Pre-Feasibility Study

Animal Feed Mill

(Inclusive of Urea Molasses Block Preparation)

Small and Medium Enterprise Development Authority

Government of Pakistan

www.smeda.org.pk

HEAD OFFICE

6th Floor LDA Plaza Egerton Road, Lahore
Tel 111 111 456, Fax 6304926-7 Website www.smeda.org.pk
Helpdesk@smeda.org.pk

REGIONAL OFFICE PUNJAB
8 th Floor, LDA Plaza, Lahore,
Tel: (042) 111-111-456
Fax: (042)6304926-7
helpdesk@smeda.org.pk

REGIONAL OFFICE SINDH
5TH Floor, Bahria Complex II, M.T. Khan Road, Karachi.
Tel: (021) 111-111-456
Fax: (021) 5610572
helpdesk-khi@smeda.org.pk

REGIONAL OFFICE NWFP
Ground Floor
State Life Building
The Mall, Peshawar.
Tel: (091) 9213046-47
Fax: (091) 286908
helpdesk-pew@smeda.org.pk

REGIONAL OFFICE BALOCHISTAN
Bungalow No. 15-A
Chaman Housing Scheme
Airport Road, Quetta.
Tel: (081) 831623, 831702
Fax: (081) 831922
helpdesk-qta@smeda.org.pk

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1 INTRODUCTION TO SMEDA

The Small and Medium Enterprise Development Authority (SMEDA) was established with the objective to provide fresh impetus to the economy through the launch of an aggressive SME support program.

Since its inception in October 1998, SMEDA had adopted a sectoral SME development approach. A few priority sectors were selected on the criterion of SME presence. In depth research was conducted and comprehensive development plans were formulated after identification of impediments and retardants. The all-encompassing sectoral development strategy involved recommending changes in the regulatory environment by taking into consideration other important aspects including finance, marketing, technology and human resource development.

SMEDA has so far successfully formulated strategies for sectors including, fruits and vegetables, marble and granite, gems and jewelry, marine fisheries, leather and footwear, textiles, surgical instruments, transport and dairy. Whereas the task of SME development at a broader scale still requires more coverage and enhanced reach in terms of SMEDA's areas of operation.

Along with the sectoral focus a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of viable business opportunities for potential SME investors. In order to facilitate these investors, SMEDA provides business guidance through its help desk services as well as development of project specific documents. These documents consist of information required to make well-researched investment decisions. Pre-feasibility studies and business plan development are some of the services provided to enhance the capacity of individual SMEs to exploit viable business opportunities in a better way.

This document is in the continuation of this effort to enable potential investors to make well-informed investment decisions.

2 Purpose of the document

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs to facilitate investment and provide an overview about processing of animal feed and urea molasses blocks. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document covers various aspects of feed milling and urea molasses block concept development, start-up, and production, finance and business management. The document also provides sectoral information, brief on government policies and international scenario, which have some bearing on the project itself.

This particular pre-feasibility is regarding "Animal Feed Mill with Urea Molasses Block (UMB) Preparation" which comes under "Livestock and Agriculture" sector. Before studying the whole document one must consider following critical aspects, which form the basis of any investment decision.

3 Crucial Factors & Steps in Decision Making for Investment

Before making the decision, whether to invest in this project or not, one should carefully analyze the associated risk factors. A SWOT analysis can help in analyzing these factors which can play important role in making the decision.

3.1 Strengths

- Investment in dairy and livestock sector is increasing day by day and quality feed is a pre requisite in profitable dairy and livestock farming.
- Feed and Urea Molasses Blocks (UMB) formulation according to modern techniques with proper utilization of locally available cheaper feedstuffs leads to success in dairy and livestock farming hence for feed business too.

3.2 Weaknesses

- Limited availability of protein sources of standard quality due to low or static production, processing technology, variable composition and adulteration.
- Comparatively poor nutrient composition of indigenous feed ingredients due to differences in varieties and use of improper soil fertilizers.
- Improper use of pesticides, the residues of which result in poor feed utilization.
- Lack of proper storage facility. Due to this fact various agricultural products when produced under quite high moisture content, thus liable to be affected with insect damage, auto-oxidation and fungal contamination.
- Lack of nutritional data of indigenous feed ingredients particularly for amino acids, energy, vitamins, minerals and by pass protein value especially in high producing cattle/buffalo.
- Improper storage, transfer, grading, feed milling and mixing of feed ingredients may also affect the quality of feed.
- Animal feed and urea molasses blocks (UMB) cannot be produced economically on a small scale. Cost of labour for each batch and cost of overhead keep on decreasing with the increasing production.
- There is no quality standards and quality control for UMB. The excess intake of Urea may be fatal to livestock resulting in urea toxicity.

3.3 Opportunities

- The annual growth rate in livestock population of Pakistan was 3.8 percent (Economic Survey of Pakistan, 2007-08) due to which there is demand for compound feed. The increased productivity would require better feed utilization and increase in overall feed availability both from fodder crops and formulated compound feed.
- The agro industrial by products can be better utilized in formulated compound feed.
- In order to meet the rapidly increasing demand for the various kinds of livestock products (Milk & meats), the better rations with improved feed formula are needed to get more meat and milk, for the same feed supplies. By increasing

livestock numbers, rather than their average weight, the feed requirements are much larger.

3.4 Threats

- Implementation of WTO. Open and competitive commodity pricing
- There is no feed ingredient quality control program as improper storage, transfer, grading, feed milling and mixing of feed ingredients may also affect the quality of feed.
- The prices of different feedstuffs vary through out the year. Improper storage of raw material can affect its nutritional value.
- There is limited availability of protein sources of standard quality due to low or static production, processing technology, variable composition and adulteration.
- Lack of proper labeling on product.
- Lack of awareness among dairy and livestock farmers to use compound feed & UMB for the high production of their animals is a constant threat for feed mill business as well.

4 Project Profile

4.1 Opportunity Rationale

Livestock production is an integral part of Pakistan's agriculture sector and plays a vital role in national economy. At present, livestock is contributing about 52% to the agricultural sector and 10.9% to the GDP. The role of livestock in rural economy may be assessed by the fact that 30 to 35 million of the total rural population is engaged in livestock farming, having 2 to 3 cattle/buffalo and 5 to 6 sheep/goats per family deriving 30 to 40 per cent of income from it[1].

Pakistan's livestock population is supported by feed resources derived from the crops sector, rangelands, grazing areas and agro industrial by-products. The type, availability and utilization of these feed resources vary greatly in the country's different agro ecological zones. In order of importance, the major feed resources are crop residues (46%), grazing (27%), cultivated fodder (19%), cereal/legume grains and by-products (6%) and oil cakes, meals and animal protein (2%). Most farmers (about 75%) have small land holdings on which most of the livestock population is concentrated. The smallholders' priority is to grow cereal grains for human consumption, but these also provide straw and Stover for their animals, which is low in protein and energy. In the case of wheat, the value of the straw is around 60% of that of the grain. The nutrients available under the present pattern of feed utilization do not meet the requirements of Pakistan's existing livestock population.

