
Pre-Feasibility Study

POTATO POWDER MANUFACTURING UNIT



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1 DISCLAIMER

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2 EXECUTIVE SUMMARY

Potato Powder Manufacturing Unit is proposed to be located keeping in view the easy availability of the raw material (fresh Potatoes). As per current agricultural practices, Okara is the largest producer of Potatoes not only in Punjab but in Pakistan, hence the proposed unit may be installed near district Okara in Punjab.

The proposed unit will produce dehydrated potato powder. Dehydrated potato powder is used by the food industry to bind meat mixtures and thicken gravies and soups. The proposed unit has the capacity to produce 400 kgs per hour of Potato Powder. The unit will produce 1,728 tons of Potato Powder per annum based on 180 working days (24 hours a day). However, the capacity utilization during the first year of operations is assumed to be 75% i.e. 1,296 tons of Potato Powder.

The proposed Potato Powder manufacturing business comprises a total investment of Rs. 312.10 million with fixed investment of Rs. 299.49 million and working capital of Rs. 12.61 million. The Net Present Value (NPV) of the project is Rs. 27.12 million with an Internal Rate of Return (IRR) of 19% and a payback period of 5.41 years.

The project will provide employment opportunities to 32 people. Apart from this, additional labor will be hired on daily wages during the peak production season. Higher return on investment and a steady growth of business is expected with the entrepreneur having some prior experience or education in the related field of business.

3 INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out 'sectorial research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need based

capacity building programs of different types in addition to business guidance through help desk services.

4 PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to facilitate potential investors in **Potato Powder Manufacturing Unit** by providing them with a general understanding of the business with the intention of supporting potential investors in crucial investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business set-up and its successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form basis of any investment decision.

5 BRIEF DESCRIPTION OF PROJECT & PRODUCT

Potatoes are not only used as a vegetable for consumption at home but also at restaurants. Global consumption of potato as a food item has seen a shift from fresh potatoes to value-added products. It is estimated that a little less than 50 percent of potatoes grown worldwide are consumed fresh. The remaining are processed into potato food products and food ingredients like animal feed, processed into starch for industry, and re-used as seed for growing next season's potato crop.

The market of Potato Powder and Flakes is increasing at a rate of 4.52% each year. In 2015, Italy, United Kingdom and France imported 134 million dollar's Potato Powder and Flakes out of 616 million dollar trade in the same year. In

2015, Pakistan imported 2,764 tons of Potato Powder and Flakes worth 3.78 million dollars in the same year¹.

Pakistan has abundance of unprocessed potatoes, especially in Punjab province. However, many companies in Pakistan and China are importing potato powder to meet their demand due of lack of potato processing units. The proposed unit having capacity to produce 1,728 tons of Potato Powder a year based on 180 processing days, can meet the local demand and enter into global market for export.

Potato Powder is a dehydrated vegetable made from the whole potato which absorbs large amount of water. The manufacture of potato powder is based on the efficient dehydration of peeled cooked potatoes on single drum dryer. The thin dried sheet of potato solids is then ground to the desired fineness. As a dehydrated vegetable, Potato Powder can be used in a wide variety of industries including: food production, beverage, agriculture / animal feed, and various other industries. It can be used as:

- Nutritional supplement in food production
- Bread improver in baking
- Breeding for fried foods; frozen fried chicken and seafood products
- Thickening agent; used in soup mixes sauces and baby foods
- Base material for many snack foods including potato-chip like fried products
- Ingredient formula in making pharmaceutical and cosmetic products
- Nutritional supplement in Agriculture / Animal Feed

