.
- Amrit Feeds Ltd.
- Anirudh Foods Ltd.
- Annam Feeds Ltd.
- Baramati Agro Ltd.

- Gajanan Extraction Ltd.
- Goldmohur Foods & Feeds Ltd.
- Grintec India Ltd.
- Hanuman Minor Oils Ltd.
- Hatsun Agro Products Ltd.
- Indian Potash Ltd.
- Khandesh Extraction Ltd.
- Kumar Food Inds. Ltd.
- Kwaliti Feeds Ltd.
- Kwaliti Ltd.
- Lakshmi Energy & Foods Ltd.
- Maheshwari Solvent Extraction Ltd.
- Piccadily Agro Inds. Ltd.
- Puri Oil Mills Ltd.
- S K M Animal Feeds & Foods (India) Ltd.
- Sakthi Beverages Ltd.
- Schreiber Dynamix Dairies Ltd.
- SreeTulasi Solvent Extractions Ltd.
- Vegepro Foods & Feeds Ltd.
- Vimal Dairy Ltd.

Departmental profile

Kerala Feeds Ltd. has multiple functional departments and each department is required to perform multiple functions within the organization. The following are confined to various divisions of Kerala Feeds.

1. Material department

The materials department plays a key role in maintaining the quality of the final product. The materials department takes almost care to load only good quality

materials, store them without quality loss, and output only good quality materials. Their goal is to ensure a continuous process by establishing the flow of raw materials to production departments and ensuring the identification and traceability of raw materials. It also minimizes loading and unloading times for finished feed and raw materials.

2. Human resource department

The Human Resources Department includes Assistant Managers, Human Resources Officers, Stenographers, Janitors and Clerks. It includes a number of goals and functions for the employees or workers of an organization, provides training programs for efficient performance by employees of an organization, and provides training programs for efficient performance by employees during working hours in an organization. We offer training programs for optimal performance.

3. Production department

The function of the manufacturing department is to transform raw materials into finished products. The functions of the production department start from bringing raw materials into the factory to packing the materials. Each stage is controlled and monitored by programming logic controls. MMCP technology is one of the key advantages of KFL's production divisions: grinding, mixing, cooking and pelletizing. In this method, a sample of the product is passed to an analytical lab. The quality of subsequent solids, regrind and mash pellets is checked.

4. Purchase department

The main goal of the purchasing department is to have the right quality materials in the right place at the right time. Proper quality material enhances the quality of the material. Proper timing enhances the ability to deliver materials. Proper pricing of products helps reduce production costs.

5. Quality control department

Quality control and feed analysis laboratories are located within Kerala Feeds Ltd. campus. This department started its operation in 1998. The departmental function begins with quality assurance of incoming raw materials, and considers the needs of customers, between quality assurance of processed products and quality assurance of finished products. The department's laboratories include the latest and most advanced technologies for the analysis of moisture, crude protein, crude fiber, ether extracts, sand and silica, and aflatoxins in coded samples of raw materials, in-process products, and finished products. equipped with analytical instruments.

6. Marketing department

The marketing department's goal is to increase customer and dealer satisfaction and maintain brand image. It also ensures product availability in the market and develops development activities to achieve the company's goals.

7. Information technology department

Information technology departments are rewriting business rules. Our customer service, logistics operations, product and marketing strategies rely heavily, and in some cases completely, on information technology. As such, it is an integral part of an organization's success.

8. Finance department

Finance's role in an organization is to ensure that sufficient resources are available to achieve organizational goals. This department also ensures that costs are controlled,

that there is sufficient cash flow, and that all levels of profitability are established and controlled.

Plant design and technology

Our factory design is based on European standards and our manufacturing process follows proven MMCP technology. All manufacturing units are fully automated and controlled from the control room, minimizing room for human error and quality fluctuations. This high degree of automation and modern imported machinery makes the process very efficient and helps us maintain consistent quality of our products. Currently, we have KFL Kallettumkara, KFL Karunagappally, KFL Thiruvangoor, KFL Thodupuzha, KFL Muthalamada and KFL Athavanad. All units include separate administrative offices, factory buildings, quality laboratories, warehouses, weighing platforms, silos, molasses tanks, workers' toilets, etc.

Production and maintenance

Production processes

- Raw material storage
- Intermediate raw material storing
- Proportioning
- Sieving and milling
- Storage at the buffer in bb4
- Batch mixing
- Molasses mixing
- Storage at the mash bins
- Conditioning and cooking with steam
- Pelleting and cooling
- Powder separation/ sieving

- Bagging and stitching
- Storage of finished feed in warehouses

Major value addition process

- **Batching process**
Automated and accurate batch preparation from a variety of raw materials held in intermediate bins according to recipes to meet the nutritional needs of each variation of the final product.
- **Milling process**
Reduces grain size and other raw materials to maintain uniformity and improve feed digestibility.
- **Mixing**
Homogeneous blending process to maintain batch consistency and uniformity of material values.
- **Cooking**
Improves feed digestibility and palatability. It eliminates harmful microorganisms contained in raw materials and makes products safe.
- **Pelleting**
Reduce animal waste and selective feeding. Improve animal feed intake. Extends product shelf life.

Quality policy

Our quality policy is to provide high-quality compound feed for cattle in pellet form, mineral to manufacture and sell formulations and other feed ingredients. The quality policy is communicated to all ads and regularly checked for ongoing

conformance. Management and employees are committed and committed to realizing this quality policy and shaping the dairy farm.

Management principles

- Customer focus
- Leadership
- Involvement of people
- Process approach
- System approach to management
- Continual improvement
- Factual approach in decision making
- Mutually beneficial supplier relationship

Products

Kerala feed produces cattle feed in the form of semi-cooked and watertight pellets. In Kerala, pellet type feed is manufactured by Kerala Feeds Ltd. introduced. Our products are marketed under the Kerala Feeds brand name. Product types are:

- Kerala Feeds Midukki
- Kerala Feeds Elite
- Kerala Feeds Dairy Rich plus
- Keramin mineral mixture
- Densified TMR block
- Kerala Feeds milk booster
- KF Malabari premium goat feed
- Kerala Feeds regular goat feed
- Kerala Feeds calf starter
- Kerala Feeds Athulyam grower & layer mash

- Athulyam chick mash for layer
- Kerala Feeds Kairali
- Kerabbit

SWOT ANALYSIS

Strength

- KFL has well-organized MMCP technology not found in other competitors. It works fully automatically under the control of a computer system.
- The company is ISO 9001-2000 certified. This indicates that the company only manufactures quality products under government regulations.
- When it comes to sourcing raw materials, companies look to every state in the country. Therefore, the company can purchase materials at low prices and get high quality.
- KFL has a well-organized QC department to ensure the quality of raw materials and final feed.
- The company has broader distribution channels as it sells through private dealers, cooperatives and government agencies.
- Provide many securities and benefits for employees.
- KFL is the sole supplier of pelleted cattle feed.

Weakness

- Products may become more expensive if raw material prices increase.
- Transportation costs are high as most of the raw materials come from outside Kerala.
- All devices are designed to operate with an uninterruptible power supply only.
- Critical parts of the plant are imported and are very expensive and some spare parts are not readily available in the domestic market.

- Demand for the company's products is low during the rainy season.

Opportunities

- The company faces intense competition in the Indian market. The demand for animal feed is increasing day by day. This is due to the strength of product quality and stable supply.
- We currently own 27 acres and have the ability to scale our operations to increase our production capacity.
- The company focuses only on the Kerala market and is able to expand its market outside of Kerala.
- Demand is outstripping supply, so companies can increase production and distribute it evenly across demand.

Threats

- The competitors are flooding the market with their products which is gradual.
- Increasing trend of raw material cost.
- Availability of raw material.
- Changes in government policies.

2.1 LITERATURE REVIEW

A literature review is a type of review article. A literature search is a scientific task that includes the current state of knowledge, including not only theoretical and methodological contributions to a particular topic, but also content-related findings. These are secondary sources and do not report new or original experimental studies. Such reviews are usually found in scientific journals in association with science-oriented literature, but should not be confused with book reviews, which may also appear in the same publication. Literary studies form the basis of research in almost every field of science. A thorough literature review can be part of a peer-reviewed journal article that presents new research to help position current research in the relevant literature and provide context to the reader. In such cases, the review usually precedes the methodology and results part of the work.

- **Seunghwankim (2015) conducted a study entitled on ‘cost volume profit analysis for a multi-product company’.**

Cost-Volume-Profit (CVP) analysis is one of the most common and important chapters in introductory management accounting courses. While his CVP analysis for single-product companies is relatively easy to demonstrate, his CVP analysis for multi-product companies requires additional steps to demonstrate. In this study, for multi-product companies with sales composition ratios between products, we developed a micro-approach to deal with the occurrence of decimals when the company finds the break-even point and aims for profit. This study shows how the developed approach gets closer to the break-even point and target profit point than existing approaches. A cost-volume-benefit analysis is a commonly used tool that provides managers with information to help them make decisions. CVP analysis is also used by businesses to make critical and wise decisions when faced with management issues that affect costs, volumes and profits.

- **Halilakmese, Ahmetbuyuksalvarci, Kadriyeakmese (2016) conducted a study on the use of cost-volume-profit analysis.**

Cost-volume-gain analysis is one of the most important management tools used for forecasting purposes, revealing empirical results about its unique placement in management interactions. Survey data collected through survey questionnaires. The researched information and findings are represented by means of a procedure of basic facts. Rather than being used in isolation, the research rationale that CVP analysis can add to the business-to-blade advantage is related to a variety of research techniques. CVP analysis is commonly used by organizations in decision making.

- **B. navaneetha, k. Punitha, Raichu He Mercy Joseph, s.rashmi, t.Saiashwarya (2017) conducted a study entitled “Analysis of Cost Volume Profit of Nestlé Limited”.**

The Cost-Volume-Profit Analysis examines the relationship between changes in activity and changes in total revenues, costs, and profits. It can provide very useful information, especially for companies starting a business or facing difficult economic times. A cost-volume-profit analysis determines how many products must be sold for a business to collapse. This allows companies to consider the impact of various changes in operating expenses and revenues on profits. Lowering selling prices or increasing fixed costs to determine the volume of sales required to achieve a given level of profit and how much lower than current sales levels can be before losses are incurred. A cost-volume-profit analysis examines the changing behavior of production levels, selling prices, variable unit prices, and fixed costs of a product or service. Cost-volume-benefit analysis can be difficult. The purpose of this article is to explain how to include the cost of capital in his CVP analysis. Create a mathematical relationship between a product's discounted after-tax operating income minus the cost of capital and the product's price, cost, investment capital, and sales volume. From this relationship, it's can estimate the turnover required to generate a profit equal to the company's cost of capital. The primary uses of cost-volume-profit analysis are performance measurement and control, inventory valuation, and sales price

determination. A cost-volume-benefit analysis is a cost target to be achieved. A cost-volume-benefit analysis is a pre-determined cost, a target cost, or a carefully planned cost that states that management strives to establish or achieve maximum efficiency in the production process. increase.

