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Integrated Agribusiness Model- A Public Sector Success Story of Instructional Dairy Farm

SINGH, SAURABH

College of Agribusiness Management, Govind Ballabh Pant
University of Agriculture Technology, Pantnagar, Uttarakhand,
India

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**Integrated Agribusiness Model: A Public Sector Success Case of University
Instructional Dairy Farm, Pantnagar**

Saurabh Singh*

ABSTRACT

Agribusiness is the buzzword these days and is the main force behind the commercialization of the agriculture. Contract farming, One stop shop, Opening of the retail stores, starting of the terminal markets, establishment of processing units etc. has proved that agribusiness is very much happening in India. It has not only helped strengthen the forward and backward linkages but has also created opportunities for employment. With the advent of corporate players, many successful agribusiness models have been developed. Even Co-operatives like Gujarat Co-operative Milk Marketing Federation has developed a model that has become a successful case study (Amul). Many agribusiness projects are being undertaken by both public and private parties on Public Private Partnership mode.

State Governments are also trying to develop agribusiness models with the help of their agricultural universities. G B Pant University, Pantnagar, Uttarakhand, is one of the universities that have created milestones not only in academics but also in agribusiness. The university started commercial seed production on 10000 acre farm in 1960; launched a seed company in 1969 has now launched agribusiness model on its Instructional Dairy Farm. The farm has 13 units that are closely interrelated to each other. Out of these 13 units two units vermicompost and fodder bank have been recently developed and making good commercial impact on IDF. The unit is conducting all the livestock farming activities on commercial lines. The case study aimed at evaluating this agribusiness model. The model is found working very well and is worth replicating. The model also showcases the successful establishment of agribusiness unit on public private and NGO relationship mode.

*** Contact Details:**

**Saurabh Singh, Assistant Professor
College of Agribusiness Management
G. B. Pant University of Agriculture & Technology, Pantnagar
PIN - 263145, U. S. Nagar, Uttarakhand
Email: saurabhrsingh@rediffmail.com**

Integrated Agribusiness Model: A Public Sector Success Case of University

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In the process of diversification, livestock and poultry are the most favored agribusiness ventures. Out of about 20% contribution made by agriculture in national GDP, 5.4% is contributed by livestock sector. During the last two decades, value of livestock products increased at the rate of 5.2% per annum which is more than twice the growth in agricultural sector. In terms of share in the total value of output from livestock sector, bovine milk is the most important product. The contribution of milk group to the national GDP is more than other major agricultural products like wheat, rice and sugarcane.

The emerging concept of agribusiness has changed the scenario of agriculture and livestock. Now the basic purpose of agricultural activities is not the self sustenance but commercialization thereof. The commercialization of agriculture and livestock sector has not only strengthened the backward and forward linkages, but has also provided employment to a large number of people. It has improved the economic condition of the farmers and most importantly has added value to the produce. With the advent of big private players many successful models have been developed. Even the cooperatives like Gujarat Cooperative Milk Marketing Federation (GCMMF) have developed a successful case study of Amul.

Many agribusiness projects are being undertaken by both public and private parties on PPP (public private partnership) mode. State governments are also trying to develop such successful models with the help of their Agriculture Universities. These Universities are also trying to develop agribusiness model(s) on their own. The first farm University, G. B. Pant University of Agriculture and Technology, Pantnagar, has recently done a pioneering work on developing agribusiness model at its Instructional Dairy Farm (IDF).

The Instructional Dairy Farm established in 2002 has 13 units. All these units are integrated with each other. The farm is carrying all the activities right from the

maintenance of the herd to milk production and supply, management of waste products and fodder production. Vermicompost unit and fodder bank have been launched recently and are reportedly making a good commercial impact on IDF. The University has developed IDF as an integrated agribusiness model. The purpose of this case study is to evaluate the agribusiness model at IDF with following specific objectives:

1. To study the integrated agribusiness model adopted at Instructional Dairy Farm (IDF)
2. To document the key success drivers of commercial units of IDF; and
3. To suggest improvements in the existing model

Research Methodology

To attain the objectives of the study case study method of research was adopted using both primary and secondary data. Secondary data were collected from the official records of IDF as well as from magazines, journals and Internet. Primary data was collected through personal interviews of senior functionaries of the University and other stakeholders. The data was collected through the well designed questionnaires.