[1] Economic Survey of Pakistan, 2007-08

Table 4-1: Population of livestock (million)[2]

Species	2005-06	2006-07	2007-08
Cattle	29.6	30.7	31.8
Buffalo	27.3	28.2	29.0
Sheep	26.5	26.8	27.1
Goats	53.8	55.2	56.7

Table 4-2: Production of Livestock Products[3]

Product	2005-06	2006-07	2007-08
Milk (Million Tones)	39.596	40.872	42.199
Beef (Thousand tones)	1,449	1,498	1,549
Mutton(Thousand tones)	554	566	578

There appear to be deficiencies of 24% of the Total Digestible Nutrients (TDN) and 39.4% of Crude Protein (CP) requirements for livestock. There is a growing trend towards the establishment of more intensive dairy cattle and buffalo production systems in peri-urban areas of Pakistan. An estimated 40 million tones of crop residues are produced annually in Pakistan, out of which 52.5 % and 22.0 % are contributed by wheat and rice respectively. Traditionally, cereal straws are fed to cattle and buffalo year-round, but their proportion in the ration increases during periods of feed scarcity. The major sources of supplementary feed in Pakistan are by-products from cereal milling and oilseed production. Wheat bran, rice bran and rice polishing are the main milling by-products. Cottonseed cake, rapeseed cake and maize oil cake account for almost two-thirds of the total protein supplement used to feed dairy animals.

Cultivated fodder is used as cut-and-carry feeds and may include berseem, oats, rape, barley and sometimes wheat during the winter season and maize, sorghum and millet during the summer season. Most of these crops are ready for harvesting about 2 to 3 months after sowing. Periods of scarcity occur in May-June. Fodder becomes available in July and again in October- November. Of the total cultivated area, only 13% is devoted to fodder crop production. Despite large increases in the ruminant population (62%) during the past 20 years, the land devoted to fodder crops has declined by about 17%, with a corresponding increase in land used for food grain production. This has further increased the dependence of livestock on crop residues and by-products.

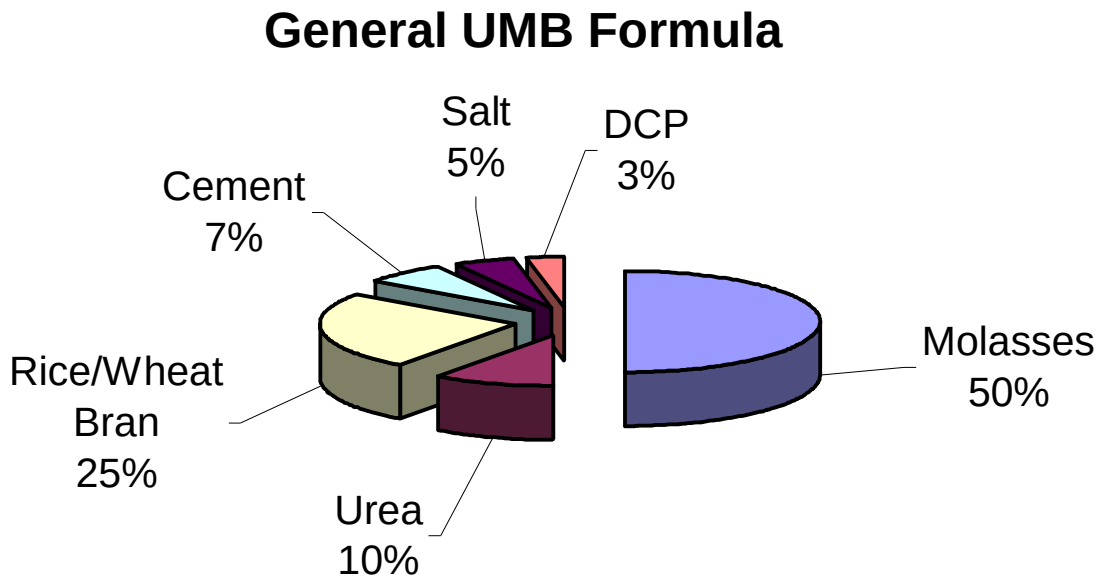
Animal feed mill with UMB preparation is an agro-based project in which locally available feed resources rich in protein and carbohydrate are mixed according to nutritional formula in order to raise the livestock in such a manner that when fed to livestock, they get nutritionally balanced feed according to their body needs. The process is done through semi mechanized and with/ with out manual handling of different feedstuffs.

[2]Economic Survey of Pakistan, 2007-08
[3] Economic Survey of Pakistan, 2007-08

At present, Pakistan has 215 feed mills, but only few are preparing compound feed for livestock. Generally, mixed compound feeds are prepared at home by farmers. Feed accounts for almost 70% of total cost of production of milk or meat. Hence a balanced feed will positively affect milk and meat production of livestock. The cake is a by-product from oil mills and is a valuable raw material for animal feed. Since animal keeping is worldwide, hence animal feeding is an important component.

Molasses is a thick, viscous material, which is a by-product of the sugar industry. Being a concentrated by-product, it provides a range of trace minerals and a complete mixture of vitamins. It is high in soluble carbohydrates. Although a cheaper source of energy, it is not commonly used by farmers due to difficulty in handling. Molasses can be included in ration by mixing it with other concentrates in the form of licks. Molasses increases the palatability and consumption of poor quality roughage and is a good carrier for urea as Non-Protein Nitrogen (NPN) source for livestock (ruminants).

Cereal brans are high in phosphorus, trace minerals and also a range of vitamins. In addition they provide a slow release amino acid source from the relatively insoluble



proteins to the microbes.

As the name suggests, Urea Molasses Blocks (UMB) are lick blocks containing urea, molasses, vitamins and minerals. The feeding of the blocks is a convenient and inexpensive method of providing a range of nutrients required by both the rumen microbes and the animal, which may be deficient in the diet. The main justification for using the blocks depends on their convenience for packaging, storage, transport and ease of feeding.

Urea contains 46% nitrogen, which is equivalent to 287% crude protein and is rapidly digested by ruminants. Urea provides the small amount of extra nitrogen required, for utilization of the dry matter, in addition to that present in the forage. The UMB, therefore, provides the nutrient requirements of both the microbes and the host animal. The

ingredients are designed to provide a wide rage of nutrients to cover all potential deficiencies. But the UMB should be fed only in limited quantities. The UMB is designed in such a way that animals can only lick it but not chew it. Because by chewing the animals will eat more urea per unit of time than they can handle and can result in urea toxicity in the animals

4.2 Project Brief

The proposed project will be producing 8,400 tons of compound animals feed and 42,000 no. of Urea Molasses Block (UMB) both in first year. This feed and UMB will be supplemented to livestock in addition to green fodder *and libitum (Freely available to animals)* for high production. Different formulae may be used to prepare compound feed such as calf fattening formula and dairy animal formula etc. to facilitate the customers nationwide. The proposed business will be manufacturing compound animal feed and Urea Molasses Block (UMB) for meeting the demand of dairy and livestock farmers.

4.3 Viable Economic Size

Animal feed and UMB Mill can be designed with a wide range of processing capacity and product mix depending upon the demand, according to availability of feed stuffs and their storage capacity. However, it is suggested that the viable economic unit should have a capacity of preparing 5 ton of compound feed per hour and 25 UMB in 8hrs. The project in this pre feasibility study has an annual production capacity of 12,000 tons of compound animal feed and 60,000 of UMB.

4.4 Market Entry Timing

Compound animal feed and UMB is used in all class of livestock throughout the year that the demand never gets affected with seasons. So the proposed business can be started at any time of the year. At the commencement of the proposed business, it is important that the entrepreneur must have good knowledge of the production and have contacts with the farmers.

4.5 Proposed Business Legal Status

The proposed legal structure of the business entity is either sole proprietorship or partnership. Although selection totally depends upon the choice of the entrepreneur but this financial feasibility is based on a Sole Proprietorship.

4.6 Proposed Capacity

This pre feasibility suggests production of 12,000 tons of animal feed and 60,000 UMB annually. However the proposed project will be started with an initial year capacity of 70% i.e. 8,400 tons of animal feed and 42,000 UMB. This production capacity justifies the running cost of the project.