- **Sadiqrabiullahi, bello abiodumsulaimon, ibrahimsalihumukhtar, muhammed hardy musa (2017) conducted a study entitled 'Cost Volume Benefit Analysis as a Management Tool for Decision Making in SMEs'.**

To shed light on the realities of using his CVP analysis as a decision-making tool for SMEs, this study examines whether SMEs use cost-volume-benefit analysis as a management tool for decision-making. It was intended to find out what Process at the Bavarian University Kano.

- **Vedatekergil (2017) conducted a study on the use of cost volume profit analysis techniques with the objective to understand the cost behaviour.**

Managers of all companies use cost-volume-benefit analysis to make decisions and it is an important consideration in their business as a whole. Speculating on unprofitable customers reduces an organization's utility and efficiency by increasing spending. Measuring customer productivity is now proving more important. Researchers used an incentive model to differentiate firm productivity versus validated cost behavior. The study first examines the cross-product cost-volume-benefit analysis followed by the customer-related cost-volume-benefit analysis.

- **R. Punniyamoorthy (2017) conducted research on examining cost volume profit and decision tree analysis of a selected company.**

A study to study cost-volume-benefit and decision tree analysis with the goal of understanding the level of turnover required to achieve a desired profit. This survey helps distinguish between club development and opportunity. The study is based on secondary data. The study design used for this study is an analytical and descriptive

study design. The financial instruments used were breakeven, P/V ratio, margin of safety and margin of contribution. A cost-volume-benefit analysis is used as a tool in the planning process by which an organization forecasts future development volumes, costs, and benefits to be achieved.

- **Dr. R. Kavitha (2018) has conducted a study on cost volume profit analysis with the objectives to find out the company's profitability based on their cost volume of the production.**

An effective cost-volume-profit analysis derives how much effort must be expended to create the required number of goods to meet ideal profit target. Tools used by researchers are ratio analysis and break-even analysis to determine a company's profitable position. The researchers conclude that managers can use cost-volume productivity analysis to calculate profits from specific measures of product sales. Help prevent future dangers for your company.

- **Kenneth enochokpala, chimsunumosanebi (2020) has conducted a survey on cost volume profit analysis and profit planning.**

The study analyzes that applying the cost-volume-profit method to manufacturing SME benefits is one way to address the problem. Information was collected through a survey. Descriptive analysis, Pearson correlation and regression analysis methods were used for data analysis. The study suggests that small manufacturing business owners need to hire and retain accountants and rebuild effective oversight boards.

- **Sinha, Abhishek (2000)** He had an in-depth discussion on the current situation, issues and challenges facing the Indian cattle feed industry. The authors discuss growth trends and favorable macroeconomic and demographic factors, among others, leading to a positive outlook for the industry.

- **Vaidya S.V (2001)** In his article 'Indian Feed Industry' which contains an analysis of the Indian feed industry, he elaborates on the Indian livestock industry, its growth patterns and the issues associated with this industry. Therefore, suitable strategies are proposed to combat these problems.
- **CLFMAI (2012)** Compound Livestock Feed Manufacturers of India (CLFMAI), in its industry analysis on the livestock feed industry in India, explored the growth trends and patterns of this industry, the growth prospects of the industry and the drivers of this growth.
- **Varmudy, V (2012)**It points to a huge market potential for animal feed in India which is mainly composed of two segments. Cattle and poultry feed. "India has ample opportunities to meet new market demands, but needs to improve livestock health and productivity," he said. Based on market analysis, the author proposes his 10 strategies to address the challenges facing the animal feed industry in India.
- **John M P & Manoj P K (2013)**Their study analyzes purchasing and buyer behavior of cattle feed products based on Kerala cattle feed market. The paper highlights key factors that influence purchasing decisions, including price, quality, and convenience. Purchasing behavior related to different product types (pellets and mash) and brands (KFL, KSE, etc.).
- **John M P & Manoj P K (2013)** Their study conducted an in-depth analysis of the dynamics of the Indian cattle feed industry, focusing on the state of Kerala. Feed consumption patterns, composition of the cattle feed market, cattle breeding and feed consumption patterns, milk production and use of branded cattle feeds, and factors influencing purchasing decisions are studied. This paper proposes strategies to effectively market cattle feed and thereby increase market share.
- **John M P & Manoj P K (2014) [9]**He extensively investigated the importance of product type (pellet-type and broad-type) and brand in farmers' purchasing decisions. Therefore, strategies to exploit market potential were proposed based

on the findings. Considering the above, it should be noted that there are virtually no macro-level studies on the outlook for the Indian feed industry, except for his Varmudy (2012) study which includes data up to 2009. In this context, this study seeks to revisit macro-level scenarios, taking into account the latest available data, including data from 2013 to 2014 Government of India (2015).

2.2 THEORETICAL FRAMEWORK

The basis of accounting is that all income and expenses must be accounted for, and the difference between income and expenses is the profit or loss of the business. Costs can be classified as either fixed costs or variable costs.

Fixed costs are not related to sales, but are related to the passage of time.

Variable costs are directly related to sales.

This classification of costs into 'variable' and 'fixed' items and their relationship to sales and profits was developed as a break-even analysis. This break-even analysis is also known as cost-volume-profit analysis. A cost-volume-profit analysis examines the relationship between changes in activity and changes in total sales, costs, and profits. It can provide very useful information, especially for companies starting a business or facing difficult economic times.

The CVP analysis determines how many products a company must sell to break even. This allows companies to consider the impact of various changes in operating expenses and revenues on profits. Lowering selling prices or increasing fixed costs to determine the volume of sales required to achieve a given level of profit and how much lower than current sales levels can be before losses are incurred. The three elements included in the CVP analysis are:

- Cost: Cost of manufacturing or selling a service product
- Volume: Number of units manufactured or amount of service sold.

- Profit: The difference between the selling price of a product or service and the cost of producing or providing it.

Cost-volume-profit analysis is generally defined as a planning tool that enables managers to assess the impact of changes in price, volume, variable costs, or fixed costs on profits. In addition, CVP analysis is the basis for understanding contribution margin pricing, related short-term decisions, target costing, and transfer pricing. In marginal costing, it varies directly with production or output. Fixed costs, on the other hand, remain constant regardless of production volume. In net effect, when the quantity changes, the variable costs change with the change in quantity. In this case, the selling price is fixed, the fixed price remains fixed, and the profit changes. CVP analysis is a logical extension of marginal costing. It is based on the same principle of dividing business costs into fixed and variable costs. Today, it is a powerful tool for policy makers to maximize profits. In addition to profit projection, the concept of cost volume profit is relevant in the short term. The relationship between costs, revenues, and profits at various levels can be represented in charts such as break-even charts, profit amount charts, or reports in various formats. Achieving maximum profit is the ultimate goal of almost every business venture. The most important factor influencing profit generation is the level of production, i.e. the amount produced.

Profit depends on many factors, the most important of which are manufacturing costs and sales volume. Sales volume depends on production volume and market forces, which affect costs. Management cannot control the market. In order to secure a certain level of profitability, it is necessary to control and manage costs, especially variable costs. This is because fixed costs are costs that cannot be controlled. It helps determine the profitability of a product, division, or division to achieve better product mix, assist in profit planning, and maximize company profits. These decisions include important considerations such as pricing, product mix, market expansion or contraction, outsourcing agreements, underutilized asset utilization, discretionary spending plans, and other important considerations in the planning process. fields are included. Given the broad context in which cost-volume gains can be used. That is,

determining profit, cost, and revenue at various levels of production helps identify levels of production that divide broad costs and revenues evenly. means an analytical system. A cost-volume-benefit analysis establishes the relationship between cost, volume, and profit.

Cost-volume-profit thus provides an overview of the profit structure. In other words, Cost/Quantity/Profit is a management accounting tool that expresses the relationship between revenue, quantity, expense, and profit. Cost volume analysis uses the techniques of break-even analysis, operating leverage, margin of safety, impact of change on sales, and contribution to margin and net operating income. The level of sales required to achieve the desired target profit in order to predict the change in net operating profit.

CVP analysis

According to CIMA, cost volume profit analysis is defined as, “The study of the effects on future profit of changes in fixed cost, variable cost, sales price, quantity and mix”.

CVP analysis, also commonly referred to as break-even analysis, is a method for companies to determine how changes in costs and sales are affecting the company's bottom line. With this information, companies can better understand their overall performance by looking at their breakeven point or how many units they need to sell to reach a certain breakeven point or margin of safety. A break-even point analysis (CVP analysis) determines the level of activity at which all associated costs are recovered and no win-loss situation occurs. This level of activity is called the break-even point. The break-even point in a business is the point at which sales or revenue exactly equals total cost, or the point at which there are no gains or losses at various levels of activity. The break-even point tells managers the level of production or activity required before a company is profitable, and reflects the relationship between cost, volume, and profit. CVP analysis helps management find the ratio of costs and revenues to profits. The purpose of a company is to make a profit. Profits depend on many factors, the most

important of which are manufacturing costs and achieved sales volumes. These two factors are interdependent. Sales volume depends on mass production related cost. CVP analysis classifies all costs as fixed or variable. Fixed costs are costs that do not vary directly with the quantity of units produced. This cost remains virtually constant.

Variable costs, on the other hand, vary according to production volume. This cost includes materials and labor for each unit produced.