Origin of the Case

There was a Tarai State Farm in Uttar Pradesh, which was set up in 1948 with a herd of Murrah Buffaloes and Haryana cows. Later in 1956 the Sahiwal cattle were introduced at the farm. The University came into existence in July 1960, on a large erstwhile Tarai State Farm. Till then, Tarai State Dairy Farm remained under the administrative control of the State Government of Uttar Pradesh. It was in September 1961 that the State Farm was transferred to the University, (then U.P. Agriculture University) set up on the Land Grant Pattern of U.S.A. to cater to the research, teaching and training needs of the faculty and students of the University. The farm was then known as “**Livestock Research Centre**”. It was under the administrative control of Dean, College of Agriculture.

At the time of transfer, the farm had around 150 buffaloes, 40 Haryana and a small number of Sahiwal cows. It was engaged in supplying breeding bulls to the farmers and livestock owners in Tarai area and its neighbourhood and also for use in key villages

through State Animal Husbandry Department. It was also engaged in the distribution of milk to nearby Haldwani and Rudrapur townships. In addition to this it had one sale depot at Nainital which was closed in 1963 due to the shortage of milk, as by then the milk produced at farm had started distributing in the university campus. In 1963, Jersey crossbreds were procured from Hassargatta Farm, Bangalore. From 1961 to 1964 the Dairy farm remained under the administrative control of Dean, College of Agriculture. From 1965, the administrative control of the Livestock Research Centre (LRC) was transferred to Director, Experiment Station of the University. Under the administration of Director, Experiment Station, LRC had become rich in hybrids of cows and buffaloes. In 1967 a good number of Rathi cows were purchased from Rajasthan, Red Dane from Denmark and Jersey cows from Australia were made available to the farm through Indian Council of Agriculture Research, New Delhi. To meet the demand of milk in the campus, crossbreeding with Indian breeds was started in the year 1968 with Jersey male line. Later on in the year 1972 Red Dane and Holstein Friesian bulls were also incorporated in the crossbreeding programme to produce hybrid of different genetic groups which was an aid in selecting best in the group to multiply on large scale in future breeding of cattle breed of the Dairy farm. This process of breeding of cattle breeds on the dairy farm continued since then. At present the total herd strength is 698 (as on 1st April, 2006).

Managing the herd was becoming a problem for Director, Experiment Station on account of lack integration of animal sciences and veterinary sciences with its activities. This problem of coordination led to the decision by the University to transfer the control of the LRC to the College of Veterinary and Animal Sciences.

With the transfer of LRC under the administrative control of College of Veterinary and Animal Sciences in 2002 it was named as **Instructional Dairy Farm**. The I D F has worked not only on the research and experiment but has also progressed in developing the agribusiness model for profit and revenue generation. In order to facilitate working and easy inspection, the farm was divided in different following units:

1. Livestock production unit

2. Milk production unit
3. Milk supply unit
4. Artificial Insemination and reproduction unit
5. Veterinary clinics
6. Fodder production unit
7. Feed processing unit
8. Farm machinery and implements
9. Establishment
10. Store
11. Watch and wards

Two units namely Vermicompost and Fodder Bank were added to the IDF in 2005. With these the number of units under IDF increased to 13. The main aim of establishing the Fodder Bank was to collect the agri waste like wheat and paddy straw from University farm, convert it into balanced cattle feed to provide it to the animals where fodder availability is limited and to reduce the cost of transportation of animal feed to higher altitude area of Kumaon region. Later on this unit was commercialized and on the basis of the demand by farmers or livestock owners the selling of fodder started. The “Pant fodder” is the brand name of the fodder. The University itself is marketing its fodder through its research centers in hills and is planning to promote its product.

The establishment of Vermicompost unit in the year 2005 was an innovative idea on the part of the University. To make it an agribusiness unit an agreement was reached with a NGO named SHAPE and the Uttarakhand Seeds and Tarai Development Corporation (UAS&TDC). Though the initial aim of the unit was to convert biodegradable mass in vermicompost but the unit was also commercialized and the products vermicompost, vermiwash and earthworms were marketed as Pant vermicompost to various institutions, states and the President House. The first demand came from the President’s house. According to tri-partite agreement UAS&TDC was the marketing agency for these products. It was decided in the agreement that if there is a demand of less than 10

quintals, University can directly sell the produce but if the demand order is of more than 10 quintal, the produce will be marketed by UAS&TDC. Since the volume of production is still not much the marketing is not very aggressive.