4.7 Project Investment

The total cost of the project is Rs.31, 869,148.

Table 4-3: Project Costs

	Amount (Rs.)
Capital Investment	16,242,235
Working Capital Requirement	15,626,913
Total Investment	**31,869,148**

The proposed pre-feasibility is based on the assumption of 50% debt and 50% equity. However this composition of debt and equity can be changed as per the requirement of the investor.

Table 4-4: Project Financing

Debt	50%	15,934,574
Equity	50%	15,934,574
Total project Investment		**31,869,148**

Table 4-5: Viability

IRR	40%
NPV @20%	38,506,219
Pay Back Period (year)	3.31

4.8 Proposed Location

Feed mill should be in an area where there is more product demand e.g. near the areas where dairy and livestock farming is already being done. These areas include:

- Karachi
- Lahore
- Rawalpindi
- Multan
- Faisalabad
- Sahiwal
- Jhang
- Okara
- Bahawalpur
- Sargodha
- Gujranwala etc.

4.9 Key Success Factors/Practical Tips for Success

The feed industry should aim at fully utilizing all low cost feed ingredients available in country such as molasses, urea, by products of edible oil and grain milling industries, minerals and vitamins. There is a need to launch programs in following areas to achieve the desired targets.

- Establishment of Animal feed mill with UMB preparation in feed ingredients surplus areas such as sugar mills & oil mills to fully utilize the molasses, oil cakes and other by-products of milling industries to prepare cheaper feed.
- Introduce the use of urea molasses block feeding for meeting the protein, energy and mineral requirement of the animal. (This is marketing aspect of the UMB)
- Formulate the nutritionally balanced but cheaper formula for feeding animals. This is called Least Cost Ration Formulation.
- The farmers having large number of animals (more than 100 animals) can prepare compound feed and UMB on their own farms **(Optional)** but Animal feed and UMB Mill is an independent enterprise and should not be linked with livestock farming.

5 SECTOR & INDUSTRY ANALYSIS

5.1 Major Players

There are few numbers of animal feed mills, which are in operation both in organized sector and informal sector in Pakistan. Livestock sector is utilizing many different feed resources of varying quality and availability. Most small-scale farmers base their livestock enterprises on the use of crop residues, resulting in a low output of milk and meat per animal. The need to make better use of crop residues has prompted considerable research and many promising technologies are now available. New avenues for research and policy development may lie in the adjustment of livestock types and numbers, increased production of fodder, the tapping of new or non-conventional feed resources, and the strategic movement of fodder.

Animal feed industry has not yet developed to any sizeable extent in Pakistan. The feed industry is presently working only 60 percent of its installed capacity. This is hardly enough to satisfy the domestic demand. But as the unutilized capacity is available with the existing mills, they can easily increase their capacity. Only some sporadic efforts have been made to undertake cattle feed industry on commercial lines and with limited success. However, these are made available at reasonable prices to our cattle farmer.

5.2 Hubs of Animal Feed Mills

There are hardly a couple of industrial units in Punjab, which are exclusively producing compound animal feed. If we look at the development of animal feed industry in the country, it is revealed that this industry, so vital for the growth of livestock sub-sector of agriculture is still in a bad shape. A number of poultry feed mills of varying capacities have been established across the country, their main concentration being in the Punjab and Sindh provinces. A few of these poultry feed mills are also occasionally engaged in

preparing compound animal feeds. The feed industry in the country made a start on scientific and commercial lines in the early sixties. But it remained confined to the manufacture of poultry feeds. Messrs Lever Brothers (a foreign-based company) were the pioneer in this industry.

The quality of various types of feeds produced by different mills has wide variations. It is felt that the quality of feed in general is deteriorating. This, on the other hand, is disturbing the economics of the producers and is hampering the growth and development of the industry.

The deterioration in quality is due to:

- Non-availability of good quality protein ingredients
- Shortage of coarse grains (constituting about 50 percent of total ingredients)
- Non-existence of quality control of end products.

As a matter of fact feed mills regulate their production schedule according to the effective demand from the livestock farms. They do not produce in excess of ready demand as the shelf life of feed ranges from 2 to 3 months only. Even the ready demand fluctuates periodically with the change in weather and feed prices.

As there are no specified quality standards followed by feed mills and as they produce average quality feed, there are no wide variations in their selling prices of the same type of feed. However, there are some differences in prices of feeds produced by mills located in different regions, mainly due to difference in raw material prices.

Some of the poultry feed mills, which have the requisite machinery and equipment also occasionally, produce cattle feed. But the total quantity thus produced is very small. The cattle feed industry in the country is not developed scientifically and commercially due to ignorance of livestock owners about the utility of concentrated feeds and therefore they resort to cheaper conventional feed stuffs.

Moreover, the livestock population is scattered in small herds over vast areas making its commercial distribution a difficult job. This is also a limiting factor in popularizing the use of mill-made livestock feed in the country. However, cattle feed may be manufactured for export market.

5.3 Legal Issues Regarding Animal Feed and UMB Mill

Compound feed is packed in bags of approximately 50 Kgs per bag capacity. The label includes following information:

1) Brand name
2) Date of manufacture
3) Particulars of feed additives
4) Nutritive composition of compound feed

On the other hand, one UMB may be of 5 kgs weight with above information provided on it. It is to be noted that misbranding and adulteration is prohibited according to ‘ The Punjab Animal Compound Feed and Feed Stuff Ordinance, 2002’.

6 MARKET INFORMATION

6.1 Sector Characteristics

The size of this sector is still growing. Animal feed mills have been set up around the areas where the livestock are kept in abundance. Few of the feed mills are as follows:

- National Feeds Limited, Lahore
- Punjnad Feeds Pvt. Limited, Okara
- Vanda Pvt. Ltd, Sheikhupura
- Kahoot Feeds, Chalkwal
- Hafiz Vanda, Okara
- Al Hafiz Feed Mill, Faisalabad
- Asia Feeds Pvt. Ltd., Multan
- Lahore Cattle Feed, Rehman Dairies, Lahore

6.2 Market Potential

Feed is a major cost (about 70%) in livestock and dairy farming. The processing and manufacturing of feed along with the efficient use of feed by cattle also contribute to the cost of feed. The demand for compound feed and Urea Molasses Blocks (UMB) is increasing day by day with the increase in awareness among farmers. The trend for concentrate feeding to livestock is changing from the conventional concentrate feeding to a formulated compound feed. Now a days, compound feed is used by many livestock and dairy farmers to get the maximum potential in terms of milk and meat. Compound feed and UMB are very beneficial as both provide all essential nutrients to the animal. The markets for animal feed need to be created within the country. Currently, there are 105 animal feed mills in Pakistan approximately.