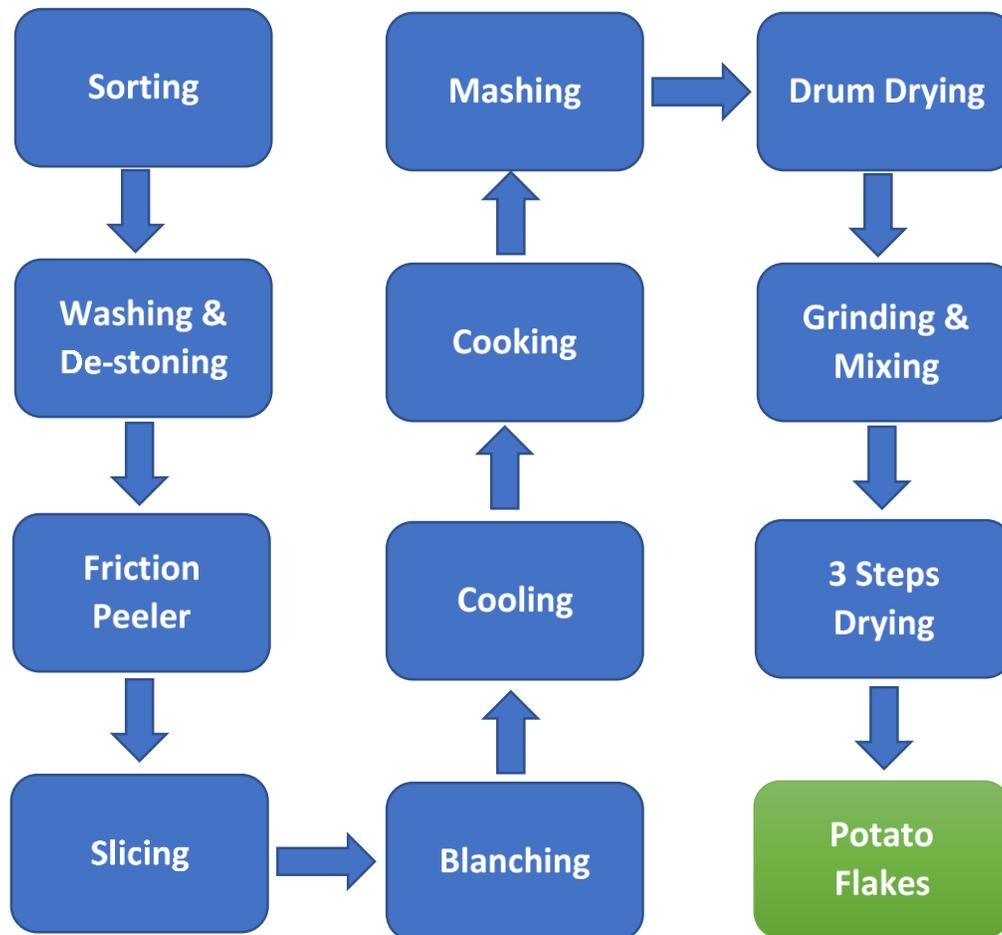
Potato dehydrated products are lightweight, easy to transport and require less storage space. “Lady Rosetta, Chipsona, Hermes and Pamela” have proven to be successful varieties as raw material and meet global requirements. It should be noted that these varieties are available and grown in Pakistan. Dry matter levels higher than 20% are ideal for processing flakes and powder and produce increased recovery rates and lower overall production cost. Maximum shelf-life of properly dehydrated and packed products is around 18-24 months.

The by-products of this process i.e. peel and cutting losses can be sold to cattle farmers or compost producers to generate additional revenue and off-set the input cost of raw material.

¹ Source: Trademap (Product: HS 1105 Flour, meal, powder, flakes, granules and pellets of potatoes)

5.1 Production Process Flow

Production Process of Potato Powder is given below in detail;



I. WASHING & DESTONING

The process starts from intake of raw potatoes. The raw potatoes come via a belt conveyor into the rod de-soiler of the washing plant. The potatoes then arrive into the cyclone de-stoner, where an upward stream makes the potatoes float, while heavy parts such as stones and clods sink. A special stone conveyor seizes these separated heavy parts, lifts them out of the water and drops them in a container.

A flume transports the product with circulation water in a washing machine with two compartments.

1. Separation of circulation water
2. Washing

In the first compartment, the potatoes are separated from circulation water. The potatoes then enter the washing compartment, where a bar-type drum immersing 10 to 15 cm into a water bath with its special internal components thoroughly moves and rubs the potatoes so that even loam comes off easily. The potatoes are then sprayed with water. The washed potatoes are transferred into a hopper for intermediate storage.

II. FRICTION PEELING

Friction peeler is a dedicated machine to remove the skin of potato, potatoes move up and down in the barrel, which produces relative movement of friction, so as to achieve friction peeled effect. A screw conveyor serves to reclaim the product, evens it and feeds it into the dry de-skinner. In the front part of the skinner, thorough and suitable surfaced rolls remove the loose potato skin. A pump discharges the mushy skin, which is used as high quality animal feed.

A screw conveyor serves to deliver the potatoes through the machine, the speed of which (and consequently the retention time) is variable. A downstream washing machine washes skin residues and dissolved potato cells off the potato surface. From the washer, the peeled and washed potatoes get onto an inspection belt conveyor, where they are sorted by hand and, if necessary, trimmed. Rejected potatoes get into separate containers and are also used as animal feed.

III. SLICING, BLANCHING & COOLING

An inspection belt conveyor transfers and feeds the peeled potatoes through a distributor into the slicing machines. Here the potatoes are cut into slices to allow easy transfer of heat during the pre-cooking process. The thickness of the cut can be adjusted according to the requirements.

Then the potatoes are pre-cooked in a warm water bath. The pre-cooker is of a steam injection screw type. This is called blanching and it is carried out in order to achieve the following:

1. Helping in gentle gelatinization of the starch (**Starch gelatinization** is a process of breaking down the intermolecular bonds of **starch** molecules in the presence of water and heat, allowing the hydrogen bonding sites (the hydroxyl hydrogen and oxygen) to engage more water. This irreversibly dissolves the **starch** granule in water), without impairing the cell membranes as a result of the large volume.
2. Changing the intercellular cementing substance in such a way that the cells separate more easily after cooking.
3. Preventing the enzymatic discoloration of the product.

A lifting wheel separates the potatoes from the pre-cooking water and feeds them through a flume into a screw-type cooler, where they are cooled in a water bath.

The result of this is the retro-gradation of the starch gelatinized in the pre-cooking stage. Retro-gradation in turn reduces the amylose solubility. Starch retro-gradation is desirable for starchy food products in terms of textural and nutritional properties.