Some recent developments on the IDF are as follows:

1. A unit of pure Murrah buffalo breed has been established with 25 buffaloes.
2. Maximum milk production from buffalo is recorded as 24 liters of milk a day.
3. A unit of pure breed of Sahiwal cattle has been established for conservation and propagation of this indigenous breed
4. Calving rate has been raised from 68.5% to 76% during last 5 years from 2001-2006

Ongoing Diversifications

The university has decided to further diversify the activities of IDF, so that it could work more efficiently and could act as a self sustaining unit. Some of the plans for the diversification that are being implemented or are in pipeline are as follows:

1. Modernization of Instructional Dairy Farm by making it fully mechanized.
2. Use of the technology to prepare skimmed milk and non skimmed milk and for hygienic packing. The idea is to transfer milk from “**Teats to lips**”.
3. A pilot work on the biofertilizer.
4. Supply of the cow urine to the pharmaceutical companies.

Components of the Agribusiness Model

Instructional Dairy Farm is located about 3 Kilometers eastward from the administrative building of the University at Nagla. The southern boundary is covered by the road approaching Anandpur village. IDF shares a total of 735 acres of land with its two close neighboring centers and college, namely Instructional Poultry Farm in the south and Fisheries Research and Training Center (FRTC) and College of Fisheries in the North. The distribution of the total land area of the farm as per its existing utilization is given in table1.

Table 1 Distribution of Land Area of IDF

Activities	Area covered(acres)	Percentage (%)
Fodder Production	477	64.90
Fodder Research	25	3.40
Plantation	15	2.04
Non-farm use: cattle sheds, Poultry Farm, PG family hostel, Residential buildings	218	29.66

Organizational set up of the Model

IDF vision statement stands as “**dissemination of good livestock farming practices to augment productivity**”. The agribusiness model adopted at IDF has been integrated with every unit of the farm and has thus strengthened its backward and forward linkages. Now IDF is generating revenue and profit for the university. The agribusiness model adopted at the farm is shown in the exhibit 1.