Table 6-1: Pakistan feedmill production data by province: 2000 –2006 (000 tonnes) [4]

Provinces	Feed Capacity	2002	2003	2004	2005	2006
Punjab	3,600	1,420	2,180	2,250	2,600	3,000
Sindh	1500	510	420	620	680	875
NWFP	250	100	120	130	80	50
Balochistan	120	97	97	100	50	50
Total Pakistan	**5,470**	**2,127**	**2,817**	**3,100**	**3,410**	**3,975**

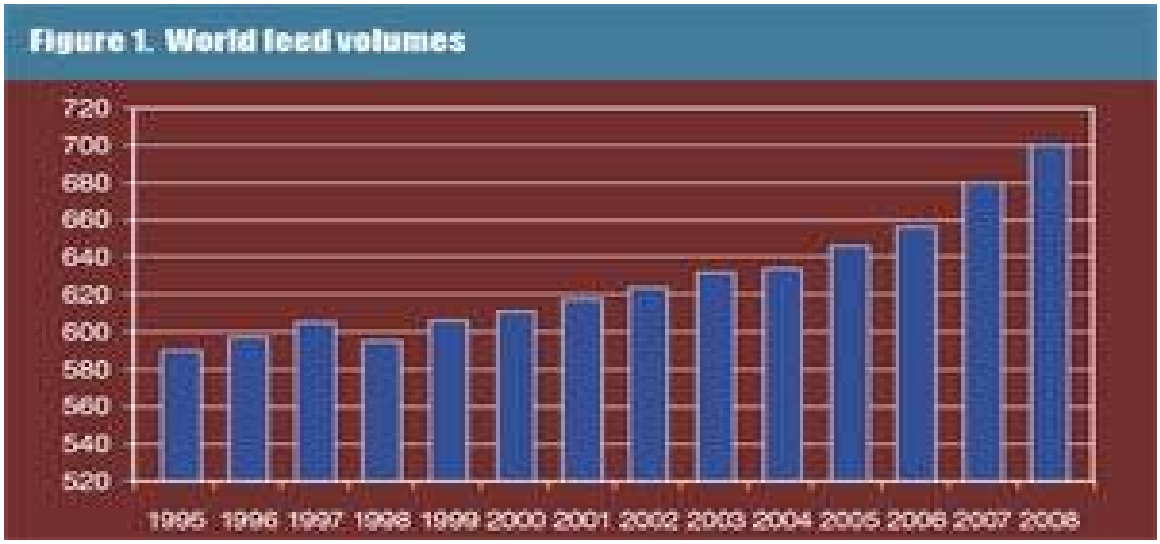
[4] PPA souvenirs and writers estimates

Table 6-2: Top 10 countries with industrial feed production in 2008[5]

Country	Feed production (million metric tons)
USA	154.5
European Union	151.3
China	93.0
Brazil	59.0
Mexico	25.0
Japan	24.9
Canada	20.5
Russia	20.1
Korea	16.2
Thailand	11.3

These top 10 producing region amount to about 79% of the total estimated world production of feed. Top two players stand out from the list in of the 10 places we regard as having produced most industrial feed in the past 12 months. They are the U.S. and the European Union, treating the EU-27 as a single entity. The combined output of the top 10 amounted to approximately 556 million metric tons. Although this is still over 79% of our estimated world total, it represents only a small growth from the 553 million metric tons accorded to the 10 largest feed producers 12 months ago. Evidently, the main expansion of 2008 was among the smaller players.

Figure.1: World feed volumes have grown from just over 610 million metric tons in 2000 to pass 700 million metric tons for the first time in 2008.[6]



[5] www.feedingindustrynetwork.com

[6] FAO

Figure 1 illustrates the trend that has taken world-feed volumes from just over 610 million metric tons in 2000 to pass 700 million metric tons for the first time in 2008. Our actual estimate for production last year is 700.1 million metric tons, up from an annual total of 680.4 million metric tons for 2007. Therefore, it seems from our database that the global output of feeds for farm animals and fish has grown by nearly 18% in the last 10 years and by almost 15% since 2000.

Table 6-3: Global Output of Feed[7]

Region	Output (million metric tons)
Asia	191
South America	80.3
European Union	151.3
Non-EU Europe	39.5
Middle East/Africa	29.9
North America	208.1
Total	**700.1**

6.3 Target Customers

This pre feasibility study suggests that compound feed bags and UMB will be sold to livestock farmers. Following are some of the target clients for a manufacturer of compound feed.

- Dairy farmers
- Calf fattening farmers
- Sheep farmers
- Goat farmers

The price of compound feed per kg and that of one UMB should be lower than that of simple cakes so that farmer could feel it economical. The cheaper the product, more will be its use in livestock feeding. To avoid risk of price fluctuations, the feed ingredients should be stored in season of availability.

7 PRODUCTION PROCESS FLOW FOR COMPOUND FEED

The compound feed preparation process requires:

a) high accuracy and precision of weighing

b) feed ingredient handling and processing

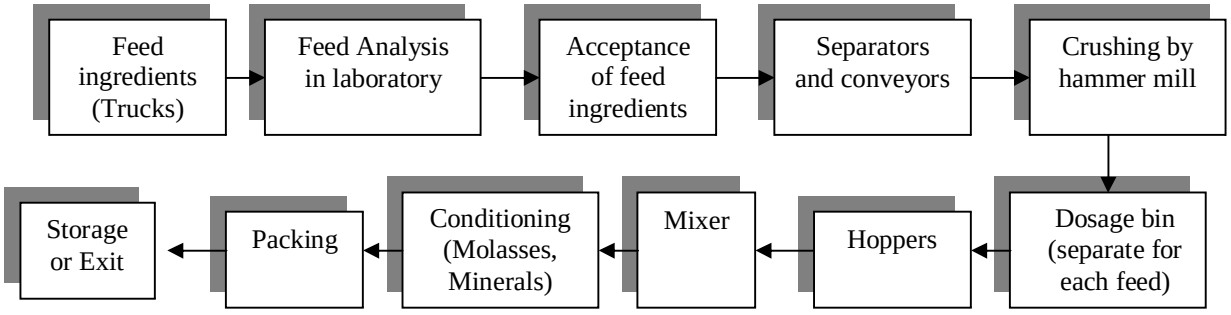
c) mixing

d) packing

e) labeling

[7] FAO

Figure 7-1 Process Flow Diagram



A liquid storage and a direct-weight system for adding fat, molasses, and water is required. Grain processing is done through hammer mill grinding. Mixed feed is delivered in bags or bulk load out to livestock farms.

7.1 Raw Material Requirement

Cattle are ruminant animals with four compartment stomach, capable of utilizing fibrous feedstuffs (forages, roughage, and by product feeds) and Non-Protein Nitrogen (NPN) source like urea that humans cannot utilize. By producing a high-quality protein from these resources otherwise unusable by humans, cattle make a positive contribution to human nutrition in terms of meat and milk.

7.2 Classification of feed ingredients:

Feeds or feedstuffs are composed of several distinctly different groups of substances, known as nutrients e.g. proteins, carbohydrates, fats, minerals, vitamins and water. These have definite functions in body. For intelligent ration formulation, nutrients, nutrient composition and palatability of feedstuffs are important. These feedstuffs are grouped as follow,

7.2.1 Protein feedstuffs:

Common protein feedstuffs from plant origin are residues of oilseed after expeller or solvent extraction or products of wet milling of maize in starch making process. Nutritive value of protein feedstuffs depend upon their available amino acid composition, toxic materials and the changes brought during processing if any.

- Rape seed cake/meal
- Canola meal
- Cotton seed cake/meal
- Sunflower cake/meal
- Corn gluten meal (30 or 60%)
- Sesame cake/meal
- Urea

- Milk by products
- Maize oil cake

7.2.2 Carbohydrate/energy feedstuffs:

These are the products with less than 20%crude protein and 18% crude fiber.

- Molasses
- Rice polish
- Corn by products such as, Corn glutens; Corn steep liquor and enzose.

7.2.3 Mineral supplements:

- Salt (white/black)
- Bone meal
- Dicalcium phosphate (DCP)

7.2.4 Fats and oils:

This source of energy can be obtained from meat processing industry, refining of vegetable oils or vegetable oils itself.

7.3 Feed Formula for Cattle/Buffaloes:

These feed ingredients when mixed according to feed formula will provide adequate energy according to type, breed and physiological status of animal.