IV. COOKING

The product is discharged from the wet hopper via a water lock and transferred hydraulically. A vibrating screen separates the potato slices from the conveying water, which flows back through an equalization tank into the hopper. A balance provided in the downstream belt conveyor measures the mass flow rate, which is set by varying the speed of the product feeder. Via a final lock, the belt conveyor feeds the product into a screw type cooker, where it is cooked at atmospheric pressure in steam or vapor.

The cooker used is a screw type unit, injecting steam just above the machine bottom and the screw shaft to provide a uniform temperature in the product and consequently homogeneous cooking. Efficient removal of condensate makes sure that the water content of the cooked product only increases just slightly. The optimum cooking time must be determined empirically and will have been reached when the cell-cementing substances have been weakened to such a degree that the cells separate with no major destruction of their membranes.

V. GRINDING / MIXING

After mashing and drying. The grinder unit will crush the dried potato layers into powder form and also the feeder system will add dried potato material (add-back) from granules which will process the cell bondage and provides for homogenization of both materials. Necessary additives are also fed into the mixer during the mixing process.

THREE STEP DRYING

1. Drying (Air-Lift Dryer)

The drying air is heated by a steam heat exchanger with high pressure steam to obtain the necessary drying temperature. The mixed product enters the drier at right angles to the air flow. Subsequent deceleration and multiple diversion of the product stream leads to frequent high relative movements between the particles and the hot air, resulting in optimum utilization of energy and an optimum drying efficiency. Centrifugal-force cyclones separate the dried product and discharge the exhaust air into the open.

2. Drying (Fluidized-Bed Dryer / Cooler)

The separated product from the cyclones is conveyed to the second dryer. In the unit fluidized product bed develops above a distributor plate. This is a perforated plate which produces an even inclined air stream. This makes the fluidized bed

move almost in a linear way, and the thickness of the bed determines the specific residence time of the product. The fluidized-bed unit consists of two zones:

2.1 Drying zone

An appropriate part of the in going air is heated by a steam heater and then is blown by a fan into the drying zone.

2.2 Cooling zone

Another fan feeds cooling air into the cooling zone. The temperature of cooling air is the same as outside temperature.

3. Final Dryer (3rd Drying)

The drying and cooling air is blown by separate fans through a perforated plate into the drying and cooling zone. The fluidized product bed develops above the perforated plate. An appropriate part of the in going air is heated by a steam heater. The temperature of cooling air is the same as outside temperature.

VI. BAGGING

The product is bagged into PE-lined multi-layer paper bags. Package weight: 25 kg bagging, bag closing and palletizing are manual processes.

5.2 Installed and Operational Capacities

The proposed Potato Powder Manufacturing Unit will have a maximum capacity of producing 1,728 tons of Potato Powder, annually. As the Potatoes are a seasonal commodity, therefore, Plant will be operational for 6 months (January ~ June). One of the reasons to operate this plant in these months is low prices of the Potatoes due to its harvesting season in Punjab.

Capacity utilization during first year of operations is assumed to be 75% with an annual growth rate of 5% up to maximum level of 100% capacity utilization in 6th year of operation. This production capacity is estimated to be economically viable and justifies the capital as well as operational costs of the project.

Details of operational and installed capacities according to product mix are provided in the table below:

Table 1: Installed and Operational Capacities

Description	Operational Hours During Season/day	Installed Capacity (Tons/Hour)	Installed Production Capacity (Tons)	Operational Capacity 75% - in tons Year 1
Potato Powder	24	0.40	1,728	1,296

6 CRITICAL FACTORS

Following principles need to be pursued for the best productivity of Potato Powder:

- Prices of Potatoes are volatile, so due care and diligence should be taken while procuring fresh potatoes. An experienced procurement officer having good knowledge and understanding of potatoes quality and price fluctuation should be permanently hired for the facility.
- Higher recovery ratio of powder is from fresh potatoes while stored potatoes give lower recovery ratio.
- Potatoes with high solid contents and low sugar are best to produce dehydrated products. These types of potatoes are widely available in Pakistan.
- Quality raw (potato) material and adaptive research & development is necessary for the project.
- Storage management and quality improvement is needed.
- Policy intervention and government support is required.
- Enhance the skill of the contract farmers, the process relevant staff and management should be ensured.
- Capacity building of the farmers, company staff and the management are lacking as this is a newly ventured sector, infusion of technical services & appropriate know-how are always a catalyst for the better performance.
- Run project on 3 shifts in peak season of potatoes harvesting as the raw material will be available at cheap price and the quality of Potato powder and flakes will be of high standards, while, it will save cost of storage.

7 GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The unit can be installed anywhere in Pakistan where the raw material (fresh potatoes) is easily accessible. As per current agricultural practices, Okara is the largest producer of Potatoes not only in Punjab Province but in Pakistan. In 2014-15, Okara district produced 1.4 million tons of Potatoes which is 37% of the production of Punjab and 34% of the Pakistan's total Potato Production.² Total production of Potatoes in Pakistan during 2014-15 was 4.16 million tons out of which Punjab province is producing 97% of the potatoes production³.

Keeping in view the above statistics and availability of raw material (fresh potatoes), the proposed unit will be installed near district Okara in Punjab. Potato Powder imports may be reduced by installation of such processing units.

8 POTENTIAL TARGET CUSTOMERS / MARKETS

As stated above Pakistan is importing large quantities of Potato Powder and it is estimated that in future this quantity will increase. This kind of unit and the ones similar will help to reduce the import of such products and make Pakistan capable of exporting Potato Powder to the world.