The factors which are usually involved in this analysis are:

- Selling price
- Sales volume
- Sales mix
- Variable cost per unit
- Total fixed cost

Objectives

The purpose of the Cost-Volume-Benefit analysis is to:

- To accurately forecast profit, it is essential to know the relationship between profit and cost on the one hand and volume on the other.
- Cost-Volume-Benefit analysis helps you create flexible budgets that show costs at different activity levels.
- Cost-volume-profit (CVP) analysis is useful for performance evaluation for control purposes.
- Pricing plays an important role in stabilizing and fixing volumes. A cost-volume-margin analysis helps formulate pricing guidelines for specific situations by predicting the impact of different pricing structures on costs and profits.
- A cost versus volume analysis is used to determine the amount of overhead that can be converted to product cost at various levels of operations, as the specified overhead rate is related to the selected production volume is required.

Benefit

- CVP analysis helps companies clearly and easily understand the level of sales required to reach breakeven and the level of sales required to achieve target profit.
- CVP analysis helps management understand different costs at different levels of production/sales volume. CVP analysis helps decision makers predict the costs and benefits of changing volumes.
- The impact of changes in fixed and variable costs helps management determine the optimal level of production.

Uses of Cost Volume Profit Analysis

- CVP analysis helps predict costs and benefits due to changes in volume.
- Helps set sales volumes to achieve or cover a specific turnover, return on capital employed, or dividend rate.
- Helps determine the impact of quantity changes due to factory expansion or order intake, with or without increased costs. In other words, it can be used to determine the level of profit that can be achieved if sales volume changes.
- CVP analysis helps determine the relative profitability of a product, line, project, or profit plan.
- CVP analysis can be used to intelligently perform profitability comparisons between companies.
- Use the Cash Breakeven Chart to help determine the required liquidity at the desired output.
- Break-even analysis emphasizes the importance of utilization in achieving profitability.
- The impact of fixed overhead changes on total costs is more clearly shown by the break-even analysis and the cost-volume-profit chart.

- This chart shows the interaction of three factors: cost, volume and profit. Graphs are graphs that show information such as fixed costs, variable costs, profits from production and sales, and their trends at a glance.

Assumptions of cost volume profit analysis

CVP analysis provides useful results only when certain assumptions are made, such as:

- Fixed costs do not change.
- Profit is calculated based on variable costs.
- All variables per unit remain constant.
- For a single product, or multiple products, there is a fixed sales structure.
- Costs can be accurately divided into fixed and variable components.
- Analysis applies only to short-term time periods.
- Analysis applies only to relevant areas.
- Total cost and total income are linear functions of output.

Advantages of cost volume profit analysis

- Provides detailed and clearly understandable information:

The graphics visualize information very clearly, and the big picture is clear when looking at the graphics. The information is presented in a simple format so that even a layperson can easily understand it.

- Know the profitability of various products:

The profitability of various products can be determined using break-even charts. The problem of management's decision to temporarily or permanently close a business, or to continue at a loss, can be solved by break-even analysis.

- Explore the impact of changes in costs:

The impact of changes in fixed and variable costs at different stages of production or profit can be shown in an easy-to-read manner using graphs.

- Consider the relevance of fixed costs:

The break-even graph shows the relative importance of fixed costs in the total cost of a product. When costs are high, management is encouraged to take steps to control those costs.

- Provides analysis of various variables:

Economies of scale, capacity utilization and equivalent plant efficiency can be analyzed using break-even charts. The operating efficiency of a factory is represented by the angle of incidence at the intersection of the total cost line and the sales line.

- Break-even analysis is very useful for forecasting, long-term planning, growth and stability.

Limitations

Though break-even analysis has gradually become service tool for modern financial management, there are certain objections raised against the utility of break-even analysis:

- Fixed costs are not always constant.
- Variable costs do not always change proportionally.
- Sales do not always change proportionally. The horizontal axis cannot measure unit sales when the same company sells different types of products.
- Break-even analysis is of questionable relevance when a company sells many products with varying profit margins.
- Break-even analysis is based on the assumption that revenue is affected by changes in sales, so changes in inventory do not directly affect revenue. This assumption holds true when marginal costing is used, but because the absorption of fixed costs

depends on production rather than sales, changes in inventory can also affect revenue.

- Break-even analysis does not assume the growth or expansion state of the organization. In the real life of business organizations, operations go through a continuous process of growth and expansion.
- The amount of information that can be represented in a single break-even chart is limited. If we need to look at fixed costs, variable costs, and changes in selling prices, to create a series of charts.
- It is not necessary to represent the data in a break-even chart, as a simple tabulation of cost and revenue results also serves the purpose of the break-even chart.
- A large number of lines and curves plotted in a graph can make the graph very complicated and difficult for laymen to understand.
- This chart does not provide a basis for comparing efficiency between different units or organizations.

Margin of safety

The safety margin is the difference between the actual sales level and the break-even sales. The greater the difference between break-even sales and actual sales, the more a company can accept reduced sales without risking a loss. If the margin of safety is small. If the distance between the actual sales line and the break-even sales line is too small, even a small decrease in sales volume will drive the company into loss territory.

It is important to have a reasonable margin of safety. Otherwise, lower activity levels can have disastrous consequences. A company's prudence is measured by its level of safety margin. A small margin of safety usually indicates high fixed costs, so profits are not realized until there is more activity to absorb them. A high margin of safety indicates that the break-even point is well below actual sales, so even if sales decline, there is still a point. Low safety margins lead to high fixed costs, and action must be

taken to reduce fixed costs or increase sales. The safety margin can be improved in the following ways:

- Lower fixed costs.
- Reduce variable costs to improve marginal contribution.
- Increased sales volume when capacity is idle.

Elements of CVP analysis

- Contribution
- P/v ratio
- Breakeven point
- Margin of safety
- Margin of safety ratio

- **Contribution**

When a marginal costing system operates in an organization with multiple products, determine the net profit per product because the total fixed overhead costs are charged to the income statement and not to the product costing. Each product's contribution is charged to the company's total fixed costs to determine its profit. Contribution is the difference between the selling price and the variable cost of goods sold. It is visualized as a sort of fund or pool where all fixed costs of any kind are covered and each product must contribute its share. The excess of the contribution over the fixed costs is the profit. A loss is incurred if the total contribution does not cover the total fixed costs.

Contribution = Sales – Variable costs

- **P/V ratio**

The P/V ratio is a measure of the percentage change in earnings due to changes in sales. It is one of the most important metrics for calculating profitability as it shows the contribution to sales. The ratio or percentage of contribution margin to sales is known as the P/V ratio. This ratio is also known as marginal income ratio, sales contribution ratio, or variable profit ratio. Expressed as a percentage, it is the rate at which profit increases as volume increases. Profit volume ratio is a logical extension of marginal costing. This is a study of the interrelationships of cost-behavior patterns, activity levels, and benefits obtained from each alternative combination.

The higher the P/V ratio, the higher the profit; the lower the P/V ratio, the lower the profit. The P/V ratio can be improved by:

- Increase unit selling price
- Reduce direct and variable costs through effective use of people, machinery and materials.
- Shift production to products with higher P/V ratios and higher profitability.

Importance of Sales Volume Percentages

- Determining Profit at a Specific Sales Volume
- Determining the Breakeven Point
- Calculating the Sales Needed to Achieve a Specified Performance
- Estimating Sales Volume Required
- Helps create flexible budgets for cost control purposes
- Determining the minimum amount of activity a company must accomplish in order to avoid losses.
- Costs related to decisions regarding pricing, maintaining or removing product lines,
- accepting or rejecting certain orders, make-or-buy decisions, sales configuration plans, changes in system layouts, sales specifications, advertising measures, etc.
- Instructions for determining sales price when quantity is closely related to price level.
- Assess the impact of cost factors on profit.

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} * 100$$

- **Break-even point**

The break-even point can be defined as the point at which total costs (expenses) equal total sales (income). Sales, which is the total turnover including the associated break-even point, tells managers the level of production or activity required before the company is profitable and reflects the relationship between cost, volume and profit. At the break-even point, sales correspond to expenses incurred. Below the break-even point, the company is in loss and above this level is profitable. This is because fixed costs do not change, while variable costs change based on volume or activity level. Below breakeven, fixed costs eat up more revenue than variable costs, and you're still unsatisfied and at a loss. Above the BEP, the excess of sales over variable costs is much higher than the fixed costs of the activity, leading to profit. BEP calculation formula.

$$\text{Break even point} = \frac{\text{Fixed cost}}{\text{Contribution}} * \text{sales}$$

- **Margin of safety**

The margin of safety is a financial indicator that measures the turnover at which is the breakeven point. In other words, this is the income a company or division makes after paying all fixed and variable costs associated with producing goods or services. The margin of safety is the difference between actual sales and break-even sales. Selling above the break-even point will bring in profits. Such sales represent a margin of safety. Having a reasonable margin of safety is important. Otherwise, lower activity levels can have disastrous consequences. A company's prudence is measured by its level of safety margin. A low safety margin usually indicates high fixed costs, so profits are not realized until there is more activity to absorb them.

A high margin of safety indicates that the break-even point is well below actual sales, so even if sales fall, there is still a point. Low safety margins are offset by high fixed costs, so action is required to reduce fixed costs or increase sales.

$$\text{Margin Of Safety} = \text{Sales} - \text{Break Even Sales}$$

- **Margin of safety ratio**

The margin of safety is the extent to which planned or actual sales exceed the break-even point. It shows how much sales can fall before a company suffers a loss. The higher the margin of safety, the lower the risk that the sales will be balanced and the higher the profit. This version of the safe margin equation expresses the buffer zone as a percentage of sales. The safety margin can also be expressed as a percentage (safety margin percentage). This percentage is obtained by dividing the safety margin in dollars by total sales. Safety margins can be expressed in both sales units and currency units. For this purpose the following formula is used:

$$\text{Margin of safety ratio} = \frac{\text{Margin of safety}}{\text{Sales}} * 100$$

In general, cost-volume-profit analysis aims to show how changes in product margins, prices, and number of units affect a company's profitability. Cost-volume-profit analysis is one of the basic financial analysis tools for determining a company's potential profitability. The components of the analysis are:

Activity level

This is the total number of units sold in the measurement period.

Price per unit

This is the average price per unit sold including any sales, discounts and allowances that may reduce the gross price. The price per unit can vary substantially from period to period based on changes in the mix of products and services, these changes may be caused by old product terminations, new product introductions, product promotions and seasonality of sales for certain items.

Variable cost per unit

This is the totally variable cost per unit sold, which is usually just the amount of direct materials and the sales commission associated with a unit sale. Nearly all other expense do not vary with sales volume and so are considered fixed costs.

