

# Training Manual for Milk Traders

Prepared under the  
**Assam Agribusiness & Rural Transformation Project (APART)**  
ARIAS Society, Khanapara, Guwahati



For  
**Dairy Development, Assam**  
**Animal Husbandry & Veterinary Department, Govt. of Assam**

By  
**International Livestock Research Institute (ILRI)**





# **Training Manual for Milk Traders**



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By  
**International Livestock Research Institute (ILRI)**

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INTERNATIONAL  
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## Foreword

Milk traders play an important role in dairy development by creating linkages between milk producers and consumers. Their role is also important from the standpoint of ensuring milk quality and safety in which they can contribute by adopting good practices in handling, storage and transportation of milk. In a situation where 97% of the state's total milk production traded through informal milk traders and given that these traders lack basic training on clean and hygienic milk handling, this is bound to cause lesser consumers' trust on milk quality and safety resulting in lesser consumers' satisfaction and demand. Despite the milk traders playing pivotal role in the society they are always considered as bad element of milk business and no holistic effort has been made yet to improve their knowledge and capacity to deliver better quality milk.

This training manual is the first of its kind in India developed by the International Livestock Research Institute (ILRI) under the World Bank aided Assam Agribusiness & Rural Transformation Project (APART). I have learnt that the training manual has been designed based on a Training Need Assessment (TNA) exercise and through a consultative process with the traders and technical people of Animal Husbandry and Veterinary Department (AHVD) and Directorate of Dairy Development, Govt. of Assam. The manual covers some important topics including attributes determining consumers' preference and behavior, germs that cause milk spoilage and diseases, hygienic milk handling, storage and transportation, cleaning of milk utensils, personal hygiene, basic tests for milk quality checks, prevailing rules and regulations for milk traders, personnel behavior and communication quality and record keeping and business development skill.

I am sure that dissemination of knowledge on the above topics would certainly improve the quality of milk traded by milk vendors. I truly commend the efforts of International Livestock Research Institute (ILRI) and the concerned officials of the Directorate of Dairy Development (DDD) and ARIAS society for conceptualizing the milk traders' manual and bringing the same to its present form. The publication of this manual is timely and need based. Given that clean and hygienic milk handling practices are explained in short and simple language with several photographs and illustrations incorporated in the manual, I am confident that users of this manual will greatly be benefitted.

(Rajesh Prasad)



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## **Preface**

The role of the milk traders is very much important for the overall development of the dairy sector. They act as the communicating medium between the milk producers and the consumers. Any lapse on their part can lead to development of negative impact on both the producers and the consumers. The producer community will suffer in terms of delivering milk to main urban consumption center by spending their time and labour and the consumers will not get the milk at their door step. Because of the missing link, neither consumers would have access to milk nor the producers would get a remunerative price. However, the main criticism of the informal sector is that they adulterate the milk and the quality of milk is not up to the mark which may pose risk to human health. In Assam, about 95% of the locally produced milk is marketed through informal sector but until date no effort has been made to build the knowledge and capacity of informal milk market actors, other than simply blaming them for poor quality. To address the issue Dairy Development, Assam under the Animal Husbandry & Veterinary Department (AHVD) has come up with a promising programme of Training, Monitoring & Certification (TMC) under the World Bank aided Assam Agribusiness & Rural Transformation Project (AACP). The initiative would help in ensuring the quality and safety of milk marketed by informal market actors and increasing the consumers' satisfaction and demand so that all the value chain actors get benefited. The International Livestock Research Institute (ILRI), a global research institute for livestock sector is technically backstopping the initiative of the government and they have come up with a customised training course for the milk vendors based on Training Need Assessment (TNA) of the milk vendors and in consultation with the concerned officials of Directorate of Dairy Development (DDD), AHVD and ARIAS Society.

I am truly hopeful that this training manual will meet the must needed knowledge requirement of the milk vendors and help in changing their knowledge, attitude and practices in milk business. I appreciate the sincere efforts made by ILRI along with the concerned officials of DDD and ARIAS Society. I am confident that this training manual will be an important knowledge product for the state.

Commissioner & Secretary

A.H. & Veterinary Department, Govt. of Assam





## Acknowledgment

We sincerely thank and acknowledge the guidance and support that we received from the Agriculture Production Commissioner (APC) to the Govt. of Assam; Commissioner and secretary to the Govt. of Assam, Animal Husbandry & Veterinary Department (AHVD); State Project Director, ARIAS Society; Director, Nodal Officer (APART) and other concerned officials of Directorate of Dairy Development (DDD) and AHVD and concerned officials of the ARIAS Society without which this training module would not have been possible to complete.

We are grateful to all of the District Dairy Officers (DDO), Veterinary Officers (VOs), Food Safety Officers and other concerned officials who gave important feedback during content development and content finalization of this training module.

We also express our deep sense of gratitude to the milk traders/milk vendors who immensely helped us by supplying the necessary information during Training Need Assessment (TNA) surveys and supported in collecting images of specific milk vending activities needed to incorporate in the manual.

At last but not the least we express our sincere thanks to all those ILRI and partners colleagues who contributed in drafting the earlier version of this training manual based on which present revised version has been prepared as per its suitability in the present day context of the state.

Team Leader and Resident Consultant, ILRI-APART  
International Livestock Research Institute



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## Abbreviation

<b>AHVD</b>	: Animal Husbandry and Veterinary Department
<b>AI</b>	: Artificial Insemination
<b>APART</b>	: Assam Agribusiness and Rural Transformation Project
<b>ARIAS</b>	: Assam Rural Infrastructure & Agricultural Services
<b>BVO</b>	: Block Veterinary Officer
<b>CLR</b>	: Corrected Lactometer Reading
<b>CMT</b>	: California Mastitis Test
<b>DDD</b>	: Directorate of Dairy Development
<b>DDO</b>	: District Dairy Officers
<b>DVO</b>	: District Veterinary Officer
<b>FSSA</b>	: Food Safety & Standard Act
<b>FSSAI</b>	: Food Safety & Standard Authority of India
<b>ILRI</b>	: International Livestock Research Institute
<b>KII</b>	: Key Informants Interview
<b>KVKs</b>	: Krishi Vigyan Kendra
<b>NABARD</b>	: National Bank for Agriculture and Rural Development
<b>SNF</b>	: Solids Not Fat
<b>TNA</b>	: Training Need Assessment
<b>ToT</b>	: Training of Trainers
<b>VO</b>	: Veterinary Officer





## Proposed training schedule

		Registration	10:30-11:00 am
Day 1	Session 1	Pre-training status evaluation	11:00 am-11:15 am
		Introduction to the training and germs that cause milk spoilage	11.15 am -12.30 pm
	Session 2	Milk quality and safety	12:31 pm -2.00 pm
Day 2		Participants' reflection of Day 1	
	Session 3	Hygienic milk handling, storage and transportation (part 1)	11:00 am-12:30 pm
		Hygienic milk handling, storage and transportation (part 2)	12:31-02:00 pm
Day 3		Participants' reflection of Day 2	
	Session 4	Cleaning and sanitizing milk containers and equipments	11:00 am-12:30 pm
	Session 5	Basic milk quality tests	12:31-2.00 pm
Day 4		Participants' reflection of Day 3	
	Session 6	Rules and regulations, communication and business development for trader	11:00 am-12.15 pm
	Session 7	Personal behavior & record keeping	12.15-1.15 pm
		Post training evaluation	1.15-1.30 pm
		Formation of Hygienic Milk Monitoring Committee	1.30- 2.00 pm

**Note:** The suggested training schedule is only indicative, facilitator may modify the schedule as deemed fit to the local circumstances. High tea may be provided at the end of the 2<sup>nd</sup> session on each day

**Duration of training: 4 days**

**Total time: 12 hours**

# SESSION 1: Introduction to the Training and Milk Quality and Safety

<b>Introduction to the training</b>
The training facilitator will introduce the training by following the sequence as stated below-
<b>Welcome address:</b> Organizer/facilitator will welcome the participants and explain the objectives of the training.
<b>Self-introduction:</b> Facilitator will ask the participants to state their name, primary occupation, years of experience on milk trading.
<b>Expectation from the training:</b> Facilitator will ask the participants to explain their expectations from the training. He/she will write down the key points in a flipchart/whiteboard/black board in order to revisit the same at the end of the training.
<b>Pre-training status evaluation:</b> Facilitator will distribute the pre-training evaluation form (provided by ILRI) amongst the participants. Ask them to put tick marks in the boxes (Agree/Disagree/Don't know). After the evaluation, he/she will collect the forms and use the same at the end of the training to compare the differences.
<b>Ground rules:</b> Facilitator will ask the participants what general behavior they expect to experience in order to run the training smoothly and effectively, he/she will list all suggestions in a flip chart and post the flipcharts where it is visible throughout the training.
<b>Content:</b> Importance of the milk trader, changing consumers' behavior, relevance of the training and benefits of the training, normal composition and germs and milk spoilage
<b>Training Method</b>
<ul style="list-style-type: none"> <li>• Participatory discussion</li> <li>• Group exercises</li> </ul>
<b>Training materials</b>
<ul style="list-style-type: none"> <li>• Laptop, LCD projector and screen</li> <li>• White board and marker (with multiple colour)</li> <li>• Flip chart</li> <li>• Pre-training evaluation form</li> <li>• Manual and handouts</li> <li>• Some flour/talcum powder</li> </ul>

## 1.1 Why is a milk trader important?

A milk trader-

- Creates linkages between producers and consumers;
- Helps producers by procuring the milk produced in his farm premises and consumers by supplying milk at their door step;
- Helps in meeting animal protein requirement of the neediest group of people particularly children and aged people;
- Helps the producers by providing credit at times of need;
- Can inform producers about consumers' concerns for milk quality and safety and thereby helps in producing quality milk to meet consumers' demand and satisfaction.

## 1.2 Changing consumers' behavior and relevance of training

- With increase in income, urbanization and population growth, the demand for milk and milk products are constantly increasing.
- Consumers are increasingly becoming cautious about the food they eat due to their exposure to health hazards caused by consumption of unsafe food.
- Various food safety regulations (e.g. Food Safety & Standard Act, 2006) are constantly reminding the consumers to buy food items from sources that guarantee better clean and hygiene and comply with safety protocols.
- If consumers are not satisfied with the quality and safety of milk marketed by milk traders, even in the event of rise in demand, traders will fail to reap the benefit.
- Adoption of training, certification and clean milk handling practices may potentially raise the quality and safety of milk traded by milk traders.
- There will be increased popularity among consumers in the milk traded by trained milk traders resulting increased demand for milk traded by them.

## 1.3 How does the training benefit you?

- The training will enrich your knowledge on clean and hygienic milk handling, transportation and storage that will help in reduction of microbial load in milk and thus increase the shelf-life of milk and reduce spoilage.
- The training will enrich your knowledge on improvement of milk quality and safety and thereby increase the demand for your milk.
- The training will help you in improving your personal health and hygiene and style of doing your business resulting increased acceptability and demand for your milk.
- The training will help you in improving your business development and management skill. Also, increase compliance with the state's policy.
- The training participation will help in availing training certificate that may help in getting trade license and FSSAI registration smoothly in future.
- Training and certification will increase the trust and recognition in the society.
- Training certificates may help in getting access to institutional credit and availing insurance services.

## 1.4 What is the good quality milk that a consumer expects to buy?

Milk can be considered good quality if it is-

- Of normal composition,
- Free from any adulterants like water, starch, urea, etc.,
- Free from any foreign particles/ dirt like straws, hairs, etc.,
- Free from off-flavors, abnormal colour and odor,
- Fresh milk without starting to sour.



**All the visible dirt are strained to keep the milk clean**

### 1.4.1 What is the normal composition of milk?

Milk can be considered of normal composition if its constituents are found within the required range (for both cow and buffalo) as indicated in table below.

**Table 1:** Normal composition of milk

Species	Fat%	SNF%
Cow	3.5	8.5
Buffalo	6.0	9.0

### 1.4.2 What is safe milk that consumers should have?

Milk is considered as good quality if it-

- Does not contain any physical contaminant,
- Does not contain germs beyond the acceptable limit,
- Does not contain any residues (antibiotic residues, pesticide residues, etc.) beyond an acceptable limit,
- Does not contain any toxic or poisonous substance (aflatoxins, phytotoxins, etc.).

