

Dairy

ANANYA
Finance For Inclusive Growth Pvt. Ltd.



This training manual is for training women who have decided to start and run a small 'dairy' business. It is a training module of 35 hours, designed to train those women for five hours for seven days.

Introduction

Making a livelihood from animals is an important source of income for the rural people in India. Around 70% of the animals in rural areas are in the hands of small and marginal farmers and landless laborers. Rearing cows and buffalos for milk production has a big employment potential for rural women. About 70% of the people working in milk production or dairy farms are women. Congratulations! You have decided to start and run a 'dairy business'. During this training you will learn different aspects of the business; from buying cows or buffaloes to calculate your profit from the business.

The main objectives of the training

- To provide a thorough knowledge to the participants about 'dairy' business.
- To provide information about taking care of cows or buffaloes, so that milk production can be increased.
- To provide information about government schemes available for small dairy farms and also about available cattle insurances.
- To develop understanding of the profit that women entrepreneurs can get from this business.

An outline of the training

Session	Detail Content	Time	Method
DAY ONE			
Session 1	-Welcoming the participants -Getting to know each other -Introducing the 7 day training -Sharing of objectives of the training	1 hour	-Explanation -Interaction
Session 2	-Steps to start and run a 'Milk Production and selling' business	1 hour	-Explanation -Activity: What does the picture say?
Session 3	- Making a cattle shed for cows and buffaloes	1 hour	-Interaction -Explanation -Activity: Activity: Shed of my cow will have....
Session 4	- Buying a good breed of cow / buffalo Government Schemes related to Small scale Dairy Outlets and Insurance of the Cattle:	2 hours	- Explanation -Discussion -Activity: Which cow/buffalo I will buy
DAY TWO			
Session 5	-Recap of day 1	2 hours	-Explanation

	Taking care of the animals -Food and water -Reproduction		-Discussion -Pair works
Session 6	Taking care of the animals -Common diseases & preventions - Hygiene in milk production	1 hour	-Explanation -Discussion
Session 7	Milk production -Calf nutrition	1 hour	-Explanation -Discussion
Session 8	-Preparation for visiting milk producer	1 hour	- Group discussion - Pair works
DAY THREE			
Session 9	- Visiting and talking with milk producer (caring, feeding, disease, <u>-Conclude the learning of the day</u>	5 hours	-Field visit -Interaction -Individual works
DAY FOUR			
Session 10	- Talking with milk producer about construction and maintenance of cattle shed - Conclude the learning of the day	5 hours	-Field visit -Interaction -Individual works
DAY FIVE			
Session 11	Taking a closer look at the market - knowing the demands of milk and milk products - talking with local shops, society selling milk (price of milk) -Conclude the learning of the day	5 hours	-Field visit -Interaction -Individual works - Activity: 'To whom can I sell the milk production?'
DAY SIX			
Session 12	- Visiting villages and talking about finding a good quality breed of cow/buffalo for milk - Conclude the learning of the day	5 hours	-Field visit -Interaction -Individual works
DAY SEVEN			
Session 13	-Sharing findings from the visit	1 hour	-Presentation -Discussion
Session 14	- Pricing of milk and milk products and doing quality control: - Wastage & other risk factors in dairy and how to deal with it? - Importance of record keeping and budgeting in a dairy business	1 hour	-Explanation -Discussion
Session 15	-Making a budget -Presenting the budgets	1.5 hours	-Explanation -Working individually -Presentation
Session 16	-Developing a business plan	1 hour	-Explanation -Working individually -Presentation

Session 17	-Concluding the training	0.5 hour	-Interaction
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DAY 1

Session 1:

Welcoming the participants

- The trainer will welcome the participants and register them for the training.

Getting to know each other

- The participants will introduce themselves by telling their names.
- The participants will tell why they chose 'dairy' as their small businesses.
- Other participants can ask questions.

Introducing the 7-day training

- The trainer will share the 7 days training programme with the participants.

Sharing the objectives of the training

- The trainer will share the objectives of the training.

Session 2:

Steps of starting and running a small scale 'dairy' business

- The trainer will explain all the steps of starting and running a 'Milk Production and Selling' business.

Activity: 'What does the picture say?'

The objective of the activity is to come to the discussions on the different steps of starting and running a 'Milk Production & Selling business'.

The activity:

- The trainer will show picture of a cow or buffalo to the participants.
- The participants will say whatever comes to their minds by looking at the picture of a cow or a buffalo.
- The trainer will write all responses on the board. He will also give his inputs, and then categorize the responses according to the works.

Session 3:

Making a shed for cows/buffaloes

Space needed for a cow or buffalo depends on the size of the animal. Usually, 40 sq. ft. area of shed is needed for a cow or a buffalo and 20 sq. ft. area for a calf.

Things to consider while making a shed:

- The cow or buffalo has to be protected from cold, rain and heat.
- It is good to make the floor cemented and slightly tilted, so that urine and water do not accumulate and it can easily be cleaned. The floor should not be slippery.
- There should be some space for the animal to roam around.

Activity: 'Shed of my cow will have.....'

- The trainer will tell the participants about how much space a cow/buffalo needs.
- Each participant will think for 5-10 minutes:
 - Where will she build the shed?
 - What should see keep in mind while making a shed?
- Each participant will share with the group, if she has found a place to build the shed, and what are the various things a shed should have.
- The trainer will give his/her inputs on the basis of the above text and conclude the point.

Session 4:

Buying a good breed of a cow or buffalo


Choosing a good breed of cow or buffalo is crucial for milk production and for reproduction.







Things to consider while buying a cow or buffalo for milk production:





- The animal should give high daily milk production.
- It should have long lactation period and short dry period. Lactation period is the duration of time when a cow or animal gives milk.
- The animal should have good resistance power to diseases.
- The animal should have a calf twice before, as it has a good potential for milk production.