Total fixed cost

This is the total fixed cost of the business within the measurement period. This figure tends to be relatively steady from period to period, unless there is a step cost transition where management has elected to incur an entirely new cost in response to a change in activity level.

3.1 RESEARCH METHODOLOGY

A research methodology is a method of systematically solving a problem. They are specific procedures or techniques used to identify, select, process, and analyze information about a subject. This allows readers to critically assess the overall validity and reliability of the study. This study is an analytical type study. The types of data collected are secondary. The main data sources are balance sheets and annual reports. The survey period is five years from 2016-2017 to 2020-2021. The techniques used for analysis are contribution, P/V ratio, break-even point, margin of safety, operational leverage, regression, and correlation.

3.2 RESEARCH DESIGN

Research design is the design of the conditions for data collection and analysis in a manner aimed at combining relevance to research objectives and cost-effectiveness of the process. A study design is the conceptual structure in which research is conducted, providing a blueprint for data collection, measurement and analysis. As such, the design includes an overview of what the researcher will do, from developing hypotheses and their operational implications to the final analysis of the data.

In this research paper, researchers chose an analytical research design. Analytical research is a specific type of research that involves critical thinking skills and an assessment of facts and information relevant to the research being conducted. Study design helps studies find the most relevant information

3.3 SOURCES OF DATA COLLECTION

In research process, the next step is collection of relevant data. There are two types of data :

- Primary data
- Secondary data

3.3.1 PRIMARY DATA

Primary data is data that is collected for the first time and is unique in its type and nature. Primary data collection was omitted in this study.

3.3.2 SECONDARY DATA

Secondary data is data that has already been collected by someone and has run the stats engine at least once. Secondary data are primarily used for research. Annual Reports, Internal Manuals, and other related documents. Another data source was a library, reviews of various articles and relevant previous research, and references to his website for the company.

The main sources of secondary data are:

- Company balance sheet for the last five years
- Company income statement for the last five years
- Company website
- Company annual report for the last five years

3.4 PERIOD OF THE STUDY

The period of this study was 56 days from the date 14th July 2022 to 8th September 2022.

3.5 TOOLS FOR DATA ANALYSIS

In this research study, tools used are:

- a) Contribution
- b) P/v ratio
- c) Break-even point

- d) Margin of safety
- e) Margin of safety ratio
- f) Degree of operating leverage
- g) Regression
- h) Correlation

a) Contribution

Contribution margin is the difference between a company's revenue and variable costs, expressed as a percentage. Gross margin earned by a company represents the total revenue available to pay fixed costs and make a profit. Contribution is the difference between the selling price and the variable cost of goods sold. It is visualized as a sort of fund or pool where all fixed costs of any kind are covered and each product must contribute its share. The excess of the contribution over the fixed costs is the profit. A loss is incurred if the total contribution does not cover the total fixed costs.

$$\text{Contribution} = \text{Sales} - \text{Variable costs}$$

b) Profit volume ratio

The P/V ratio (profit volume ratio) measures the percentage change in profit due to changes in sales volume. It is one of the most important metrics for calculating profitability as it shows the contribution to sales.

The ratio or percentage of contribution margin to sales is known as the P/V ratio. This ratio is also known as marginal income ratio, sales contribution ratio, or variable profit ratio. Expressed as a percentage, it is the rate at which profit increases as volume increases. The higher the P/V ratio, the higher the profit; the lower the P/V ratio, the lower the profit. The P/V ratio can be improved by:

- Increase unit selling price

- Reduce direct and variable costs through effective use of people, machinery and materials.
- Shifting production to products with higher P/V ratio and higher profitability

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} * 100$$

c) Break-even point

The break-even point can be defined as the point where total cost equals total revenue. This can be described as the point where there is no net profit or net loss. The break-even point tells managers the level of production or activity required before a company is profitable and reflects the relationship between cost, volume and profit. At the break-even point, sales correspond to expenses incurred. Below the break-even point, the company is in loss and above this level is profitable. This is because fixed costs do not change, while variable costs change based on volume or activity level. Below breakeven, fixed costs eat up more revenue than variable costs, and you're still unsatisfied and at a loss. Above the BEP, the excess of sales over variable costs is much higher than the fixed costs of the activity, leading to profit.

The formula to calculate BEP.

$$\text{Break-even point} = \frac{\text{Fixed cost}}{\text{Contribution}} * \text{Sales}$$

d) Margin of safety

The margin of safety is a financial metric that measures the number of sales at breakeven. In other words, this is the income a company or division makes after paying all fixed and variable costs associated with producing goods or services. The safety margin is the difference between the actual sales level and the break-even sales. The

greater the difference between break-even sales and actual sales, the more a company can accept reduced sales without risking a loss.

$$\text{Margin of safety} = \text{Sales} - \text{Break even sales}$$

e) Margin of safety ratio

The margin of safety is the extent to which planned or actual sales exceed the break-even point. It shows how much sales can fall before a company suffers a loss. The higher the margin of safety, the lower the risk that the sales will be balanced and the higher the profit. This version of the safe margin equation expresses the buffer zone as a percentage of sales. The safety margin can also be expressed as a percentage (safety margin percentage). This percentage is obtained by dividing the safety margin in dollars by total sales. Safety margins can be expressed in both sales units and currency units. For this purpose the following formula is used:

$$\text{Margin of safety ratio} = \frac{\text{Margin of safety}}{\text{Sales}} * 100$$

f) Degree of Operating Leverage

The operating leverage level is a financial indicator that measures the sensitivity of a company's operating profit to sales. This financial indicator shows how changes in a company's earnings affect its operating profit. The Operating Leverage (DOL) level is a multiple that measures how much a company's operating profit changes in response to changes in revenue. Firms with a high ratio of fixed costs (or costs that do not vary with production volume) to variable costs (costs that vary with production volume) have higher operational influence. The DOL ratio helps analysts determine the impact of changes in sales on a company's revenues or profits. The higher the operating leverage (DOL), the more sensitive a company's earnings before interest (EBIT) is to

changes in earnings, assuming all other variables remain constant. The DOL ratio helps analysts determine the impact of changes in sales on the company's bottom line.

Operating leverage measures a company's fixed costs as a percentage of total costs. It is used to assess a company's break-even point. This is the point where sales are high enough to cover all costs and profits are zero. Companies with high operating leverage have a high percentage of fixed costs, and large increases in sales can lead to large changes in profits. Companies with lower operating leverage have a higher proportion of variable costs. This means that your profit per sale will be smaller, but you won't need to increase your sales as much to cover your low fixed costs.

$$\text{DOL} = \frac{\text{Contribution}}{\text{Operating profit}}$$

g) Regression

Regression is a statistical measure used in finance, investment, and other fields that compares a dependent variable (usually denoted by "y") with a set of other varying variables (known as independent variables). attempts to measure the strength of the relationship between Decision. Regression is defined as a statistical technique that helps analyze and understand the relationship between two or more variables of interest. A good process for performing regression analysis helps you understand which factors are important, which factors are negligible, and how they affect each other. Linear regression, also called simple regression or usually least squares (OLS), is the most common form of this technique. Regression analysis is a powerful tool for revealing associations between observed variables in data, but cannot easily demonstrate causal relationships. It is used in many areas of business, finance and economics. For example, it helps investment managers value assets and understand the relationship between factors such as commodity prices and the stock of companies trading those commodities.

Regression as a statistical technique should not be confused with the concept of regression to the mean. Regression captures the correlations between variables observed in a dataset and quantifies whether those correlations are statistical. Regression is useful not only for financial and investment professionals, but also for professionals in other organizations. Regression is also useful for predicting company sales based on weather, past sales, GDP growth, or other types of conditions. Statistical analysis uses regression to identify associations between variables that appear in some data. You can indicate the magnitude of such associations and determine their statistical significance (that is, whether the association is due to chance).

$$x = c + dy$$

$$c = \frac{\sum x}{n} - d \frac{\sum y}{n}$$

$$d = \frac{n \sum xy - (\sum x \cdot \sum y)}{n \sum y^2 - (\sum y)^2}$$

h) Correlation

Karl Pearson's coefficient of correlation

Biologist and statistician Karl Pearson provided a formula for calculating the correlation coefficient. Correlation coefficients are used in statistics to measure the strength of the relationship between two variables. There are several types of correlation coefficients. Pearson's correlation is a commonly used correlation coefficient in linear regression. Pearson's coefficient is a type of correlation coefficient that describes the relationship between two variables measured on the same interval or ratio scale.

The Pearson coefficient is a measure of the strength of the relationship between two continuous variables. Numerically, the Pearson coefficient is expressed in the same

way as the correlation coefficient used in linear regression and ranges from -1 to +1. A value of +1 is the result of a completely positive relationship between two or more variables. A positive correlation indicates that both variables are moving in the same direction. Conversely, a value of -1 represents a completely negative relationship, and a negative correlation indicates that as one variable increases, the other decreases. They are inversely proportional. Zero indicates no correlation.