## 1.5 Adulteration of milk

Milk adulteration means addition of any external material like water, starch, skim milk powder etc. in milk which alters the natural quality of milk. It might give you short term benefits but in the long run you may face losses due to poor demand for your milk.

- Inform the milk produces not to collect green grasses from where pesticides are being used.

### **Preventive actions**

- Milk should not be adulterated. Poor quality adulterants (e.g. addition of poor quality milk, skimmed milk powder etc.) can pose serious health hazards to its consumers.
- Adulterants decrease the nutritive value of the milk;
- Consumers do not get the original flavor and taste in adulterated milk and thus they buy less or stop buying of it.
- This may reduce consumers' trust on the adulterating trader as well as his fellow traders' milk and may move to other available options.

Milk quality can be checked by the food safety officers at any time and if found guilty of adulteration, traders can be penalized under the act of law. The punishment might be in terms of fine or imprisonment (few months to life imprisonment depending upon the severity of offence). Once a trader is found guilty of it or if convicted, he will be even less trusted in the locality in his subsequent return to the business. It will be thus difficult to promote his business even after following the best practices of milk handling. So, a trader needs to keep in mind all these issues to sustain his business for the long run.



## **Group exercise: How germs spread disease**

### **Instruction for the resource person:**

- Hide a small amount of flour powder or talcum powder in your hand
- Ask participants, “Have you ever seen germs?” (No.) Say, “That’s right, because germs are so tiny that we can’t see them with our eyes”
- Tell them that you brought some pretend germs, and sneeze into your hand so that the flour/ talcum powder is spread in your hand
- Touch a few people wearing dark clothing, and touch a few participants’ hands. The participants should be able to see the powder traces
- Say “If these were real germs, they could make you sick”
- Make the participants with powder on their hands to shake hands with participants who have none.
- Explain how germs can pass from person to person and role play proper hand washing

### **Key messages of session 1**

- A milk trader plays an important role in the society by supplying milk to the consumers at their door steps.
- Milk traders should take note of consumers’ increased consciousness and FSSAI regulations and accordingly try to ensure better clean and hygiene of milk they sell.
- The traders should also know the characteristics of good quality milk and how to recognize the poor quality milk.
- The trader should always adopt good practices to keep the milk clean and cool
- He should discard the milk if it is not of natural colour, flavour, consistency and taste
- Adulterated milk should not be sold
- Milk adulteration may give short term benefits but in the long run trader’s business may get affected negatively.

## SESSION 2 : Germs that cause milk spoilage and disease

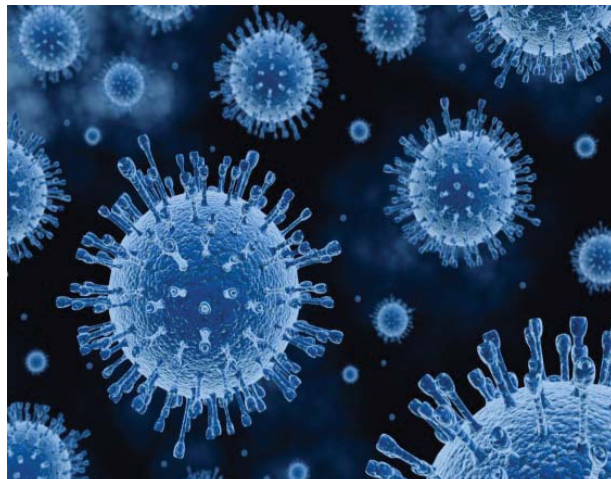
<b>Session objectives</b>
<ul style="list-style-type: none"><li>• To provide knowledge how to ensure quality and safety of milk</li><li>• To sensitize the milk handlers about various myths they are pursuing</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion</li><li>• Explanation with the help of exercises and activities.</li><li>• Group work</li><li>• Group exercise</li></ul>
<b>Training Materials</b>
<ul style="list-style-type: none"><li>• Laptop, LCD projector and screen</li><li>• Manual and handouts</li><li>• Flip chart</li><li>• A packet of pasteurized milk</li><li>• 10 ml plastic sample tube for each participant</li></ul>

### 2.1 What are germs?

Germs are tiny living creatures and are present everywhere more particularly in dirt, faces, other body excreta, farm wastes, etc. They are too small to see with the naked eyes but can be seen with a microscope. Germs also come from the skin of animals and people, from discharges of animals and people, from the soil and untreated water, flies and other pests etc. You may have heard of ‘bacteria’ or ‘viruses’ – these are types of germs.



**Photograph of bacteria**



**Photograph of virus**

In general milk has lesser number of germs at the stage of production of milk in mammary gland. If the animal is suffering from any infectious disease, particularly in udder, there is the chance of higher microbial load in milk. Milk becomes contaminated with germs during or after milking. Immediately after milking germs start multiplying rapidly and milk further gets contaminated if exposed to dirty environment. Generally milk gets spoiled after 5-6 hours. However, depending on degree of environmental temperature the shelf life of milk may vary from this range. If milk is kept in a warm place then the germs will multiply very fast and the milk will get spoilt in a very short

span of time. To make sure that raw milk remains fresh for a longer time, one should ensure that hygienic handling practices are followed and milk is kept in cool and dry place or in refrigerator.

Two types of germs are present in milk- good and bad germs

- Good germs help break down of our food so that we can digest it. Other good germs ferment milk into curd.
- Bad germs cause spoilage of food quickly. Bad germs in human body cause fever, vomiting, diarrhea, colds, rashes, coughing and other diseases.

## **2.2 How germs are spread?**

There are various means through which germs are spread:

- Physical contact of one animal/man with other,
- Animal excreta and discharges,
- Milk utensils,
- Water and air,
- Milk handlers (mainly through dirty clothes, nails, hairs, sneezing, coughing, etc.),
- Flies, mosquitoes, etc.,
- Birds and animals.

## **2.3 Ensuring milk free from physical contaminant**

Physical contaminants are dirt like sack of animal excreta, dust, piece of grass, hairs etc. Presence of physical contaminants in milk indicates that the milk is not handled carefully and there is lack of proper hygiene. Since quality and safety of milk starts at farmers' place traders should advise the farmers to produce milk that is safe for consumers.

To avoid physical contaminants, the trader should-

- Cover the milk containers with a clean cloth or keep the containers closed with a lid.
- Suggest to trim the long hairs of the cow, more particularly the hairs of the tail and in area around the udder on regular intervals.
- Suggest to tie his hairs up or cover his head with a cloth/wear cap during milking the animal; follow this practice by himself during milk handling.
- Strain milk with a clean cloth/ strainer while collecting milk from the producers.
- Take utmost care of personal health and hygiene.
- Suggest the farmers to maintain proper sanitation and hygiene in the farm.
- Use clean utensils during milk storage, handling and transportation.

## **2.4 Characteristics of poor quality milk**

The characteristics of poor quality milk are:

- If it has foul smell,
- If it tastes slightly sour,
- If milk is thicker (coagulate) than normal,
- If the color is not yellowish white (e.g., reddish-blood or yellow-pus),
- If it is from sick animal,

- If it is from animals that are under treatment, particularly of antibiotics.

## 2.5 No germs beyond the acceptable limit

Some germs always remain in milk but they should not exceed the acceptable limit. Germs exceeding the acceptable limit lead to spoilage of milk and consumption of such spoiled milk may cause disease to consumers.

To keep the germs under the acceptable limit the traders should-

- Advise farmers to reduce the occurrence of diseases by proper treatment and vaccination;
- Advise farmers to maintain the farm in clean and hygienic condition;
- Advise farmers to provide good feed and clean drinking water;
- Treat diseased animals as early as possible;
- Do not sell milk before 48 hours of completion of treatment of diseased cows;
- Avoid getting milk exposed to high environmental temperature for a long duration;
- Keep milk in dry and cool place;
- Transport milk during cooler hours of the day;
- Use clean equipments and utensils including milk strainer;
- Use long handle milk measuring utensils;
- Keep your hands, body and clothes clean;
- Try to wash your hands before and after handling milk;
- Follow proper personal health and hygiene.



**Straining milk using a cloth**



**Straining milk using a plastic strainer**



## 2.6 Human health risk associated with dairy animals



**Protective wears for maintaining personal hygiene**

Dairy animals suffer from number of diseases caused by germs. Some of these diseases may transmit to human from animals or vice versa. These diseases are known as zoonotic diseases. Such diseases get transmitted to humans through contact with the diseased animals/animal excreta or through consumption of raw milk or milk products (produced from raw milk).



**Drinking raw milk is a bad practice**

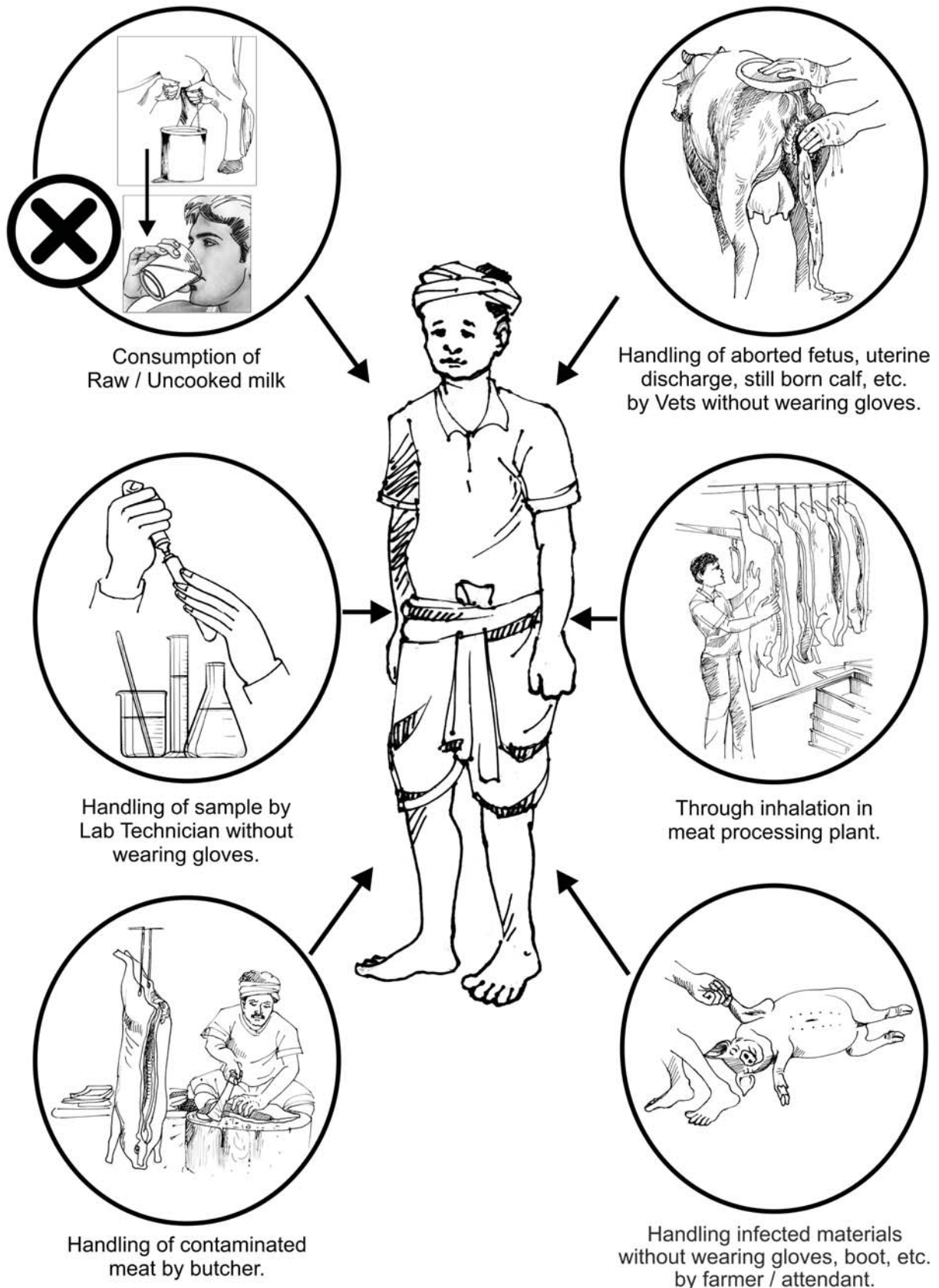
Some of the important zoonotic diseases of dairy animals are:

- Brucellosis
- Tuberculosis
- Leptospirosis
- Q-fever

These diseases affecting humans show a wide range of symptoms based on organs affected. There are other human health risk as well that include toxins produced by bacteria and fungus (e.g. aflatoxins), residues of pesticides and residues of antimicrobials.