The targeted customers for these products are food, bakery, agriculture / animal feed, and various other industries. The main export markets for Pakistani processed Potatoes are Middle East, Far East, China, Malaysia, and neighbouring countries. Apart from this, local demand can also be met by this unit.

9 PROJECT COST SUMMARY

9.1 Project Economics

All the figures in this financial model have been calculated for estimated production of 1,728 tons in the year one. The capacity utilization during year one is worked out at 75% with 5% increase in subsequent years up to the maximum capacity utilization of 100%.

The following table shows internal rate of return, payback period and net present value of the proposed unit.

² Agriculture Department Punjab

³ Ministry of National Food Security & Research, Government of Pakistan

Table 2: Project Economics

Description	Details
Internal Rate of Return (IRR)	19%
Payback Period (Years)	5.41
Net Present Value (@17%)	Rs. 27,116,834

9.2 Project Financing

Following table provides details of the equity required and variables related to bank loan:

Table 3: Project Financing

Description	Details
Total Equity (50%)	Rs. 156,047,877
Bank Loan (50%)	Rs. 156,047,877
Annual Markup to the Borrower– Long Term Loan	14%
Tenure of the Loan (Years)	5
Annual Markup to the Borrower – Short Term Debt	15%

9.3 Project Cost

Following fixed and working capital requirements have been identified for operations of the proposed business.

Table 4: Project Cost

Description	Amount In Rs.
Land	12,000,000
Building / Infrastructure	70,175,749
Machinery & Equipment	204,243,002
Furniture & Fixtures	975,700
Office Vehicles	2,632,875
Office Equipment	1,232,550
Pre-Operating Costs	7,528,078
Training Costs	700,000
Total Capital Costs	299,487,954
Working Capital	

Equipment Spare Part Inventory	86,400
Raw Material Inventory	11,021,400
Cash	1,500,000
Total Working Capital	12,607,800
Total Investment	312,095,754

9.4 Space Requirement

Approximately 1 acres of land would be required for establishment of proposed unit, it is recommended that required land should be procured in the industrial estates of identified city / area. The cost of land is estimated at the rate of Rs. 12 million per acre.

The infrastructural requirements of the project mainly comprise the construction of management building, sorting, processing hall, store and other facilities. The cost of construction of building for the proposed unit is provided in the table below:

Table 5: Space Requirement

Description	Area (Sq.ft.)	Unit Cost (Rs.)	Total Cost (Rs.)
Management Office	1,000	2,500	2,500,000
Processing Area	25,667	2,000	51,334,000
Laboratory	500	2,500	1,250,000
Meeting Room	600	3,500	2,100,000
Shed	1,000	800	800,000
Dining/Mess Hall	400	1,800	720,000
Toilets	300	400	120,000
Change Room	200	1,000	200,000
Guard Room	120	1,800	216,000
Pavement / Driveway	5,000	200	1,000,000
Open Grounds	2,000	50	100,000
Raw Material Store	5,000	1,500	7,500,000
External Development			1,000,000
Boundary Wall (Run. Feet)	835	1,600	1,335,749
Total Infrastructure			70,175,749

9.5 Machinery & Equipment Requirement

Plant, machinery and equipment for the proposed project are stated below;

Table 6: Machinery & Equipment Requirement

Sr. No	Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
1	Steam Peeling System			
1.1	Hoist	1	1,376,676	1,376,676
1.2	Stoner	1	1,449,144	1,449,144
1.3	Washer	1	2,898,180	2,898,180
1.4	Hoist	1	1,594,080	1,594,080
1.5	Automatic Feeder	1	1,992,600	1,992,600
1.6	Peeling and Tank	1	12,136,500	12,136,500
1.7	Hoist	1	887,544	887,544
1.8	Brush Peeling	1	7,970,292	7,970,292
1.9	Sorting Platform	1	1,557,792	1,557,792
2	Pretreatment			
2.1	Hoist	1	941,868	941,868
2.2	Slicer	1	1,594,080	1,594,080
2.3	Rinser	1	2,717,172	2,717,172
2.4	Blancher	1	7,245,720	7,245,720
2.5	Cooler	1	5,796,576	5,796,576
2.6	Hoist	1	1,358,532	1,358,532
2.7	Cooker	1	7,245,720	7,245,720
2.8	Mud Machine	1	833,220	833,220
3	Quenching and Tempering System			
3.1	Auxiliary tank	1	867,780	867,780
3.2	Blender	2	4,628,124	9,256,248
3.3	Bidirectional Screw Conveyor	1	1,002,780	1,002,780
3.4	Aging Processor	2	5,399,406	10,798,812
3.5	Hoist	2	867,780	1,735,560
3.6	Vibration Sieve	1	771,336	771,336
3.7	Riddle Machine	1	1,735,560	1,735,560
4	Drying and Packaging System			
4.1	Air Dryer	1	14,462,604	14,462,604
4.2	Grading Screen	1	1,377,432	1,377,432
4.3	Material Feeding System	1	2,457,432	2,457,432
4.4	Storage Bin	1	375,624	375,624
4.5	Cryogenic Dryer	1	6,746,112	6,746,112