Correlation indicates the strength of the relationship between two variables and is represented numerically by the correlation coefficient. Correlation coefficient values range from -1.0 to 1.0

$$r = \frac{n\sum xy - (\sum x \cdot \sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2]} \cdot \sqrt{[n\sum y^2 - (\sum y)^2]}}$$

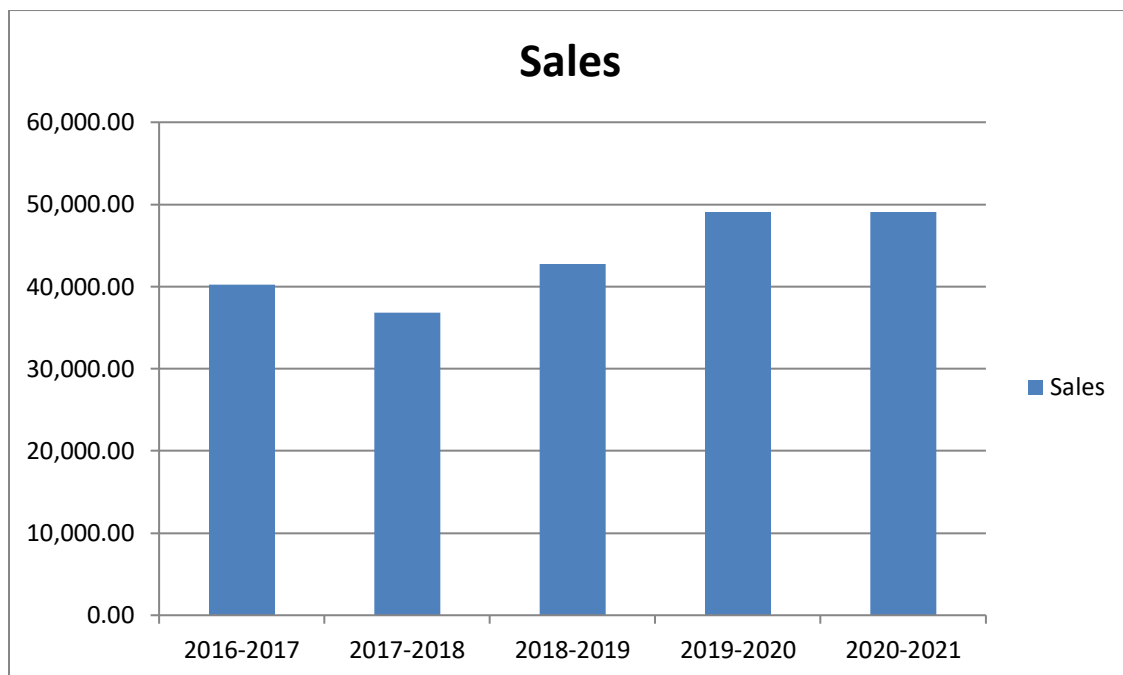
4.1 SALES

Sales refers to all activities involved in selling a product or service to a consumer. A sales determines that the seller provides the buyer with a good or service in exchange for a specific amount of money. In the financial market, a sale can also refer to an agreement that a buyer and seller make regarding the price of a security.

Table 4.1 Sales of Kerala Feeds Limited for the period from 2016-17 to 2020-21 (in Rs)

Year	Sales
2016-2017	40,193.00
2017-2018	36,864.73
2018-2019	42,764.88
2019-2020	49,107.19
2020-2021	49,063.58

Figure 4.1 Sales of Kerala feeds limited for the period from 2016-17 to 2020-21 (in Rs)



Interpretation

From the above graph shows the sales for the last five years. It shows company's sales is increasing. In the year 2016-17 Rs. 40,193.00. And it decreases to Rs. 36,864.73. It again increases to Rs. 42,764.88 And goes up to Rs. 49,107.19 and Rs. 49,063.58 in the year 2019-20 and 2020-21.

4.2 CONTRIBUTION

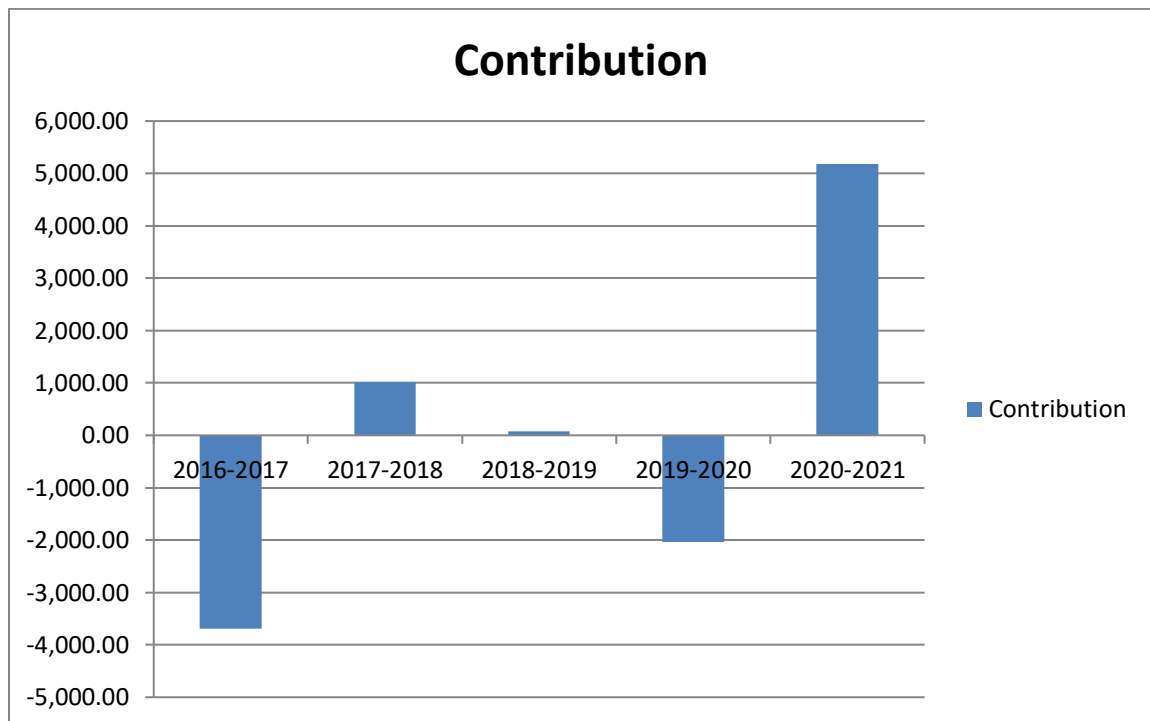
The contribution margin ratio is the difference between a company's sales and variable expenses, expressed as a percentage. The total margin generated by an entity represents the total earnings available to pay for fixed expenses and generate a profit.

$$\text{Contribution} = \text{Sales} - \text{Variable cost}$$

Table 4.2 Contribution of Kerala Feeds Limited for the period from 2016-17 to 2020-21 (in Rs)

Year	Sales	Variable cost	Contribution
2016-2017	40,193.00	43,887.41	-3,694.41
2017-2018	36,864.73	35,843.43	1,021.3
2018-2019	42,764.88	42,686.58	78.3
2019-2020	49,107.19	51,144.65	-2,037.46
2020-2021	49,063.58	43,877.41	5,186.17

Figure 4.2 showing contribution of Kerala Feeds Ltd for the period from 2016-17 to 2020-21



Interpretation

The above graph shows contribution for various years. Generally, the amount of contribution margin should be sufficient to cover all fixed costs as well as to contribute towards profit. Here the contribution has been fluctuating over the years. During the period 2016-17 the contribution was Rs. -3694.41 and it goes up to Rs. 1021.3 in the year 2017-18. After it decreased to Rs. 78.3 during the period 2018-19 from there it decreased to Rs. -2037.46 during the year 2019-20 and again it increased in the year 2021-22 to Rs. 5186.17. In the year 2016-17 & 2019-20 a negative contribution margin, the company's variable costs exceed its sales. If the company increases its sales with the same sales mix, it will experience larger losses. In 2021-22 year, the company has highest contribution margin, it indicates that more money available after paying variable cost expenses.

4.3 PROFIT VOLUME RATIO

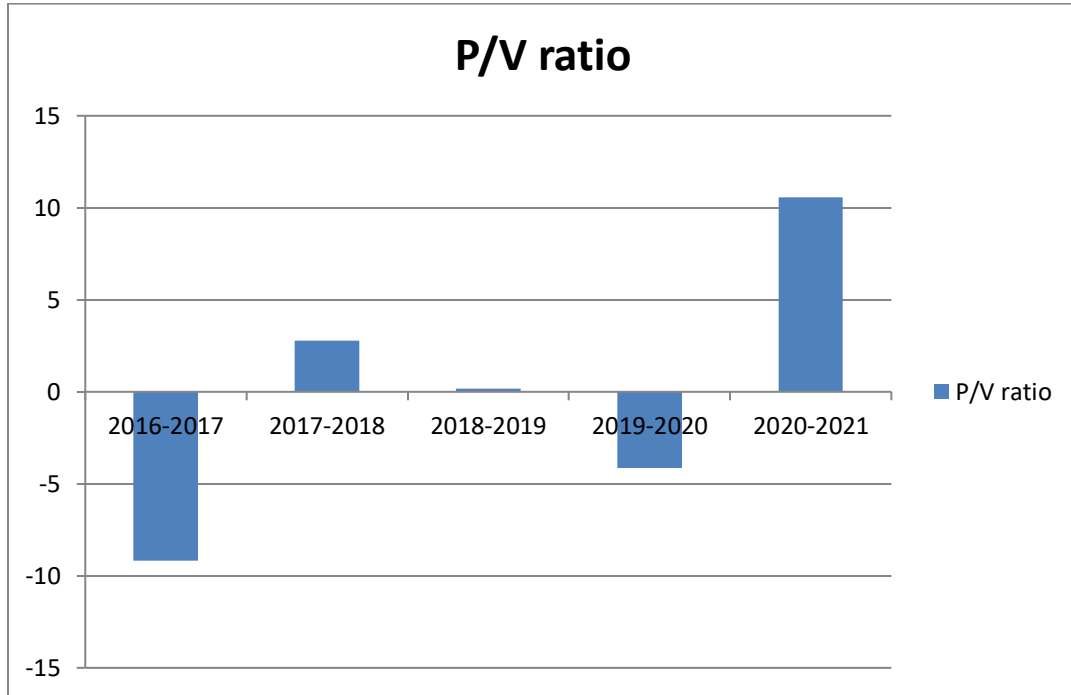
Profit volume ratio is the measurement of the rate of change of profit due to change in volume of sales. It is one of the most important ratio for computing profitability as it indicates contribution with respect of sales.

$$\text{P/V ratio} = \frac{\text{Contribution}}{\text{Sales}} * 100$$

Table 4.3 P/V ratio of Kerala Feeds Limited for the period from 2016-17 to 2020-21 (in Rs)

Year	Contribution	Sales	P/v ratio
2016-2017	-3,694.41	40,193.00	-9.1916751673
2017-2018	1,021.3	36,864.73	2.770398698
2018-2019	78.3	42,764.88	0.183094165
2019-2020	-2,037.46	49,107.19	-4.14900547
2020-2021	5,186.17	49,063.58	10.5703048983

Figure 4.3 Showing P/V ratio of Kerala Feeds Ltd for the period from 2016-17 to 2020-21



Interpretation

The above graph shows the p/v ratio for the last five years. From the above graph it is clear that the company is having a low p/v ratio in all the five years. In the year 2016-17 of about -9.1916751673% and it increased to 2.770% during the period 2017-18 and decreased to 0.183094165% in 2018-19. And it declined in the year 2019-20 to -4.149% and increased to 80.85% during 2020-21. The company has negative P/V ratio in the year 2017-18 & 2019-20. It indicates the low profitability, the company has to increase the selling price to improve the P/V ratio. The year 2020-21 P/V ratio increase to 80.85 %, indicates high profitability so that a slight increase in volume, without increase in fixed cost, would result in high profit.