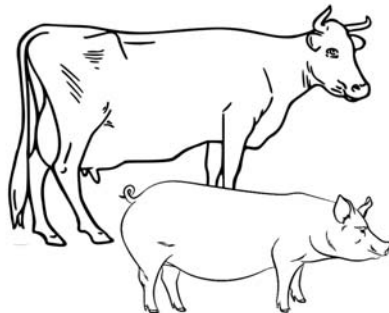
## Routes of Transmission of Brucella Organism



Routes of transmission of Brucella organism

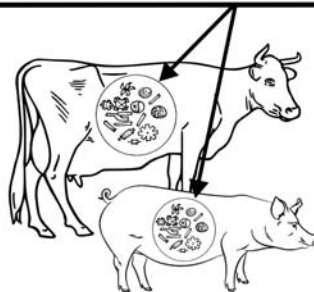
**Antibiotic residues:** Antibiotics are given to the animals to treat infectious diseases caused by bacteria and are also used as growth promoters with the feed that is given to the animals. The particles of these antibiotics slowly come out through milk. Such milk, if consumed by humans, get these antibiotic particles into their body. While the germs present in the human body get exposed to these antibiotics they might get resistant to the same antibiotic. If the resistant bacteria cause disease in human body these antibiotics may not work and may fail to cover from the disease.

**Antibiotic residue:**  
How it contribute to development  
of antibiotic resistant bacteria?



**ANTIBIOTICS**

- I. Low doses of antibiotics are put into feed for better growth of the pig & treatment of diseases.
- II. Animal products are sold within the withdrawal period and antibiotics are passed to humans when consumed.
- III. Overuse / Misuse of antibiotics by farmers.



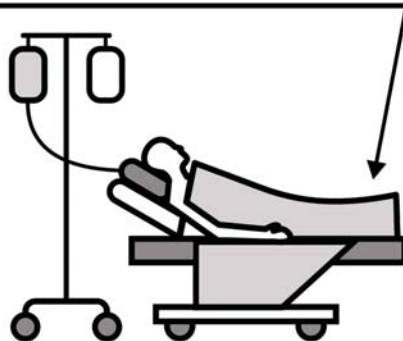
**ANTIBIOTIC - RESISTANT BACTERIA**

develop in the intestine  
of the animal.



Bacteria from animal's intestine enters -

- I. Meat during sloughtering and processing.
- II. Milk during production



Bacteria are carried through  
animal waste  
& then by air to crops.

Humans consume the contaminated  
meat, milk and food products and  
the antibiotic resistant bacteria  
and gets totally sick.

**Steps involved in development of antibiotic resistance**

### ***Preventive actions***

- Do not buy milk from the animals if they are known to be under treatment and until two days after the completion of the treatment (particularly antibiotic).
- Suggest milk producers not to treat animals on his/her own with antibiotic.
- Suggest producers to consult with veterinary practitioner before using any medicine to avoid any unnecessary use of antibiotic.

**Pesticide residues:** Pesticide is a chemical substance used for destroying insects or other organisms harmful to cultivated crops/fodder plants. When the animals take plants or feed sprayed with pesticides, the particles of the pesticide come in the milk they produce.

### ***Preventive actions***

In order to do away with the problem of pesticide residues, milk traders should note the following:

- Pesticides cause a wide range of toxic effects in human body. So, the milk containing particles of pesticide are harmful for you as well as for your consumers.
- Inform the milk producers, from whom you buy milk, to avoid using chemical pesticides in the farm.
- A number of organic pesticides can be used instead of the chemical pesticides.

**Aflatoxins:** Milk gets contaminated with Aflatoxins due to the consumption of mouldy feed or fodder. These toxins can pose health hazards to the milk consumers.

### ***Preventive actions***

To avoid the problem of Aflatoxins, you can give following advice to milk producers:

- Feed and fodder given to the animals should be stored in a clean and dry place;
- Stored feed should not come in contact with water/moisture;
- Storage area should have proper ventilation.

## 2.7 Group work: Myths about milk

**Instruction for the Resource Person:** Discuss the following myths about milk. Ask how many people believe the myths. Then give the reason why it is not true.

**MYTH: If milk and dairy products look and smell good, then they are safe**

**TRUTH:** Many diseases are spread by germs which are too small to see by naked eyes. These can make you sick or kill you, even if the food looks and smells perfectly good.

**MYTH: If you boil milk well it is completely safe**

**TRUTH:** boiling will kill the germs responsible for some diseases. But, some germs shed poison and boiling will not remove these. Also, boiling will not destroy harmful chemicals like antibiotic and pesticide residues in milk. Boiling or cooking will always make food safer but it will not remove all things that can cause disease.

**MYTH: If you are sick then it is the last thing you ate is responsible**

**TRUTH:** Sometimes you are sick directly after eating bad food; but often you become sick 1-3 days later. In the last is the case, then it will not be the last food you ate which caused the sickness.

**MYTH: Bad food just causes vomiting and diarrhea**

**TRUTH:** Bad food causes vomiting and diarrhea but it can also cause paralysis, depression, infertility, abortion, kidney failure, arthritis, and other serious conditions.

**MYTH: The faces of cattle (and children) is harmless**

**TRUTH:** Faces is the number one cause of diarrhea! 1 pinch of cow feces can contain lakhs of germs.

**MYTH: If it doesn't make me sick, it won't make anyone else sick**

**TRUTH:** Just because you can eat food without ill effect does not mean everyone else can. Some people are much more likely to get disease as they are less resistant, especially children, old people, pregnant women and people weak from HIV or another illness

**MYTH: Milk quality can be tested by dipping hand and seeing the thickness on finger nails.**

**TRUTH:** Milk quality cannot be accurately judged by this practice and it can introduce germs from one's hand making milk unsafe to consume and lessening the keeping quality.

**MYTH : Fat content depicts the quality of milk exclusively**

**TRUTH :** Milk quality is dependent on both fat and solids not fat (SNF), as well as other factors such as presence of adulterants, presence of germs that can make people ill, freshness, taste etc.,

## 2.8 Group exercise: How germs spoil milk

### Instruction for the Resource Person:

- Carefully fill 3 plastic sample tubes with milk
- Divide trainees/participants into three groups and ask to do
  - Dirty milk experiment
  - Warm temperature milk experiment
  - Cool temperature milk experiment
- In the Dirty Milk Experiment participants are asked to put their finger in one sample tube and mark with an X. Explain there are many germs too small to see on the surface of our skin
- In the Warm Temperature Experiment participants are asked to leave one tube in a warm place (marked with a Y). Explain germs grow faster when it is warm
- In the cool temperature, ask the participants to keep one tube in domestic refrigerator (mark with Z). Explain germs grow slower when it is in cool condition.
- Participants are asked to observe after 5 hours the tubes home and check to see how long they stay fresh for
- They will report back in the next session how long it takes milk to get spoiled in case of each sample

### Key messages of session 2

- Germs cause milk spoilage and disease to human
- Poor handling practices increase number of germs in milk
- Number of germs increase rapidly in dirty and warm environment
- Higher number of germs may cause deterioration of milk easily and cause disease to human
- Milk containing antimicrobials and pesticide residues may cause health hazards
- The zoonotic diseases, residues (antibiotic and pesticides) and aflatoxins may pass from animals to human through milk and thus traders should know about such risks to human health. He should follow risk reduction practices.



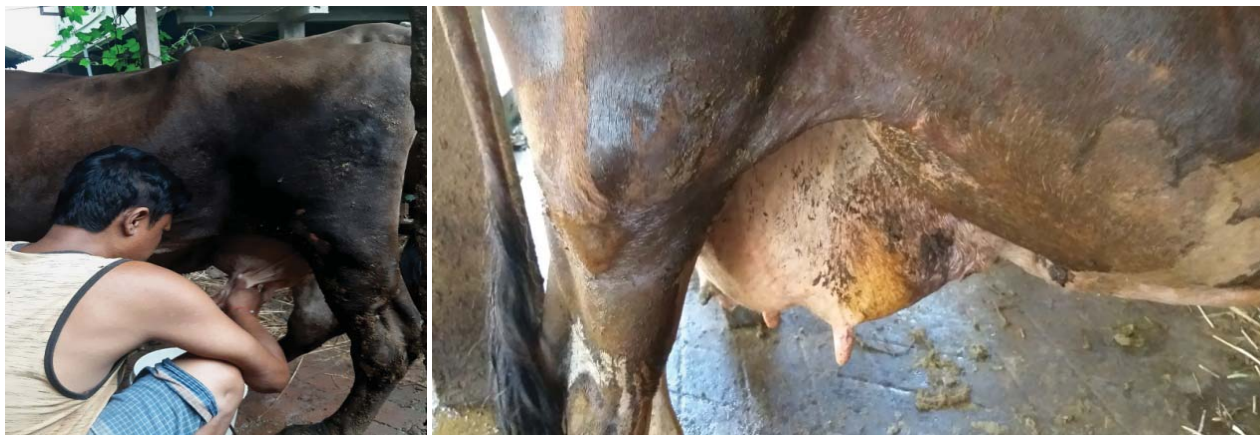
## SESSION 3 : Hygienic Milk Handling, Storage and Transportation

<b>Session objectives</b>
<ul style="list-style-type: none"> <li>• To acquaint the trainees about the different sources of dirt in milk</li> <li>• Making the participants explain hygiene and why hygienic milk handling is important</li> <li>• Make them aware about the milk quality and safety issues to improve upon his milk business.</li> <li>• To enable the participants about the five rules for good milk handling</li> </ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"> <li>• Participatory discussion.</li> <li>• Explanation with the help of pictures, illustrations and exercises, activities</li> <li>• Physical demonstration</li> <li>• Role play</li> </ul>
<b>Training materials</b>
<ul style="list-style-type: none"> <li>• LCD projector</li> <li>• Flip chart</li> <li>• Manual and handouts</li> <li>• Soap</li> <li>• Hand sanitizer</li> <li>• A metal container</li> <li>• A piece of wet cloth to wrap the metal container</li> </ul>

### 3.1 Different sources of dirt in milk

Milk may get dirt from the following sources:

- From dirt on the cow,
- From disease in the cows udder (e.g. mastitis),

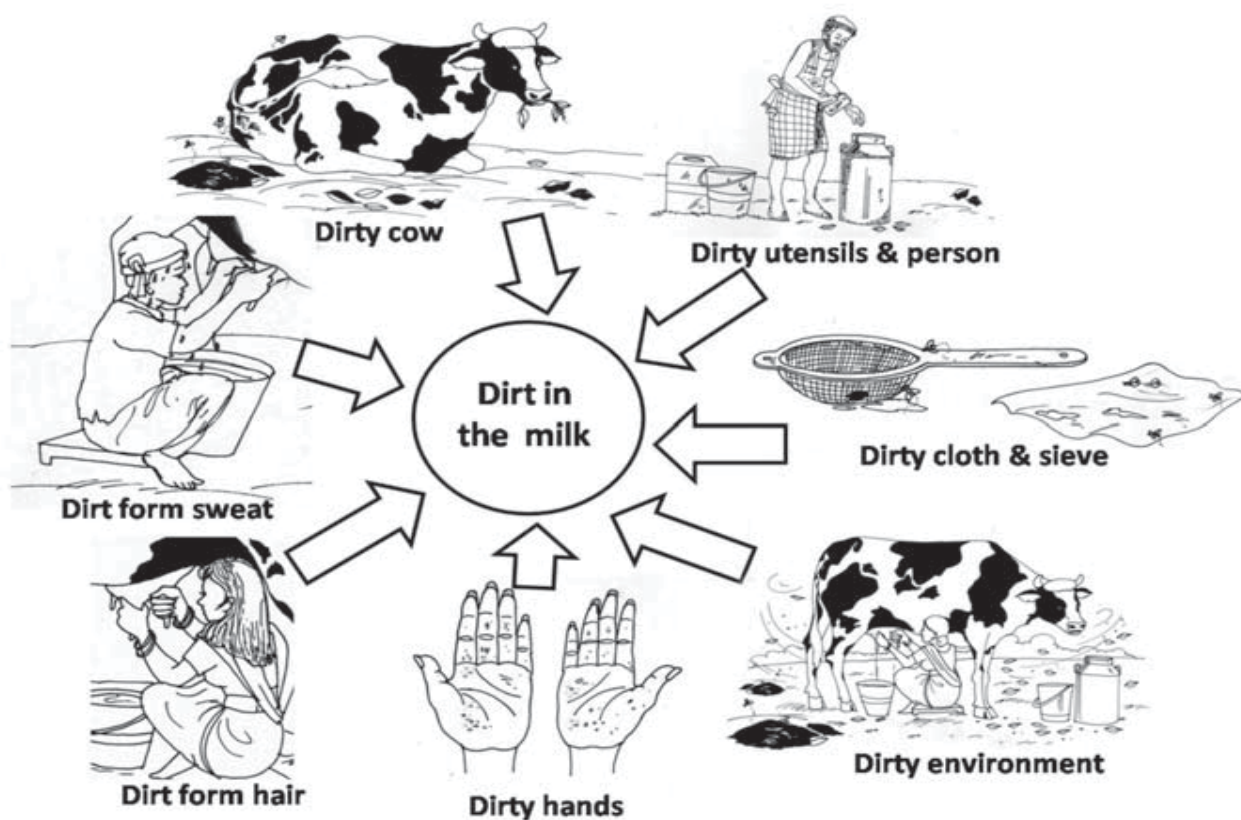


*Contamination of milk from dirt on the cow*



*Milk is being collected on the wayside of a busy highway*

- From dirt in the container or milk measuring litre put into the milk container,
- From dirt on the cloth used for straining milk,
- From dirt falling into the container from outside,
- From dirt having at hand,
- From hairs of the milk handlers,
- From sweat of milk handlers,
- From dirt in the environment.



*Different sources of dirt*

### 3.2 What is hygiene?

Hygiene is a set of practices that help to maintain health and prevent the spread of diseases. By maintaining hygiene you can prevent the spread of germs and illness to others. By maintaining personal hygiene you can protect yourself from illness as well. Also, if personnel hygiene is maintained and equipments/utensils are cleaned properly the consumers may unlikely to get offended by bad smells or dirt.

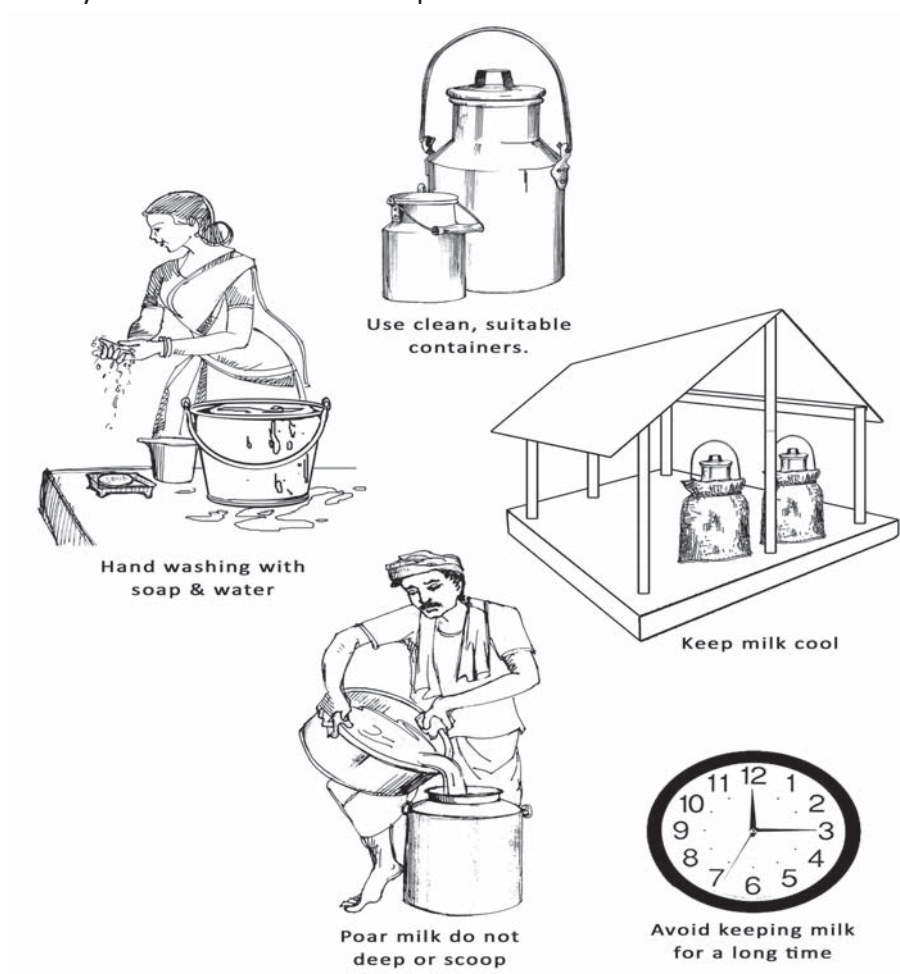
### 3.3 Why is hygienic handling of milk especially important?

Poor hygiene during milking, handling, storage and transportation of milk can introduce the germs that cause milk spoilage. By keeping germs under control one can reduce spoilage of milk and occurrence of milk borne diseases in human.

### 3.4 Five rules for good milk handling

#### Rules:

- 3.4.1. Follow good personal hygiene,
- 3.4.2. Use clean, suitable, equipment,
- 3.4.3. Keep milk cool,
- 3.4.4. Pour milk: don't dip or scoop,
- 3.4.5. Get milk to your customer as soon as possible.



Good milk handling practices

### 3.4.1. Rule One: Observe good personal health and hygiene

- People may carry germs which is likely to spread to food.
- These germs are present on our hands, face, hair, noses, in our mouths and gut.
- Even the healthiest person may carry germs without being sick. This indicates the importance of personal hygiene.
- No customer wants to drink milk that is sold by persons with dirt in his/her hands, face, nose or other places. In fact majority of the customers' first observation is the personnel cleanliness of the sellers.

<b>Remember and practice the following</b> <ul style="list-style-type: none"><li>• Do not wear rings, watches, jewellery or other items in your hands and wrist while handling milk,</li><li>• Tie back or cover hair,</li><li>• Keep finger nails short and clean,</li><li>• Keep clothes clean. If clothes are light in colour it is easy to see if they are clean,</li><li>• Cover cuts (if any) and sores with a water proof, brightly coloured plaster,</li><li>• Be careful not to cough, sneeze or breath into milk.</li></ul>	<b>When handling milk, avoid</b> <ul style="list-style-type: none"><li>• Touching parts of your body (especially your face, nose, ears and mouth),</li><li>• Wiping off sweat,</li><li>• Coughing or sneezing,</li><li>• Smoking or chewing <i>paan</i>/betel nut,</li><li>• Putting your hands or fingers in milk,</li><li>• Touching any other item except for the clean, disinfected milk equipment.</li></ul>
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#### **Keep your hands clean and wash your hands with soap/use hand-sanitizer**

- Before and after handling food or eating,
- After using the bathroom for any reason,
- After sneezing, blowing your nose or coughing,
- After touching a cut or open sore,
- Before and after handling animals or animal waste,
- After working outside or touching soil,
- After handling rubbish or anything dirty,
- Every time you enter the house from the outside.



## Don'ts during milking (Personal hygiene)



Have long nails



Smoking



Sneezing or coughing



Have long beards



Have long and untidy hair



Scratching



No finger deeping



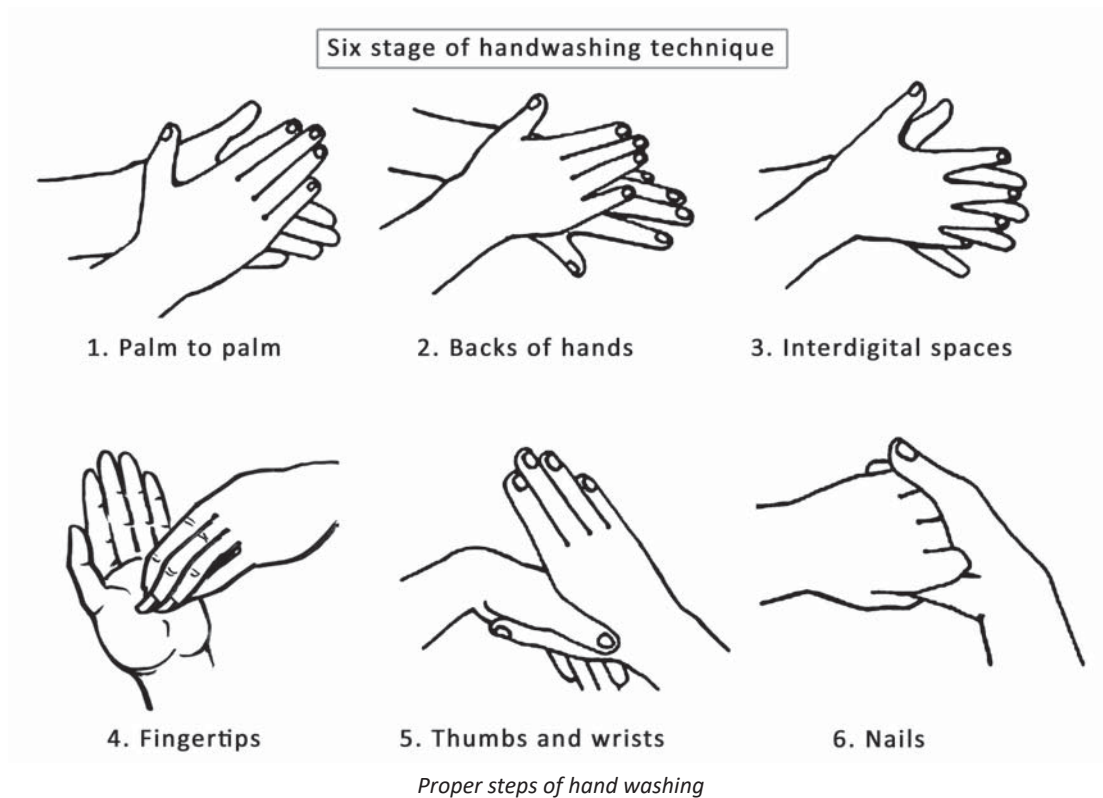
Use long handled measuring scoop

### Don'ts in milking/milk handling

#### Physical Demonstration: The correct method of hand washing

**Instruction for the resource person:** Ask any two of the participants to show how they wash hands. Later on, show the correct way of washing hands. If the two participants have followed the correct method appreciate them and ask the rest of the participants follow them in their day to day life.

Demonstrate the use of hand sanitizer and explain to them that it can make their hands germs free.