There are different breeds of cows and buffaloes you can choose from.

Let's look at some of them.

Cattle Breeds for Dairy	Location (States, Districts)	Average Milk Productivity (Yield in kg) per lactation	Milk Fat in %
<p>Khariar (draught) breeds, with brown and grey looks</p> 	Odisha (Bolangir District)	milk production 308 – 360 kg Lactation length-around 10-12 months. Calving interval 17 months. First calving- at 4 yrs of age	4.9%

<p>Red Sindhi: This breeds of cow have red colour with shades varying from dark red to light, strips of white.</p> 	<p>Odisha (Bolangir & Dhenkanal District),</p>	<p>Milk yield ranges from 1250 to 1800 kg. per lactation.</p>	<p>4.5%</p>
<p>Jersey: This breed is the smallest of the dairy types of cattle. The typical colour of Jersey cattle is reddish fawn. Dished forehead; compact and angular body.</p> 	<p>Odisha,</p>	<p>4500 kg. per lactation.</p>	<p>4.5%</p>
<p>Dangi (draught breed): This breed of cow have medium to large body size, small head protruded forehead, short thick horn, and adoptability to high rainfall.</p> 	<p>Madhya Pradesh</p>	<p>430 kg milk yield (range from 175-800kg) per lactation.</p>	<p>4.3%</p>
<p>Hariana; This breed of cows have large to medium body size with white colour, Horns are small.</p> 	<p>Originated in Haryana also popular in UP and parts of MP.</p>	<p>600 to 800 kg per lactation.</p>	
<p>Holstein Friesian: This Largest dairy breed and ruggedly built is shape and possess large udder. These breeds have typical marking of black and white.</p> 	<p>Odisha,</p>	<p>6000 to 7000 kg. per lactation.</p>	
<p>Bachaur : This breed of cow looks grey or greyish white with well-rounded barrels, short necks and muscular shoulders. The forehead is broad and flat or slightly convex. horns are medium-sized and stumpy.</p> 	<p>Bihar (Sitamadi, Madhubani, Darbhanga District) and Uttar Pradesh</p>	<p>495-605 kg. per lactation.</p>	<p>4.5 – 5 %</p>

<p>Gangatiri: Cows of this breed have complete white or grey colour. The horns are medium sized and curving upwards and inwards ending with pointed tips. The forehead is straight and broad with shallow groove in the middle.</p> 	<p>Bihar, Uttar Pradesh & Madhya Pradesh</p>	<p>The average milk yield in a lactation is around 1050 Kg, varying from 900 to 1200 Kg</p>	<p>4.9 - 5.2 %</p>
<p>Bhadawari: This breeds are of medium size. The body is usually light or copper coloured is a peculiarity of this breed. Eye lids are generally copper or light brown colour. Two white lines chevron are present at the lower side of the neck.</p> 	<p>Uttar Pradesh (Agra, Etawah), Madhya Pradesh (Bhind, Gwalior)</p>	<p>800 to 1000 kg. Milk contains high butter fat.</p>	<p>6 – 13 %</p>
<p>Kalahandi This breed of buffaloes have body colour blackish grey, with golden hairs & flat foreheads. Horns go horizontally backward, upward and inward to make a half-circle appearance.</p> 	<p>Odissa(Kalahandi, Raigarh)</p>	<p>680-912 kg. per lactation</p>	<p>7.8 - 8.2 %</p>
<p>Deshila (Diara): This breed buffaloes are of medium size body with light black to silver grey coat colour and light black skin colour. They manage under low input system of management and climate.</p> 	<p>Bihar</p>	<p>Daily milk yield (Kg) 7.07 kg. Lactation period: around 300 days. Milk production around 1300 kg per lactation.</p>	<p>8.87%</p>

These are some examples. Try in your local area and find out a good breed of milch animal.

Activity: 'Which cow/buffalo should I buy?'

- The trainer will explain the above text to the participants. He/she will show the pictures of cows/buffaloes if possible.
- He/she will write the characteristics of each cow and buffalo on the board.
- Each participant will choose which of the above mentioned animal she wants to buy and why?
- Each participant will share her thoughts with the group.

Government Schemes related to Small Scale Dairy Outlets and Insurance of the Cattle:

Government Schemes & Programmes

Looking at the demands and future perspectives in dairy, government of India is making efforts to support the small scale dairy farmers, technically and strengthening the infrastructure for production of quality milk, procurement, processing and marketing of milk and milk products.

There are many initiatives taken through Dairy Development Schemes like:

- National Programme for Dairy Development(NPDD)
- National Dairy Plan (Phase-I)
- Dairy Entrepreneurship Development Scheme(DEDS)
- Support to Dairy Cooperatives
- Dairy Processing and Infrastructure Development Fund (DIDF)

Different projects like “Rashtriya Gokul Mission”, “Gopal Ratna”, “Kamadhenu” etc. have been initiated by government for enhancement of milk production and productivity, conservation and development of indigenous breeds distribution of disease free high genetic merit bulls for natural service, incentive to farmers maintaining elite animals of indigenous breeds. There is also organization of training programme for technical assistance to the people, doing small scale dairy production. There is "Department of Animal Husbandry Dairying and Fisheries," in state level. People can become update about the schemes and facilities provided for small scale dairy business.

Insurance:

As dairy business is link with the health and management of life stock, there is also risk factor of death of the cattle and loss of economy due to outbreak of diseases and incidents like fire, flood, cyclone etc. To avoid this type of incidents, insurance of the cattle and the dairy outlet is essential.

Beneficiaries need to pay a minimum amount to make insurance of the cattle or the dairy outlet. They get an insured amount as a recovery of the loss due to certain reason. At the time

of claim, a death certificate and post-mortem examination report from a qualified veterinarian is needed to submit to the respective insurance authority.