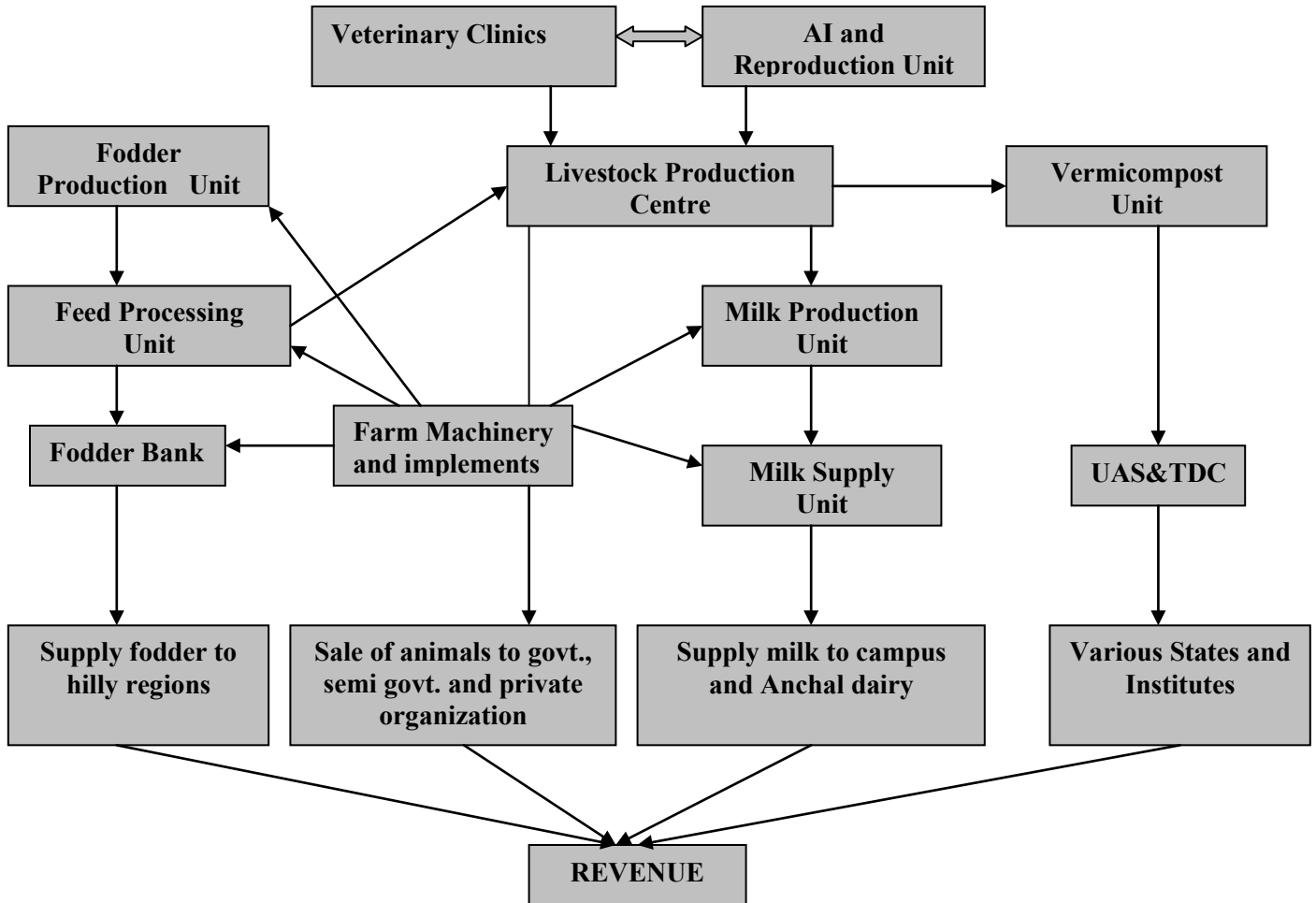


Exhibit 1: Agribusiness Model Adopted at IDF, Pantnagar

Units and their functions

Following are the main functions and achievements of 13 units of IDF:

Livestock production unit: The livestock production unit takes care of all type of livestock for feeding, shelter, water etc. This unit, however, is mainly involved in rearing of cattle and buffaloes. Presently the unit is having Sahiwal, Crossbreds of Cattle and Murrah buffalo. The strength of the herd in the unit is shown in the table 2. Among crossbreds the milch animals are more than 150 in number while in Sahiwal the number of heifers is the highest and in Murrah buffaloes dry type animals are more in number.

The main functions of this unit are as follows:

- To rear purebred and crossbred animals of various genetic groups
- To provide proper facilities of housing to various categories of cattle and buffalo
- Generation and maintenance of all types of livestock records
- Culling of unwanted and surplus male calves and their disposal through auction
- Sale of bull calves to Government, semi government and private organizations

Table 2: Herd strength of IDF

Breed	Milch Animals	Dry	Calves	Heifers	Bullocks	Bull	Total
Crossbred	160	96	110	100	6	18	490
Sahiwal	10	25	16	28	2	0	81
Murrah	29	22	33	29	0	14	127
Total	199	143	159	157	8	32	698

As shown in the exhibit 2, the number of the calves died has considerably reduced in the year 2005-06 and hence the mortality rate has also reduced and is constant since the year 2004-2005.

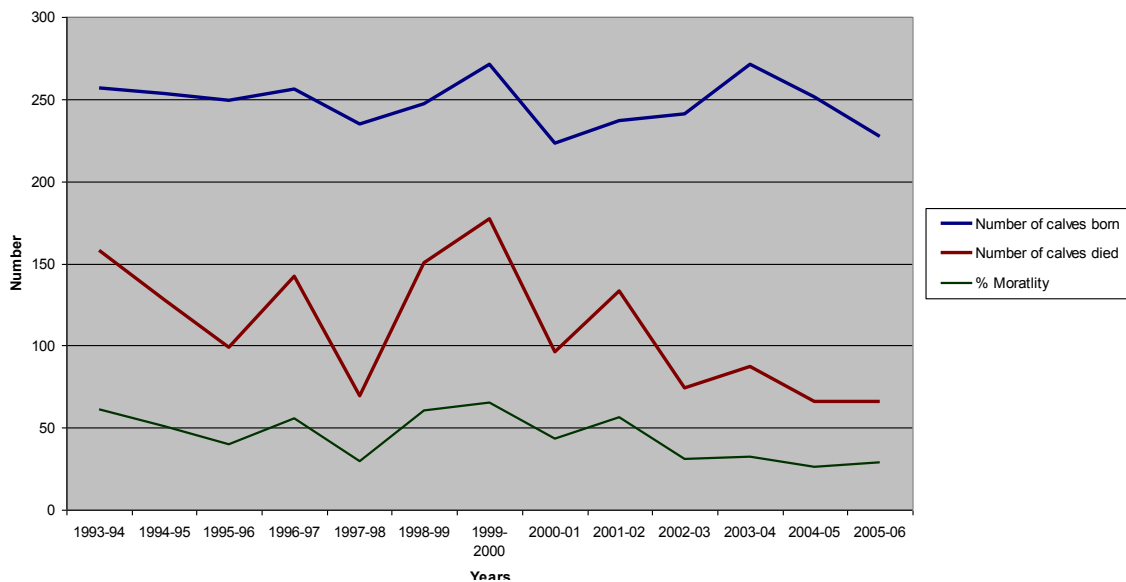


Exhibit 2: Birth and Mortality of Calves

Milk Production Unit: This unit consists of about 200 milking animals, milking parlors, about more than 20 milkmen, measuring and recording units. All animals are hand milked. One gwala daily milks 13 animals twice. He also takes care of their health, feeding, cleaning etc. The unit keeps hygienic conditions in mind and proper washing of the udders of the cows and buffaloes and the hands of the milkmen are washed with permissible chemical. The utensils are also washed properly twice a day. The room where milk is taken is also washed daily. In order to prevent the adulteration in milk, a supervisor is kept there. All milking and packaging activities are proposed to be fully mechanized so as to ensure hygienic conditions during the milking of the cows. The major functions of this unit are as follows:

- Feeding, managing and maintenance of milk animals including clipping of the hair, grooming, brushing, cleaning and washing
- Milking animals and collection and recording of milk
- Providing milk for feeding newly born and young calves
- Providing milk for research purpose

Milk production has continuously increased as shown in the exhibit 3. After the shifting of the IDF to the Veterinary College, the milk production has shown an upward trend. During 2005-06 the milk production has crossed 65000 litres which is a record in the history of IDF.

Milk Supply Unit: This unit consists of 18 salesmen, three helpers, one in charge milk supply, one vehicle and 15 rickshaws. The milk from the milk production unit is taken to this unit for pasteurization and processing. For supplying milk in the hostels vans are used and for supplying milk to the campus community rickshaws are used. The customers have to buy coupons to get milk from the dairy. The surplus milk is processed in to ghee and ice-cream that is sold locally or supplied to Anchal Dairy. The main functions of the unit are as follows:

- Collection of milk from production unit
- Transportation of milk from production to processing unit
- Processing and pasteurization of milk
- Supply of milk to hostels, campus community and Anchal dairy
- Preparation of cream and ghee

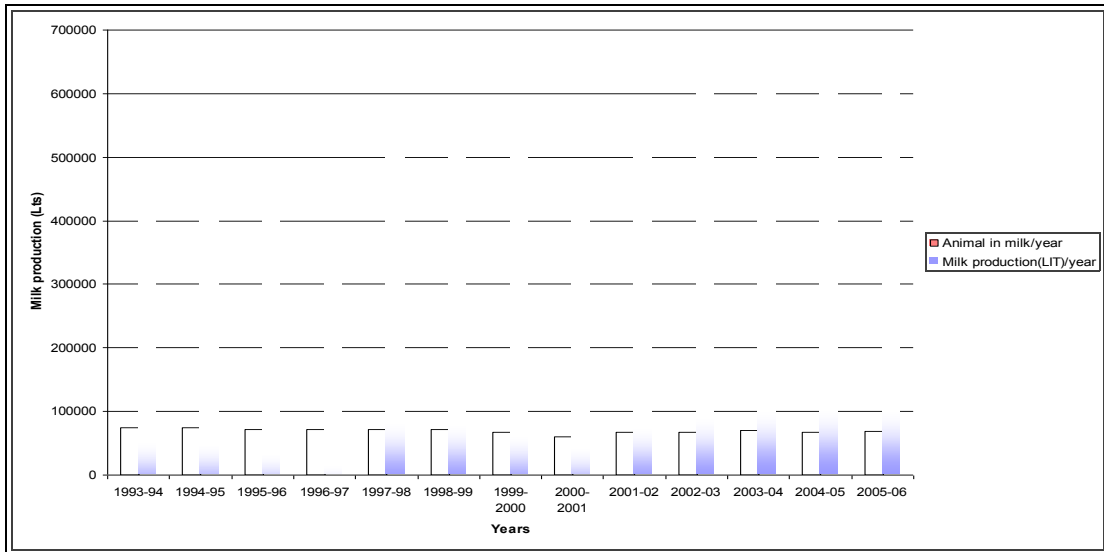


Exhibit 3: Milk Production trend of IDF

The milk supply from the unit in the campus varies from 1500 ltrs to 2000 ltrs per day. Shortage of staff in this unit is responsible for lower level of milk processing possibility and demand for which exists. There is also a lack of unity of command in the administration. The milk supply and utilization has increased during the year 2004-05 from 525000 ltrs to 550000 ltrs and has decreased in 2005-06 to 510000 ltrs. This may be due to the increment in the share to calf feeding. The supply to Anchal Dairy has also reduced with the passage of time. As shown in the exhibit 4, the losses are also at the minimum.