Table 7-1: Details of Raw Material

Material	Percentage Input	Input in Tones	Cost (Rs./Kg)	Total Cost (Rs.)
Cottonseed cake/ Maize grain	15%	1,260	15	18,900,000
Corn gluten	20%	1,680	11	18,480,000
Rice Polish	20%	1,680	7	11,760,000
Wheat straw/ Rice bran	22%	1,848	9	16,632,400
Molasses	15%	1,260	8.25	10,395,000
Urea	2%	168	10	1,680,000
Salt	2%	168	2	336,000
DCP	2%	168	23	3,864,000
Vegetable Oil	2%	168	85	14,280,000
Total	**100%**	**8,400**		**96,327,000**
Wastage	1%	84		963,270
Total qty of raw material to be used	**101%**	**8,484**		**97,290,270**

Note: There are seasonal fluctuations in the prices, hence the formula has to be changed accordingly keeping the feed cost as low as possible to compete the market. The information useful here is the composition of the feed ingredients. The feed mill owner can hire a technical person to formulate a least cost ration, as formulation of ration is a technical job. The basic feed ingredients can be procured from local mandies.

7.4 Packing Cost

A 50 kg bag is sold in the market for compound feed which is easily available at a price of Rs. 11. Cost of bags for the first year is approximately Rs. 1,848,000.

7.5 Machinery Requirement

Following machinery will be required for the proposed project.

Table 7-2: Machinery Details (Animal feed)[8]

Sr. No.	Particulars	Quantity	Amount (Rs.)
	Grinding Section		
1.	Hopper Elevator, Sheet Body 3mm	1	25,000
2.	Elevator 9"x11"x30" sheet body 3mm Pipe 14G	1	60,000
3.	Hammer Mill 16", Sheet Body 10mm	1	100,000
4.	Hopper hammer mill, sheet 3mm	2	40,000
5.	Packing Wall	1	10,000
6.	Hopper Elevator, Sheet 3mm	1	40,000
7.	Elevator 12"x9"x45', Sheet Body 4mm Head Boot	1	157,500
8.	Rootry Separator, Sheet Body 6mm x 3mm	1	80,000
	Mixing Section		
9.	Hopper Mixer 1 Ton, Sheet Body 3mm	2	100,000
10.	Mixer 1 Ton, Sheet Body 4mm x 10mm, Shaft 7", Ribbon 50mm x 12mm	1	250,000
11.	Worm Conveyor 12"x10', Sheet Body 3mm x 6mm, Shaft 3'	1	30,000
12.	Hopper Molasses, Sheet Body 3mm	1	25,000
13.	Molasses Mixer 16", Sheet Body 4mm Shaft 3"x3" with Conveyor	1	100,000
14.	Separator (Mash Feed), Sheet Body 3mm Shaft 3"	1	100,000
15.	Packing Hopper & Value	1	30,000
16.	Separator Pelt, Sheet Body 3mm Shaft 3"	1	100,000

[8] **UNIVERSAL INDUSTRIES**, Opp. Al-Rehmat Filling Station, G.T. Road Gujranwala. Concat Person: Mirza Maqsood Ahmad, Cell: 0300-6400442, Tel: 055-3891318, Fax: 055-3893437.

17.	Hopper Pelt Mill 5 Ton	1	150,000
18.	Air Lock 14", Sheet Body 4mm x 5mm	1	35,000
	Pelting Section		
19.	Center Flow Cooler 10 Ton cpm copy, Sheet Body 3mm with moving grill	1	350,000
20.	Crumbles Body 8"x55", Sheet Body 4mm x 6mm with Autosilt	1	275,000
21.	Fan Low Pressure, Sheet Body 4mm	1	100,000
22.	Cyclone 66" x 14', Sheet Body 3mm1	1	75,000
23.	Air lock cyclone	1	10,000
24.	Pipe line 22" fan cyclone & cooler sheet 2.5mm	1	75,000
25.	Elecvator 9" * 12" * 45' sheet body 4mm * 2.5mm	1	157,500
26.	Micro mixer 250 kg sheet body 3mm * 6mm	1	40,000
27.	Molasses pumps 2" * 2"	1	10,000
28.	Molasses tank sheet body 3mm	1	20,000
29.	Fitting charging	1	250,000
	Sub total		**2,795,000**
30.	Pelt Machine 5 ton (China)	1	1,820,000
31.	Boiler 400 ht	1	500,000
32.	Boiler Fitting & Accessories		300,000
33.	Electric Motors		400,000
34.	Electric Panel		400,000
35.	Power Factor		100,000
	Sub total		**3,520,000**
	Total Machinery Cost		**6,315,000**

8 RAW MATERIAL (UMB)

8.1 Classification of Feed Ingredients:

8.1.1 Protein Sources:

For urea molasses blocks (UMB), these are;

- Cotton seed cake/meal
- Corn gluten meal (30 or 60%)
- Urea

8.1.2 Carbohydrate Sources:

These are the products with less than 20% crude protein and 18% crude fiber.

- Molasses
- Corn by products such as corn cobs no; other corn by products

8.1.3 Mineral supplements:

- Salt (white/black)
- Bone meal
- Dicalcium phosphate (DCP)
- Calcium oxide (CaO)

These feed ingredients when mixed according to UMB formula will provide adequate energy to livestock. The formula for a UMB is not a fixed one. It has to be changed from time to time keeping in view the cost of ingredients used in the formula. And the cost of feed ingredient is never static.

9 Production Process OF Urea MOLASSES BLOCK (UMB)

A standard UMB consists of:

a) Molasses 30-50 %
b) Urea 5-10 %
c) Rice/wheat/maize bran 15-25 %
d) Salt 5-7 %
e) Lime or cement 5-7 %
f) DCP 2-4 %
g) Minerals 1-2 %

Table 9-1: Details of Raw Material

Material	Percentage Input	Input in Kgs	Cost (Rs./Kg)	Total Cost (Rs.)
Rice/ Wheat Bran	25%	52,500	11	577,500
Molasses	50%	105,000	8.25	866,250
DCP	3%	6,300	23	144,900
White Salt	3%	5,250	2	10,500
Black Salt	3%	5,250	4	21,000
Urea	9%	18,900	17	321,300
Cement	7%	14,700	7.5	110,250
Calcium Oxide	1%	2,100	3	6,300
Total	**100%**	**210,000**		**2,058,000**
Wastage	1%	2,100		20,580
Total qty of raw material to be used	**101%**	**212,100**		**2,078,580**

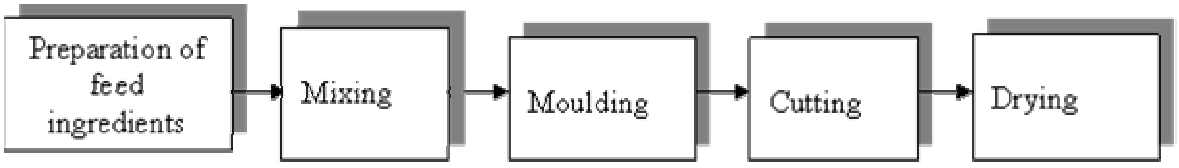
The manufacture of UMB is done in advance of their proposed use. If they are to be used as a supplement during the dry season, when the quality of forage is very low, their production should start before this period in order to have sufficient numbers of blocks available when required. But in view of the hygroscopic nature of the components, as well as of the blocks, it is better not to start production before the onset of the dry season and use it maximum after 3 months of their manufacturing.