The insurance policy provides coverage for death of the insured cattle due to:

1. Natural Accident (Inclusive of fire, lightning, flood, inundation, storm, hurricane, earthquake, cyclone, tornado, tempest and famine)
2. Diseases contracted or occurring during the period of this policy
3. Surgeries
4. Riot and strike and Civil Commotion risk

Cases those are not covered under the insurance:

Insurance cover shall not be provided for Death or loss due to: -

- Negligence, unskilled treatment or animal's use (without Company's consent) for - Purposes beyond the policy's guidelines.
- Such diseases/accidents that were contracted prior to policy's commencement.
- Intentional killing, however, killing under legal and/or veterinarian's supervision is an exception.
- Air or sea transport and transit beyond 80 kilometers.
- Any kind of partial disability, be it permanent or temporary.
- Damage due to war, nuclear exposure, theft, secret sales or a missing case of an insured animal.
- Animal's demise within 15 days of policy's inception.
- 'No tag-No claim' provision is applicable to the policy.

The sum insured under the policy depends on the market value of the animal. The basic premium rate per annum is up to 4% of the sum insured.

There is "Pashu Dhan Bima Yojna", an online rural insurance policy to offer insurance cover to indigenous cattle owned by farmers, cooperative societies, dairy farms and the like.

There is provision of insurance of cattle by the central government for risk management and insurance scheme in all the districts of India for all animals including non-milch ones. You can learn detail about the policies, and the terms and conditions from the local government bodies dealing with insurance.

Activity: "How can I insure my cattle and dairy outlet?"

- The trainer will explain about the government schemes and programmes on dairy, and how to get benefit of that.
- The trainer will explain about insurance; its importance in the dairy business, different insurance schemes and their terms and conditions; how they can get benefits of the insurance schemes.
- The participants will discuss in pairs about the practicalities to do it and share if they have any other queries.

- The trainer will answer to the queries of the trainees and conclude the point.

DAY 2

Session 5:

Recap of day 1

Each participant will share her learning from day 1 of the training.

Taking care of the animals

The cow or buffalo needs to be taken care of mainly in the following areas:

- Fodder and water
- Breeding
- Diseases

Fodder and Water

Animal	Approximate food requirement per day during Lactation Period				Approximate food requirement per day during Dry Period		
	Dry fodder	Green fodder	Concentrate	Water	Dry fodder	Green fodder	Concentrate
Buffalo	6 kg	20 kg	4 kg	Approximately 4-5 litres of water per litre of milk production	8 kg	10 kg	1 kg
Indigenous cow	2.5 kg	15 kg	3 kg		3 kg	10 kg	1 kg
Cross-bred cow	3 kg	25 kg	4 kg		5 kg	15 kg	1 kg

*For more details, please take advice of your local veterinary doctor.

Balanced diet for cattle

For the better health of milch cattle and more milk production, they should be fed balanced diet. Diet containing all the essential nutrients such as protein, energy, fats, minerals and vitamins in appropriate proportion and amounts are called balanced diet.

The unbalanced diet has ill effect on the health of animals, as well as their capacity milk production is underutilized. According to the science, milch animals need body weight, according to the burden of the body of, for their needs various elements such as proteins, energy, fats, minerals, vitamins and water as per their body weight. Balanced diet for animal means feeding animals on 'right' time in a 'right' quantity that gives them all kinds of nutrients. The

quantity of animal diet depends on its productivity and state of reproduction. The animal should be fed 2/3 parts of the total diet as a mixture of dry/green fodder and 1/3 part grain mixture. We can broadly divide the diet of adult milking animals into three categories.

1. Diet for maintenance
2. Diet for milk production
3. Diet for pregnancy

1. Diet for maintenance: - It is the amount of diet which is given to keep the animal's body healthy. This animal performs the necessary functions of its body such as digestion, blood circulation, respiration, metabolism etc. It also keeps its weight stable in a range. Whether the animal producing milk or not, this diet has to be given to it. In its absence, the animal starts becoming weak, its effect on its productivity and fertility. For this, 4 kg of dry or green grass is given to indigenous breed cow 4 to 6 kg for hybrid cow. Together with this, 1 to 1.25 kg of concentrate mixture of grain is also given to indigenous breed cow and 2.0 kg to hybrid cow and indigenous buffalo.

To feed the animal by this method it is necessary to make a mixture of granule by mixing the appropriate material in the correct proportion. For this, mixing the following material in the given ratio can create a suitable animal compound feed. There are different ways to make a compound cattle feed that trainees can learn from local cattle experts. For example, the method of making 100 kilos of balanced grain can be done in this way:

- Grains (maize, barley, wheat, millet) quantity should be approximately 35 percent of total feed. The grains can be of various types or only one kind.
- The quantity of cakes (khali) (mustard, peanut, binola, linseed, sunflower, cotton, cloves etc.) should be approximately of 32 kg. Only one of these can also be added to the concentrate feed.
- The quantity of bran (wheat, gram, pulse, rice bran) is of approximately 35 kg.
- Mineral salts are about 2 kg
- Iodine salt is about 1 kg
- Vitamins A, D-3 mixture of 20-30 grams

2. Diet for milk production: - To obtain maximum milk production from cows and buffalos, they require adequate nutritious fodder. Additional amount of fodder is given to the milking animals together with the diet given for their maintenance, so that the amount of milk production can increase. Additional 1 kg of grains is given for the production of 2.5 liters of milk from indigenous cow and 2 liters from hybrid cows/ buffaloes. For the maximum milk production, clean water should be provided at least three times a day.

3. Diet for Pregnancy: - In the pregnancy of the animal, it is given additional food from the fifth month, because after this period, the development of the calf in the womb starts to grow very fast. Therefore, it is absolutely necessary to give this diet for the proper development of the calf in the womb and for the right milk production after delivery of calf. 1.25 kg of additional feed is

given to indigenous breed of cows and 1.75 kg additional grain for hybrid cows and buffaloes. By feeding the additional feed, the animals can make maximum milk production according to their capacity in the next delivery.