Fodder Production Unit: This unit has about 477 acre land for fodder and seed production. It has good facilities of irrigation, labour and implements. The unit provides green as well as dry fodder to the whole herd and seeds of various fodder crops. The main functions of the unit are as follows:

- Production and supply of green fodders
- Supply of dry fodders
- Hay making particularly from oat
- Field operations
- Seed production of fodder crops
- Storage and preservation of fodder

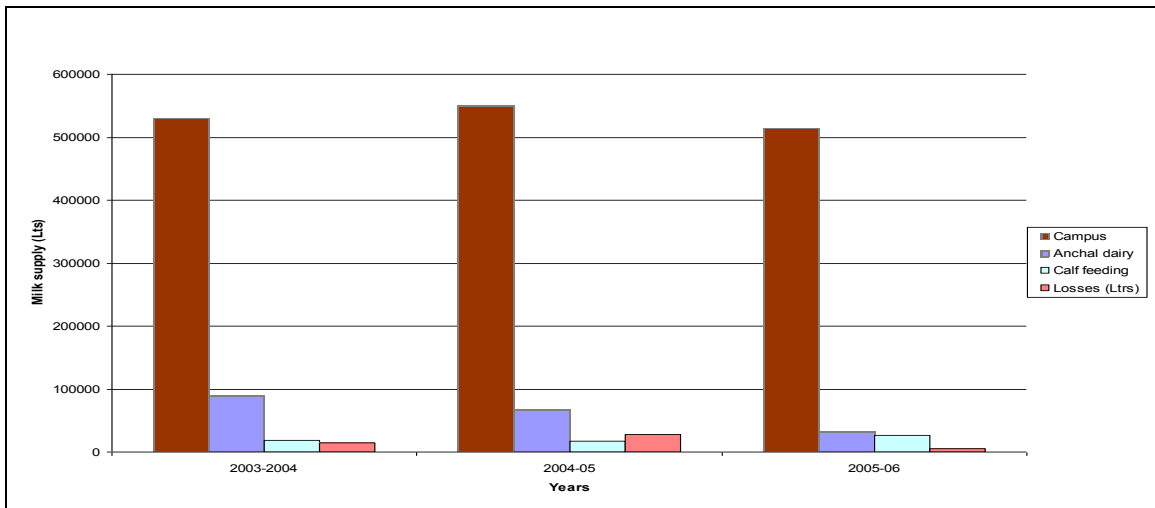


Exhibit 4: Milk Supply and Utilization

Feed Processing unit: This unit consists of a grinder and mixer with a capacity of 10 tons per day. The unit procures feed/ feed ingredients as per the demand of various categories of the animals. For the year 2005-06, this unit has procured more than 1000 quintals of wheat, 250 quintals soybean and 100 quintals of molasses. The major functions of this unit are as follows.

- Procurement of various feeds and feed ingredients
- Formulation of ration for different categories of livestock
- Grinding, mixing, final preparation and supply of feed to the cattle yard
- Storage and supply of prepared feed to various units regularly

Farm Machinery and Implements Unit: The major functions of this unit are as follows:

- Purchase and maintenance of various farm power machines
- Maintenance of vehicles like jeep, milk van and tractors
- Disposal of unserviceable items

Fodder Bank: This unit was established in August 2005 under the scheme "Assistance to States for Feed and Fodder Development", sanctioned by the Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India". Two fodder banks were established in the state; one at DFSPC (Deep Frozen Semen Production Centre), Shyampur, Rishikesh and other at the IDF, Pantnagar to cater to the needs of Garhwal and Kumaon regions respectively. The scheme was jointly sponsored by GOI and State Government of Uttarakhand on 75% and 25% cost sharing ratio respectively.

This unit consists of a Complete Feed Block (CFB) preparation machine which can prepare 2 to 5 quintals block per hour. Beside this, the unit has a machine for Urea Mineral Molasses Block (UMMB) preparation. This unit has sufficient storing and feed processing facilities. The unit produces approximately 8 quintals of CFB and 5 quintals of UMMB per day. It produces CFB of two types one having more seeds and one having

less seeds rates of which are Rs 5 and Rs 6 per Kg respectively. UMMB is sold at the rate of Rs 27 per Kg. The unit has a monthly demand of 3-4 quintals.

The product is sold to various agencies in Almora, Pithoragarh, Majhera, Dehradun and various KVKs. Sometimes demand also comes directly from farmers. The unit has procured about 2500 quintals of wheat straw, 100 quintals molasses for preparing CFB and UMMB by the end of 2006. One of the major factors for the preparation of CFB and UMMB is to reduce the transportation cost of the fodder. The major factor behind the low demand for these products is lack of awareness about the nutritious feed for the animals among the farmers. The second reason is the transportation problem in high hills.

