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ENGINEERING
COMPANY (INDIA) PVT LTD**

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Subject : Your requirement of Feed Machines
Kind Attention : Sir

Dear Sir,

Please refer to your telephonic discussion with the undersigned, regarding above cited subject; we thank you very much for your interest in our machines, which is highly appreciated. We are pleased to quote herewith price and brief details for the same:

Pellet Feed Plant with capacity of 8-10 TPH Pellet feed (with 8 Ingredients Auto Batching and Auto Bagging)

Structure of the each Quotation is as follows:

Annexure 1	:	Production Parameters
Annexure 2	:	Machine features
Annexure 3	:	Flow Diagram
Annexure 4	:	Price Quote
Annexure 5	:	Optional Features
Annexure 6	:	Technical details
Annexure 7	:	Exclusions
Annexure 8	:	Business Terms

The complete plant features the following:

Plant Features-

- The designed capacity for poultry feed is 8-10 MT/Hour with single Line on standard broiler feed on **3.0 mm crumbs and finisher pellet at min 90 PDI. The above said output is average of 10-12 hours or uninterrupted running of complete shift at single recipe and standard broiler feed formulation. (at minimum 90 PDI and maximum 13 % average moisture in raw material batch).**
- Total Power: 541 H.P
- Design: Compact design, easy to control and maintain.
- Total Power Consumption per ton of feed ~ 23 units** (depends upon formulation and operational parameters)
- Area – 46 x 46 x 70 feet**

All bolted structure design with good safety factor; all the material/components selection with good service factor, only branded/standardized products of reputed make used. The plant is designed for highest safety in mechanical or electrical. All the machines selected are of matching capacity for trouble free running and most of the parts are automatically controlled for better performance. All machines are designed to produce hygienic feed. e.g., dead corners removed to avoid fungus, contamination. Even without use of aspiration system, dust will be very much controlled and within limits.

For LARK ENGINEERING COMPANY (INDIA) PVT LTD

Harjot Singh

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Annexure 1

1.1) Production Parameters

Feed mill production; is hard to define as it is combination of so many factors. Considering all factors mentioned below the designed capacity for poultry feed is :

- a) Pre-starter ~ 7.0 TPH (Considering maximum 18 % recycling)
- b) Starter ~ 8.0 TPH (Considering maximum 15 % recycling)
- c) Finisher Crumbs ~ 9.0 TPH (Considering maximum 10 % recycling)
- d) Finisher Pellet ~ 10 TPH (Considering maximum 7 % recycling)

The above said output is based upon

- a) Average of 10-12 hours or uninterrupted running of complete shift
- b) Single recipe and standard broiler feed formulation.
- c) Minimum 88 PDI
- d) Maximum 13 % average moisture in raw material batch.

Some others factors affecting project output are discussed below:

1.1.1) Feed Formulation & Raw material quality :

a. Fiber

High fiber reduces rate of production, as fiber is hard to compress into a pellet. But due to natural binders inherent to fiber, a good quality pellet is produced.

b. Fat

Fat content of ingredient or feed aids in increasing production rate but too much fat can affect pellet quality for eg. Too much fat affects pellet durability.

c. Starch

High starch formulations or ingredients are difficult to produce a tough, durable pellet. High starch formulations are needed to produce energy dense feed which is required to fulfill nutritional need of high yielding dairy animals. The natural agglutinants can be activated only with high temperatures and moisture. The gelatinized material acts as a binder to produce the desired pellet quality. High starch material with good gelatinization enhances pellet quality.

d. Moisture

Due to high moisture (more than 13 %) in raw material grains; it is difficult to maintain balance of heat and moisture in conditioning process. Too high moisture results in roll slippage and too low moisture results in die choking. At low and high moisture operator have to run the pellet mill @ 60 -70 % efficiency.

e. Protein & Density

Ingredients with high natural protein will plasticize under heat, which will cause good quality pellets. Ingredients or feeds with high density have high production rates. If an ingredient or feed is high in natural protein as well as density, the high production rates and good pellet quality can be expected.

At low oil & hard formulations project will give around 80 % of the stated production.

1.1.2) Particle size :

If there are bigger granules of maize or other grains the pellet will tend to break at that point after the pellet is formed, resulting in more fines. It is important to maintain uniformity of grinding.

1.1.3) Pellet Durability :

Pellet quality is usually expressed as the pellet durability index(PDI) and measured by using a tumbling can device , in which the pellet sample to be tested is first sieved to remove fines, then tumbled in the tumbling can device for a defined period of time. Then after tumbling we compare the fines produced during tumbling with actual weight.

$$\text{PDI} = \frac{\text{weigh of pellet after tumbling}}{\text{weight of Pellet before tumbling}} \times 100$$

At PDI lower than 88 pellet tends to break during crumbling; producing more fines which results in more recycling of feed and low final output.

1.1.4) Die configuration :

Selecting a die as per formulation is very important. As Broiler contain less fibers and more oil %age (soft formulation), which provides better pelleting properties, less frictional load on pellet die. Hence, we can use compression ratio of 1:12, 1:13 & even more.

Using high compression ratio for layer feed may leads to poor die life, die chocking, non-uniform PDI, more power consumption in layer feed, low output, more wear & tear.

And using low compression dies in soft broiler formulation may lead to poor PDI (Pellet Durability Index – Pellet Strength) .Considering all above factors using separate die for both layer & broiler feed is a better and cost effective solution. Die selections governs **approx. 10-15 %** in pellet quality & output.

1.1.5) Operational Parameters:

a) Operators skill :

Operational parameters and skill , experience & knowledge of operator plays an important role in plant performance. Same die with similar technical specifications behaves differently in different pellet mills.