Along with this, other green fodder available as per the seasons such as maize, jowar, oats, hybrid napier, bajra, beans and barsim grass can be fed in limited quantity. If green fodder is available in adequate quantity, then one kg of grain can be reduced by giving 10 kg of good variety of green fodder. This will reduce the cost of animal feed.

Azolla is another alternative of green fodder which increases the milk production capacity of milking animals by up to 15 percent. It is a very nutritious small aquatic fern, which is floating up in the stagnant water. It can be grown in the house by making a tank, in paddy fields, pits, ponds, and lakes. Many farmers also grow in tubs and drums. This plant develops in water and looks like a thick green mat. Usually, Azolla is rich in proteins, essential amino acids, vitamins (vitamin A, vitamin B12 and beta carotene) and growth agents and minerals. Due to being high protein and low lignin (whose availability hardens the plant), livestock can easily digest it. Azolla can be mixed with animal grains or can be fed directly to animals.

How to produce azolla for your animals

In the field of production, the soil should be levelled first by removing the weeds. Arrange the bricks horizontally in a rectangular area. Cover the rectangular area by a silpaulin sheet. Now spread 10-15 kg of clay soil evenly in the pit. After this, mix the 2 kg dung, add 30 grams of super phosphate with 10 litres of water and make the solution. Now put the solution on the plastic sheet and add water to it to increase the water level up to 10 cms. Spread 0.5 to 1 kg of pure azolla culture seeds over the water equally and immediately sprinkle fresh water on azolla. Add 20 grams of super phosphate and 1 kg of dung mixture into azolla pit once in 5 days. Which will help in growing it and this mixture will yield 500 grams per day. Within a week, azolla will spread throughout the entire area and form like a thick mat. To increase the mineral content in azolla, a micronutrient mixture containing magnesium, iron, copper and sulfur etc. can be put on weekly intervals. To prevent the production of nitrogen and the lack of microscopic elements, replace it with fresh 5 kg of soil every 30 days and replace 25-35 percent of water every 10 days with fresh water. Clean the production pit in every six months, change the water and soil and sow new azolla. If the crop is infected with pests and diseases, then prepare a new pit.

Harvesting of azolla

Due to rapid growth, the production pit fills in 10-15 days. Since then, 500 to 600 grams of Azolla can be harvested every day. After 15th day azolla can be collected using plastic sieve or tray.



How to preserve green fodder

To obtain maximum milk production from animals, they require adequate quantity of nutritious fodder. Fodder is fed mostly to the animals in green condition and its excess quantity is dried and stored for future use. Generally, nutrients in the feed remains very low due to storage. If the storage of this fodder is done by scientific method then there is no shortage of nutrients and by treating this fodder by certain methods, its nutrition can be extended to a great extent. Fodder can be stored by the following methods:

By making hay (a heap of dried grass)- green fodder or grass is kept for drying to reduced its moisture content up to only 15-20 percent. Grass used to make hay includes cow pea, barsim, legumes, Napier, barley, millet, jowar, maize, ginni anjan etc. To make the hay, any of the following methods can be adopted for drying the grass-

- ***Drying the fodder in the layers***-when the fodder crop is in the state of ripening, it is cut down and spread it across the entire field and flattens it in the middle until the amount of water in it reduced up to 15 percent. After this, it is collected and stored in a dry place.
- **Drying the fodder in the bundle**- After cutting the fodder it is left in the field for 24 hours, after which small stacks or bundles are made and spreads across the farm. These bundles are manually rolled in between, which reduces the amount of moisture to about 18 percent.
- **Drying the fodder by tripod method** - Where the land is wet or where the rainfall is high, in such places, tripods are fixed in fields and spread the crops of fodder over them. In this way, they are dried with air and sunlight without touching the land. In many places, the grass is also dried on the roofs of the houses.

Treatment by the urea of the fodder - Nutrients in dried fodder such as husks and straw etc. are bonded with lignin which animals cannot digest easily. These fodders are treated by some chemical substances and their nutrients are separated from the lignin. The method of urea treatment is the cheapest and best for this. For more information about urea treatment method, participants can consult local experts.

Making silage - The green fodder which has a substantial amount of moisture is pressed into a pit in the absence of air made like a pickle after a while, known as silage. Silage is used to feed the animals when there is a shortage of green fodder. The Silage can be made from almost all grasses alone or by their mixture. In the crops which contain soluble carbohydrates, such as jowar, maize, guinea grass, Napier and setaria grass etc, are suitable for making silage.

How to make the silage - The silage built in the pits can be of several types. Such trench silos are cheap and easy to make. A silage for three months can be made for 4 animals in an eight-foot-deep pit. The pit should be deep, and it should be hardened. The floor and walls of the silo should be pucca and if this is not possible then the walls can also be plasters with mud.

To make silage, cut green fodder in the appropriate stage and make them in to pieces of 2 to 3 centimeters. Press them in the pit and cover the pit with a polythene sheet. Lay a thick layer of soil above it up to 18-20 cm. Plaster the soil layer with dung and mud. Close the cracks with the mud so that the air and water cannot enter the pit. In about 45 to 60 days, the silage is prepared. The pit can be opened from one side by shifting soil and polyethylene sheet. Now it is ready to feed the cattle as per the requirement. Take out the required among of silage and cover the pit again with polythene sheet and soil.