Veterinary Clinics: The veterinary clinic takes care of the health management of the animals and works with AI and reproduction unit which help in breeding and reproduction of the animals. This unit consists of one veterinarian, two helpers with one full fledged clinic. A Veterinarian is the hospital superintendent. It intends to introduce software in near future by a unit of veterinarians that will take care of all the data related to every animal in the herd. This will facilitate in the working of the unit and will reduce unnecessary paper work.

The diseases in the animals are mainly due to the management problems like improper floor that causes hoof deformity or some times mastitis problems to the animals. Veterinarians suggested improving the floor condition of the sheds as most cases of hoof deformity have been reported due to improper floor condition. The animals that are not in use or that are less productive are also suggested to be transferred to a Gaushala.

As IDF is the model dairy farm for the nearby villagers, these people frequently visit the Veterinarian to get their animals problems solved. The veterinarian also provides consultancy services to the farmers. Besides the unit also provides training to the students of Veterinary College about the health related problem of animals as well as their diagnosis and preventive measures.

Artificial Insemination and Reproduction Unit: This unit also consists of same Veterinarian, that works in the veterinary clinic, three attendants and one tease bull, a

large AI lab, insemination stalls. Calving pens are also available with this unit. It is observed that there is a need for one more Veterinarian so that these two units are looked after by independent Veterinarians. The procurement of the semen is done from ULDB (Uttarakhand Livestock Development Board). The unit also provides training to the students about various aspects of AI.

Vermicompost Unit: The waste product of IDF is taken to vermicompost unit where vermiwash, vermicompost and earthworms are prepared and then sent to UAS&TDC for marketing. This unit owes the responsibility of utilizing the dung, urine and left over organic matter of the farm. The main functions of the unit are as follows:

- To collect the waste matter available at the farm
- To convert the waste into vermicompost, bio-fertilizer, vermiwash etc.
- To market the above products and generate finances for the dairy farm

The University is responsible for providing cow dung, urine and left over organic matter, land, residential facilities, water etc to the workers of the NGO. Besides this, the University is also working on the development of new breeds of earthworms so that the production of the vermicompost could be enhanced. The NGO is responsible for the production of vermicompost, vermiwash and provide earthworms. The NGO is providing various breeds of earthworms that are prepared at its research centre at Kotdwar. The revenue generated from the business is shared by the NGO and the University in the manner as shown in table 3.

Table 3: Percent Distribution of the revenue between the NGO and University

Product	Share of NGO	Share of the university
Vermicompost	30	70
Earthworms	60	40
Vermiwash	50	50
Consultancy	75	25

The responsibility of marketing of the produce is with UAS&TDC. It works on the packaging and the distribution of the product to various institutions, states and the President House under the brand name of Pant Vermicompost. IDF is giving vermicompost to UAS&TDC @ Rs.2.5 /Kg. The commission of UAS&TDC is Rs. 0.5 /Kg for the packaging and distribution of the produce. The IDF is getting the revenue @ Rs. 2/ Kg. At present the unit is producing 10 tones of the product/ day and in future it is targeting of producing 15-20 tons /day. Presently the production is very low and the demand is high from the other states and various government institutions including KVKs. Marketing of the produce needs to be made more effective through promotional schemes and good packaging.

The unit has at present three technical experts, one person looks after the management, second after the finance and the third after the production of vermicompost. The unit intends to diversify in waste management first in Pantnagar and then Dehradun. A revolving fund of Rs.2.00 lacs has been created by the University for this unit for efficient working of the unit.

Store Function: This unit has one well trained store keeper and three helpers with good stores and storing facilities for fodder, concentrate, implements and other materials required for the dairy farm. The dairy has a store for about 1000 tones of grains and other materials. The main functions of the unit are as follows:

- To procure all items required for workers, livestock and agriculture unit
- To maintain records of all purchases and disposals
- To dispose/ auction left over surplus

Watch and Wards Function: This section takes care of all types of securities at IDF.

Establishment: IDF is under the administrative control of Dean, College of Veterinary and Animal Sciences who is assisted by a Joint Director, an Associate Director and an Assistant Director as well as by the technical staff for health and reproduction unit. All these officers are supported by a number of technical and non technical staff. At present

the total manpower strength of the unit is more than 230. The main functions of the unit are as follows:

- Purchase/ procurement, storage and supply of various items/ requirements of IDF
- To keep accounts of expenditure and income
- Personnel management

Financial Health of IDF

Presently IDF is making a profit of Rs. 80, 02,032 with gross revenue of Rs.97, 20,032 per year.