The operator should regularly check the:

- 1.1.5)1. State of wear on the deflectors and scrapers and also the roll adjustment: To avoid uneven wear on the die and consequently inefficient pelleting.
- 1.1.5)2. The state of wear of the conditioner paddles: To ensure efficient pre-conditioning.
- 1.1.5)3. Steam traps and filters: To ensure that no condensate is being passed into the conditioner.
- 1.1.5)4. Press Roll slippage due to increased moisture content, it leads to die roll over.
- 1.1.5)5. Observing wearing pattern of die; it is recommended to change the side of die (front side – Back side) for more uniform wear.
- 1.1.5)6. Setting optimum parameters for different formulations and ingredient qualities .

b) Using spare parts more than their optimum life.

Some time we use the consumable parts more than their standard life but loose much more in feed quality and life of other parts which directly are related to them. Like for an average die life cycle it is recommended to use 5 pieces (2.5 set) of roll shells for a better die life and uniform PDI feed quality. Hence using the roll shells & beaters more than recommended life results in great losses in terms of grinding texture, conditioning & pelleting which directly affects pellet strength and PDI; and productivity and above all pellet quality.

c) Steam quality and quantity :

Proper steam of good quality is required for better performance of machines and production of quality feed. Steam parameters required are:

1. Dry Saturated Steam Minimum 9-10 kg/cm² at boiler.
2. 2-2.5 Kg/Cm² after PRV
3. Good & reputed make boiler, Water softener.
4. Proper Steam traps, insulation of steam line and supporting valves.

d) Recipe Management:

It will take around 30-40 minutes to change recipe. It's better if we run one recipe a shift as it saves lots of time.

e) Manpower :

Good results certainly cannot be achieved without the adequate availability of qualified & skilled manpower . Timely response of labour & supervisors to automation controls, over filling / under filling bins - alarms etc. helps in smooth production.

f) Power Failure/ Trips / jamming :

Machines require a starting time to achieve their full capacity load. One time power failure /jamming in pellet mill hamper the production by minimum 20 minutes.

1.2) Space Requirement :

This Project generally requires area of apporox 46 x 46 x 70 feet (L X B X H) and a godown warehouse of approx. 25,000 square feet (100 x 250) feet is sufficient to store approx. 3500 MT of raw material at 15 feet stacking height & maize density and approx. 500 MT of finish feed at 10 feet stacking height . Minimum 1.5 -2.0 acres land is suffiecient to design a complete project including boiler , warehouse , weigh bridge , office , oil tanks , all necessary utilities.

1.3) Power Required :

Approximate 544 H.P. of power is required by project . Considering other utilities like boiler , bulk silos , office etc. 650 kva transformer is suffiecient for this project and power connection of approx. 500 KW.

This data is based upon feedback from existing clients and are for refence only we suggest you to verify these facts & figures from civil , shed & electrical experts.

Annexure 2 : Machine Features

For viewing detailed features of individual machine please visit our website www.larkengqco.com. The brief details are as under:

Pre - Cleaning

The first step in pelleting is conveying of ingredients from bulk silos or godown to the batching bins. It is essential to remove oversized foreign materials and iron trash etc. which otherwise can affect functioning of slide gates, gravity /screw feeder in batching or down stream.

Pre-cleaning machines generally include rotary sieve, jute remover, magnetic catchers etc.

In automatic plants, it is desired that system is designed to give continuous efficient cleaning at maximum flow of ingredients.



Batching

In modern plants, automatic weighing of different materials as per formulation to make one batch is called batching or proportioning. In this any no. of silos of suitable capacity as per total capacity of plant, are incorporated and are having gravity or screw feeders for controlled discharging of material into weigh bin underneath it. Generally two set of bin or silos are installed - one for major ingredients, second for minor ingredients. The discharge of both weighing bin come into common surge for further processing. Bin vibrator or shaking devices are installed on some or all of bins to make the material flow in case of jamming of bin.

The weighing is done through an electronic controller working on PLC or micro processor based, which can be operated through a computer. The computer control and record all the detail of a batch- over or under weighing of ingredients from set point, reporting on each batch, shift, day, week, month basis. The generally desired features of a batching system are:

It should give accurate weighing within specified time to meet output of plant.

Though it should be highly reliable and work automatically, it should have manual control also in case of auto failure.



Grinding

After batching, next step is to reduce the material to the required degree of fineness to have maximum surface area for exposure to heat and moisture to accomplish gelatinization in conditioners. In pelleting process grinding and pelleting are two major energy consuming operations.

If we can perform fine grinding with minimum of energy, it will not only cut grinding cost but also save on energy required in pelleting.



Mixing

Efficient mixing of micro ingredients in whole batch is significant in making quality feed. The designed features of a good mixing system are:

It should perform mixing to achieve minimum coefficient of variation in minimum time.

Mixer discharging mechanism should aim at no leakage of gates with minimum residue in drum to avoid carryover to next batch.



Conditioning

Conditioning is done to add heat and moisture in mixed feed to achieve gelatinization and making the product more pliable for pelleting. An ideal conditioning system should meet the following:

It should raise the temperature and moisture of product by direct or indirect heating.

It should give desired retention time in conditioners.



Pelleting

After conditioning the product is passed through a die in pellet mill with the help of rollers and powdery material is converted into pellets. The quality and output of pellet mill is dependent on so many parameters, like:

Quality of grinding, conditioning.

Formulation of feed: - (percentage of oil, protein, fiber etc.)

Die configuration: - Deciding working on product in pelleting.



Cooling

Hot pellets coming out of pellet mill are required to be cooled immediately to remove moisture and heat. Generally counter flow coolers are used for the purpose. The desired feature of an efficient cooler are:

It should be capable to remove the unwanted heat and moisture from pellets to improve its shelf life.

The cooling should be uniform from all the sides.



Crumbling

Crumbling is a process in which pellet after cooling is broken into small pieces to make it suitable for small chicks. If not required it can be by-passed and product escapes from side of crumbling rolls. A well designed crumbler should have following features:

Should give uniform size of crumbs at the both ends of crumbling rolls.

Should break the material without making much fines.

Should have mechanism for equal gap adjustment on both sides.