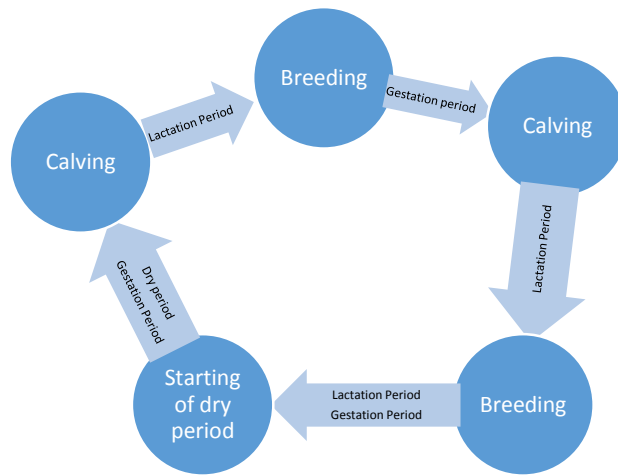
Breeding

Artificial Insemination is an artificial breeding process done by depositing semen into the female reproductive tract. Contact and get the local animal husbandry doctor for executing Artificial Insemination.

Advantages of Artificial Insemination:

- Economic benefit for small farmers
- Spreading of defective genes prevented
- Spread of reproductive disease slows

Milk cycle of a cow/buffalo



Activity: 'What should I feed my cow/buffalo with?'

- The participants in pairs will discuss what they should feed their cows/buffaloes with.
- Each pair will make a list of locally available fodder for their animals.
- Each pair will present their list to the group.
- Other participants will add items to the list.
- The trainer will explain the above table to the participants.
- The trainer will also explain about Artificial Insemination.
- The trainer then will explain about the milk cycle of a cow/buffalo.

Session 6:

Diseases

Some of the common diseases of cattle:

Disease/Condition	Cow/ Buffalo	Cause	Symptoms	Prevention
Black Quarter	Buffalo	Bacteria	High fever, lameness and death within 48 hours.	Vaccination
Hemorrhagic Septicemia	Buffalo and Cow	Bacteria, Food and water	Swelling on the throat and neck region, respiratory distress, rise in temperature and causes death	Annual prophylactic vaccination with oil adjuvant vaccine
Foot & Mouth Disease (FMD)	Cow and Buffalo	Virus, direct contact with affected animal	High fever, sluggishness, profuse salivation, formation of Vesicles on mucous membrane of mouth and foot, lameness,	Six monthly vaccination

			decrease in the milk yield, abortion	
Infertility	Cow and Buffalo	Malnutrition, infections, congenital defects, hormonal imbalances		Proper nutrition and breeding at right heat time, Deworming once in 6 months Treatment if required

- The trainer will explain about the common diseases of cows and buffaloes to the participants.

Hygiene in milk production

As milk production is directly link with our food, health & life, so it is important to be cautious about maintaining hygiene of everything that is used in the process of cattle rearing, feeding, milking, storing and its overall environment. It is essential to be free from contamination of milk and contagious diseases.

Lets' learn about some of the major areas and how to maintain hygiene:

a). Animal hygiene;

Maintaining good health of the Animals

- The cattle should be periodically examine for udder and other disease and treated the cattle soon keeping isolation from others in case any infections. Sanitary precautions is must for every time.
- Milk of infected animal should not be mixed with the bulk supply until the cattle is fully recovered.

Maintaining cleanness of udder and body

- The body and udder of the animal should be cleaned before milking by washing firstly with normal clean water and then with Luke warm water (temperature <50 degree c) and wiping with a clean cloth.
- If necessary soap or sodium hydrochloride solution or chlorinated water can be used.

b). Hygiene of the Milker

- Persons milking the cattle should maintain personal hygiene.
- She should avoid coughing or sneezing while milking
- She must be free from any contagious disease and at the same time take care to avoid contamination of milk and contagious diseases.

c). Hygiene of utensils or other equipment

- Clean and tinned utensils having smooth surface should be used for milking and storing of milk.
- Milk pails: buckets or other utensils should be cleaned with detergent powder and properly rinsed with boil water immediately after use.

d). Hygiene during milking process

- Complete milking - No milk should be left inside the udder after milking elimination of poor quality milk because this is high in bacterial count which get mixed with subsequent milk lot and raised over all bacterial number in milk.
- Dry milking - It is preferable to avoid wet milking and wash the hands & the udder with clean cloth. Wet milking increases the bacterial number in the milk by dripping of water and dirt's on milkers hands in to the milk.

e). Environmental hygiene

- The cow shed should be clean and hygienic with respect to aeration, humidity, lighting, ventilation, sunlight, bedding floor, wall ceiling, and presence of other insect's etc.
- The cow shed and the milking place should be located far away from the human living quarters, sewage, manure pits and stagnant water pools etc.

Activity: How can I maintain health & hygiene of the cattle?

- The participants will discuss in pairs on the followings:
 - What are the common diseases of cattle and how to avoid them
 - What are the things need to be care and what are the things need to avoid while milking a cattle
 - Each pair will present their discussion.
 - The trainer will write the responses of the participants in two columns: Dos and Don'ts.
 - The trainer will add points as per the text given above.

Session 7:

Caring & Nutrition of Calves

Care and attention for calves especially below 3 months of age is critical as they are vulnerable to many infectious diseases mostly the respiratory and enteric infections, specifically their first week.

Precautions for safety of the calf:

Immediately after the birth, it needs to clean the mucus from the nostril and mouth of the calf. The calves need to keep in the calf pen for minimum of 5 days after their birth and it should be neat & clean.

From day 5 onwards, the calves should be let free to move and the area should be neat & clean.

Feedings for well growth

Day 0: On birth, within one hour the new born calf should be feed colostrum feeding from the mother.

Day 1: Milk feeding is needed frequently and especially in the morning and evening. Fresh and clean water to provide in a well cleaned bowl.

-By 1 to 1.5 months of age, good quality calf starter (Concentrate feeding) should be given.

-Gradually quantity of milk fed to be reduced from 1/10th to 1/15th of its body weight.