4.4 BREAK-EVEN POINT

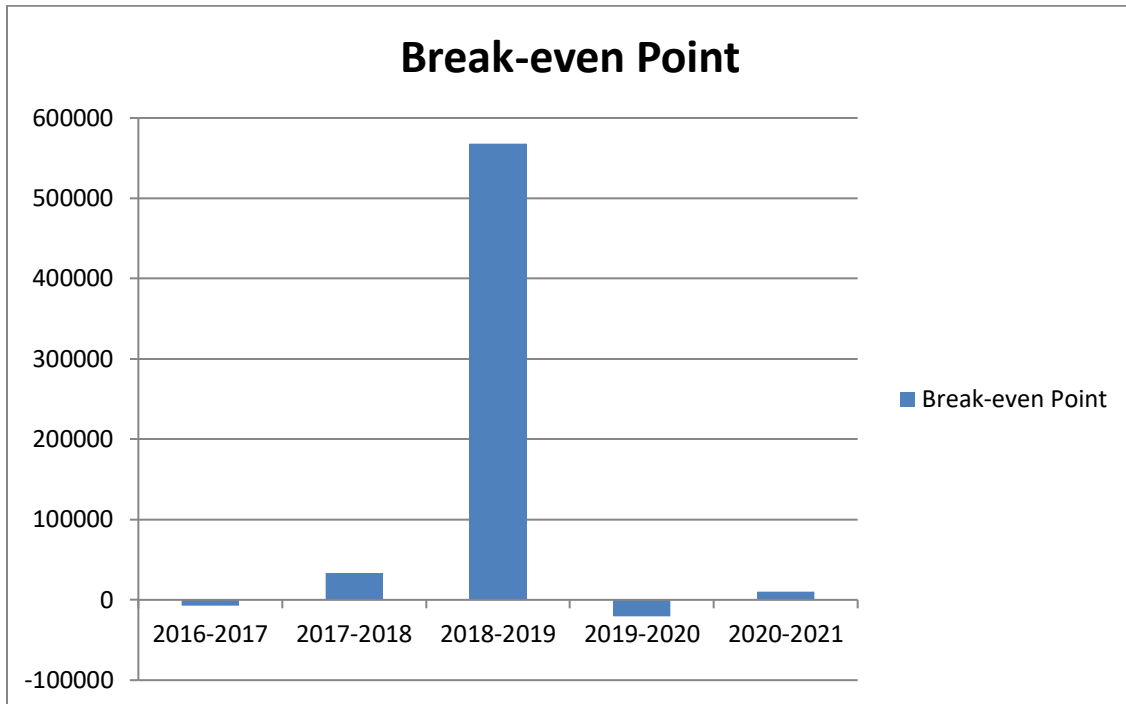
The break-even point can be defined as a point where total costs (expenses) and total sales (revenue) are equal. Break-even point can be described as a point where there is no profit or loss.

$$\text{Break-even point} = \frac{\text{Fixed cost}}{\text{Contribution}} * \text{Sales}$$

Table 4.4 Break-Even Point of Kerala Feeds Limited for the period from 2016-17 to 2020-21 (in Rs)

Year	Fixed cost	Contribution	Sales	Break-even point
2016-2017	668.29	-3,694.41	40,193.00	-7270.60071
2017-2018	925.92	1,021.3	36,864.73	33421.90424
2018-2019	1,040.78	78.3	42,764.88	568439.7421
2019-2020	854.38	-2,037.46	49,107.19	-20592.40476
2020-2021	1,101.14	5,186.17	49,063.58	10417.29648

Figure 4.4 Showing Break-Even Point of Kerala Feeds Limited for the period from 2016-17 to 2020-21



Interpretation

Break-even point for the period 2016-2017 to 2020-21 is depicted in the above graph. Increase in the break-even point will lead to decrease in the contribution and hence adversely affect the profitability of the company. Here the break-even point is very low. We can see that the break-even point during the period 2016-17 was about Rs. -7270.6 and increased to Rs. 33421.90424 in the year 2017-18. The break-even point of about Rs.568439.7421 in the year 2018-19, Rs. -20592.40476 in the year 2019-20 and increased Rs 10417.29648 in the year 2020-21. In the year 2016-17 & 2019-20 the break even point is negative, the company's total costs outweigh the sales revenue. That means company operating at a loss. The last five year break-even point was fluctuating.

4.5 MARGIN OF SAFETY

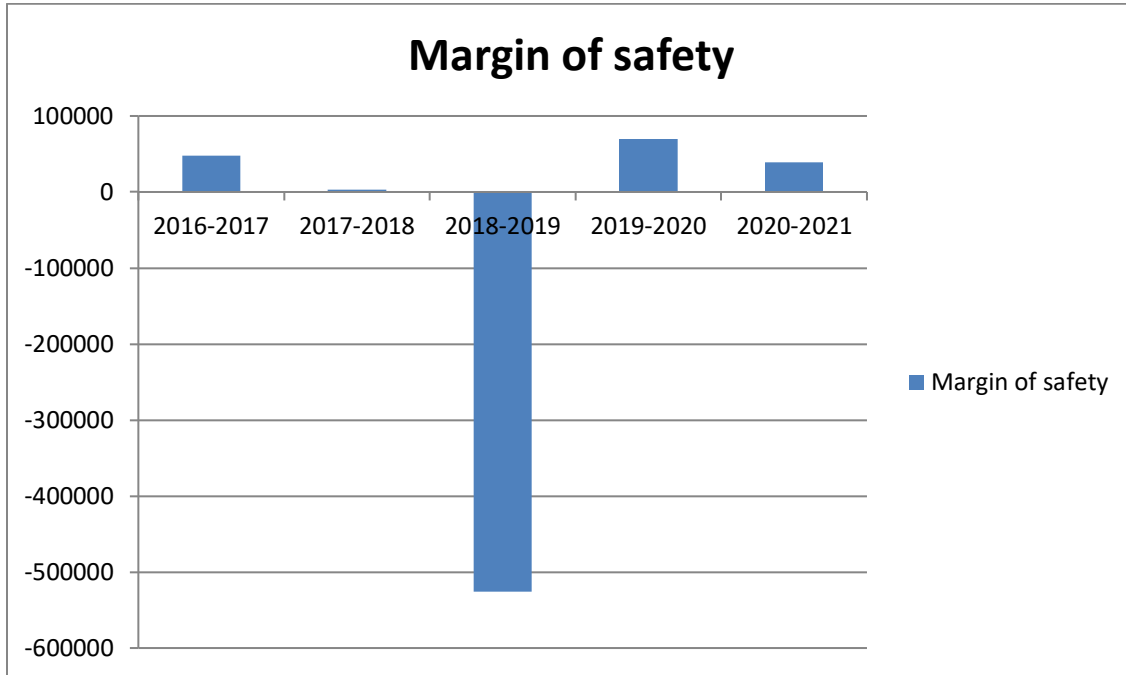
The margin of safety is a financial ratio that measures the amount of sales that exceed the break-even point. In other words, this is the revenue earned after the company or department pays all of its fixed and variable costs associated with producing the goods or services.

$$\text{Margin of safety} = \text{Sales} - \text{Break even sales}$$

Table 4.5 Margin of Safety of Kerala Feeds Limited for the period from 2016-17 to 2020-21 (in Rs)

Year	Sales	Break-even sales	Margin of safety
2016-2017	40,193.00	-7270.60071	47463.60071
2017-2018	36,864.73	33421.90424	3442.82576
2018-2019	42,764.88	568439.7421	-525674.8621
2019-2020	49,107.19	-20592.40476	69699.59476
2020-2021	49,063.58	10417.29648	38646.28352

Figure 4.5 Showing Margin of Safety of Kerala Feeds Limited for the period from 2016-17 to 2020-21



Interpretation

The above graph shows the margin of safety for the years. An increase in the break-even sales leads to a decrease in the margin of safety and which will affect the profit margin. The company is having a low margin of safety in all the five years. Among the five years the least margin of safety is in the year 2018-19 of about Rs.- 525674.8621. The company's break-even sales exceed sales. It indicates greater the risk of doing business. In 2016-17 Rs. 47463.6 and it decreased in 2017-18 to Rs. 3442.82576 and increased to Rs. 69699.59476 in 2019-20. In 2020-21 it was up to Rs. 38646.28352.

4.6 MARGIN OF SAFETY RATIO

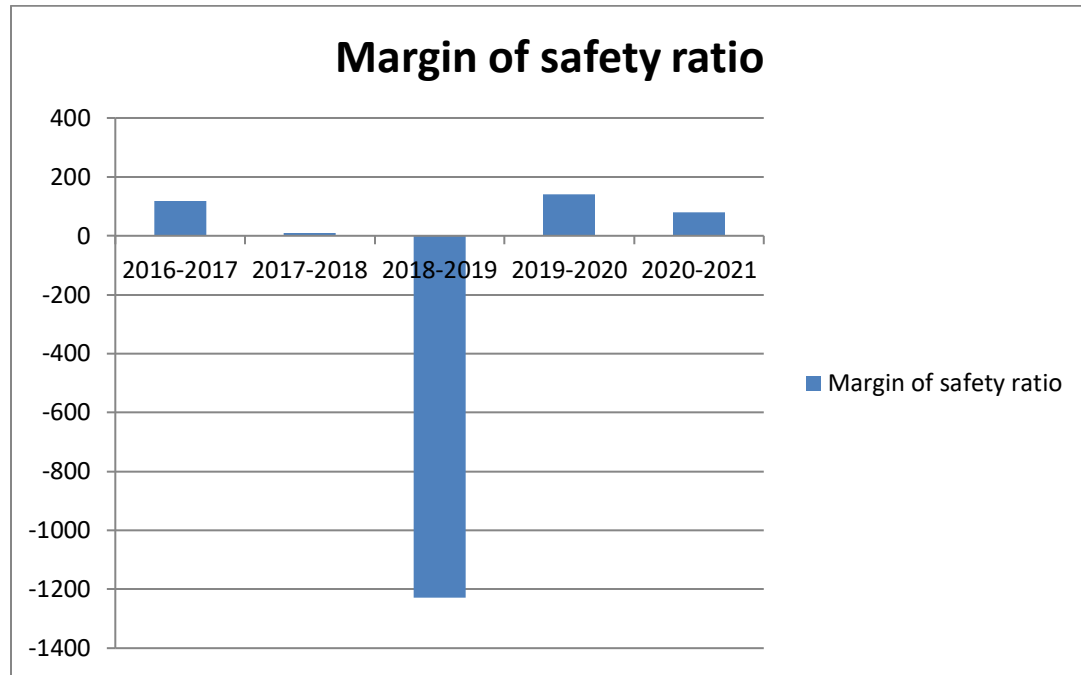
Margin of safety is the extent over which the budgeted or actual sales exceed the break-even sales. It denotes the extent to which the sales can drop before a company starts incurring losses. Also, the higher the margin of safety is, the lower is the risk of sales breaking even and higher is the profit. This version of the margin of safety equation expresses the buffer zone in terms of a percentage of sales.