9.1 Process Flow of UMB

The requirements are:

a) Accuracy and precision of weighing (the standard scale should be OK)
b) ingredient handling and processing
c) premixing of salts
d) mixing

Figure 9-1 Process Flow of UMB



Urea-molasses blocks (UMB) may be manufactured either on a small or on a larger scale depending on the number of uses and the expected length of the feeding period. Whatever scale of production is applicable the method of manufacture will be the same; the difference being the quantities of feed ingredients and the implements used in the manufacturing process. Industry experience shows that blocks weighing 5 kg are most appropriate for feeding dairy cattle under smallholder situations. Assuming a daily intake of around 700 g/cow, each block will last for 7 days. Therefore, blocks can be replaced once a week on a specific day, making it a regular activity for the farmer.

9.2 Preparation of feed ingredients

All components should be weighed out before mixing. A standard volume or weight can be adopted for each component which would correspond with the weight of the block desired.

9.2.1 Molasses

For the molasses no preparation is necessary apart from measuring the quantity. Even if handling the molasses is a little difficult it should not be diluted with water. When ordering molasses from the sugar factory specify 'undiluted' molasses and check the BRIX value when the molasses is received. Molasses can be stored in the same tank as that used for transporting it. If the quantity of blocks manufactured is large enough, it might be preferable to have two tanks in order to avoid running out of stock.

9.2.2 Urea

The introduction of urea in the form of lumps in the mixture must be avoided in order to eliminate chances of urea toxicity in livestock. It may be necessary to crush the lumps, either by hand or by passing the urea through a hand mill and sieve.

9.2.3 Salt

As with the urea it is better to avoid lumps. The salt could be mixed with cement and then water added to improve the setting of the blocks.

9.2.4 Cement or quicklime

Cement should be mixed with water and salt. The quantities are:

- 3-4 liters of water
- 2.5 kg of salt per 10 kg of cement.

If quicklime is used it should be finely ground and it's reaction to the addition of water tested.

9.2.5 Bran

Bran does not need any preparation. However, bran is replaced by another fiber source such as peanut hulls or straw, these materials should be ground before mixing. Experience show that sometimes coarse grinding of fibrous material gives a better consistency to the block than fine grinding, especially if polishing are being included.

9.2.6 Equipment for mixing:

According to the rate of production foreseen and the level of investment, different types of mixers can be used. If adequate labor is available and only few blocks (say 150-200 UMB) are needed then manual mixing is possible. With 2 laborers, approximately 200 blocks of 5 kg each could be made over a period of 8 hours shift. However, for producing larger numbers of blocks, a concrete mixer is recommended. The cylinder of this concrete mixer should turn horizontally and as slowly as possible, to avoid the molasses, which is highly viscous, sticking to the side of the mixer. Spillage of the mixture should also be avoided. For bigger units it is recommended that a horizontal paddle mixer is installed (the ribbon mixer used in feed manufacture is not suitable) with one or two axles and a discharge valve.

9.3 Introduction of the components

It has been found that the order of introduction of the components plays an important role in the mixing process. The recommended order is as follows:

- Molasses
- Urea
- Salt, minerals etc.
- Cement or quicklime
- Bran

Following this order a homogenous mixture of the urea, salt and gelling agent in the molasses is assured. Any other components (e.g., minerals, and drugs) to be included are introduced together with the salt. When using a concrete mixer the bran must be introduced in small quantities at a time, in order to ensure a homogenous mix. After a few minutes, when the mixture appears homogenous like peanut butter, the mixer is emptied (e.g. into wheelbarrows if large-scale production is being undertaken) and transported to the molding area.

9.4 Molding

Moulds are necessary to set the blocks in an acceptable shape. Once set, the frame can be removed for reuse and to allow the drying process to continue. Moulds can be of different types. The size of the mould(s) will depend on the preferred size of the block(s). The one recommended by the FAO is made out of 4 wooden planks with slots sawn in order to be able to assemble the frame easily. The dimensions of the frame can vary depending on the expected rate of production and size of blocks. The most appropriate for small scale manufacture of blocks are frames made out of a number of wooden planks with slots cut out to enable easy assembly and removal. Each compartment measures 12 x 10 x 8 inches.

It can hold a urea-molasses block weighing 4.5-5.0 kg. This type of mould is most suitable when drying and storage area is limiting. Since the frames are removable they can be re-used as soon as the urea-molasses mixture has started setting-in. Small plastic containers have been used successfully in Indonesia for preparing urea-molasses blocks. They produce blocks with acceptable solidity and are suitable for use in small units. An advantage of this type of mould is that the block can be offered to the animal while it is in the plastic container and once the block has been consumed the container can be re-used.

9.5 Cutting the blocks

Turning out and cutting is necessary when using large moulds. The board can be taken away the day after molding in order to facilitate drying. The cutting will take place later with a flat spade. The spade should be wetted in a bucket between each cut to avoid the mixture from sticking to it. With small plastic moulds, the blocks can be offered to animals while in the mould or the blocks may be removed simply by turning the containers upside down and tapping on the bottom of the container.

9.6 Drying

After removal of the moulds and cutting up, blocks are arranged on a drying area. Blocks must not be exposed to direct sunlight, but placed under a shade with good ventilation. After 24 to 72 hours the blocks are dry enough to be transported.

10 Utilization of UMB

Some important guidelines towards the optimum utilization of UMB as supplements for forage based diet are described below. Urea molasses blocks should not be fed alone but only as a supplement. It requires a minimum amount of roughage to ensure that the animals are not over fed and thereby avoid urea toxicity.

10.1 Species of livestock

Since the blocks contain urea, therefore, these must only be fed to ruminants (buffalo, cattle, goats and sheep) and never to mono gastric (Single Compartment Stomach) species like chicken, donkeys, horses, pigs, and rabbits or to young, especially pre-ruminant calves, kid and lambs.

10.2 Feeding period

The aim of the UMB is to improve the utilization of low quality roughage, especially during and at the end of the dry season, when livestock are often dependent on crop residues or low quality dry season grazing, which are low in crude protein and high in fiber. Therefore, the production and distribution of UMB should be limited to these critical periods. There is no advantage in offering blocks when green forage is available, as during the wet and early dry seasons. To avoid wasting resources these should not be made available at these times.

10.3 Minimum Roughage Requirements

Since Urea Molasses Blocks are supplements, therefore, these should not be fed alone. A minimum quantity of roughage is needed to ensure that the animals do not consume too much urea, possibly leading to urea toxicity. One should remember that the purpose of the block is to improve the utilization of roughage and not to substitute it.

10.4 Adaptation of animals

The full daily ration of the block (e.g. ±700 g/day per adult cow) should not be offered as soon as the feeding period starts but should be built up to over a period of at least 7-10 days. This is particularly important when animals have suffered a degree of underfeeding, as intake can be more rapid than usual. Animals not used to urea and also eating rapidly are the most likely to suffer from urea toxicity. After the adaptation period, animals will adjust their intakes to around those recommended, i.e., cattle: 700 g/day & small ruminants: 100 g/day. An easy way to restrict intake during the adaptation period is to limit the amount of time the blocks are accessible to an animal. A thumb rule is to offer UMB for one hour per day (about 200g for cattle and 30g for sheep/goat) during the first 3-4 days, then 3 hours per day (about 400 g for cattle and 60 g for sheep/goat) during the next 4-6 days. Thereafter, UMB along with ample supply of drinking water can be offered to them 24 hrs a day.

10.5 Feeding system

The distribution of the UMB should be done according to the livestock management system. Blocks can be offered to the animals in the evening when they are in their sheds.

10.6 Establishing priorities

If a farmer has a limited number of blocks available, he must also establish an order of priority for feeding his animals. Priority should be given to pregnant, lactating cows and draught animal.