-Good quality dry fodder to be used during this period for development of rumen.

-Milk feeding the calf to be stop from 2.1/2 months of age.

-Measuring and keeping record of the calf's growth is needed up to its 4 months. (Per day body weight gain in calves varies between 300-600 gm. from breed to breed)

Health care & treatment:

Day 7: Consulting with the VS. The first deworm should be given to the calf & to repeat it after 21st day.

- De-wormers should be changed to avoid creation of resistance to particular type.

1. Feeding for calf of local breeds (cattle and buffalo) until 3 month of age is given below for various periods (daily)

Age	Whole milk (in Kg)	Skimmed milk (in Kg)	Calf starter (in Gm.)
1- days*	2.0		
4 th day	2.0		Offered
2 nd week	2.5		
3 rd week	1.75	0.75	50-75
4 th week	1.75	0.75	75-100
5 th week	1.25	0.75	100-150
6 th week	0.75	0.75	250-300
7 th week	0.50	0.75	350-450
8 th week	0.50	0.50	450-500
9 th week	-	0.50	550-600

2. Feeding of a calf of local breeds (cattle and buffalo) 3 to 6 months of age (daily)

Age	Feeding types	Feeding quantity
3 to 6 months of age	Concentrate mixture	1.0 to 1.25 kg.
	Green fodder	5 to 10 kg
OR		
	Concentrate mixture	1.25 to 1.5 kg.
	Green fodder	3 to 5 kg
	Dry fodder	1.5 to 2 kg.

- The trainer will tell the participants about caring of calves.
- The participants will discuss in pairs about how to take care of the calves and present the conclusion of their discussion to all.
- The trainer will add points to their presentation as per the above information.

Session 8:

Preparing to visit the field

- The participants form pairs for visiting to milk producers.
- Each pair will prepare questions they want to ask to the milk producer.
- Each pair will present their questions to the group. Other participants and the trainer will give their inputs.
- Question should be asked related to cattle shed, fodder management, reproduction or breeding, diseases, breeds of cattle, caring and nutrition of calf, increasing milk production and maintaining hygiene, market, investment, selling price, profit, etc.

DAY 3

Session 9:

Visiting and talking with milk producer about caring of cattle

- The participants will visit a milk producer in pairs and ask as per the questions they had prepared before.
- They will take notes of the important things during their talking, so that they can discuss on it later.

Concluding the learning from the field visit

The participants will conclude the information gained from interactions with the milk producers during the field visit.

Each participant will:

- Present the learnings and their ideas to their colleagues.
- Make a writing on what she decides about own milk production and selling business on behalf of her learning.

DAY 4

Session 10:

Visiting and talking with milk producer about construction and maintenance of cattle shed

The participants will meet the people producing milk and talk with them as per their questions prepared before, about how to build a low cost cattle shed for her cows or buffaloes and how to do maintenance of the cattle shed. They will talk & question about the size of the shed, how to make it safe, hygiene and cleanliness of the environment around it, approximate cost to make a shed, etc. and discuss on it.

- They will make notes of the important things during talking with the people.

Concluding the learning from the field visit

The participants will conclude the information about construction of cattle shed gained from interactions with the milk producers during the field visit.

Each participant will:

- Present the learnings and their ideas to her colleagues.
- Make a writing on what she decides about making sheds for her cattle on behalf of her learning.

DAY 5

Session 11:

Knowing about the market

Before deciding to start the business of "production and selling of milk", the participants might have collected information that, who else in their area is doing the business of milk production and selling and at what price they are selling it. This time, during the field visit they will collect information about the demands of milk other milk products in that area. They will also initiate an activity; "To whom can I sell my milk?"

- The participants will meet the people in the village.
- During talking with people they will make notes of the important things they feel, so that they can discuss on it later.

Activity: 'To whom can I sell the milk production?'

- The participants will share the information got from the people in the village.
- The participants will discuss, where there is demand of milk in their area. For example, sweet shops, tea stalls, some households, milk cooperatives, and the companies which produce various milk products.
- Each participant will make a list of people to whom she can sell milk. The list should be long enough, so that the entrepreneur can sell all the milk produced by them.

DAY 6

Session 12:

Visiting villages and talking about finding a good quality breed of cow/buffalo for milk

Choosing and buying a good breed of cow or buffalo is crucial for milk production and for reproduction. You have to visit around the nearby village and try to find certain information about the cows or buffaloes you are going to buy that which cow has been giving much milk, in which breeds of cattle, the fat percentage is high. You can take suggestions from the specialist, milk and animal husbandry.

- The participants will meet with people (they can visit in pairs or in smaller groups)
- While talking with people the participants will make notes of the important information such as the names of the breeds of cows and buffaloes, their milk production capacity, and other specific things so that they can discuss on it later.
- Each participant will decide on behalf of her learning, which breeds of cattle she is going to buy and why.
- The participant will share their ideas with others and give suggestions.

DAY 7

Session 13:

Sharing the experience of field visit

- The participants will prepare for the conclusion and sharing of the 4 day field visit. (They can do it in pairs or in smaller groups)
- Each participant will share her individual experience with the group.

Session 14:

Pricing of milk and milk products and doing quality control:

The price of a product in the market is an important factor to influence the demand of customer. So, to sell a dairy product it must be competitively priced. This implies that the costs involved in raw material procurement, processing, packaging, storage, marketing and distribution must be kept as low as possible. Generally, the price of a dairy product will involve the following costs:

• Cost of raw milk	• Cost of packaging
• Cost of raw milk collection and transportation	• Cost of marketing and distribution
• Cost of processing	• Taxes and tariffs etc.

In order to arrive at a realistic costing of a product, all those elements involved at each stage must be carefully calculated on a unit basis. The cost can be broadly categorised as fixed costs and variable costs. Fixed costs include things like equipment and buildings while variable cost include direct expenses such as raw material; marketing expenses; labour expenses etc.