4.6	Conveyor Belt	1	438,264	438,264
4.7	Cooling Mechanism	1	3,005,208	3,005,208
4.8	Packing Mechanism	1	2,457,432	2,457,432
5	Control System	1	15,381,684	15,381,684
6	Wires	1	7,700,832	7,700,832
7	Pipe and valves	1	4,695,624	4,695,624
8	Platform	1	3,130,380	3,130,380
Total (Ex-Shanghai Port)				147,992,400
Freight for Karachi				108,000
Total CNF Karachi				148,100,400
Custom Duty (FoB)			5.0%	7,399,620
Sales Tax (FoB)			17.0%	25,158,708
Additional Sales Tax (FoB)			3.0%	4,439,772
Clearance and Transportation Charges			0.5%	15,381,684
Price of Imported Plant				185,839,002
Supervision in Commissioning & Installing				864,000
Total Imported Machinery Cost (Rs.)				186,703,002
	Boiler	1	3,000,000	3,000,000
	Generator 450 KW	1	8,000,000	8,000,000
Machinery & Equipment Cost				197,703,002
	Misc. Equipment (Water Pump, Reverse Osmosis plant, etc.)	1	3,500,000	3,500,000
	Fork Lifter 2 ton	1	1,800,000	1,800,000
	Laboratory Equipment - Microbiological and Analytical Lab	1	1,000,000	1,000,000
	Weighing Scale	2	120,000	240,000
Total Machinery & Equipment Cost				204,243,002

9.6 Furniture & Fixtures Requirement

Details of the furniture and fixture required for the project are given below;

Table 7: Furniture & Fixture Requirement

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
CEO Office Furniture	1	100,000	100,000

Managers Tables along with side tables	3	30,000	90,000
Manager / Officers Chairs	3	8,000	24,000
Visitor Chairs	6	8,000	48,000
Officers Tables along with Chairs	6	20,000	120,000
File Racks	5	15,000	75,000
Sofa Set	4	20,000	80,000
Split Air-conditioner 1.5 Ton	5	70,000	350,000
Misc. & Contingency		10%	88,700
Total Furniture & Fixtures			975,700

9.7 Office Equipment Requirement

Following office equipment will be required for Potato Powder Manufacturing Unit;

Table 8: Office Equipment Requirement

Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Laptop	2	100,000	200,000
Computers with LCD	7	60,000	420,000
Printer	2	20,000	40,000
Scanner	2	15,000	30,000
Networking Equipment & Accessories	1	150,000	150,000
Mini Telephone Exchange	1	100,000	100,000
Telephone Sets	5	1,500	7,500
Fax Machine	2	20,000	40,000
Water Dispenser	2	16,500	33,000
Refrigerator	1	50,000	50,000
Electric Water Cooler	2	25,000	50,000
Misc. & Contingency		10%	112,050
Total Office Equipment			1,232,550

9.8 Office Vehicle Requirement

Following office vehicles are required for Potato Powder and Flakes Manufacturing Unit;

Table 9: Office Vehicle Requirement

Description	Quantity	Unit Cost (PKR)	Total Cost (PKR)
1300 CC Car (For CEO)	1	1,650,000	1,650,000
800 CC Carry	1	900,000	900,000
Registration fee		3.25%	82,875
Total Office Vehicles cost			2,632,875

9.9 Human Resource Requirement

To run operations of Potato Powder and Flakes Manufacturing Unit smoothly, details of human resources required along with number of employees and monthly salary are recommended as under;

Table 10: Human Resource Requirement

Description	No. of Employees	Salary Per Month (PKR)
CEO	1	125,000
Manager Marketing	1	50,000
Plant Manger	1	70,000
Plant Operator	3	22,000
Manager Finance & Admin	1	50,000
Accounts officer	1	20,000
Assistant to Admin & HR	1	20,000
Boiler Operator	3	20,000
Procurement Officer	1	50,000
Quality Control Officer / Food Technologist	1	35,000
Mechanic	2	18,000
Electrician	2	18,000
Shift Supervisors	3	20,000
Driver	2	15,000
Lifter Operator	1	16,000
Office Boy	2	15,000
Guard	4	18,000
Sweeper	2	15,000
Total	32	

Seasonal labor will be hired on daily wages. In year 1 the seasonal labor cost will be around Rs. 1.62 million with 10% incremental effect each year.

9.10 Utilities and Other Costs

An essential cost to be borne by the project is the cost of electricity, gas and fuel for generator. The utility expenses are estimated to be around Rs. 2.45 million per month. Furthermore, promotional expenses are essential for marketing of this unit, and are estimated as 1% of revenue each year.