$$\text{Margin of safety ratio} = \frac{\text{margin of safety}}{\text{sales}} * 100$$

Table 4.6 Margin of Safety ratio of Kerala Feeds Limited for the year 2016-17 to 2020-21 (in Rs)

Year	MOS	Sales	MOS ratio
2016-2017	47463.60071	40,193.00	118.0892213
2017-2018	3442.82576	36,864.73	9.33907765
2018-2019	-525674.8621	42,764.88	-1229.220945
2019-2020	69699.59476	49,107.19	141.933584
2020-2021	38646.28352	49,063.58	78.76776118

Figure 4.6 Showing Margin of Safety ratio of Kerala Feeds Limited for the year 2016-17 to 2020-21



Interpretation

The above graph shows the margin of safety ratio for last five years. The margin of safety ratio shows the extent to which the sales can drop before a company starts incurring losses in percentage. In 2016-17 the company is having a margin of safety ratio of about 118.089%. Its decrease in the year 2017-18 to 9.33907765%. During the period 2018-19 the ratio was about -1229.22% and during 2019-20 it increased to 141.933584%. And in 2020-21 it decreases to 78.76776118%. From the graph, we can see that 2018-19 the company has negative margin of safety ratio, it shows company in danger in terms of earning profit for this year.

4.7 DEGREE OF OPERATING LEVERAGE

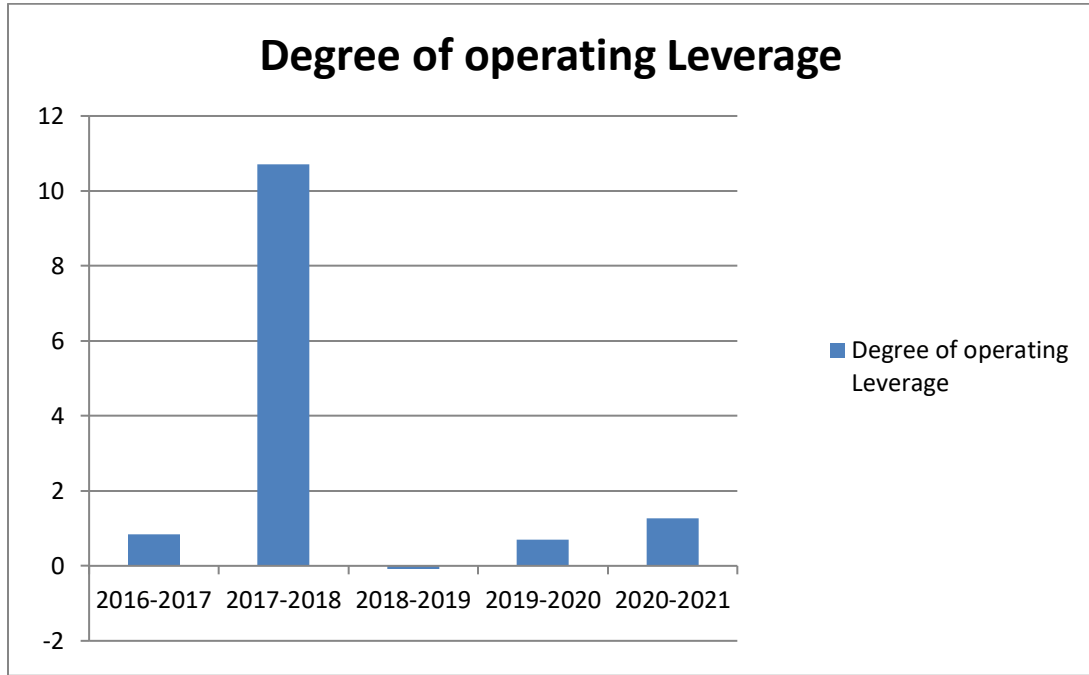
The degree of operating leverage is a financial ratio that measures the company's operating income to its sales. This financial metric shows how can change in the company's sales will affect its operating income.

$$\text{Operating leverage} = \frac{\text{Contribution}}{\text{Operating profit}}$$

Table 4.7 Degree of Operating Leverage of Kerala Feeds Limited for the year 2016-17 to 2020-2021

	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
Sales	40,193.00	36864.73	42764.88	49107.19	49063.58
Variable cost	43,887.41	35,843.43	42,686.58	51144.65	43877.41
Contribution	-3,694.41	1021.3	78.3	-2037.46	5186.17
Fixed cost	668.29	925.92	1040.78	854.38	1101.14
Operating profit	-4362.7	95.38	-962.48	-2891.84	4085.03
Dol	0.846817	10.70769	-0.08135	0.70455	1.26955

Figure 4.7 Showing the Degree of Operating Leverage of Kerala Feeds Limited for the year 2016-17 to 2020-21



Interpretation

The above graph shows the DOL for last five years. Here the company have a low DOL which means that the company's variable costs are larger than its fixed costs. During the period 2016-17 the company have a degree of operating leverage of about 0.846817%, it increased to 10.70769 in the year 2017-18 and decreased to -0.08135% in 2018-19 and 2019-20 the DOL increased to 0.704554% and again, it increased in the year 2020-21 to 1.26955%. From the graph, we can see that 2018-19 low degree of operating leverage from last five years degree of operating leverage. It shows fixed cost has a greater portion in the total cost of company and there is a decrease in sales.

4.8 REGRESSION

Regression is a statistical measurement which is used for in finance, investing and other disciplines, that to determine the strength of the relationship between one dependent variable (usually denoted by 'y') and a series of other changing variables (known as independent variables).

$$x = c + dy$$

$$c = \frac{\sum x}{n} - d \frac{\sum y}{n}$$

$$d = \frac{n \sum xy - (\sum x \cdot \sum y)}{n \sum y^2 - (\sum y)^2}$$

Table 4.8 Regression between total cost and profit (in Rs.)

x	y	y ²	xy
44555.7	2975.32	8852529.102	132567465.3
36769.35	219.55	48202.2025	8072710.793
43727.36	490.92	241002.4464	21466635.57
51999.03	-2604.83	-6785139.329	-135448633.3
44978.55	3607.33	13012829.73	162252472.8

$$\sum x = 222029.99$$

$$\sum y = 4688.29$$

$$\sum y^2 = 28939702.81$$

$$\sum xy = 188910651.1$$

$$d = \frac{n\sum xy - (\sum x \cdot \sum y)}{n\sum y^2 - (\sum y)^2}$$

$$d = \frac{5 \cdot 188910651.1 - (222029.99 \cdot 4688.29)}{5 \cdot 28939702.81 - (4688.29)^2}$$

$$= 0.785$$

$$c = \frac{\sum x}{n} - d \frac{\sum y}{n}$$

$$c = \frac{222029.99 - (-0.785 \cdot 4688.29/5)}{5}$$

$$= 45142.05953$$

In 2024, they required to achieve operating profit

$$y = 6000$$

$$x = c + dy$$

$$= 45142.05953 + (-0.785 \cdot 6000)$$

$$= 40432.05953$$

Interpretation

The above table shows the total cost and profit of company. Here, we take total cost as independent variable denoted by 'y' and profit as dependent variable denoted by 'x'. From the above table, it shows that company need to achieve an operating profit rupees. 6000 (Lakhs) in the year 2024, it can reduce the cost of sales by Rupees. 40432.05953.

4.9 CORRELATION

Karl Pearson's correlation coefficient

Karl Pearson, is the great biologist and statistician has given a formula to calculate the coefficient of correlation. Correlation coefficients are used in statistics to evaluate its strong a relationship between two variables.

$$r = \frac{n\sum xy - (\sum x \cdot \sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2]} \cdot \sqrt{[n\sum y^2 - (\sum y)^2]}}$$

4.9.1 FIXED ASSET AND COST

x	y	x ²	y ²	xy
9,790.26	44555.7	95849190.87	1985210402	436211887.5
10,669.36	36769.35	113835242.80	1351985099	392305432.1
11,298.70	43727.36	127660621.70	1912082013	494062322.4
10,947.28	51999.03	119842939.40	2703899121	569247941.1
7,235.25	44978.55	52348842.56	2023069960	325431053.9

$$\sum x = 49940.91$$

$$\sum y = 222029.99$$

$$\sum x^2 = 509536837.3$$

$$\sum y^2 = 9976246596$$

$$\sum xy = 2217258637$$

$$r = \frac{n\sum xy - (\sum x \cdot \sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2]} \cdot \sqrt{[n\sum y^2 - (\sum y)^2]}}$$

$$\begin{aligned} &= \frac{5*2217258637 - (49940.91 * 222029.99)}{\sqrt{[5*509536837.3 - (49940.91)^2]} \cdot \sqrt{[5*9976246596 - (222029.99)^2]}} \\ &= -0.01171951 \end{aligned}$$

Interpretation

From the above table, we can see that fixed asset denoted by 'x' variable and total cost by 'y' variable. Then using the Pearson correlation, calculate the 'r' correlation coefficient between two variables. -0.01171951 has correlation coefficient between fixed asset and total cost. Here exists a negative correlation coefficient between fixed assets and cost of sales.