It is important that all the cost elements are included in the calculation of the market value of the product. Overpricing can lead to less demand for the product while under-pricing can cause financial loss and eventual collapse of the dairy business.

Quality control of milk and milk products

Normally we hear many instances of adulteration of milk. Milk is adulterated if its quality is lowered or affected by the addition of substances which are injurious to health or by the removal of substances which are nutritious. Though water remains the most common milk adulterant, increasingly detergent, caustic soda, glucose, white paint and refined oil are being used to adulterate milk. Water thins the milk, but other adulterants make it appear thick. Adulterants like salt, detergents and glucose add to the thickness and viscosity of the diluted milk while starch

prevents its curdling. So non-water adulterants make it difficult for a consumer to suspect that the milk is diluted or adulterated.

A dairy farmer needs to stay away from these malpractices to gain the trust of her costumers. It will help her to establish a sustainable and successful business.

To check adulteration in any level testing and quality control should be an essential component of a dairy unit. Milk is prone to adulteration by dishonest middlemen and unfaithful workers. Certain basic quality tests should be done to assure the quality of raw milk at various stages of transportation of milk from the diary to the middleman and finally to the consumer. Proper hygiene should also maintain in dairy farm and during the transportation process to check the milk and milk products being adulterated.

Wastage & other risk factors in dairy and how to deal with it?

Along with selling the milk directly, it is more profitable to sell other milk products such as butter milk, yogurt, cheese, paneer, ghee etc. by little processing it. But there are lots of risk factors that cause spoiling of milk and the other milk products. The small milk producer can have loose the profit from the business, if it is not done in a proper way or prepare with all the required tools & equipment. So the small farmers, need to be aware of the risk factors and learn how to deal with the risks factors in dairy business.

Risk factors in dairy include:

- Milk and milk products are very perishable and especially in India's hot climate, milk spoils within five hours.
- In the hot season, farmers can lose as much as 30% of their milk to spoilage due to lack of pre-storage conditions, available storage facilities
- There are certain conditions like the lack of health and hygiene of the dairy stock, environment, the low quality raw milk, and wrong milking process etc. cause presence of foodborne pathogens in milk, which is a great risk for public health.
- Improper cleaning the milking pots or other container used for storing and transporting milk or milk products.
- Delay in transporting the milk product to the customer due to less workforce and transport facilities.
- Not getting right market to sell own milk products reduces income and limits the growth in the dairy business.
- Less demand of products with high competitive market.
- Shortage of free-range feed and fodder and unable to afford high cost supplementary feedings affects the reproduction and milk production & quality of dairy cattle.
-

Actions to avoid these situation;

- Getting training about food processing and management practices.

- Organizing tools and equipment, and refrigeration system to make milk products and preserve them safe mainly during hot days for selling.
- Ensuring good quality milk products we can get maximum selling price.
- Having a regular contact the customers for knowing the demands, getting ready and delivering of milk and milk products.
- Making a regular cleaning practice of tools and equipment used in the dairy process.
- Maintaining proper hygiene we can safeguard our milk and milk products in dairy and develop reliability of customers towards own dairy business.
- Developing a cost effective system for producing quality green fodder for dairy cattle to meet their nutritional needs.

Activity: "How can I mitigate & overcome the risks in my dairy business?"

- The trainer will explain about the risk factors in dairy business, how they act as important factors in running the dairy business with good profit, and those factors how it can be handled
- The participants will discuss in pairs about the practical difficulties factors of dairy business and handling of the milk and milk products in their areas. (They can point out the problems and how to solve that on behalf of their experiences from the field visit and individual situation)
- Each pair will present their understandings and conclusion to the group.

Session 15:

Importance of record keeping and budgeting in a dairy business

Record keeping and budgeting is a necessary element of dairy business. With no written records, the dairy owner has to depend on their memory while making decisions regarding their daily practices. There are several useful records such as production and financial transactions in the dairy unit. To track the progress of business it is very much essential to maintain some useful records. It is also important to have accurate facts and figures of the dairy business when borrowing money, seeking government loans and tax returns. Following are the key benefits of maintaining records and budgeting for dairy farming:

- Helps in analyzing feeding cost and benefits from animal product outputs. Hence helps to formulate economic feeding strategies for optimal productions.
- Helps in finding the commonly occurring diseases in the herd and thus to formulate in time precautionary measures like vaccination, deworming etc.
- Helps in fixing right prices of animal meant for purchase and sale.
- Helps in overall better supervision and management of herd.
- Helps in determining the income and expenditure (economics) of dairy farm.
- Helps in estimating the cost of milk production.

- To compare the herd performances in different years to determine the amount of profit/loss each year and setting future goals/directions for the farm.

Activity: Keeping records and making budget for my dairy

- The trainer will explain the importance of maintaining records and making budget for the dairy.
- The participants will recall and discuss in the pair about making budget and maintaining records such as cash book, business plan etc. that they have learnt during the LEAP and FEST training.
- Each pair will present their understandings to the group.

Making a Budget

We will make a Start-up budget and an Operating budget.

Round 1: Making my Start-up budget

Activity: 'What are the things I need?'

The participants will make a list of the things they need to start up their milk production and selling.

Let's take an example: Rohini made a list of things she would need to start a cow milk production and selling. She included:

1. 1 cow shed of 60 sq. ft.
2. 1 milch cow with a calf
3. 2 Milk containers
4. Measuring containers of different sizes
5. 1 tank each for fodder and water

Activity: 'How much money I need for each of the things?'

The participants will put a price for each of the things in their lists. The participants should consider if they can find some of the things without spending any money or by spending less.