Screening

Product coming out of crumbler is either in pellets (if crumbler by-passed) or crumbs form. These are required to be screened to remove fines and overs. Single deck screeners are used to remove fines only while double deck screeners are used to remove both fine and overs. The unbroken or the overs are returned to crumbler and fines return to pelleting line for repelleting.

A screener should have following features:

It should remove the desired percentage of fines from product.

Screens should not clog frequently.

Changing of screens of desired mesh should be easy and quickly.



BAGGING

After screener, the finished product is filled into bags. In small to medium plants, bagging can be carried out manually but for higher output it is better to go for electronic bagging machine. Electronic bagging machine can perform bagging with high accuracy and much faster rate.



Annexure 4
POULTRY FEED PLANT (with 8-10 TPH Pellet and Mash)
With 8 ingredients Auto Batching

S.No.	Description (Intake Section)	Power In H.P.	Qty.	Unit Price Rs.	Total Price Rs.
1.1	Intake Chain conveyor for transferring Raw material to 1 st Elevator without motor, gear box/chain drive (with 5 Dumping Points) Capacity – 25TPH, Drive – Geared Motor (<i>Bonfiglioli</i> Make) Model – CC 65 Length – 119 Ft. MOC – MS Model: CC-65, Casing thickness: 3 mm, Side thickness: 4 mm Bottom thickness: 5 mm With overload control mechanism	10	1	5800/Ft.	690200
1.2	Dumping Hopper for direct dumping of ingredients at 1 st elevator MOC- MS fabricated steel stiffener for reinforcement Man Hole – For Easy Cleaning		1	22000	22000
1.3	Jute remover without geared motor & drives (with extra rotor)	2	1	135000	135000
1.4	Intake Bucket Elevator (10" bucket) without motor, gear box & chain drive Capacity – 22 MT/Hr , Model – BE-14 Height – 65 Ft. , MOC – MS Fabricated Bucket Size – 10" x 6" Drive – Geared Motor (<i>Bonfiglioli</i> Make) Belt – M-24 Rubberized 4 –Ply Nylon Belt CONTINENTAL Make Suitable for Food Grade , High Tensile strength , superior in abrasion, cut and wear resistance Boot and Head fabricated out of 4mm sheet. Elevator's Boxes fabricated out of 2mm sheet with angle supports. Base Frame of Gear motor fabricated out of 6 mm plate. Platform at top for maintenance is provided with access thru monkey type ladders or via Platform. Top Pulley is crowned for self-alignment of Elevator's belt With overload control mechanism	7.5	1	5500/Ft.	357500
1.5	Cascading Self Cleaning Magnet System (with Collection Tray) MOC – SS 304 with rare earth magnets (~ 7000 gauss)		1	92000	92000
1.6	Rotary Bin Distributor (For Selection of bin to be Charged) 8 way	1	1	187500	187500
1.7	Connecting Pipes & Bends			45000	45000
1.8	Bin Block Having 8 bins for Raw Ingredients 1 Bin- 20 MT 2 Bin - 12 MT 2 Bin- 10 MT 3 Bin- 6 MT MOC – MS, Main Body – 3 mm / Cones – 4 mm. Slope is provided in all bins for free flow of material without jamming.		82 MT		1781000
1.9	Gates Below Bins (8 No.s)		8	17600	140800
1.11	Feeder Below Bins (3 Gravity + 5 Screw Feeders) Variable Pitch of Screw Feeder for Uniform Flow Of Material Material flow first in first out principle is secured	25	8	74800	598400
1.12	Weigh Bin – 1000 Kgs		1	74000	74000
1.13	Pneumatic Slide gate Below Bin		1	46200	46200
1.14	Dumping Bin - 1000 Kgs		1	68000	68000
1.15	Chain Conveyor for Transferring Weight Batch	5	1	87000	87000
	Total For Intake Section				4324600

	Grinding Section				
2.1	Pulse Jet Bag type Dust Collector System	2	1	225000	225000
2.2	Dumping Hopper		1	24200	24200
2.3	Grinding Bucket Elevator Capacity – 22 MT/Hr , Model – BE-14 Height – 43 Ft. , MOC – MS Fabricated Bucket Size – 10" X 6" Drive – Geared Motor (Bonfiglioli Make) Belt – M-24 Rubberized 4 –Ply Nylon Belt – CONTINENTAL Make With OverLoad Control Mechanism	7.5	1	5500/Ft.	236500
2.4	Two Way at Elevator's Outlet (For Discharge of Silos) Type – Manual Operated		1	25500	25500
2.5	Cascading Self Cleaning Magnet System (with Collection Tray) MOC – SS 304 with rare earth magnets (~ 7000 gauss)		1	92000	92000
2.6	Intermediate Bin over Hammer Mill ,. MOC -MS , Capacity – 1000 Kg/Batch		1	84500	84500
2.7	Rotary Vane Feeder for Hammer Mill without Motor Pocket Cup Design that provides more discharge points ,which results more even feed rate and distribution of material across full width of mill intake Drive – Geared Motor (Bonfiglioli Make)	2	1	95000	95000
2.9	Magnetic Plate Powerful "rare earth type" magnet. Fabricated out of 6mm Plate with angle support.			30000	30000
2.10	Full Screen Hammer Mill (QGA –50120) Patent Application No.1993/DEL/2007 Hammer Mill is fabricated with plates of varied thickness depending upon the requirement. Support rings for screen fabricated with 25 mm thick plate, Main body fabricated with 8 mm thick Plate and 12 mm thk (20 MM Total thickness) supporting plates. A special feature of Gap adjustment between screen and hammers is provided for output of varying fineness. Keeping in view the maintenance time wasted in repairing/ replacing rotor, we have given a special provision, which hardly takes one hour to dismantle rotor from grinder and then fitting it back to its position without altering the position of the Grinder. Rotor is dynamically balanced. Recently added features: 1) Gap Adjustment: As fineness or coarsity is greatly governed by the gap between hammers and screen, we have recently provided an adjustment to vary the gap between hammers and screen. In our previous models of hammer mill gap adjustment was made by varying the position of hammers on the rotor of different PCDs which was time consuming but in our new models this be done by altering the position of screen i.e. either nearer to hammers of farther from hammers. This feature has the great utility when you are continuously making feed of varying size (such as broiler feed chicks, grower and finisher	150	1	685000	685000
	Total for grinding section				1497700