### 3.4.2 Rule two: Use clean and suitable equipment

The equipment used to store and transport milk should be

- Made of metal that does not rust (stainless steel or aluminum is the best);
- Of no cracks and damage;
- With a tightly fitting cover;



**Transportation of milk in metal container with tightly closed lid**



**Milk is being carried without any lid on the container**

- Without any difficulty to reach angles as the corners may have store of dirt and germs and these are hard to clean – round cornered equipment is the best to clean;
- With a relatively narrow mouth as this is easier to cover. But the mouth should not be so narrow that it is difficult to put through one's hand and clean using scrub;
- Do not store milk in plastic jerry cans, mustard oil tins, locally made tin container that previously contained paint, herbicides and other chemicals because traces of these substances may taint your milk;
- Do not use plastic jerry cans to transport milk; these are impossible to clean properly. During sun heat these may make milk extra warm and spoil quickly. Some plastics are knowingly not good to keep any food items;
- When transferring milk from one container to another use strainer to remove dirt.
- It is the best to use a clean and dry plastic or metal sieve for straining milk;
- You can also use cleaned, disinfected, dry and white cloth for straining;
- Never use wet cloths as the water carrying germs/detergent/disinfectant absorbed in it may pass to the milk;
- Some traders are found to use unwashed banana leaves inside the containers to avoid spilling over of milk during jerking in carriage. One should avoid this kind of practices and instead use containers with tight lid.

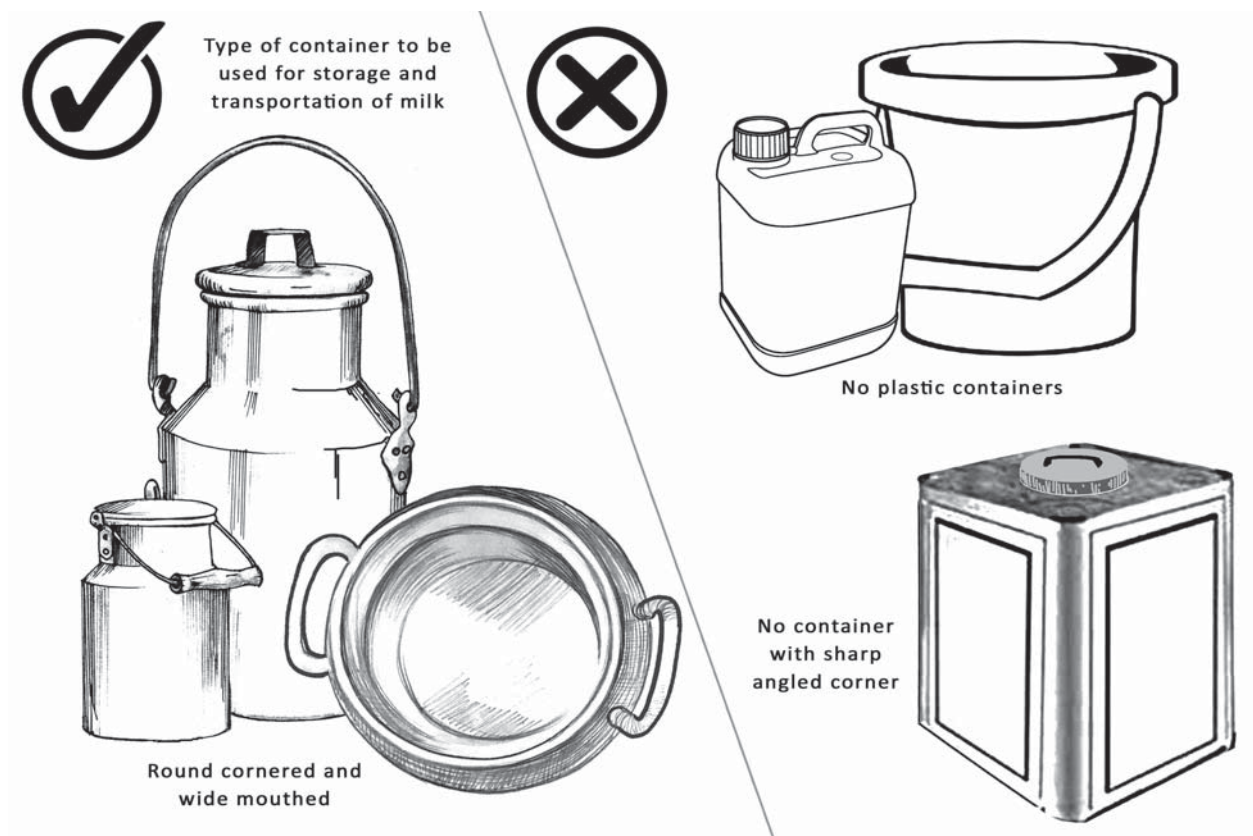


**Round cornered milk container (easy to clean)**



**Straining milk during transferring**





**Type of containers to be used for storage and transportation of milk**

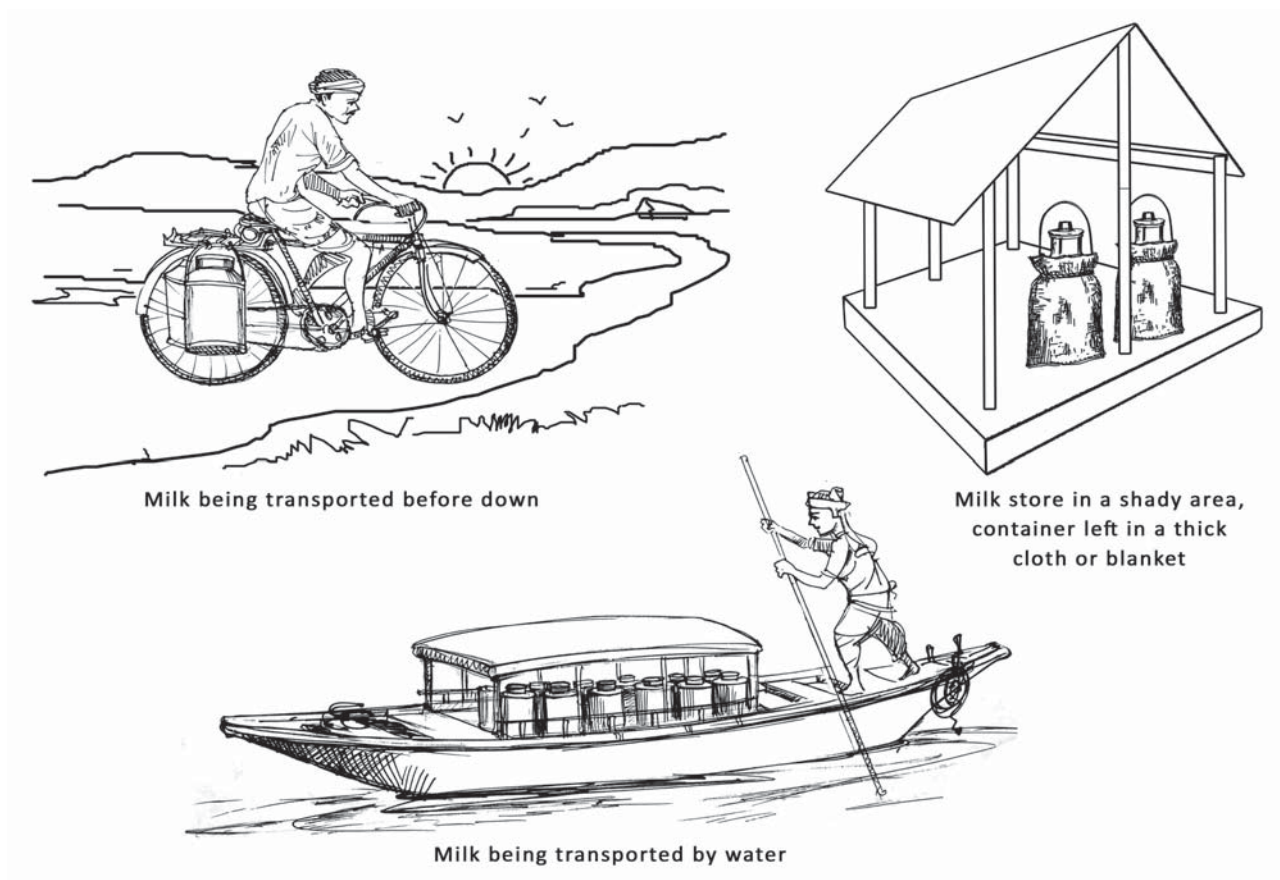
### 3.4.3 Rule three: Keep milk cool

Germs grow quickly in warm conditions. The germs will grow lesser below 5 degrees centigrade. If the milk is cool, it can be stored for a relatively longer duration.

#### ***Tips for keeping milk cool:***

- Transport milk as early as possible after milking before the day becomes hot as the Sun rises;
- Keep milk can in the shade while it is not transported;
- Keep milk in a place where there is proper air ventilation;
- You may wrap milk container in a wet sack or blanket. Remember to use a clean blanket for wrapping so that customers do not remain unimpressed;
- Suggest farmers to store milk in well ventilated and cool environment;
- Don't store milk in places where there is source of off-smelling and chemicals.





### Tips for keeping the milk cool

#### 3.4.4 Rule four: Pour milk never dip or scoop with your hand

When transferring milk from one container to another, always pour or use a scoop with a long handle and never dip your hand in the milk. Never let your hand enter the milk container as it can introduce germs.



*Not a good practice*



*Pouring of milk from one container to another*

### 3.4.5 Rule five: Get milk to your customer as soon as possible

You should collect your milk as early as possible from the farm and then transport it as quickly as possible to the consumer.



Various means of transportation of milk to customer

### Role play: good personal hygiene

**Instruction for the Resource Person:** Divide the participants into three equal groups and ask each group to do a role play on the following:

- Role play (one trader, one consumer and few observers) on a consumers' reaction and conversation when a trader sells milk to consumers with long nails with dirt inside and scooping his hand while pouring milk. **(Remaining participants in the group will note down their observations on the role play and contribute later in the discussion)**
- Role play (one trader, one consumer and few observers) a consumers' reaction and conversation when they are drinking milk and they find a hair in the milk. **(Remaining participants in the group will note down their observations on the role play and contribute later in the discussion)**
- Role play (one trader, one consumer and few observers) a consumers' reaction and conversation when one trader is supplying milk with long moustache, dirty cloths and a sweating body. **(Remaining participants in the group will note down their observations on the role play and contribute later in the discussion)**

### Key messages of session 3

- Dirt in milk may come from dirty cow, dirty utensils, dirty hand and clothes of milk handlers and the environment.
- There are five rules of good milk handling practices- follow good personal health and hygiene, use clean and suitable equipment, keep milk cool, don't dip hand or scoop in milk and transport milk as early as possible.



## SESSION 4: Cleaning and Sanitizing Milk Containers and Equipments

<b>Session objectives</b>
<ul style="list-style-type: none"><li>• To enable the participants explain the steps to be followed in cleaning and disinfecting</li><li>• To make participants know about various cleaning and disinfecting agents that can be used</li><li>• Making them aware of the methods to clean milk utensils and equipments</li><li>• To make participant traders aware of the method to clean the cloths used in milk handling</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion.</li><li>• Explanation with the help of pictures, illustrations, exercises and activities.</li><li>• Practical exercise.</li></ul>
<b>Training tools</b>
<ul style="list-style-type: none"><li>• Laptop, LCD projector and screen</li><li>• Flip chart</li><li>• Manual and handouts</li><li>• Metal containers (one with bigger mouth and one with smaller mouth)</li><li>• Disinfectant solution</li></ul>

Milk containers (e.g., milk cans) and utensils (e.g. measuring litre, scoop, etc.) should always be kept to increase milk safety. If customers see that your containers are dirty they will not have high regards for you. Instead they will prefer to buy from vendors with clean containers. In that sense you will lose customers. Also remember that if one customer leaves you to buy your product, it would be very difficult to get that customer back to make him buy again, which resultantly affects your business.

### 4.1 What is cleaning and disinfecting?

Cleaning means physical removal of dirt by washing with soap/detergent/liquid dish-washer and water. Cleaning with soap/detergent/liquid dish-washer or detergent is not the same as disinfecting. Cleaning with soap and water will remove the visible dirt but this does not indicate that all the germs are removed. To remove germs you need to use a disinfectant such as commercial disinfectant solutions, bleaching powder, potash, boiling water, etc. Some may use earthen containers which need heating in fire and then to use detergents to clean it and rinse it with water, dry in Sun heat and place in a clean rack.