4.9.2 FIXED ASSET AND VOLUME

x	y	x ²	y ²	xy
9,790.26	40,193.00	95849190.87	1615477249	393499920.2
10,669.36	36,864.73	113835242.80	1359008318	393323075.7
11,298.70	42,764.88	127660621.70	1828831540	483187097.7
10,947.28	49,107.19	119842939.40	2411516110	537590158.9
7,235.25	49,063.58	52348842.56	2407234882	354987267.2

$$\sum x = 49940.91$$

$$\sum y = 217993.34$$

$$\sum x^2 = 509536837.3$$

$$\sum y^2 = 9622068099.31$$

$$\sum xy = 2162587520$$

$$r = \frac{n\sum xy - (\sum x \cdot \sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2]} \cdot \sqrt{[n\sum y^2 - (\sum y)^2]}}$$

$$= \frac{5 \cdot 2162587520 - (49940.91 \cdot 217993.34)}{\sqrt{[5 \cdot 509536837.3 - (49940.91)^2]} \cdot \sqrt{[5 \cdot 9622068099.31 - (217993.34)^2]}}$$

$$= -0.415480125$$

Interpretation

From the above table, we can see that fixed asset denoted by 'x' variable and sales volume by 'y' variable. Then using the Pearson correlation, calculate the 'r' correlation coefficient between two variables. -0.415480125 has correlation coefficient between fixed asset and sales volume. Here exists a negative correlation coefficient between fixed assets and sales volume.

4.9.3 FIXED ASSET AND PROFIT

x	y	x ²	y ²	xy
9,790.26	2975.32	95849190.87	8852529.102	29129156.38
10,669.36	219.55	113835242.80	48202.2025	2342457.988
11,298.70	490.92	127660621.70	241002.4464	5546757.804
10,947.28	-2604.83	119842939.40	6785139.329	-28515803.36
7,235.25	3607.33	52348842.56	13012829.73	26099934.38

$$\sum x = 49940.91$$

$$\sum y = 3607.33$$

$$\sum x^2 = 509536837.3$$

$$\sum y^2 = 13012829.73$$

$$\sum xy = 34602503.2$$

$$r = \frac{n\sum xy - (\sum x \cdot \sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2]} \cdot \sqrt{[n\sum y^2 - (\sum y)^2]}}$$

$$= \frac{5 \cdot 34602503.2 - (49940.91 \cdot 3607.33)}{\sqrt{[5 \cdot 509536837.3 - (49940.91)^2]} \cdot \sqrt{[5 \cdot 13012829.73 - (3607.33)^2]}}$$

$$= -0.753696819$$

Interpretation

From the above table, we can see that fixed asset denoted by 'x' variable and profit by 'y' variable. Then using the Pearson correlation, calculate the 'r' correlation coefficient between two variables. -0.753696819 has correlation coefficient between two variables. Here exist a negative correlation between fixed assets and profit.

4.9.4 CURRENT ASSET AND COST

x	y	x ²	y ²	xy
5,575.67	44555.7	31088095.95	1985210402	248427879.8
5,784.46	36769.35	33459977.49	1351985099	212690834.3
6,937.40	43727.36	48127518.76	1912082013	303354187.3
6,950.11	51999.03	48304029.01	2703899121	361398978.4
7,967.39	44978.55	63479303.41	2023069960	358361649.5

$$\sum x = 33215.03$$

$$\sum y = 222029.99$$

$$\sum x^2 = 224458924.6$$

$$\sum y^2 = 9976246596$$

$$\sum xy = 1484233529$$

$$r = \frac{n\sum xy - (\sum x \cdot \sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2] \cdot [n\sum y^2 - (\sum y)^2]}}$$

$$= \frac{5 \cdot 1484233529 - (33215.03 \cdot 222029.99)}{\sqrt{[5 \cdot 224458924.6 - (33215.03)^2] \cdot [5 \cdot 9976246596 - (222029.99)^2]}}$$

$$= 0.44019828$$

Interpretation

From the above table, we can see that current asset denoted by 'x' variable and total cost by 'y' variable. Then using the Pearson correlation, calculate the 'r' correlation coefficient between two variables. 0.44019828 has correlation coefficient between current asset and total cost. Here exist a positive correlation between current assets and total cost.

4.9.5 CURRENT ASSET AND VOLUME

x	y	x ²	y ²	xy
5,575.67	40,193.00	31088095.95	1615477249	224102904.3
5,784.46	36,864.73	33459977.49	1359008317.97	213242556
6,937.40	42,764.88	48127518.76	1828831540.22	296676801
6,950.11	49,107.19	48304029.01	2411516109.69	3413003772
7,967.39	49,063.58	63479303.41	2407234882.42	390908676.6

$$\sum x = 33215$$

$$\sum y = 217993.34$$

$$\sum x^2 = 224458924.62$$

$$\sum y^2 = 9622068099.31$$

$$\sum xy = 1466231310.37$$

$$r = \frac{n\sum xy - (\sum x \cdot \sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2] \cdot [n\sum y^2 - (\sum y)^2]}}$$

$$= \frac{5 \cdot 1466231310.37 - (33215 \cdot 217993.34)}{\sqrt{[5 \cdot 224458924.62 - (33215)^2] \cdot [5 \cdot 9622068099.31 - (217993.34)^2]}}$$

$$= 0.854055906$$

Interpretation

From the above table, we can see that current asset denoted by 'x' variable and sales volume by 'y' variable. Then using the Pearson correlation, calculate the 'r' correlation coefficient between two variables. 0.854055906 has correlation coefficient between two variable, current asset and sales volume. Here exist a positive correlation between current assets and sales volume.

4.9.6 CURRENT ASSET AND PROFIT

x	y	x ²	y ²	xy
5,575.67	2975.32	31088095.95	8852529.102	16589402.46
5,784.46	219.55	33459977.49	48202.2025	1269978.193
6,937.40	490.92	48127518.76	241002.4464	3405708.408
6,950.11	-2604.83	48304029.01	6785139.329	-18103855.03
7,967.39	3607.33	63479303.41	13012829.73	28741004.97

$$\sum x = 7967.39$$

$$\sum y = 3607.33$$

$$\sum x^2 = 63479303.41$$

$$\sum y^2 = 13012829.73$$

$$\sum xy = 28741004.97$$

$$r = \frac{n\sum xy - (\sum x \cdot \sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2]} \cdot \sqrt{[n\sum y^2 - (\sum y)^2]}}$$

$$= \frac{5 \cdot 28741004.97 - (7967.39 \cdot 3607.33)}{\sqrt{[5 \cdot 63479303.41 - (7967.39)^2]} \cdot \sqrt{[5 \cdot 13012829.73 - (3607.33)^2]}}$$

$$= 0.078362218$$

Interpretation

From the above table, we can see that current asset denoted by 'x' variable and profit by 'y' variable. Then using the Pearson correlation, calculate the 'r' correlation coefficient between two variables. 0.078362218 has correlation coefficient between current asset and profit. Here exist a positive correlation between current assets and profit, that means is in same direction.

5.1 FINDINGS

- The company's sales is increasing for the last five years. It indicates company's ability to generate revenue through sales over a fixed period of time.
- The company's contribution was low for the last five years. It is because of the high variable cost. Amount of contribution margin not sufficient to cover all fixed costs. But in 2020-21 there occurred a great change that is company's contribution had increased. It is sufficient to cover all fixed costs.
- The profit volume ratio of company is satisfactory i.e. the company is having an average profit margin. It indicates that the company earn a satisfactory profit from its sales. There is a variation between the revenue and profit earned.
- By analyzing the margin of safety, it shows the company is having a low margin of safety. A decrease in the margin of safety because of abundance of break-even sales.
- From analysis, the degree of operating leverage for company is having a low degree of operating leverage. It is because of that the variable cost is greater than the fixed cost of company.

Regression

- Through the analysis, the company need to achieve an operating profit, they have to reduce the cost of sales by rupees. 40432.05953 in the year 2024.

Correlation

- From the analysis between fixed asset and cost of sales for 2017 to 2021 years, here negative correlation between fixed asset and cost of sales, which means they tend to move in opposite direction.

- From the analysis between fixed asset and sales volume for 2017 to 2021 years, here negative correlation between fixed asset and sales volume, that they tend to move in opposite direction.
- From the analysis between fixed asset and profit for 2017 to 2021 years, here negative correlation between fixed asset and profit, they are opposite to each other.
- From the analysis between current asset and cost of sales for 2017 to 2021 years. There is positive correlation between current asset and cost of sales, which are interrelated.
- From the analysis between current asset and sales volume for 2017 to 2021 years. Here a positive correlation between current asset and sales volume, which are interrelated.
- From the analysis between current asset and profit for 2017 to 2021 years, here positive correlation between current asset and profit, which are interrelated.

5.2 SUGGESTIONS

- The firm needs to raise the selling price per unit or increase the sales volume in order to make more profit in the business.
- Company has to give small reduce in variable cost, to improve the contribution margin.
- Companies should focus on cost reduction techniques to increase profits.
- Companies should identify new markets for their products and take the necessary steps to penetrate them.
- By reducing the cost of goods sold without a corresponding reduction in selling price, the company can increase gross and net profit.
- Company should expand their operations to other states. It helps to increase the demand for product.
- Domestic livestock production must flourish and remain based on feed from agro-industrial by-products and crop residues, which are the primary energy and protein sources for livestock feed.
- To achieve operating profit, company has to reduce cost of sales by 40432.059 Rs. in 2024.
- Work on the new unit should be completed as soon as possible because demand is outstripping supply.

5.3 CONCLUSION

This study focus on cost-volume-profit analysis of Kerala Feeds Ltd with the aim of finding the relationship between cost, volume and profit of the company. Kerala Feeds Limited is a public sector company reporting to the Government Livestock Service. The company is committed to manufacturing and marketing affordable, high quality cattle formula and feed supplements to dairy farmers. The company started operations in Kallettumkara, Thrissur Province, manufacturing cattle feed in pellet form, and later expanded into other products such as poultry feed, goat feed, keramine, and other supplements such as milk boosters of feed.

This study helps to seek out whether the corporate is achieving a satisfactory gross margin with its sales. Various tools like contribution, p/v ratio, break-even point, margin of safety, operating leverage, regression and correlation were utilized in this study. The cost of sales of company is very high, it is near to sales values that means the cost and revenue are almost equal. So, the firm isn't achieving a high profit from their sales. The high cost is mainly the rise in variable cost. So here the firm must put more focus on fixed cost, they have to utilize more fixed cost on operational activities.

The study makes evident that the general performance of the company reference to profitability is average but still, the performance of the firm is maximized through careful measures of cost control which enhance the operating efficiency of the corporate. The company can decrease their cost by reducing the variable cost, thereby the sales get increases to their quality and also the performance are going to be improved within the future.

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