Rohini put costs as follows:

1. 1 cow shed of 60 sq. ft. – Rs.7,000
2. 1 cow with a calf – Rs.30, 000-Indeginous cow
3. 2 milk containers- Rs.1,000
4. Measuring containers of different sizes - Rs.500
5. 1 tank for the cow for food and water- Rs.500
6. Insurance cover of cow-Rs.1,000 @5% of the cost price

TOTAL-Rs.40,000

She will take a loan from the MFI of which she is a client.

Round 2: Making an operating budget for my small business

Things to consider for making an Operating budget:

- Probable volume of milk you will get from the cow/buffalo.

- Probable number of days of getting milk and number of days you will not get milk.
- At what cost you can sell the milk and how much your income per day will be?
- What you need to spend every month as your fixed expenses? For example, electricity bill, repayment of loan, phone expenses, annual vaccination cost, artificial insemination cost, etc.
- What variable costs you may have. For example, cow/buffalo feed (green fodder, dry fodder and concentrates), transport if any, etc. You need to think of putting some money aside for emergency also.

Some more things to consider:

**** Lactation Period and Dry Period**

Animal	Average lactation period	Average dry period
Buffalo	280	110
Indigenous cow	260	130
Cross-bred cow	300	90

**** Milk production**

Animal	Approximate milk production per day
Buffalo	10 litres
Indigenous cow	7 litres
Cross-bred cow	12 litres

**** Price of animal fodder**

Animal fodder	Approximate cost per kg
Dry fodder	Rs.4
Green fodder	Rs.2
Concentrates	Rs.20

Activity: 'I will consider...'

- The trainer will distribute a piece of paper to each participant.
- The participants in pairs consider the probable fixed and variable monthly expense heads and their costs, and write them on the paper in two columns.
- The participants will also consider the lactation period, dry period, and costs of fodder for the cow/buffalo.
- Each participant will present their consideration to the group. The trainer and other participants will give their inputs.

Let's look at Rohini's example:

Rohini calculated her fixed and variable costs for the month of June as follows:

Fixed Costs	Rupees	Variable Costs	Rupees
Electricity	300	Green fodder for one cow	900
Repayment of loan	600	Dry fodder	220
Phone expenses	150	Concentrate	1,800
Vaccination cost	150	Transport for delivering milk to the customers	0
Total	1,200	Total	2,920
So, Rs.1,200 + Rs.2,920= Rs.4,120 Rohini needed per month to run her business.			

Activity: 'My monthly sale'

- The trainer will distribute a piece of paper to each participant.
- The participant will work in the same pairs and find out what will be their monthly sale of milk.
- Each participant will present her monthly sale estimation.
- The trainer will correct if any mistake and conclude the point.

Let's look at Rohini's calculation. She calculated 8 litres of milk she will get every day.

Milk per day (in lit.)	Selling price of one lit. milk	Income in a day	No. of days	Total income in a month
8	Rs.30	Rs.240	30	Rs.7,200

A six-month budget of Rohini is as below:

Precondition(Cow is in lactation period)	Jan	Feb	Mar	Apr	May	Jun
Sales estimated(Milk in litres)	248 lit	224 lit	248 lit	240 lit	248 lit	240 lit

Month	Jan	Feb	Mar	Apr	May	Jun	Total
Income							
Sales income	7,440	6,720	7,440	7,200	7,440	7,200	43,440
Total Income	7,440	6,720	7,440	7,200	7,440	7,200	43,440
Expenses							
Fixed costs	1,200	1,200	1,200	1,200	1,200	1,200	7,200
Variable costs	2,920	2,920	2,920	2,920	2,920	2,920	17,520
Saving to tackle prevent/treat diseases	500	500	500	500	500	500	3,000
Total expenses	4,620	4,620	4,620	4,620	4,620	4,620	27,720
Balance	2,820	2,100	2,820	2,580	2,820	2,580	15,720

Balance - carried forward	2,820	4,920	7,740	10,320	13,140	15,720	
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Activity: 'Putting everything together'

By putting the fixed and variable costs and monthly sales estimation together, an operating budget can be made.

- The trainer will distribute an Operating budget format to the participants.
- Each participant will make her budget for a year. She can take help from other participants.
- Each participant will present her budget to the group. The trainer will give his/her inputs and conclude the point.

Session 16:

Developing a Business Plan

The participants have already known and understand how to make a business plan for a small business during their FEST (Fundamental Entrepreneurship and Skill Training). Here, they will make a business plan specifically for 'Milk Production and Selling'.

Let's look at Rohini's business plan:

BUSINESS PLAN		
1	Name of the business woman	Rohini
2	Name and type of business	Rohini Milk Production and Selling
3	Address	Ainlapali, Patnagarh, Balangir, Odisha
4	Sales... (A) per month	Rs.7,200
5	Other expenses.... (B) per month Other than fixed expenses like rent, electricity bill, etc.	Rs.2,920
6	Sales minus Other expenses..... (A-B)	Rs.4,280
7	Fixed cost..... (D) per month	Rs.1,200
8	Profit..... (A-B-D) per month	Rs.3,080
9	Loan required	Rs.40,000
10	Interest expenses..... (E) per month	Rs.450
11	Profit after Interest.... (Profit-E) per month	Rs.2,630

Activity: 'My business plan'

- The trainer will distribute a business plan format to each participant.
- Each participant will make her business plan. She can take support from other participants.
- Each participant will present her business plan to the group.
- The trainer will give his/her inputs and conclude the point.

Session 17:

Conclusion of the training

- The trainer will ask and encourage the participants to share their experiences and learnings during the 7 day training program.
- The trainer will comment on the speeches of the participants, and conclude the training by giving thanks and good wishes for their successful business of milk production and selling.

Materials required for the training

- A board and chalk
- A writing pad and pen for each participant to be used throughout the training. They will use it during the preparations for field visit and during the interaction with the people in the field.
- Copies of requires format