### 4.2 Four steps to cleaning and disinfecting

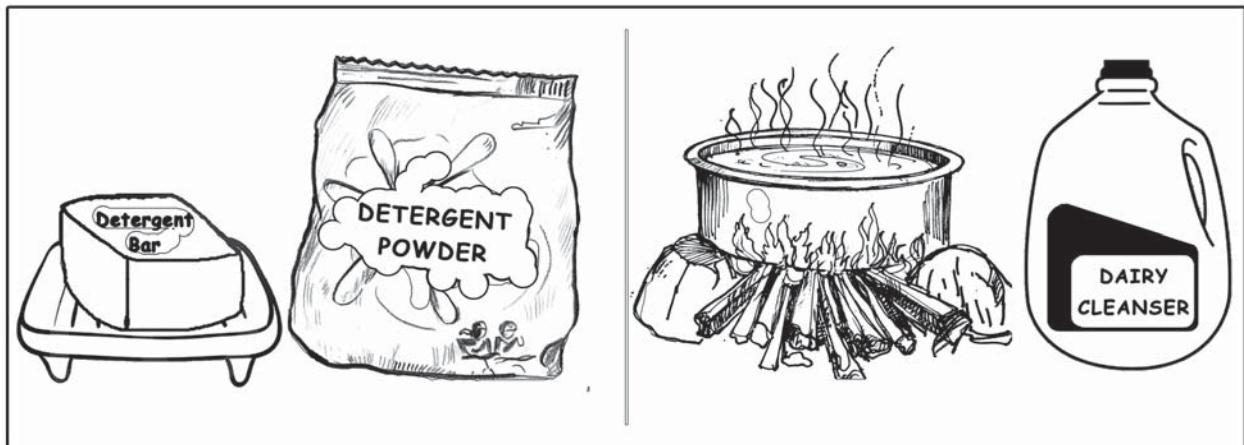
- Step 1: Clean with soap or detergent and water,
- Step 2: Rinse sufficiently to remove residues and scent of detergent or soap,
- Step 3: Disinfect to kill the germs that cause spoilage and disease and rinse with water again,
- Step 4: Dry thoroughly in sun heat.

### 4.3 What to use for cleaning and disinfecting?

There are special cleaning agents (commercial soaps, detergents, dish-washer liquid, etc.) for cleaning milk utensils.

There are also various commercial disinfectants that have been specially produced to clean and disinfect milk utensils. You may also use bleach or boiling water. In case of cleaning small milk tanker mounted on an auto van, it requires special care for cleaning using proper disinfectant as the corners of the tank may not be reached with hand.

Cleaning and disinfecting agents should be stored properly and handled with care because some of them may be corrosive to skin. Always follow the manufacturer's instructions for proper use of cleaning agents. Keep these away from the reach of children and contacting milk and other food items.



**Different cleansing agents used for cleaning and disinfecting milk utensils**

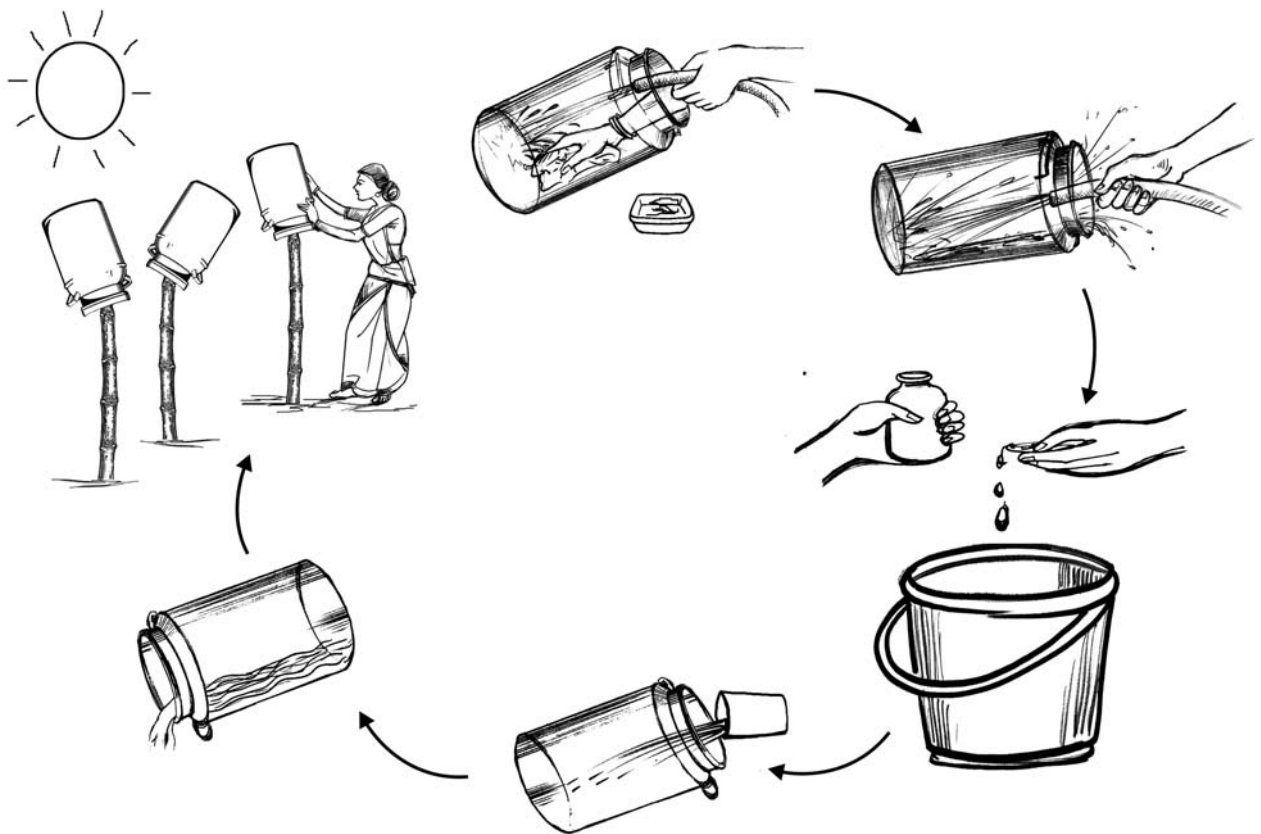
### 4.4 How to clean and disinfect milk containers and utensils?

Before re-using the milk container

- Rinse the container immediately after use;
- Thoroughly scrub (using a stiff bristled hand brush or scouring pad) the container with water and soap/detergents;
- Rinse the container in clean water;
- Clean the container again with disinfecting solution like teepol;
- Dip-rinse the small container by putting into boiling water for at least one minute to kill germs;
- Or, if the container is too big to put into boiling water, you may also rinse the container by pouring hot water into it;
- Then turn the container upside-down so that all water in it can drain and air dry on a clean rack or bench in the sun;
- Once it is perfectly dry, store in a clean, cool and dry place with the cover on;
- For the trader trading milk daily, he should try to maintain atleast 2 sets of containers as in particular day bad weather may not allow to go for sun heat. In that case previously cleaned and disinfected set may be used.



Cleaning the containers

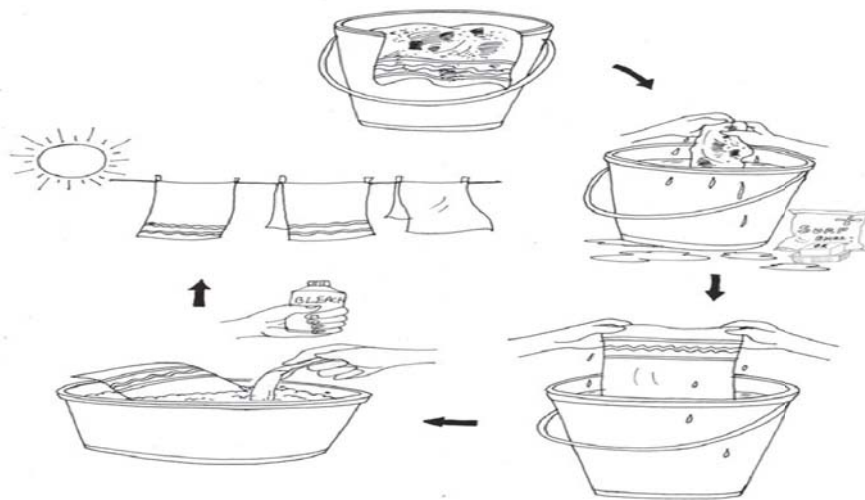


Process of cleaning the milk containers or utensils

#### 4.5 How to clean cloths used for milk straining?

Cloths used for straining of milk can be an important medium of spreading germs to milk. So along with milk utensils adequate care should also be taken in cleaning and disinfecting the cloths. The method of cleaning cloths is as follows:

- First wash cloths with soap/ detergents and water;
- Then rinse in clean water;
- Then leave in disinfectant solution for five minutes;
- Then again wash with warm water to remove the disinfectant from cloths completely;
- Then put under the sun until completely dry;
- Finally store in a clean, dry place.



Process to clean clothes used in milk handling

#### Practical exercise: Cleaning of utensils

**Instruction for resource persons:** Ask two participants to do the following. The remaining participants will observe followed by a discussion among them on its importance.

1. Make cleaning agents and disinfectant solution ready
2. Ask one participant to clean a dirty utensil with bigger mouth and another one to clean a dirty utensils with smaller mouth using the same cleaning agent and disinfectant solution. After completion of cleaning, make the remaining participants to observe the time taken in cleaning and also to observe the level of cleanliness.

#### Key messages of session 4

- Milk containers, utensils and clothes should be cleaned first by soap/detergents/ cleaning agent with scrubber and pouring ample amount of water, followed by rinsing with clean water.
- After cleaning milk utensils, they should be disinfected by the commercially available disinfectant solution or by boiling water.
- Clean the cloth used for milk straining thoroughly after every time it is used
- Finally cleaned utensils and clothes should be sun dried.

## SESSION 5: Basic Milk Quality Tests

<b>Session objectives</b>
<ul style="list-style-type: none"><li>• To make the participants know and explain various basic tests to determine quality of milk.</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion.</li><li>• Explanation with the help of pictures and illustrations, exercises and activities.</li><li>• Practical demonstration.</li></ul>
<b>Training tools</b>
<ul style="list-style-type: none"><li>• LCD projector</li><li>• Flip chart</li><li>• Manual and handouts</li><li>• Starch to add in milk</li><li>• A litre of pure fresh raw milk in a milk container</li><li>• Lactomtre, cylinder, thermometer, A spoon and a candle for heating milk</li><li>• A syringe and alcohol solution, a small tube/glass cup</li></ul>

### 5.1 Common tests to determine milk quality

Milk produced and handled in hygienic condition and maintained in quality fetch always a better price.

Milk tests are carried out at milk collection points to ensure that only milk of acceptable quality is received. Also, present day consumers are very much concerned about milk quality. You need to be able to conduct few simple tests to ensure that the milk you buy to be sure it is of good quality. If you know how to test milk quality you can demonstrate the customers about the quality of milk you handle.

#### ***How to check milk quality***

There are several tests that can be performed to determine whether the quality of milk is acceptable or not. Of these there are few simple tests that a trader can conduct. These include-

- Fat testing,
- Solids Not Fat (SNF) testing,
- Sight and smell (organoleptic) test,
- Clot-on-boiling test,
- Strip cup test,
- California mastitis test(CMT), if possible
- Alcohol test,
- Rapid Tests.
- Traditional method of testing.



### 5.1.1 Fat testing

Fat % in milk can be assessed by (i) Gerber Method (ii) Digital Milk Analyzer

#### (i) Gerber Method

##### Equipment and materials

- Sulphuric acid (density 1.807 – 1.812 g/ml at 27°C, colourless),
- Amyl alcohol,
- Butyrometers: 6%, 8% and 10% scales depending on fat content,
- Stoppers and shaker stands for butyrometers made from a suitable grade of rubber or plastics,
- 10 ml Acid pipette for sulphuric acid (with rubber suction device),
- 10 ml pipette for milk,
- 1 ml pipette for amyl alcohol,
- Centrifuge, electric or hand driven,
- Water bath at  $65 \pm 2^\circ\text{C}$ .