9.11 Revenue Generation

Based on the assumed capacity utilization for processing of Potatoes, sales revenue during the first year of operations is estimated as under:

Table 11: Revenue Generation – Year 1

Description	Production Capacity Year - 1 (75%) in Tons	Sales Price Per Ton (Rs.)	Revenue (Rs.)
Potato Powder	1,296	180,900	234,446,400

9.12 Raw Material Requirement

Fresh potatoes are the main raw material for the proposed business, which will be procured either directly from the farms or from distributors of local vegetable market. Following table provides the details of seasonal requirements of fresh potatoes as a raw material:

Table 12: Raw Material Requirement – Year 1

Description	Requirement for Producing 1 kg Powder	Requirement for Year-1 (Tons)	Cost Per Ton (PKR)	Total Cost (PKR)*
Potatoes (Fresh) for Potato Powder	7.5	9,720	13,000	126,360,000
Freight in for Potato Powder		9,720	500	4,860,000
Other Material (Mon glyceride, Glycerol mono-Palmitate, antioxidants, sodium salts, SO ₂ , etc.)		1,296	800	1,036,800
Total Raw Material Cost				132,256,800

10 USEFUL WEB LINKS

Small & Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
Government of Pakistan	www.pakistan.gov.pk
Ministry of Industries & Production	www.moip.gov.pk
Ministry of Education, Training & Standards in Higher Education	http://moptt.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	www.sindh.gov.pk
Government of Khyber Pakhtunkhwa	www.khyberpakhtunkhwa.gov.pk
Government of Balochistan	www.balochistan.gov.pk
Government of Gilgit Baltistan	www.gilgitbaltistan.gov.pk
Government of Azad Jamu Kashmir	www.ajk.gov.pk
Trade Development Authority of Pakistan (TDAP)	www.tdap.gov.pk
Security Commission of Pakistan (SECP)	www.secp.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
State Bank of Pakistan (SBP)	www.sbp.org.pk
Punjab Small Industries Corporation	www.psic.gop.pk
Sindh Small Industries Corporation	www.ssic.gos.pk
Punjab Vocational Training Council (PVTTC)	www.pvtc.gop.pk
Technical Education and Vocational Training Authority (TEVTA)	www.tevta.org
Punjab Industrial Estates (PIE)	www.pie.com.pk
Faisalabad Industrial Estate Development and Management Company (FIEDMC)	www.fiedmc.com.pk
Pakistan Horticulture Development Export Company (PHDEC)	ww.phdec.org
Ministry of National Food Security and Research (MNFSR)	www.mnsfr.gov.pk
Pakistan Agriculture Research Council (PARC)	www.parc.gov.pk
National Agriculture Research Council (NARC)	www.narc.gov.pk
Agriculture University of Faisalabad (UAF)	www.uaf.edu.pk
Agriculture Marketing Information Service	www.amis.pk
Ayub Agricultural Research Institute (AARI), Faisalabad	www.aari.punjab.gov.pk

11 ANNEXURES

11.1 Income Statement

Calculations										SMEDA
Income Statement										Amount in PKR
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	234,446,400	275,083,776	321,504,163	374,457,790	434,787,101	503,437,696	553,781,465	609,159,612	670,075,573	737,083,130
<i>Cost of sales</i>										
Fresh Potatoes Cost including Freight in	131,220,000	153,964,800	179,946,360	209,584,584	243,350,989	281,774,830	309,952,313	340,947,544	375,042,298	412,546,528
Other Material (Monoglyceride, Glycerol mono-Palmitate, antioxidants,	1,036,800	1,216,512	1,421,798	1,655,977	1,922,773	2,226,369	2,449,006	2,693,907	2,963,297	3,259,627
Operation costs 1 (direct labor)	4,548,000	5,002,800	5,503,080	6,053,388	6,658,727	7,324,599	8,057,059	8,862,765	9,749,042	10,723,946
Operating costs 2 (machinery maintenance)	259,200	304,128	355,450	413,994	480,693	556,592	612,251	673,477	740,824	814,907
Direct electricity including Generator and Boiler expense	28,241,460	33,136,646	38,728,455	45,107,260	52,374,541	60,644,205	66,708,625	73,379,488	80,717,437	88,789,181
Packing Cost	1,036,800	1,216,512	1,421,798	1,655,977	1,922,773	2,226,369	2,449,006	2,693,907	2,963,297	3,259,627
Daily Wages	1,620,000	1,900,800	2,221,560	2,587,464	3,004,333	3,478,702	3,826,572	4,209,229	4,630,152	5,093,167
Total cost of sales	167,962,260	196,742,198	229,598,502	267,058,644	309,714,830	358,231,666	394,054,833	433,460,316	476,806,347	524,486,982
Gross Profit	66,484,140	78,341,578	91,905,661	107,399,146	125,072,271	145,206,030	159,726,633	175,699,296	193,269,225	212,596,148
<i>General administration & selling expenses</i>										
Administration expense	5,724,000	6,296,400	6,926,040	7,618,644	8,380,508	9,218,559	10,140,415	11,154,457	12,269,902	13,496,893
Administration benefits expense	1,431,000	1,574,100	1,731,510	1,904,661	2,095,127	2,304,640	2,535,104	2,788,614	3,067,476	3,374,223
Electricity expense	1,123,200	1,235,520	1,359,072	1,494,979	1,644,477	1,808,925	1,989,817	2,188,799	2,407,679	2,648,447
Water expense	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Travelling expense	1,431,000	1,574,100	1,731,510	1,904,661	2,095,127	2,304,640	2,535,104	2,788,614	3,067,476	3,374,223
Communications expense (phone, fax, mail, internet, etc.)	1,144,800	1,259,280	1,385,208	1,523,729	1,676,102	1,843,712	2,028,083	2,230,891	2,453,980	2,699,379
Office vehicles running expense	1,053,150	1,158,465	1,274,312	1,401,743	1,541,917	1,696,109	1,865,719	2,052,291	2,257,521	2,483,273
Office expenses (stationary, entertainment, janitorial services, etc.)	572,400	629,640	692,604	761,864	838,051	921,856	1,014,042	1,115,446	1,226,990	1,349,689
Promotional expense	2,344,464	2,750,838	3,215,042	3,744,578	4,347,871	5,034,377	5,537,815	6,091,596	6,700,756	7,370,831
Professional fees (legal, audit, consultants, etc.)	1,172,232	1,375,419	1,607,521	1,872,289	2,173,936	2,517,188	2,768,907	3,045,798	3,350,378	3,685,416
Depreciation expense	24,803,743	24,803,743	24,803,743	24,803,743	24,803,743	25,193,328	25,193,328	25,193,328	25,193,328	25,193,328
Amortization of pre-operating costs	1,505,616	1,505,616	1,505,616	1,505,616	1,505,616	-	-	-	-	-
Amortization of legal, licensing, and training costs	140,000	140,000	140,000	140,000	140,000	-	-	-	-	-
Subtotal	42,505,604	44,369,120	46,444,776	48,756,366	51,330,320	52,939,964	55,714,628	58,766,758	62,124,101	65,817,178
Operating Income	23,978,536	33,972,458	45,460,885	58,642,780	73,741,951	92,266,065	104,012,005	116,932,538	131,145,125	146,778,970
Gain / (loss) on sale of office equipment	-	-	-	-	493,020	-	-	-	-	-
Gain / (loss) on sale of office vehicles	-	-	-	-	1,053,150	-	-	-	-	-
Earnings Before Interest & Taxes	23,978,536	33,972,458	45,460,885	58,642,780	75,288,121	92,266,065	104,012,005	116,932,538	131,145,125	146,778,970
Subtotal	21,729,275	18,069,534	14,177,078	10,055,355	5,356,591	-	-	-	-	-
Earnings Before Tax	2,249,261	15,902,923	31,283,807	48,587,424	69,931,530	92,266,065	104,012,005	116,932,538	131,145,125	146,778,970
Tax	297,352	4,788,522	10,171,832	16,228,098	23,698,535	31,515,622	35,626,701	40,148,888	45,123,293	50,595,139
NET PROFIT/(LOSS) AFTER TAX	1,951,909	11,114,401	21,111,975	32,359,327	46,232,995	60,750,443	68,385,304	76,783,650	86,021,832	96,183,831