S.No.	Mixing Section	Power In H.P.	Qty.	Unit Price Rs.	Total Price Rs.
3.1	Extra Hopper for Feeding non grindables directly into the mixer Via 2nd elevator		1	22000	22000
3.2	Mixer's Bucket Elevator Capacity – 15 MT/Hr , Model – BE-12 Height – 40 Ft. , MOC – MS Fabricated Bucket Size – 8" x 5" (Shovel Type) Drive – Geared Motor (Bonfiglioli Make) Belt – M-24 Rubberized 4 –Ply Nylon Belt – CONTINENTAL Make With OverLoad Control Mechanism	5	1	5200 /ft	208000
3.3	Batch Bin Over Mixer MOC – MS Capacity – 1000 Kgs		1	74500	74500
3.5	Pneumatic Gate between Batch Bin & Mixer		1	46000	46000
3.6	Medicine Hopper for adding Medicine into the Mixer MOC – SS 304 Specially Designed for smooth discharging of Medicines into Mixer without any residue in Medicine Hopper Sealed Top cover is provided to prevent the dust leakage.		1	30800	30800
3.7	Pneumatic Slide Gate between Medicine Hopper & Mixer		1	24200	24200
3.8	Heavy Duty Double Ribbon Screw Mixer without Motor ,Gearbox & Drives Patent Application No. 1544/DEL/2007 Model – LHMR-10 Pneumatically operated Double door bottom discharge gate MOC- Mixer Drum Const: 5 mm Thk MS , Mixer Side wall: 5 mm Thk MS Mixing Efficiency: It can mix the whole batch within 4 to 5 minutes with coefficient of variation less than 7% Design Feature: Both Inner & Outer Ribbons are having variable cross section area i.e. wider at the start of the ribbon and narrower at the end , both ribbons are having end relief . Gear box – Self Designed Heavy Duty Gear Box (5 Year Warranty *)	15	1	165000	165000
3.9	Pneumatic cylinders with FRL units, Distribution pipes & discharge mechanism		set	65500	65500
3.10	Surge bin below Mixer Capacity – 1500 Kgs MOC - 3 mm thk Sheet with necessary reinforcement for stiffness		1	82000	82000
	Total for Mixing section				718000

	Pelleting Section				
4.1	Paddle Conveyor for feeding mash feed to 3rd elevator for pelleting without Motor ,Drive – Geared Motor (Bonfiglioli Make)	5	1	62500	62500
4.2	Dump Hopper for feeding fines from Vibratory Screen for re-pelleting		1	22000	22000
4.3	Pelletizing Bucket Elevator , Height – 50 Ft. , MOC – MS Fabricated Capacity – 15 MT/Hr , Model – BE-12 , Bucket Size – 8” x 5” (Shovel Type) Drive – Geared Motor (Bonfiglioli Make) Belt – M-24 Rubberized 4 –Ply Nylon Belt – CONTINENTAL Make With overload control mechanism	5	1	5200/ft	260000
4.4	Two way at Elevator's outlet for directing mash feed to final bagging bin or towards pelleting Section Type - Pneumatically operated ,Make of Pneumatic Cylinder – Janatics		1	32400	32400
4.5	Bin Over Pellet Mill Capacity – 3 MT ,MOC- 3 mm thk Sheet with necessary reinforcement for stiffness			150000	150000
4.7	Slide Gate Below bin		1	17600	17600
4.8	Screw Feeder for Pellet Mill ,Model - MOC- SS 304 Variable Pitch of Screw Feeder for Uniform Flow Of Material .Material flow first in first out principle is secured. Rate of Feeding to the Pellet Mill will be controlled by varying the rpm of Screw Feeder through potentiometer.	3	1	110000	110000
4.9	Dual shaft (Double Barrel) conditioner without motor & Drives MOC- SS 304 Design Feature: 2500 MM long to give 55-60 sec conditioning time at 8-10 ton per hour. Large inspection Windows giving full body access for clean and maintenance Multi Point Steam Injection for Uniform Steam Addition Adjustable blade's angle for changing retention time of the feed Drive – Geared Motors (Bonfiglioli Make)	30	3	380000	1140000
4.10	Super Senior Pellet Mill Model – LHPM-520 Capacity – 8-10 Tn/hr (3.0 mm Pellet Size) MOC- Pellet Mill Front , Backside Plate , Inlet Chute , Knife Holders – SS-304 Manual Winch for lifting of Die & Roll assembly Magnetic Plate with Rare earth Self Cleaning Magnets T Shaft of alloy steel Hardened Wearing Ring Roll assembly with hardened Eccentric Shafts Shear Pin arrangement with limit switch is provided to protect against damage due to over load Straight & Spherical Roller Heavy Duty Bearings 13” motor Pulley for better contact area to V –Belts Bearings are protected by Silicon Seals Die connection is reinforced by a stainless steel ring that is molded to the quill shaft to guarantee a low wear operation of die Technical Details : * Die ID – 520 mm , Die Width – 222 mm	220	1	1250000	1250000
4.11	High Chrome , Gun Drilled , Vacuum Hardened Die 3 mm		1	156000	156000
4.12	Transition Piece (Two way) in SS304 material at Pellet mill Outlet for manually recycling the feed to die or feeding to cooler.		1	20500	20500
4.13	Transition Piece at Counter flow cooler inlet (SS304)		1	20500	20500