##### Procedure

- Use the 10 ml acid pipette to transfer 10 ml of sulphuric acid into the butyrometer,
- Fill the 10.75 ml pipette with milk and deliver the sample into butyrometer,
- Add 1 ml of amyl alcohol using the 1 ml pipette and close,
- Shake the butyrometer in the shaker stand until no white particles are seen and invert it a few times,
- Put the butyrometer in the water bath for 5 min,
- Take it out and dry with a cloth, put it in the centrifuge, placing two butyrometers diametrically opposite, centrifuge at maximum speed for 4 minutes,
- Transfer the butyrometers, stoppers downwards into water bath for 3-10 minutes,
- Bring lower end of fat column on to a main graduation mark by slightly withdrawing stopper.
  - The colour of the fat should be straw yellow,
  - The ends of the fat column should be clear and sharply defined,
  - The fat column should be free from specks and sediment,
  - The water just below the fat column should be perfectly clear,
  - The fat should be within the graduation.

##### Interpretation

Note down the upper and lower scale readings corresponding to the lowest point of fat meniscus and surface of separation of fat and acid. **The difference between the two readings gives the percentage by mass of fat in milk.** The reading has to be done quickly before the milk cools. The butyrometers should be emptied into a special container for the very corrosive acid-milk liquid, and the butyrometers should be washed in warm water and dried before the next use. Fat testing is often carried out on composite or random samples in order to reduce time and costs involved in testing.

### 5.1.2 Solids Not Fat (SNF) testing

SNF can be assessed by (i) Lactometer method. (ii) Using a Digital Milk Analyzer

#### Lactometer Method

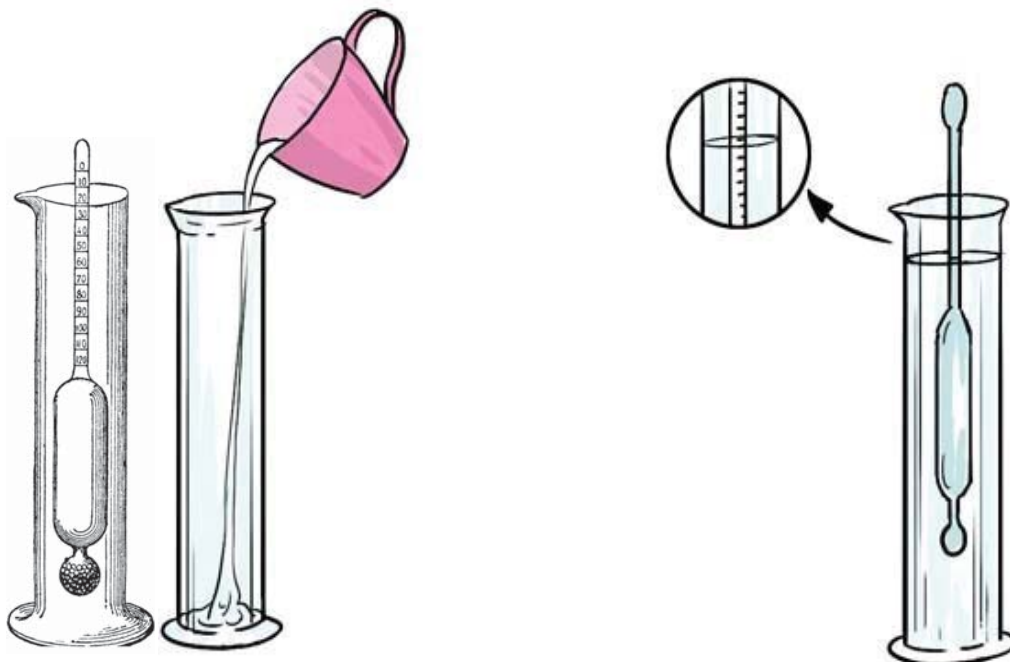
##### *(i) By using manual lactometer*

This test uses a device known as “lactometer” to detect whether milk has been adulterated with water or solids. Adding anything else to milk is also not legally permitted, as it can introduce bacteria and cause the milk to spoil quickly and also, the quality of milk will be deteriorated

Milk is more dense (heavier) than water but less dense (lighter) than solids. If water or milk fat (cream) is added to milk, the density will decrease. If solids are added, the density will increase. A lactometer can measure the density of liquid when it is immersed in a container filled with milk. If the readings are higher or lower than expected, the milk will be rejected. Even some unscrupulous farmers manage to have suitable readings through adulteration. A search for upgraded testing machines may solve this issue.

##### **Procedure**

- Leave the milk to cool at room temperature for at least 30 minutes and ensure its temperature is about 20°C;
- Stir the milk sample and pour it gently into a 200 ml measuring cylinder or any container deeper than the length of the lactometer;
- Let the lactometer sink slowly into the milk;
- Take the lactometer reading just above the surface of the milk;
- If the milk is normal, its lactometer reading will be between 26 and 32. If the lactometer reading is below 26 or above 32, the milk should be discarded because it means that it has been adulterated with added water or solids.



**A manual lactometer**



**Milk is being tested by using manual lactometer**

**(ii) By using a digital milk analyzer**

In this case, the milk sample should be put in a container that fits into the lactometer and to be placed in the machine as shown in the figure below. The lactometer will give instant results for SNF, fat percentage and water content.



**Milk is being tested by using a Digital Milk Analyzer**

### 5.1.3 Sight and Smell test

This involves checking the milk for smell, appearance and colour. The test allows the segregation of poor quality milk. The tester should have a good sense of sight and smell.

#### **Procedure**

- Open the cover of the milk container;
- Immediately smell the milk and establish the nature and intensity of smell, if any. The milk that smells slightly sour or has foreign odors should be discarded;
- Observe the colour of milk. Yellowish-white colour is normal. A bright yellow or reddish colour might indicate damage to the udder (red = blood, yellow = pus). It should be discarded;
- Check for any foreign bodies or physical dirt;
- Do not dip your hand or finger into the milk as this will contaminate it;
- Don't taste the milk. Please observe that tasting raw milk is not a good practice since raw milk can contain dangerous bacteria.

#### **Interpretation**

- The milk should be discarded if it has a foul smell or smells slightly sour.
- The milk is not fit to use if the color is not normal yellowish white. (Reddish-blood or yellow-pus). Milk should be discarded if it contains any foreign bodies or dirt.

### 5.1.4 Clot on boiling test

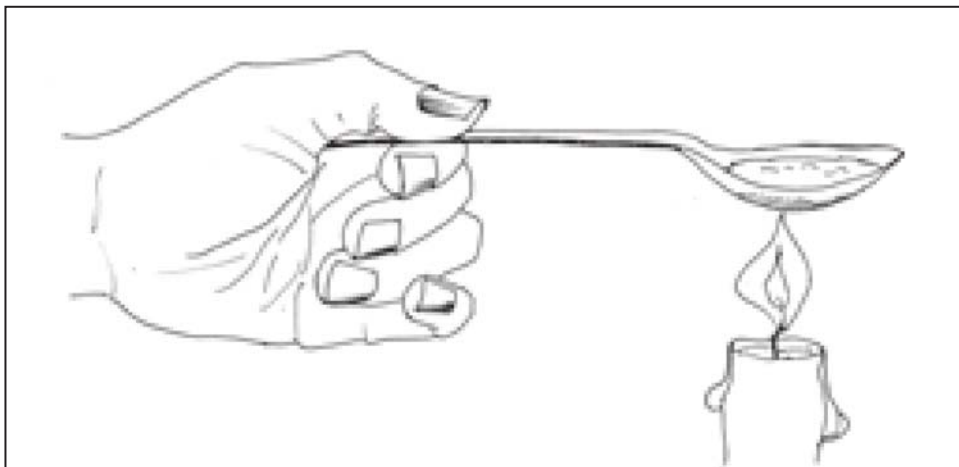
It allows for detection of milk that has been kept for too long without cooling and has developed high acidity. Milk with high acidity is not fit for consumption.

#### **Procedure**

- Boil a small amount of milk for a few seconds in a clean spoon or other suitable container;
- Observe immediately for clotting.

#### **Interpretation**

- The milk will be rejected if there is visible clotting, coagulation or precipitation.



**Clot on boiling test**

### 5.1.5 Strip cup test (Optional)

Use of the strip cup is the best way to detect mastitis. A strip cup is a shallow black cup around 10 cm in diameter. It must be black on the inside to show up the presence of mastitis.

#### *Procedure*

- At the beginning of milking squeeze the milk 2 to 3 times into a strip cup,
- In stripping you squeeze the base of the teat between thumb and fore-finger and draw down in one smooth movement squeezing out the milk,
- Observe the milk for abnormalities.



**A strip cup**



**CMT kit**

### ***Interpretation for mastitis***

- Watery or stringy milk is a sign of mastitis,
- Clots or flakes in the milk are signs of mastitis.

The mastitis milk might have abnormal smell or colour.

### **5.1.6 California mastitis test (CMT)**

It is a simple test to detect sub-clinical mastitis in cow by using the CMT kit.

#### ***Procedure***

- A four-well plastic paddle is used, one well being for each quarter of the cow to be tested;
- Foremilk is discarded, and then a small amount of milk is drawn into each well. An equal volume of CMT reagent is added, and gently agitated;
- The reaction is scored on a scale of 0 (mixture remains unchanged) to 3 (almost-solid gel forms). Score showing of 2 or 3 is considered a positive result.



**Testing of milk for detection of sub-clinical mastitis in cow by using the CMT kit**

### **5.1.7 Alcohol test**

This is a more sensitive test for detecting highly acidic (i.e., spoiled) milk that might have passed undetected in the previous two tests. It can also detect colostrums and signs of mastitis. A type of alcohol known as “ethanol” is mixed with a small amount of milk. If the milk coagulates, clots or precipitates then it will be rejected.

Milk that pass through this test is likely to be relatively free from bacteria and can be stored/kept for at least two extra hours before it gets spoiled.

### **5.1.8 Rapid test kit for milk testing**

There are certain commercially available rapid test kits that are used for conducting milk tests as stated below:

- Urea test
- Ammonia fertilizer test



- Pond water test
- Starch and flours test
- Sugar test
- Glucose test
- Salt test
- Hydrogen peroxide test

The advantage of these rapid tests are that there is no requirement of several reagents, utensils, equipments and glassware, except only the test tube. Small volume of milk should be poured in test tube and few ml of reagent/s supplied by the manufacturer should be added to it as per the norms prescribed by them. Changes in colour of milk will indicate the positivity or negativity of the test results.



### 5.1.9 Traditional method of testing milk/milk products

In addition, there are some traditional methods as explained below to test milk and milk products Indigenous ways to check adulterations

- Paneer, khova and milk are generally adulterated with starch, which is used to give a thick, rich texture to sweets. To check the presence of starch mixed with khova, take a small sample and mix it with water and bring to boil. Allow it to cool and add two drops of iodine in the solution. If the solution turns blue, then it has been adulterated with starch.
- To check if the milk has added water, put a drop of milk on a polished slanting surface or on a clean and plain glass. If the milk is pure, it will flow slowly and will leave a white trail behind it; whereas, adulterated milk with water will flow immediately without leaving a mark.

#### Practical demonstration: Conducting basic milk quality tests

**Instruction for the Resource Persons:** With the help of few participants perform the following basic milk quality tests to demonstrate.

Prepare beforehand some samples of milk

- Pure fresh raw milk
- Milk which is starting to go sour
- Milk with 5% added water
- Milk with 20% added water; Milk with 50% added water; Milk with starch added
- Milk with dirt

Basic milk quality tests

1. SNF test/Lactometer test 2. Sight and smell test 3. Clot on boiling test 4. Alcohol test.

Have the participants conduct the tests.

### Key messages of session 5

- Milk testing is essential to assess the quality of milk.
- Traders can increase the confidence of consumers by demonstrating the quality of milk by testing.
- Traders can pay right price to producers based on Fat and SNF content of milk and can encourage them to produce good quality milk.
- There are some simple tests that a trader can perform without much problem.