11.2 Balance Sheet

Calculations											SMEDA
Balance Sheet											Amount in PKR
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
<i>Current assets</i>											
Cash & Bank	1,500,000	-	5,871,837	19,115,706	38,242,799	59,181,843	137,559,425	221,227,855	312,402,008	410,601,533	603,391,470
Accounts receivable		19,269,567	20,939,596	24,517,313	28,601,176	33,256,639	38,557,183	43,447,363	47,792,099	52,571,309	57,828,440
Equipment spare part inventory	86,400	106,445	130,628	159,750	194,762	236,789	273,492	315,883	364,845	421,396	-
Raw material inventory	11,021,400	14,224,954	18,287,956	23,430,099	29,925,443	38,115,564	46,119,833	55,804,998	67,524,047	81,704,097	-
Total Current Assets	12,607,800	33,600,966	45,230,017	67,222,868	96,964,180	130,790,836	222,509,933	320,796,099	428,082,999	545,298,335	661,219,910
<i>Fixed assets</i>											
Land	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000
Building/Infrastructure	70,175,749	66,666,961	63,158,174	59,649,386	56,140,599	52,631,812	49,123,024	45,614,237	42,105,449	38,596,662	35,087,874
Machinery & equipment	204,243,002	183,818,702	163,394,402	142,970,101	122,545,801	102,121,501	81,697,201	61,272,901	40,848,600	20,424,300	-
Furniture & fixtures	975,700	878,130	780,560	682,990	585,420	487,850	390,280	292,710	195,140	97,570	-
Office vehicles	2,632,875	2,106,300	1,579,725	1,053,150	526,575	4,240,272	3,392,217	2,544,163	1,696,109	848,054	-
Office equipment	1,232,550	986,040	739,530	493,020	246,510	1,573,081	1,258,465	943,849	629,232	314,616	-
Total Fixed Assets	291,259,876	266,456,133	241,652,390	216,848,648	192,044,905	173,054,515	147,861,187	122,667,859	97,474,531	72,281,202	47,087,874
<i>Intangible assets</i>											
Pre-operation costs	7,528,078	6,022,463	4,516,847	3,011,231	1,505,616	-	-	-	-	-	-
Legal, licensing, & training costs	700,000	560,000	420,000	280,000	140,000	-	-	-	-	-	-
Total Intangible Assets	8,228,078	6,582,463	4,936,847	3,291,231	1,645,616	-	-	-	-	-	-
TOTAL ASSETS	312,095,754	306,639,561	291,819,254	287,362,747	290,654,701	303,845,351	370,371,119	443,463,958	525,557,530	617,579,538	708,307,784
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable		18,104,474	21,440,222	25,312,618	29,807,847	35,026,867	40,802,192	45,509,727	50,819,649	56,819,825	51,364,240
Total Current Liabilities	-	21,549,598	21,440,222	25,312,618	29,807,847	35,026,867	40,802,192	45,509,727	50,819,649	56,819,825	51,364,240
<i>Other liabilities</i>											
Deferred tax		-	-	-	-	-	-	-	-	-	-
Total Long Term Liabilities	156,047,877	127,090,177	101,264,845	71,823,967	38,261,365	-	-	-	-	-	-
<i>Shareholders' equity</i>											
Paid-up capital	156,047,877	156,047,877	156,047,877	156,047,877	156,047,877	156,047,877	156,047,877	156,047,877	156,047,877	156,047,877	156,047,877
Retained earnings		1,951,909	13,066,310	34,178,285	66,537,612	112,770,607	173,521,050	241,906,354	318,690,004	404,711,836	500,895,667
Total Equity	156,047,877	157,999,786	169,114,187	190,226,162	222,585,489	268,818,484	329,568,927	397,954,231	474,737,881	560,759,713	656,943,544
TOTAL CAPITAL AND LIABILITIES	312,095,754	306,639,561	291,819,254	287,362,747	290,654,701	303,845,351	370,371,119	443,463,958	525,557,530	617,579,538	708,307,784