4.14	Air Lock above counter flow Cooler (SS 304 Const)		1	55400	55400
4.15	Vertical type Counter Flow Cooler Round Cooler design Cooler roof & walls are made of SS- 304 Control window for Pellet level Control with adjustable level indicator Discharge System and supporting structure fabricated out of MS Heavy Channels	2	1	425000	425000
4.16	Rotary feeder for uniform and full length feeding to crumbler with Bye pass mechanism	2	1	52800	52800
4.17	Pellet Crumbler Moc: Main body fabricated with 12 mm thick plate <ul style="list-style-type: none"> Rolls are made of specially hardened chilled roll steel Spring loaded gap adjustment. There will be zero adjustment also and has the provision to protect the rolls touching each other Bye pass flap provided if you are not making the crumbs. Drive is through helical type gears. By pass flap 	15	1	455000	455000
4.18	Chain conveyor for transferring crumb/ pellet to elevator	3	1	94000	94000
4.19	Bagging Bucket Elevator Capacity – 15 MT/Hr , Model – BE-12 Height – 55 Ft. , MOC – MS Fabricated Bucket Size – 8” x 5” (Shovel Type) Drive – Geared Motor (Bonfiglioli Make) Belt – M-24 Rubberized 4 –Ply Nylon Belt – CONTINENTAL Make With overload control mechanism	5	5200 /ft	286000	286000
4.20	Two Way For Screener By Pass		1	19800	19800
4.21	Two Way At Elevator Outlet		1	19800	19800
4.22	Vibratory Screener(Ball cleaning design) Moc – SS 304	1	2	245000	490000
4.23	Pellet cooler Cyclone Moc – SS 304 , 3 mm thick	2	1	295000	295000
4.24	Rotary air lock (In Ms)and sight glass assembly			45000	45000
4.25	Two Way Below Airlock		1	19800	19800
4.26	Blower for Pellet Cooler Moc – Ms sheet 5 mm thick	15	1	135000	135000
4.28	Duct for Cooler, Cyclone & Blower (In SS304 Const) Moc – 2 mm thick ss-304		1	210000	210000
4.29	Final Storage Bin for Pellet/ Crumbs/ Mash 1 No.s 5 MT Each		1	140000	140000
4.31	Slide gate (Pneumatic) with pneumatic cylinder		2	36300	72600
4.32	Connecting Pipes/ Transition pieces for all machines			175000	175000
	Total for pelleting section				6231700
	Total For Section 1-4				12772000

S.No.	Description Induction motor: ABB- IE2 Geared Motor: Bongfigloli, Italy	Power	Total price Rs.
5.1	Intake Chain Conveyor, Geared Motor	10	75500
5.2	Intake elevator, Geared Motor	7.5	51000
5.3	Jute Remover, Geared Motor	2	23600
5.4	Rotary Distributor, Geared Motor (1 HP)	1	21100
5.5	Feeders below Bins, Geared Motor 5 no. 5 hp @ 34500	25	172500
5.6	Batching Chain Conveyor, Geared Motor	5	43800
5.7	Grinding Bucket Elevator, Geared Motor	7.5	51000
5.8	Rotary Vane Feeder, Geared Motor	2	23600
5.9	Full Screen Hammer Mill, 2800 rpm motor	150	383600
5.10	Mixer's Bucket Elevator, Geared Motor	5	43800
5.11	Double ribbon screw Mixer, 15 HP 1440 rpm	15	37800
5.12	Helical type Gear Box for Mixer		120000
5.13	Paddle conveyor, Geared motor	5	43800
5.14	Pelletizing Bucket Elevator, Geared Motor	5	43800
5.15	Screw Feeder, Geared Motor	3	28800
5.16	Dual Shaft Conditioner, 6 Geared motors 5HP@ 34500	30	207000
5.17	Pellet Mill, 960 rpm Motor	220	582200
5.18	Air lock above counter flow Cooler, Geared Motor	2	23600
5.19	Counter Flow Cooler, Geared Motor for discharger	2	37800
5.20	Pellet Crumbler, 960 rpm motor	15	48300
5.21	Rotary feeder for Crumbler, Geared Motor	2	23600
5.22	Chain conveyor, Geared Motor	3	28800
5.23	Bagging Bucket Elevator, Geared Motor	5	43800
5.24	Air lock at Cyclone, Geared Motor	2	23600
5.25	Blower for Pellet Cooler, 1440 rpm Motor	15	37800
5.26	Motor for Vibratory screener	2	29000
	Total for motors	541	2249200
5.26	Vibratory Screener (Price included in machine,Section – 4.20)	1	
5.28	Premix Automation Dosing System (Optional – Section 16)	20	
4.29	Pulse Jet Dust Collector (Price included in machine,Section – 1.1)	2	

S.No.	Description	Total price Rs.
6.1	Chain Drive for Intake Chain Conveyor & Geared Motor	18000
6.2	Chain Drive for Intake Bucket Elevator & Geared Motor	3600
6.3	Chain Drive for Jute Remover & Geared Motor	3600
6.4	Chain Drive for Rotary Distributor & Geared Motor	3600
6.5	Feeders below Bins, Geared Motor (5 Nos)	18000
6.6	Chain Drive for Batching Chain Conveyor & Geared Motor	3600
6.7	Chain Drive for Intake Bucket Elevator & Geared Motor	3600
6.8	Chain Drive for Rotary Vane Feeder & Geared Motor	3600
6.9	Rubber Coupling Full Screen Hammer Mill and motor	7500
6.10	Chain Drive for Mixer's Bucket Elevator & Geared Motor	3600
6.11	Chain Drive and Coupling for Gear Box of Double ribbon screw Mixer	7200
6.12	Chain Drive for paddle conveyor & Geared Motor	3600
6.13	Chain Drive for Bucket Elevator & Geared Motor	3600
6.14	Chain Drive for Screw Feeder & Geared Motor	3600
6.15	Chain Drive for 6 Motors of Conditioners (6 x 3600)	21600
6.16	V-Belts & Coupling for Pellet Mill	32000
6.17	Chain Drive for Rotary Feeder above counter flow Cooler & Geared Motor	3600
6.18	Eccentric Coupling for Counter Flow Cooler & Geared Motor	3600
6.19	V-Belts for Pellet Crumbler, 960 rpm motor	3600
6.20	Chain Drive for Rotary feeder of Crumbler & Geared Motor	3600
6.21	Chain Drive for Chain conveyor & Geared Motor	3600
6.22	Chain Drive for Crumbs/ Pellet Elevator & Geared Motor	3600
6.23	Chain Drive for Air lock at Cyclone, Geared Motor	3600
6.24	Coupling for Blower & Motor	3600
	Total	169100

