

Feasibility study of mini-feed mixing Unit (managed by CHIRAG supported SHG Federation in Nainital district, Uttarakhand)

1. Introduction

As part of the TATA-ILRI partnership programme (ELKS), ILRI is supporting Himmotthan to strengthen their activities on livestock-based livelihood improvement in their project villages in Uttarakhand. Earlier studies in the State reveal that lack of availability and quality of feeds and fodder is one of the key constraints limiting dairy production, particularly in the hilly districts. To address this issue, among other things, it was suggested to explore possibility of producing balanced feeds locally in such areas utilising locally available feed ingredients. In this context ILRI (Padma, Arindam, Sapna) along with Mr Ghanshyam Joshi (Quality Control Manager of Uttarakhand Cooperative Milk Union's Feed Plant) made a visit to a mini-feed mixing unit managed by a women Federation (Parvatiya Pashu Palak Sangh) promoted by CHIRAG (a reputed NGO in Uttarakhand) in Reeta village of Nainital district.

2. Observations

- The feed unit consists of a grinder (3 HP) housed in a rented building where feed ingredients and finished products are also stored. The Women SHG Federation received grant from Chirag (NGO) to purchase the grinder worth Rs 50,000/-. The grinder has a capacity of 50 kg per hour (4 quintals /day). The SHG members also received training from *anthra*, an NGO in Pune on feed compounding techniques. The initiative was started in 2010 on pilot basis with the support of Himmotthan /SRTT under the Integrated Fodder and Livestock Development Project (IFLDP).
- Generally, during harvest season, the SHG purchases and stores locally available feed ingredients such as maize, barley, madira (Barnyard millet), and soya seed from the farmers in the area. Other required ingredients such as wheat bran, mustard oil cake, rice polish, urad (Black gram) husk, salt and mineral mixture are purchased from the market located in Haldani (2½ hrs travel time from the village). The coarse ingredients are grinded before storage. All ingredients are stored in large steel bins. CHIRAG supported the SHG with a working capital for the purchase of the feed ingredients during harvest season (at the time of the team's visit feed ingredients worth Rs 50,000/- were in the store).
- Based on demand, 2-3 members of the SHG mixes the stored feed ingredients manually according to a formula provided by their trainers and bagged the mixed feed in 25 kg bags. The composition varies according to season (see below the formula used in February):

Maize	30%
Barley	08%
Barnyard millet	20%
Mustard oil cake	07%
Soya seed	15%
Rice polish	03%
Wheat bran	07%
Urad husk	05%
Salt	03%
Mineral mixture	02%
Total	100%



- On an average five quintals of the finished product is sold in a month. The demand varies in different months (December 2011, it was 21 quintals, whereas in January 2012 it was six quintals only).
- The feed is sold as 'organic' mainly to dairy farmers who are members of the SHG at a price of Rs 16 per kg. The SHG procures about 1000 litres of milk per month, which is sold locally.
- Discussion with the quality control Manager of Anchal Cooperative Milk Union revealed that their feed factory located in Rudrapur (one of the districts in the plains) currently produces different types of feeds (under the brand name *Anchal*), of which compounded feed (Type-II) for cattle & buffaloes has the lion share (1200 tonnes /month). This feed is distributed through village dairy cooperatives (attached to the Anchal milk Union) of various districts including the hilly districts (see details below):

Nainital	400 MT	US Nagar	400 MT
Haridwar	80 MT	Dehradun	80 MT
Almora	50 MT	Pithoragarh	50 MT
Chamoli	15 MT	Tehri	15 MT
Pauri	20 MT	Champawat	20 MT
Govt. Farms	70 MT		

Anchal's price is Rs 1000 per quintal (20 bags of 50 kg each). Transportation charge of Rs 150 /quintal is charged extra.

The team took samples of both CHIRAG feed unit and that produced by Anchal Cooperative and sent them for analysis.

3. Reflections

- The quantity of feed produced (based on demand) by the mini feed unit in Nainital is only 4% of its production capacity (16 kg per day against its capacity of 400kg /day). For every litre milk procured 500 g of feed is used (500 g per litre x 33 lit procurement /day = 16 kg /day). The low demand is justified by the low quality animals. The feed is used only for strategic feeding (at the time of lactation and advanced stage of pregnancy).
- In spite of the low scale of operation, the promoters of the mini feed mixing plant is found happy with what they do. They believe that dairying is a difficult proposition in the hills and one needs to aim to increase production only to a level, which can saturate the local market (with milk and milk products). This perspective is in variance with the general market led approaches, which aim at linking rural production centres to the fast growing urban /peri-urban demand (which requires large investments in the form of infrastructure and institutional set ups for backward-forward linkages, which is beyond the scope of NGOs).