10.7 Machinery Requirement

Following machinery will be required for the preparation of UMB:

Table 10-1: Machinery Details (UMB)

Description	Number	Cost (Rs.)	Total Cost (Rs.)
Mixer Machine	1	60,000	60,000
Molasses Pump	1	12,000	12,000
Molasses Pipeline	1	18,000	18,000
Motor	1	12,000	12,000
Donkey Pump	1	8,000	8,000
Flat Spades	4	700	2,800
Moulds with Branding Details	7	700	4,900
Molasses Mixer	1	15,000	15,000
Trolleys, drums, bins	3	9,000	27,000
Molasses Tank	1	60,000	60,000
Total cost			**219,700**

11 LAND & BUILDING

The required space for animal feed and UMB Mill is 8,246 Sq. feet (approximately 37 Marlas). Cost of land in the proposed areas is taken to be Rs. 250,000 per Kanal.

11.1 Covered Area Requirement

Building for the proposed project comprises of two major blocks i.e. office block and factory block. Areas and construction cost for the said blocks are listed in the table below:

Table 11-1: Covered Area Details

Factory Block		Sq. Ft.	Construction Cost /Ft.	Total Cost (Rs.)
Plant Hall	30x50	1500	600	900,000
Plant Hall for Urea Molasses Blocks	30x40	1200	600	720,000
Meals Store	30x25	750	600	450,000
Store house for Urea Molasses Blocks	75x30	2250	450	1,012,500
Processed Feed	30x25	750	600	450,000
General Store	40x30	1200	600	720,000
		7650		**4,252,500**
Office Block				
Office Block	14x16	224	1000	224,000
Bath room	6x6	36	1000	36,000

Staff quarters (2 rooms)	14x12x2	336	800	268,800
		596		**528,800**
Total Construction Cost		**8246**		**4,781,300**
Land Required (Marlas)		37		
Kanals		3		
Land Cost per Kanal		250,000		
Total Land Cost				**750,000**
Total Cost of Land and Building				**5,531,300**

11.2 Recommended Mode

It is recommended to purchase land on preferred locations provided already in this pre feasibility.

12 Human Resource Requirement

Table 12-1: Human Resource Requirement

Employee Designation	No. of Employees	No. of Shifts	Monthly Salary (Rs.)	Annual Salary (Rs.)
CEO	1	1	75,000	900,000
Production Manager	1	1	40,000	480,000
Laborers	10	1	6,500	780,000
Mechanic/Electrician	1	1	8,000	96,000
Guard	4	1	7,000	96,000
Driver	1	1	8,000	336,000
Sales Executive	2	1	30,000	720,000
Accounts Officer	1	1	12,000	144,000
Total	**21**			**3,552,000**

12.1 Utilities Required

- Electricity
- Telephone

13 FINANCIAL PROJECTIONS

13.1 Project Costs

ANIMAL FEED MILL				
Project Cost				
Land and Building				5,531,300
Plant and Machinery				6,534,700
Furniture and Fixture				70,000
Vehicles				787,500
Pre operating Expenses				2,992,000
Erection and Installation (5% of total machinery Cost)				326,735
Fixed Assets				**16,242,235**
Initial working Capital				15,626,913
Total Project Costs				**31,869,148**
Financing				
	Debt		50%	15,934,574
	Equity		50%	15,934,574
	Total Financing			**31,869,148**
Project Returns				
	IRR	%		40%
	Pay Back period	Yrs.		3.31
	NPV	Rs.		38,506,219

13.2 Projected Income Statement

Rs. (000)

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Sales										
Sales of Feed	134,400	151,200	169,344	188,924	210,039	232,794	244,433	256,655	269,488	282,962
Sales of UMBs	2,100	2,363	2,646	2,952	3,282	3,637	3,819	4,010	4,211	4,421
	136,500	153,563	171,990	191,876	213,321	236,431	248,253	260,665	273,699	287,384
Cost of Sales	115,063	128,981	144,121	160,327	177,792	196,604	206,480	216,887	227,854	239,414
Gross Profit	**21,437**	**24,582**	**27,869**	**31,549**	**35,529**	**39,827**	**41,773**	**43,779**	**45,845**	**47,969**
Operating Expenses	3,007	3,246	3,510	3,799	4,118	3,870	4,256	4,679	5,146	5,659
Operating Profit	**18,430**	**21,336**	**24,359**	**27,750**	**31,411**	**35,957**	**37,517**	**39,099**	**40,699**	**42,311**
Less:										
Financial expenses	2,725	2,151	1,578	1,004	430	-	-	-	-	-
Profit Before Taxation	**15,705**	**19,184**	**22,781**	**26,746**	**30,981**	**35,957**	**37,517**	**39,099**	**40,699**	**42,311**
Income Tax	3,926	4,796	5,695	6,687	7,745	8,989	9,379	9,775	10,175	10,578
Net profit After Taxation	**11,779**	**14,388**	**17,086**	**20,060**	**23,236**	**26,968**	**28,138**	**29,325**	**30,524**	**31,733**
Retained earnings	-	11,779	26,167	43,253	63,313	86,549	113,516	141,654	170,979	201,503
Profit transferred to balance sheet	**11,779**	**26,167**	**43,253**	**63,313**	**86,549**	**113,516**	**141,654**	**170,979**	**201,503**	**233,236**

13.3 Projected Balance Sheet

Rs. (1000)

Capital and Reserves	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Share Capital	15,935	15,935	15,935	15,935	15,935	15,935	15,935	15,935	15,935	15,935	15,935
Retained Earnings	0	11,779	26,167	43,253	63,313	86,549	113,516	141,654	170,979	201,503	233,236
	15,935	**27,713**	**42,102**	**59,188**	**79,247**	**102,483**	**129,451**	**157,589**	**186,913**	**217,437**	**249,170**
Long Term Loan	15,935	12,748	9,561	6,374	3,187						
Current Liabilities											
Current portion of long term liabilitites		3,187	3,187	3,187	3,187	3,187					
Tax Payable		3,926	4,796	5,695	6,687	7,745	8,989	9,379	9,775	10,175	10,578
Accounts Payable	745	5,061	5,684	6,355	7,080	7,861	8,630	9,054	9,500	9,968	8,825
	745	12,174	13,667	15,238	16,953	18,793	17,619	18,434	19,275	20,143	19,403
	32,614	**52,635**	**65,329**	**80,799**	**99,388**	**121,276**	**147,070**	**176,022**	**206,188**	**237,580**	**268,573**
Fixed Assets											
Fixed Assets	13,250	12,197	11,143	10,090	9,036	7,983	6,929	5,875	4,822	3,768	2,715
Pre-operating expenses	2,992	2,394	1,795	1,197	598	-	-	-	-	-	-
	16,242	14,590	12,938	11,286	9,634	7,983	6,929	5,875	4,822	3,768	2,715
Current Assets											
Raw Material Inventory	14,594	16,418	18,388	20,514	22,807	25,277	26,541	27,868	29,262	30,725	-
RM Inventory UMBS	312	334	356	379	401	423	423	423	423	423	-
Finished Goods Inventory	-	2,248	2,529	2,832	3,159	3,513	3,893	4,088	4,292	4,507	4,732
FG Inveentory UMBs	-	48	51	55	58	62	65	65	65	65	65
A/C Receivable	-	13,650	15,356	17,199	19,188	21,332	23,643	24,825	26,067	27,370	28,738
Cash/Bank	1,467	5,347	15,710	28,535	44,140	62,686	85,575	112,877	141,257	170,722	232,323
	16,372	38,045	52,391	69,513	89,753	113,293	140,141	170,147	201,366	233,812	265,858
	32,614	**52,635**	**65,329**	**80,799**	**99,388**	**121,276**	**147,070**	**176,022**	**206,188**	**237,580**	**268,573**
	-	-	-	-	-	-	-	-	-	-	-