7.1	<p>Automation & Instrumentation</p> <p>Load Cell & Sensors Sensors for Batching Silos-16 No.s For Mixer Batch bin & Surge Bin – 2 No.s Medicine hopper - 1 No.s Pellet Bin -2 No.s Cooler– 2 No.s Final Bin -4 pc Limit switch for rotary distributor For Batching weigh bins – 4 No.s</p> <p>VFD With Panel : (ABB/ Siemens) * Hammer mill rotary Feeder * Pellet Mill Screw Feeder * Crumbler Rotary Feeder * For counter flow cooler</p> <p>Temperature Gauges for conditioners Cabling Overload control mechanism</p>	
	Total	60000

10.1	Auto Bagging Section <ul style="list-style-type: none"> • Auto Bagging Machine (80 Kg capacity) Capacity – 5-6 bags / Min (50 – 80 Kg bags) • Slat conveyor of length 5 Mt with Drive • Double thread heavy duty bag closing sewer head Pedestal stand with belt , wheel for height adjustment 	845000
11.1	Oil batching section on weight Basis Oil Storage Tank: Capacity 1000lts 2 no.s Weigh System: 1 Weigh Hopper: Capacity 100lts 2 a) Batch control panel b) with Load cells c) Load cell Junction Box d) Load cell mounting assembly 3 Control Valves for Coarse & Fine feed 4 Control valve for discharge Distribution & operating System: All pipes for transferring oil: 1) from 1000 lts tank to common weigh tank of 100lts 2) from weigh tank of 100lts to mixer. Controller for Batching Oil	374000
13.1	Complete Paints after installation	190000

	Total for all above sections	2,09,19,300
	P&F @ 1 %	2,09,190
	Total With P&F	2,11,28,490
	Finalized Price	1,82,00,000

For LARK ENGINEERING COMPANY (INDIA) PVT LTD

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Annexure 5

Constructional & Technical Specification of the Machines

Plant Capacity

The mentioned plant output is for standard Broiler Feed (8-10 MT/Hr.) with standard feed formulation containing about 55% of maize. The plant will at least give 90 % of the mentioned output. On layer feed as the oil content is lesser than broiler feed output is less. This is based on our practical observation in the plants of similar type, provided there is no down time due to power failure, low voltage, human error (for eg: batch preparation, bagging of final product etc)

Product Quality

As the quality of product is governed by so many factors i.e., Feed formulation, Conditioning temperature, conditioning time, Die Configuration, Grinding quality, Steam Quality, Running output of pellet mill etc.

We as plant supplier, will try our best to achieve the best possible, however our responsibility is limited to performance of machines only.

1 Auto Batching

Batching System consists of :

4 load cells ,Batching controller , load cell cable upto 30 mts , junction box for load cells , provision of manual operation

Auto Batching (Process & controller)

8 Ingredients are weighed in a 1000 kgs weigh Hopper

The batch is discharged from the weigh hopper by operator by pressing the DISCHARGE push button.

Controller Features:

The batching controller is designed for batching of 4 different ingredients. The controller has following Features.

- * Recipe storage of upto 10 recipes.
- * Direct selection of 6 recipes from keyboard.
- * 6 lines LCD for programming and alarms.
- * LED display for display of weight for weigh hoppers.
- * Automatic overfill compensation.
- * Inputs for remote START BATCH- DISCHARGE BATCH- ABORT BATCH
- * Inputs and outputs optically isolated
- * 16 bit analog to digital converter
- * Calibration through keyboard
- * RS 232 port for printer interface
- * Tare Checking

* Tolerance Checking- tolerance can be set for individual material. If material is undercharged the feeder is again started to achieve the target weight. If material is over charged the system will raise an alarm. Further by incorporating **Computer** with the system through Proper Software the features of the system is enhanced many times; the above features are for controller only when operated manually without computer.

Reporting:Four separate usage periods are used to aggregate usage of materials per shift, day, week and month. The production totals use the same periods and a shift report summarizes all the batches produced in the current shift.

2 Silo Loading Panel

It will consist of controls for filling different silos by operation of certain pneumatic gate in desired pattern.

It will also indicate the high level and low level of ingredient in the silos.

3 Intake Hopper

Intake hopper capacity: 150-200 kg

4 **Bucket Elevators**

Bucket Size: 8" x 5"

Belt: M-24 rubberized 4 Ply

Boot and Head fabricated out of 4mm sheet. Elevator's Boxes fabricated out of 2mm sheet with angle supports. Base Frame of Gear motor fabricated out of 6 mm plate.

Platform at top for maintenance is provided with access thru monkey type ladders or via Platform. Top Pulley is crowned for self alignment of Elevator's belt.

5 **Chain Conveyor**

Main body fabricated out of 3mm and 4mm MS sheet and Chain Links of 8mm thick MS Flat

6 **Cascading Magnets**

Iron thrash etc. going to feed grinder is caught here in this pipe with the help of two powerful magnets. Magnetic Plate is self cleaning type with collection tray. Magnetic Plates are fitted with powerful "rare earth type" magnet.

7 **All Bin**

Fabricated out of 3 mm sheet with necessary stiffener. Slope is provided in all bins for free flow of material without jamming.

8 **Slide Gate with Flexible Connection**

This is provided to isolate the vibration of grinder from rest of the plant. And Bin over grinder is also Supported on structure.