Selling price of the feed produced by the mini feed unit is Rs 16 per kg/- against a production cost of Rs 14.45 (even with this low turn over, they made a profit of Rs 18,000 in 2010-11):. The costing is given in Table 1 below.

Table 1: Costs and profit of every 100 kg feed produced by the Mini-Feed Mixing Unit

Particulars	Price (Rs /quintal)	%
Feed ingredients	1204	75.25
Labour (grinding, packing)	150	9.37
Packing material	41	2.56
Rent, electricity	50	3.13
Total cost	1445	
Selling price	1600	
Profit	155	9.69

At the same time, the feed produced by Anchal cooperative is available in Haldwani market @ Rs 10 per kg (Rs 11.50 /kg including transportation). The Anchal Cooperative is producing balanced feed (Type II as per BIS standard) at a comparatively lower price, probably because of cheaper (bulk) purchase of feed ingredients, most of which are available locally in Rudrapur area.

- The difference in price between the two agencies is Rs 4.50 per kg. Promoters of the mini feed mixing unit claim that the feed produced by them is 'organic' and hence the higher cost is justified. Besides, it provides 8 days employment (in a month) for two women in the area. Further, the farmers who supply the ingredients (wheat, barley etc.) are paid a slightly higher price than open market price.
- It needs to be noted that almost 50% of the ingredients used for compounding the feed are purchased from open market and hence the claim of 'organic' can be challenged. Similarly how the 'organic' feed additionally contributes to the quantity and quality of milk needs to be established to understand the cost benefit. Presently it seems to be based on perceptions.
- The result of nutritional analysis (NIRS) of the two samples carried out at ILRI lab in Hyderabad is shown below, which is self explanatory;

	Anchal	Chirag
Crude protein (CP %dm)	20.86	20.30
Neutral Detergent Fibre (NDF %dm)	36.26	31.07
Acid Detergent Fibre (ADF %dm)	14.77	08.52
Acid Detergent Lignin (ADL %dm)	03.25	02.01
Metabolisable Energy (ME MJ/Kg)	09.33	11.13
Digestibility (IVOMD %)	67.29	77.17

- Ideally, before start thinking about new feed production units, one needs to see whether the animals in the area can meaningfully respond to improved feeding. If we are determined to improve feeding it is better to feed improved animals as they respond much better than the local ones. Otherwise breed improvement shall also be considered as a priority activity along with nutritional improvement. In short feed improvement alone will not be effective in an area dominated by local cattle /buffaloes.
- A practical approach for improved feeding is to first check the possibility of making available the desired quality of balanced feed from existing manufacturers through a contractual arrangement. If this does not work, then one can think of locally producing it, provided the main ingredients can be sourced locally at cheaper price.
- If the major ingredients can be locally procured, then go for a feed mixing unit. First look at the economy of scale. In the present case, the production capacity is 4 quintals/day (10 MT per month). Atleast 75% of the capacity (3 quintals /day) needs to be utilised, for which one can think about market promotion in neighbouring villages /towns.

4. Next steps

Considering the points discussed above, establishment of a mini feed mixing plant to produce 10 MT of balanced feed /month will be initiated in selected project locations in Uttarakhand. A detailed plan is attached as Annexure 1.

Annexure 1

Draft plan for a mini feed mixing unit appropriate in the hilly regions of Uttarakahnd

A. Output per day

4-5 quintals per hour (3-5 MT /day)

B. Machinery:

(a) Grinder (b) Mixture

Two types of grinders can be used:

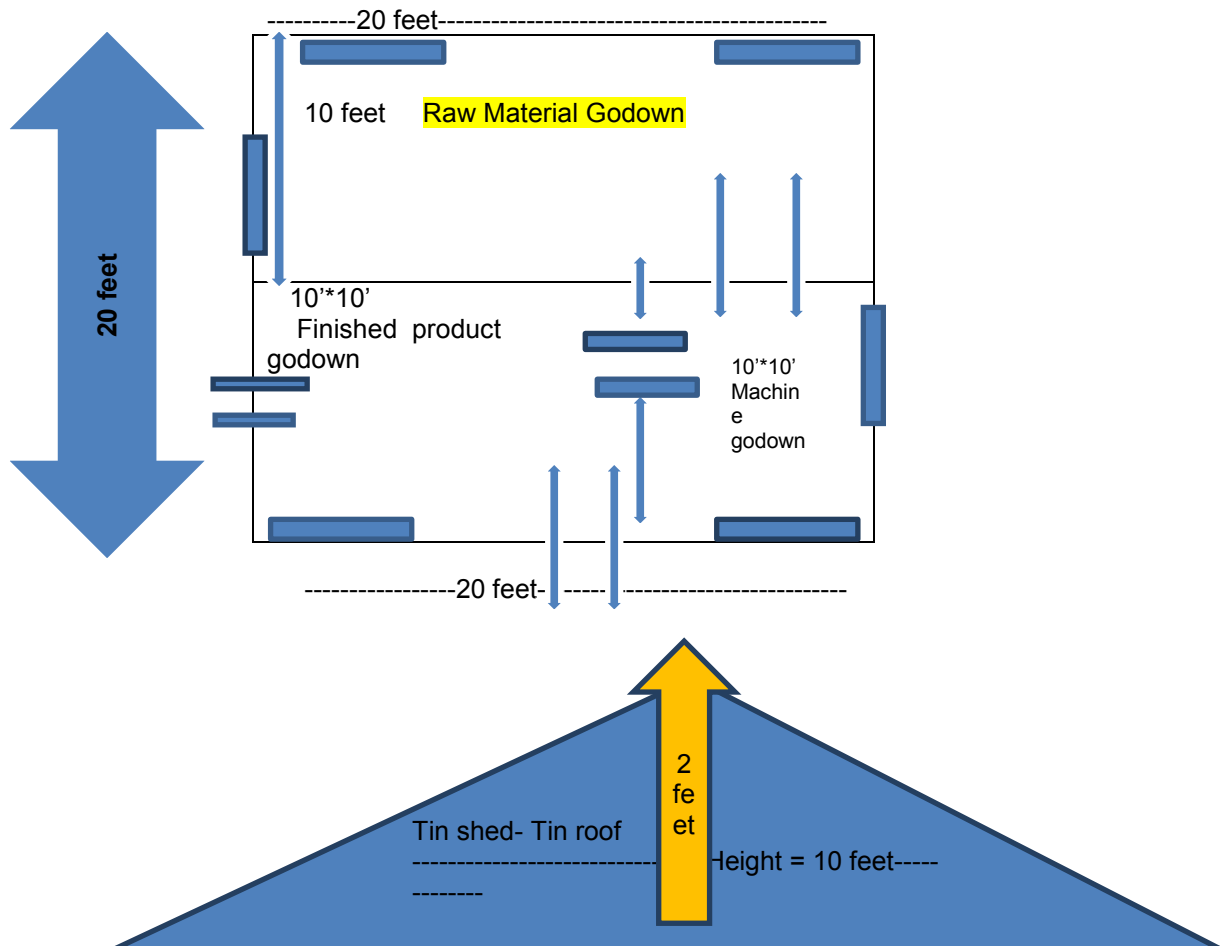
1. 20 inch –diameter- with 7.5 horse power motor- with 4q/hr capacity- its cost- Rs10,000+ Motor= Rs 18,000= Total Rs 28,000. Crompton Greives brand can be used.
2. 16 inch diameter- 5 horse power motor- capacity- 3q/hr-its cost- Rs8000 +Motor cost= Rs 14,000, Total cost= Rs 25,000/-

(Address of the party which sells this: Aggrawal Agriculture and Machinery Store, Galla Mandi Road, Rudrapur. Phone: 05944-243395,9719345548)

Note: No mixture would be required if the quantity is less. Later on a mixture can be added at a cost of Rs 25,000/- and can be run on the same motor

C. Floor design:

20 feet * 10 feet, Height of tin roof = 10 feet. Rat free design.



D. Main ingredients:

- a) Food grains and rice polish – maize, wheat, rice as energy source
- b) Protein source- mustard oil cake (soya is the best protein source) and de-oiled mustard cake.
- c) Mineral mixture
- d) Vitamin A, D3

Note: The decision to start a mini feed mixing unit in a location shall be made if major ingredients (maize, soya) can be procured locally. Otherwise it is wiser to arrange supply of total mixed ration from nearby existing manufacturers based on a contractual arrangement indicating quality and price.

E. Budget

- a) Rs 50,000- machinery
- b) Working capital for raw material purchase= Rs 5 lakh
- c) Building (hire)

F. Income and Expenditure:

Particulars	Amount /quintal (Rs) (approximate)
Raw materials	1320
Packing	20
Rent	50
Electricity	
Manpower	
Storage losses	
Depreciation	
Profit	
Profit	10
Total (selling price)	1400

Courtesy: Mr Ghanashyam Joshi
Quality Control Manager, Feed Plant, Rudrapur