13.4 Projected Cash Flow Statement

Rs. (1000)

Operating activities	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Net profit	-	11,779	14,388	17,086	20,060	23,236	26,968	28,138	29,325	30,524	31,733
Amortization (Pre-operational Expenses)	-	598	598	598	598	598	-	-	-	-	-
Depreciation	-	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,054	1,054
Raw Material Inventory	(14,594)	(1,824)	(1,970)	(2,126)	(2,293)	(2,471)	(1,264)	(1,327)	(1,393)	(1,463)	30,725
Raw Material Inventory UMBs	(312)	(22)	(22)	(22)	(22)	(22)	-	-	-	-	423
Finished Goods Inventory	-	(2,248)	(281)	(303)	(327)	(353)	(381)	(195)	(204)	(215)	(225)
Finished Goods Inventory UMBs	-	(48)	(3)	(3)	(3)	(3)	(3)	-	-	-	-
Accounts receivable	-	(13,650)	(1,706)	(1,843)	(1,989)	(2,145)	(2,311)	(1,182)	(1,241)	(1,303)	(1,368)
Accounts payable	745	4,315	623	672	724	781	770	424	446	468	(1,143)
Tax Payable	-	3,926	870	899	991	1,059	1,244	390	396	400	403
Cash provided by operations	(14,160)	3,881	13,550	16,011	18,793	21,733	26,076	27,302	28,380	29,465	61,601
Financing activities											
Long term debt principal repayment			(3,187)	(3,187)	(3,187)	(3,187)	(3,187)	-	-	-	-
Addition to long term debt	15,935										
Owner's investment	15,935										
Cash provided by/ (used for) financing activities	31,869	-	(3,187)	(3,187)	(3,187)	(3,187)	(3,187)	0	0	0	0
Investing activities											
Capital expenditure	-16242										
Cash (used for)/ provided by investing activities	-16242	0	0	0	0	0	0	0	0	0	0
Net Cash	1,467	3,881	10,363	12,824	15,606	18,546	22,889	27,302	28,380	29,465	61,601
Cash balance brought forward	0	1,467	5,347	15,710	28,535	44,140	62,686	85,575	112,877	141,257	170,722
Cash carried forward	**1,467**	**5,347**	**15,710**	**28,535**	**44,140**	**62,686**	**85,575**	**112,877**	**141,257**	**170,722**	**232,323**

13.5 Cost of Sales

COST OF SALES										(figures in 000's)
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Cost of Raw Material Consumed	97,290	109,452	122,586	136,760	152,045	168,516	176,942	185,789	195,078	204,832
RM consumed for UMBs	2,079	2,227	2,376	2,524	2,672	2,821	2,821	2,821	2,821	2,821
PACKING COST	1,848	1,980	2,112	2,244	2,376	2,508	2,508	2,508	2,508	2,508
Packing Cost for UMBs	77	83	88	94	99	105	105	105	105	105
Wages	1,356	1,492	1,765	1,941	2,135	2,349	2,584	2,842	3,126	3,439
Electricity	11,298	12,629	14,074	15,639	17,335	19,173	20,384	21,680	23,069	24,558
Repair and Maintenance	65	69	72	76	79	83	88	92	97	101
Depreciation	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
Total Cost of Sales	**115,063**	**128,981**	**144,121**	**160,327**	**177,792**	**196,604**	**206,480**	**216,887**	**227,854**	**239,414**

13.6 Operating Cost

Operating Costs										(figures in 000's)
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Administrative Salaries	2,196	2,416	2,657	2,923	3,215	3,537	3,890	4,279	4,707	5,178
Electricity	19	20	21	22	23	24	25	26	28	29
Depreciation charged to Furniture and	4	4	4	4	4	4	4	4	4	4
Telephone and telex	36	40	44	48	53	58	64	70	77	85
Travelling and Conveyance	60	66	73	80	88	97	106	117	129	141
Printing and Stationery	24	26	29	32	35	39	43	47	51	57
Mkt and promotional Exp.	60	66	73	80	88	97	106	117	129	141
Legal and Professional Charges	10	11	12	13	15	16	18	19	21	24
Amortization	598	598	598	598	598	-	-	-	-	-
	3,007	**3,246**	**3,510**	**3,799**	**4,118**	**3,870**	**4,256**	**4,679**	**5,146**	**5,659**

14 KEY ASSUMPTION

OPERATING ASSUMPTIONS		
Working days in a year		300
Shifts Operational		1
Shifts Operational for UMB		1
Hours per shift		8
Initial year Capacity utilization		70%
Production Capacity (Tons per Anum)		5
Annual Production Capacity (Tons)		12,000
Production Capacity for UMBs (Kgs per Hour)		125
Production Capacity (Blocks per Hour)		25
Capacity Utiliation growth rate		5%
Maximum Capacity utilization		95%
REVENUE ASSUMPTIONS		
Sales Price per kg (Animal Feed Mill)	Rs.	16
Sales Price per 5 kg Block	Rs.	50
Sales Price growth rate		5%
COST OF SALES ASSUMPTIONS		
Raw Material Cost growth rate		5%
Wastage		1%
Packing Cost (Rs./Bag)		11
Packing Cost		
Packing Cost for Polythene Bags (Rs per Block)		1
Cost for boxes (Rs. Per Dozen)		10
Electricity Growth rate		5%
Salaries Growth rate		10%
Repair and Maintenance (as percentage of machinery)		1%
Repair and Maintenace Growth Rate		5%
Depreciation on Plant and Machinery		10%
Depreciation on Land and Building		5%
Depreciation on Furniture and Fixture		5%
Depreciation on Motor Vehicle (Straight Line method)		10%
OPERATING ASSUMPTIONS		
Telephone and Telex (per month)	Rs.	3,000
Administrative Expense growth rate		10%

Printing and Stationery (per month)	Rs.	2,000
Legal & professional charges (annual)	Rs.	10,000
Traveling & conveyance (per month)	Rs.	5,000
Marketing and Promotional Expenditures	Rs.	5,000
Amortization of pre-operating expenses	yrs.	5
Tax rate		25%
TURNOVER ASSUMPTIONS		
Raw Material Inventory (days)		45
Finished goods Inventory (days)		7
Accounts Payable	days	15
A/C Receivable	days	30
Cash	days	30

15 Useful Terminology

Feed stuffs
Any substance of nutritive and biological value used in production manufacture of compound feed.

Feed grade
Specific product adequately tested to prove its safety for feeding purpose

Grinding
Process by which a feedstuff is reduced in particles by impact sheaving or attrition

Ration
Amount of balance feed in 24 hours

Meal
Ingredient ground in small particles for usage by animal

Compound feed
Any ground / pelleted/ crumbled/ mixture intended for feeding the animals. It includes a concentrate mixture accordingly to formula. It should not be adulterated or misbranded. It is accordingly to growth, reproduction and production status of animal.

Automatic Feed Mill
The establishment in which feed is carried out by automatic machinery, electrically operated with / without manual involvement.

Semi Automatic Feed Mill

The establishment of feed preparation carried out automatically with machinery and manual involvement.

Home Mixed Feed
Feed prepared for herds maintained on farm of owner.

Cake
Mass resulting from the processing of seeds in order to remove oils, fats or other liquids.

BRIX Value
Level of sugar in molasses

Urea Toxicity
Sick condition of animal due to excessive intake of urea.
Hygroscope:
A compound or product that absorbs moisture from environment.

Monogastric Animals:
The animals that have single compartment stomach