9 **Full Screen Hammer Mill**

Hammer Mill is fabricated with plates of varied thickness depending upon the requirement. Support rings for screen fabricated with 25 mm thick plate, Main body fabricated with 8 mm thick Plate and 12 mm thk supporting plates. A special feature of Gap adjustment between screen and hammers is provided for output of varying fineness.

Keeping in view the maintenance time wasted in repairing/ replacing rotor, we have given a special provision, which hardly takes one hour to dismantle rotor from grinder and then fitting it back to its position without altering the position of the Grinder. Rotor is dynamically balanced.

Recently added features:

1) Gap Adjustment: As fineness or coarsity is greatly governed by the gap between hammers and screen, we have recently provided an adjustment to vary the gap between hammers and screen. In our previous models of hammer mill gap adjustment was made by varying the position of hammers on the rotor of different PCDs which was time consuming but in our new models this be done by altering the position of screen i.e. either nearer to hammers or farther from hammers. This feature has the great utility when you are continuously making feed of varying size (such as broiler feed chicks, grower and finisher).

10 **Rotary Vane Feeder**

It will be fitted on Full screen Hammer Mill to gradually feed the grinder. Rate of feeding will be controlled by changing the rotational speed of vane feeder.

Rotary feeder will be fitted with full width magnets. Magnetic Plates are fitted with powerful "rare earth type" magnet. Fabricated out of 6mm Plate with angle support.

11 **Frequency Variable Speed A.C. Drive for Hammer Mill**

It will be required to change Speed of rotary Feeder for optimum feeding.

Drive Make: ABB/ Siemens complete with panel

It is provided to control the rate of feeding of raw ingredient to the grinder according to the load on the main motor. Fully Automated control through drive, eliminating manual operation. Provision of manual control through potentiometer if fully automated control fails. Further if Drive fails or due to some mechanical or electrical Fault and whole system stop working, this whole unit can be bypassed with help of the gate provided

12 **Double Ribbon Screw Mixer**

Model: LHMR-10

Capacity: 1000 Kg/batch

Power: 15 HP 1440 rpm Motor with our own make gear box

Mixer Drum Const: 5 mm Thk MS , Mixer Side wall: 5 mm Thk MS

Discharge Gate: pneumatically operated slide gates for discharge

Mixing Efficiency: It can mix the whole batch within 6 to 8 minutes with coefficient of variation less than 7%

13 **Surge Bin below Mixer**

Capacity: 1.5 ton/batch. Paddle conveyor is attached below it .

Const: 3 mm thk Sheet with necessary reinforcement for stiffness.

14 **Pellet Screw Feeder and Steam Conditioner**

All feed contacting parts will be in SS304 construction.

Rate of Feeding to the Pellet Mill will be controlled by varying the rpm of Screw Feeder through potentiometer.

Feed is processed in conditioner which is of dual shaft paddle type for maximum exposure with the steam. Conditioner has manually adjustable blade's angle for changing retention time of the feed. **Three** such conditioners will be fitted in the plant.

15 **Pellet Mill**

Super Senior Type Pellet Mill with die of 520 mm inside diameter designed for 8-10 TPH of pellets on 3mm hole die.

Pellet Mill is fitted with our own make Roll shell Assembly (Alloy Steel)

Pellet Mill front door will be in SS-304 const.

Backside side plate will be in SS-304 const

Pellet mill inlet chute will be in SS-304 const

Knife Holders will be in SS-304 const

Magnetic Plate with Rare Earth magnets provided at pellet mill inlet chute

T-Shaft of Alloy Steel in one piece

Wearing Ring of Alloy Steel

A shear pin arrangement with limit switch is provided to protect against damage due to over load

16 **Air Lock above cooler**

Will be made of SS 304 grade and fitted on top of vertical cooler for intake of hot pellets without entrance of air.

17 **Vertical Type Counter Flow Cooler**

Parts coming in contact with hot pellets will be of stainless steel SS304 grade. Discharging System and supporting structure fabricated out of MS heavy channels.

Discharge of pellets after desired cooling is Automatically controlled by Level controller

18 **Crumbler**

Main Body fabricated with 12 mm Thk Plate

Crumbler rolls made of Chilled CI

Bye pass flap provided if you are not making the crumbs

Drive is through helical type gears with provision for gap adjustment between the rolls for varying size of crumbs

For uniform feeding of pellets on the rolls rotary vane feeder is provided above the Crumbler.

19 **I D Fan (Blower), Cyclone & Ducting**

Blower fabricated out of MS 5 mm thk, Ducting 2 mm thk SS-304

20 **Others**

Steel Structure: will be of completely bolted type with all necessary ribs, railing, stairs and ample space for maintenance. Total Wt of the Structure including Chequered plates and Stairs (Approx 50 tons). Steel Structure includes Medicine hopper, Access stairs for mixer, Platform to access mixer, Chequered plate as flooring, Railing pipes, all nuts & bolts for fastening Structure

21 **Premix/ medicine hopper:**

Provided above mixer to avoid dust while dumping micro ingredient into mixer.

Premix section is equipped with two 500 kgs or 1000 kgs storage hoppers , and 75 kgs weigh hopper , two screw feeder , all made of SS 304 grade stainless steel.

Accuracy : within +- 200 gms of accuracy will be achieved .Accuracy also depends on material characteristics like flowability ,moisture content etc. We will try our best to achieve the maximum possible accuracy .

22 **Motors/ Geared motor/ Gear Box and Drives**

Geared motor where ever mentioned will be of Bonfiglioli/ Shanthi/ PBL (Elecon)

Induction Motor will be Crompton / ABB make.

For Double Ribbon Screw Mixer: Gearbox for Mixer will be of Helical type

23 **Motor Control Centre**

The MCC is consisting of followings:-

- a) An Incoming main switch.
- b) Indication lamp to indicate interchange of phases in Main supply.
- c) Main line Ampere meter and Voltmeter with selector switch and indication lamp.
- d) Switches for all motors.
- e) D.O.L. starters for motors of 10 HP or less.
- f) Star-Delta Starter for motors above 10 HP.
- g) Change over to change direction of rotation of grinder.
- h) All internal wiring of MCC.