Success Drivers of IDF

- ✓ The tri partite Memorandum of Agreement (MoA) between the University, SHAPE and UAS&TDC
- ✓ Surging Demand for organic products and livestock feed
- ✓ Strong Brand Image of the University
- ✓ Product Diversification i.e. vermicompost, vermiwash, earthworms and consultancy
- ✓ Strong Backward and Forward Linkage
- ✓ Dedicated Workforce
- ✓ Strong Research and Development Activities
- ✓ JIT(Just in Time) approach for some Products

Suggestions

Following suggestions can add value to the agribusiness model adopted at IDF and can enhance its working efficiency.

- Introduction of Indian Instrumental Music in Milk Production Unit
- Development of Online Semen Bank
- Tie-up with other NGOs to distribute fodder in hilly areas (as suggested in exhibit 2).
- Certification and improvement in packaging of Vermicompost
- Administration Changes including using Standard Costing technique, carrying work, motion and fatigue studies, employing ergonomical practices, scientifically pricing the products, designing additional marketing channels, increase in number of cattle and

buffaloes of good breeds, rightsizing the human resource, making the organizational structure flat and harness economies of scale.

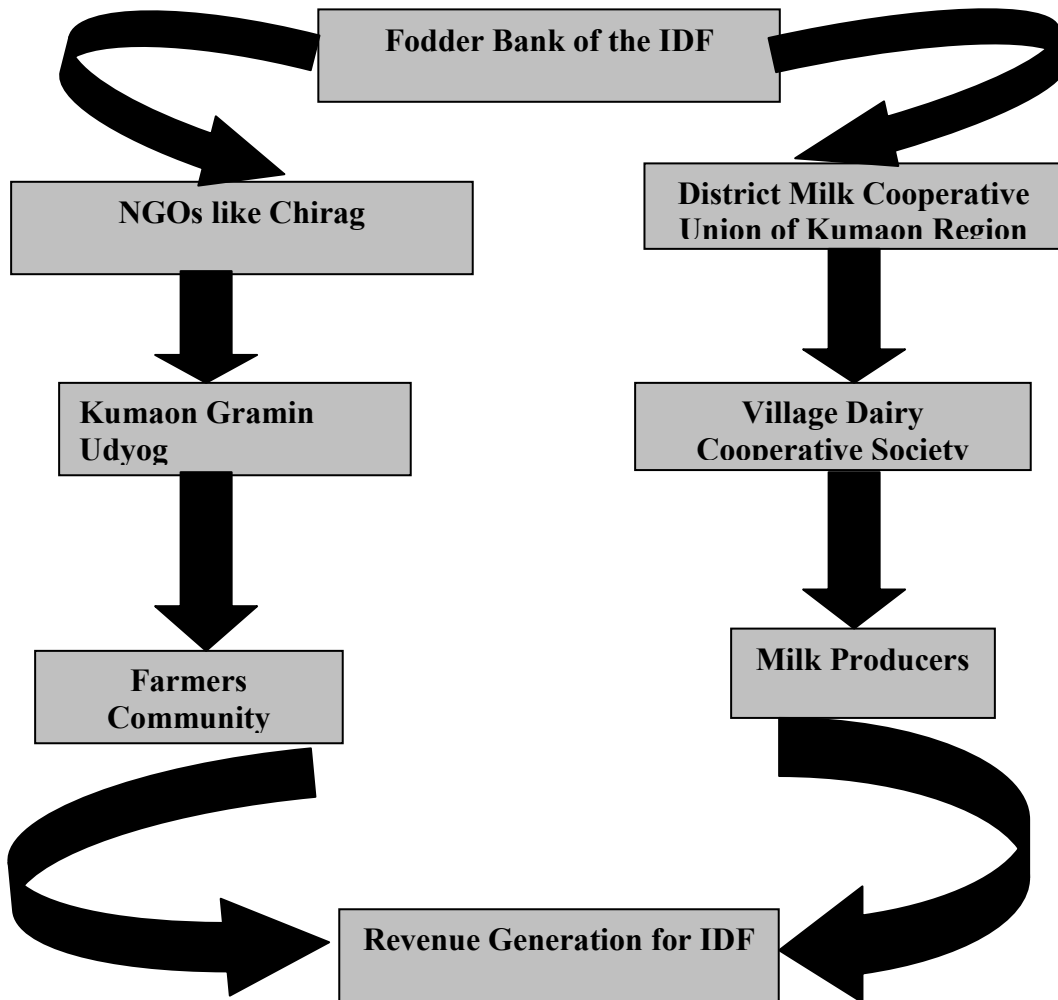


Exhibit 2: Distribution Channel for the Fodder in Kumaon Regions