11.3 Cash Flow Statement

Calculations											SMEDA
Cash Flow Statement											Amount in PKR
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<i>Operating activities</i>											
Net profit		1,951,909	11,114,401	21,111,975	32,359,327	46,232,995	60,750,443	68,385,304	76,783,650	86,021,832	96,183,831
Add: depreciation expense		24,803,743	24,803,743	24,803,743	24,803,743	24,803,743	25,193,328	25,193,328	25,193,328	25,193,328	25,193,328
amortization of pre-operating costs		1,505,616	1,505,616	1,505,616	1,505,616	1,505,616	-	-	-	-	-
amortization of training costs		140,000	140,000	140,000	140,000	140,000	-	-	-	-	-
Accounts receivable		(19,269,567)	(1,670,029)	(3,577,716)	(4,083,864)	(4,655,463)	(5,300,544)	(4,890,179)	(4,344,736)	(4,779,210)	(5,257,131)
Equipment inventory	(86,400)	(20,045)	(24,183)	(29,122)	(35,012)	(42,028)	(36,702)	(42,391)	(48,962)	(56,551)	421,396
Raw material inventory	(11,021,400)	(3,203,554)	(4,063,002)	(5,142,143)	(6,495,344)	(8,190,121)	(8,004,268)	(9,685,165)	(11,719,049)	(14,180,050)	81,704,097
Accounts payable		18,104,474	3,335,748	3,872,396	4,495,229	5,219,020	5,775,325	4,707,534	5,309,922	6,000,176	(5,455,584)
Cash provided by operations	(11,107,800)	24,012,576	35,142,293	42,684,748	52,689,694	65,013,761	78,377,582	83,668,431	91,174,153	98,199,525	192,789,937
<i>Financing activities</i>											
Issuance of shares	156,047,877	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares											
Cash provided by / (used for) financing activities	312,095,754	(28,957,700)	(29,270,456)	(29,440,878)	(33,562,601)	(38,261,365)	-	-	-	-	-
<i>Investing activities</i>											
Capital expenditure	(299,487,954)	-	-	-	-	(5,813,352)	-	-	-	-	-
Acquisitions											
Cash (used for) / provided by investing activities	(299,487,954)	-	-	-	-	(5,813,352)	-	-	-	-	-
NET CASH	1,500,000	(4,945,124)	5,871,837	13,243,869	19,127,093	20,939,043	78,377,582	83,668,431	91,174,153	98,199,525	192,789,937

12 KEY ASSUMPTIONS

12.1 Operating Cost Assumptions

Description	Details
Administration Benefit Expenses	25% of admin. expense
Traveling Expenses	25% of admin. expense
Communication Expenses	20% of admin. expense
Office expenses (stationary, entertainment, janitorial services, etc.)	10% of admin. expense
Promotional expense	1% of revenue
Office Vehicle Running Expenses	40% of the Vehicle Cost
Professional fee (Legal, Audit, etc.)	0.5% of revenue
Operating costs growth rate	10%
Depreciation on Building and Infrastructure	5%
Depreciation on Machinery & Equipment	10%
Depreciation on Furniture and Fixture	10%
Depreciation on Office Equipment	20%
Depreciation on Office Vehicle	20%

12.2 Production Cost Assumptions

Description	Details
Cost of Potatoes per Ton	Rs. 13,000
Packing Cost Per Ton ⁴	Rs. 800
Other Material (Monoglyceride, Glycerol mono-Palmitate, antioxidants, sodium salts, SO ₂ , etc.)	Rs. 800
Cost used in Per Ton Potato Powder/Flakes	
Production Cost Growth Rate	10%

12.3 Revenue Assumptions

Description	Details
Potato Powder Sales Price Per Ton	180,900
Growth in Sales Price	10%
Days Operational / Year	180

⁴ Inner Liner LDP Bag with Outer PP Bag (Food Grade) will be used as Packing

Hours Operational Per Day	24
Production Capacity in First Year	75%
Percentage Increase in Production Capacity every Year	5%
Maximum Production Capacity	100%