MCC is cubical type, self supporting and all starters and switches mentioned will be of L & T/ Schneider/ GE/ABB/ telemaquinic make.

24 **Pneumatics and Air Compressor**

Pneumatic services consisting of

- a). Compressor working on 3 HP motor (Standard Make **Elgi / Inest Iwata Motherson / Crompton Greaves**)
- b). FRL units
- c). Piping from compressor up to individual cylinders via FRL units.
- d) Drier
- e). All other necessary fittings for piping etc.

Note: Cost of cylinders and solenoid valves are included along with the individual machinery & Equipment

25 **Paints**

All Machines are duly coated with the Red oxide and Painted in the company standard colour. Structure & chequered plate is also Painted. Any repair / touching of paint required after erection of the machines will be done by us.

Annexure 7

Exclusions: (Client Scope)

S.No.	Exclusions from Offer	Specifications	Make
1.	Boiler , chimney, water softener , all valves & pipeline upto conditioners.	1500 Kgs / Hour , Dry Saturated Steam at around 85 degree celcius.	Thermex / CBL/ Forbes Marshall
2.	PRV	As per lark drawing	Thermex / CBL/ Forbes Marshall
3.	Civil Work	Pits / foundation work	As suggested by your local (we will provide the drawings)
4.	Earthing , lightning arrestor etc.	Chemical Earthing -	-----
5.	Soil Testing	As per layout	-----
6.	Power Factor Panel	650 kva	Any Reputed manufacturer.
7.	Transformer	650 kva	Any Reputed manufacturer.
8.	Panel Cabin		
9.	Lighting & Illumination		
	Electrical wiring from Mains to MCC panel		
10	Transportation	15-16 Vehicles -22 FT	-----
11	Genset	650 kva	Cummins ,Kirloskal or equivalent reputed make
12	Weight Scale	60 MT	Avery or reputed make
13	Taxes	12 % GST on Machines 18 % GST On erection & commsioning	-----
14	Plant Space	50 x 50 x 65 Feet (L x B x H)	
15.	Raw material Godown	As per raw material storage : 90 x 250 ft : is sufficient to store more than 2000 MT Raw Material(on maize density @ 15 feet stacking height) & 300 MT Finish Feed	
16.	Sheeting , Truss & Purlin on feed mill area		
17.	Material for trial run		
18.	Unloading of machines at client site		
19.	Loading , Packaging & Forwading	@ 1% project value	
20.	Main (Bulk) Tanks – Oil & Molasses , pipeline upto day tanks		

Annexure 8

BUSINESS TERMS & CONDITIONS

1. **PRICE BASIS:** Prices quoted in this offer are Ex-our works at Yamuna Nagar and with standard accessories only. **GST @ 12% will be charged extra.** Any other levies, octroi will be to your account. The present offer is based on prevailing prices of raw material, standard components, present rate of exchange Government Policies/ taxes, etc. **In case of major price inflation, we will be liable to supply you machines equal to amount paid us only.**

2. **TRANSPORTATION & INSURANCE:** On to Pay Basis – Client Scope . Client is required to draw suitable insurance policy covering all risks during transit, loading, unloading, safekeeping at site, erection, commissioning, testing, trials and all event till handing over of the project and commercial production. Policy should cover all material, events, personnel etc. for act of God, fire, malicious damage etc.

3. **PAYMENT:** * 5 Lacs Advance with Purchase Order for starting designing work , layout , site plan and foundations.
* 30 lacs after layout design & submission of foundation drawings to your civil experts – To initiate the production process.
* Balance (including taxes) - 5 lacs --- Against performa Invoices before dispatches.
* 5 Lacs – After 1 month of commissioning or 1000 MT of production whichever is earlier with post dated cheque. **(All payment to be made at yamunanagar)**

4. **DELIVERY** : Supply of machines ; 8-9 months from the date of Purchase order with advance (30 lacs) .We need Covered area
For Erection : 2-3 months from the date of receipt of all equipment's at site , completion of civil work and receipt of power connection at site.
* Delivery subject to normal availability of raw material , components, Plant Design etc

5. **VALIDITY:** This offer is valid for a period of 20 days for Mechanical equipment and 7 days for electrical equipment (If any) and subject to confirmation thereafter

6. **QUALITY WARRANTY:** Machines manufactured by us are guaranteed against any manufacturing defects for a period of one year. This does not in any case cover defects due to improper use and mishandling. Warranty for Standard items/ equipments such as motors, bearings, V-belts etc which are procured from outside, will be directly given by the supplier / manufacturer.
For pellet plants, once we have commissioned the plant with successful trial run, we will not be responsible for defects arising of operators fault, mis-handling.
For automated computer controlled plants, warranty and after sales services will be as per their terms and conditions.

7. **FORCE MAJURE:** We shall not be liable for any loss or damage due to late delivery resulting from circumstances beyond our control and in particular, but without prejudice, to the generality of foregoing act of God, war, Government, inability to obtain raw material, equipment, power, fuel, transportation, lockouts, strikes etc.

8. **ERRORS:** Any typographical errors/omissions in this offer if any are subject to corrections

- 9 **CANCELLATION**: In the event of cancellation of the order, buyer shall be liable to pay for all the machineries which are ready with us .In such an event the balance of advance amount with us shall also be forfeited.
- 10 We reserve all rights to change design or dimensions, as we deem appropriate at any time.
- 11 **JURISDICTION**: All disputes subject to Jagadhri jurisdiction only
- 12 **GST** : The client is responsible for & shall pay all differences in taxes, Charges, levies & duties of any nature payable in connection with the supply of goods, in case GST will be applicable.
- 13 **Warehouse storage**: In case of project delay from client side ; and the delivery exceeds the decided time frame ; warehouse storage charges will be applicable @ 1 % per week of the project value.

For Lark Engineering Co. (India) Pvt. Ltd.

Harjot Singh

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