## SESSION 6: Rules and Regulations, Communication and Business Development

<b>Session objectives</b>
<ul style="list-style-type: none"><li>• To make the participants know about food safety and other regulations for running milk business.</li><li>• To make the participants learn the communicating techniques for a better milk business.</li><li>• To have understanding of the business development techniques</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion.</li><li>• Explanation with the help of exercises and activities.</li><li>• Experience sharing</li></ul>
<b>Training tools</b>
<ul style="list-style-type: none"><li>• Laptop, LCD projector and screen</li><li>• Flip chart</li><li>• Handouts</li></ul>

To run milk business by complying to the prevailing rules and regulations of municipalities, Health Department and Food Safety and Standard Authority of India (FSSAI), it is important for you to understand the relevant rules and regulations meant for the milk traders.

### 6.1 Prevailing rules and regulation on food safety

#### 6.1.1 The Food Safety and Standards Act, 2006

Anyone who starts a milk business have to register under FSSAI for doing it smoothly without any disturbance from the competent authority and also to provide quality and safe product as per Food Safety and Standard Act (FSSA) as per Food safety standard Act.

The FSSA, 2006 has been framed with the merging of the salient clauses laid down under the previously formulated (i) Prevention of Food Adulteration Act (PFA), 1954 and (ii) Milk and Milk Product Order (MMPO), 1992.

#### 6.1.2 Food Safety and Standards (Prohibition and Restrictions on Sales) Regulations, 2011

Under this regulation, prohibition and restriction on sales of the following items are imposed:

- Cream which has not been prepared exclusively from milk or which contains less than 25 percent of milk fat;
- Milk which contains any added water;
- Ghee which contains any added matter not exclusively derived from milk fat;
- Skimmed milk (fat abstracted) as milk;
- *Dahi* or curd not prepared from boiled, pasteurized or sterilized milk;
- Milk or a milk product specified in food safety and standards (food products standards and food;
- Additives) regulations, 2011 containing a substance not found in milk, except as provided in the regulations.

The Act has also laid down provisions for

- Taking license for trading of milk and milk products from a competent licensing authority (the Designated Officer appointed under section 36 (i) of the Act by the Commissioner of Food Safety of the state).
- Registration under designated registering authority Designated Officer/ Food Safety Officer or any official in Panchayat, Municipal Corporation or any other local body or Panchayat in an area.

#### **Clause 2.1.2: License for food business says,**

- No person shall commence any food business unless he/she possesses a valid license.
- Any food business operator holding Registration/License under any other Act/Order as specified under schedule 2 of the FSS Act, 2006 with no specific validity or expiry date, and other wise entitled to obtain a license under these regulations.
- Shall have to apply and obtain a Registration/License under these Regulations within one year from the date of notification by paying the applicable fees.
- If it has reason to believe that the Food Business Operator has failed to comply with all or any of the conditions of the existing registration or license or the safety requirements given in Schedule 4, may give appropriate direction to the Food Business Operator to comply with.

#### **Definitions -**

Under the provisions of the **Food Safety and Standards (Prohibition and Restrictions on Sales) Regulations, 2011** definitions of milk and milk products are given as under-

**“Milk** means the normal mammary secretion derived from complete milking of healthy milch animal, without either addition thereto or extraction there from, unless otherwise provided in these regulations and it shall be free from colostrums”

#### **6.1.3 What is the reason for Registration under FSSAI?**

- It enhances the trustworthiness of the business;
- Increases the consumer’s confidence in the food items;
- Helps in the promotion of food innovations;
- Helps in getting approvals by removing multiple regulations.

***Every food business operator has to comply with all the provisions as per the Food Safety and Standards Act, if not complied then traders have to pay fine of INR. 5 Lakh or 7 Year imprisonment.***

#### **Categories of businesses**

**Basic registration:** For businesses with an annual turnover of up to INR.12 lakhs;

**II State license:** For businesses with annual turnover is of more than INR.12 lakhs but up to 20 Crores; i.e. Medium food manufacturer.

**III Central license:** For businesses with annual turnover more than INR.20 Crores, i.e. Large food manufacturer.

There is online registration process for registering under FSSAI. One can register by paying a fee.

#### **6.1.4 Licensing under Municipal Corporation/ council/ town committee/Panchayat**

According to this regulation, it is essential for each milk trader to take license for milk trading in

the town/ city. The validity of licenses is for one year which needs renewal in every year. There is license fee for issuing the license which may vary from place to place.

### Practical exercise

#### Experience sharing: Following govt. regulations

**Instruction for the Resource Persons:** Select any two participants one of whom has the experience of facing punitive action for breach of any of the following regulations and another one facing appreciation or carrying out undisturbed business from the competent authority. There should be a follow up discussion among the rest of the participants to chalk out the advantages of following govt. regulations:

- Municipality/town committee regulations.
- Health department regulations, if any.
- FSSAI registration

## 6.2 Framing business development plan by milk vendors

### 6.2.1 Setting business development aim

A business' aim can include-

- Increase the trading volume from the current to some fold in future (quality, efficiency);
- Increase the revenue by some fold within a given time;
- Increased resources (physical and financial);
- Increased adherence to policies and practices;
- Increased access to institutional services;
- Increased social recognition.

### 6.2.2 Gathering information

#### *From buyers' point of view*

Developing an overall business strategy is an important component of business development. For this the trader should know about the preference and behaviour of the consumers to whom he is most likely to sell his milk. He should consider the following points in framing his/her business plan:

- What is the consumers' preferred timing of getting the milk delivered?
- What kind of quality the consumers want in milk?
- How much the consumers are ready to pay for the standard quality milk?
- Where from the consumers prefer to buy milk (at door step, nearby grocery stall, selling outlet in the market, shopping mall)?
- What type of hygiene practices (e.g. clean milk, clean utensils etc.) that the consumers expect the traders to follow?
- What type of personal cleanliness and hygiene (e.g. clean cloth, clean shave, short nails, wearing mask and cap etc.) that the consumers expect the traders to follow?
- Do the consumers prefer to buy any milk product from the traders? If yes, what are those?

### 6.2.3 Creating plan of action

Based on the information the trader may formulate the plan of action;

- Supply milk at a time the consumer is highly comfortable with;
- Meeting the consumers' preferred product in terms of quantity and quality;
- Present the product and the self in the way that the consumer is highly satisfied with;
- Establish a cordial relation both with the supplier of milk and consumers;
- Should possess the relevant certificates and permits (municipality trade license, FSSAI registration etc.);
- Based on the knowledge of the competitors, make every effort to be the best in terms achieving the highest level of consumers' satisfaction.

Overall a trader should have the following **Business development plan**:

- **Business Intelligence:** Knowing about your customers' preferences, behaviour, and payment capacity. Knowing about your Competitors (other milk traders, pasturized milk/ tetra pack milk sellers) will provide you with the leverage you need to surpass them.
- **Active listening skill:** The milk trader should try to listen what the consumers say/ complain. Instead of arguing it is better to follow the practices to satisfy the customer. He/she should also be able to read body language as well as verbal communication.
- **Keep emotions in control:** The milk trader should have the ability to keep his emotions in check during the negotiations.
- **Clear and effective communication:** The trader should have the ability to communicate clearly and effectively to the other side during the negotiation.
- **Collaboration and teamwork:** The trader should try to develop cordial business relation with the farmers, farmers' organization, traders' organization, and concerned government officials to do the business efficiently and effectively.
- **Decision making ability:** A milk trader should have the ability to take right decision at the hours of need.
- **Maintaining good relationship:** A milk trader should have the inter-personnel skills to maintain a good working relationship with those involved in the milk business.

### 6.2.4 Other requirements for an improved dairy business

- **Self-presentation:** The trader should make the best effort to present him in the way that the consumers are impressed to buy his product. Part of the trust on product is also influenced by the presentation of the vendors with a clean get up such as wearing clean clothes, clean shave, mask, cap etc.
- **Product branding:** A trader should try to create good name and fame for the milk sold by him. He may wish to put name /symbol or design of milk/milk products that identifies or differentiates his product from others. This could be done collectively by all the trained milk traders so that consumers see the difference between the milk marketed by trained traders and non-trained traders. They can wear a cap/ uniform/badge/put logo and can use mask, gloves etc. An effective brand strategy gives you a major advantage in increasingly competitive milk market.
- **Value addition:** The trader can try to add value by converting milk into certain products.

- **Health checkup at periodic interval:** Health checkup of the milk traders should be done periodically, as no customer wants to consume milk or milk product supplied by a visibly sick person.
- **Vaccination and deworming:** Similar to health checkup at periodic interval trader should himself/herself do vaccination and deworming to keep away from infectious diseases. Falling ill and making him/her away from business means allowing consumers to buy milk from other traders and this may lead to snatching of his/her business by others.
- **Credit and insurance linkage:** Milk traders targeting to have a better milk business should have a plan to access institutional credit and insurance services and this will facilitate the flow of money for any planned expansion of business and a reduced risk that may be covered through insurance.
- **Modern transportation (milk cooling van):** The trader should opt for modern transportation facilities timely developed by the innovating entities and made available, as competitor availing the same may cause fall in business due to relatively higher shelf-life of their milk.

### Key messages of session 6

- Traders should have trade license from local authority which should be renewed yearly.
- Trader should have FSSAI registration to run the milk business legally.
- Traders should be well aware of consumers' preference and behaviour to satisfy their need
- Traders should develop cordial working relationship with all concerned and behave with them well
- Traders should try to increase his/her image/brand of milk that he/she sells by recognizing him/her different from his competitors

## SESSION 7: Personal Behavior and Record Keeping

<b>Session objectives</b>
<ul style="list-style-type: none"><li>• To help the traders explain what is personal integrity and its importance.</li><li>• To enable traders explain various key attributes that a milk trader should adhere to.</li><li>• To understand how to keep records</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion.</li><li>• Explanation with the help of pictures, exercises and activities.</li><li>• Role play</li><li>• Experience sharing</li></ul>
<b>Training tools</b>
<ul style="list-style-type: none"><li>• LCD projector</li><li>• Flipchart</li><li>• Manual and handouts</li><li>• Post training evaluation form</li></ul>

Good personal behaviour and better communication practices will help a milk trader create more confidence amongst their consumers and improve business relations with both suppliers and consumers.

### 7.1 Personal integrity

For practicing better personal integrity by a milk trader, he should-

- Keep interaction with others respectfully;
- Show willingness to understand others' problems;
- Maintain emotional control even when feeling tempered;
- Communicate honestly and openly;
- Express his/her concerns constructively;
- Be objective as far as possible;
- Improve his/her personality, appearance and body language;
- Look for solutions that meet everyone's needs;
- Keep his/her word or promise.

### 7.2 Passing messages about quality

- It is important to make an impression that is attractive to your customers. The hands, clothing, equipment, transport means (bicycle/bike/three wheelers/four wheelers) etc. of trader should be clean. No-one wants dirt in milk they drink.
- A trader should always greet the customers with a smile and show that he/she is happy to see them.
- He/she should convince the consumer that delivering the quality product matters to him/her more than anything else.
- A trader should show customers the quality brand if he/she has any. Explain that this is given to traders who have undergone training in hygiene and quality assurance.
- A trader should not sell milk if he/she is not convinced on the quality. He should discard



the milk if he/she sees any abnormal smell/ odor in milk. By selling poor quality milk a trader can avoid short term loss but in the long run it will cost him/her dearly.

- One should be honest in dealing financial matters with suppliers or customers
- If any complaint from customers on quality is valid, a trader should try to accept the fact without arguing further and try to replace the product with a better quality one (if possible), otherwise he/she should try to give the customer some other compensation.
- A trader should always think for long term.
- Verbal communication is the most important way to increase or reduce one's business: A trader should not ignore or be rude to even a single customer as they may pass this to another 10 customers. Thus, value each and every customer equally and behave cordially.
- Know your customers: It is always the customer who ultimately helps in sustaining business. He/she should always make them feel special and important and they will be loyal.
- A trader should be punctual as far as possible.
- He/she should make his/her address, telephone number available with all the sellers.
- If there are any changes in the usual services, he/she should let customers know in advance

Keeping records will help in easy management, identify errors and ultimately, leads to more profits and gains.

## 7.3 Record keeping

### *Milk trader and transporter records*

Milk traders and transporters should keep a daily record of milk supplied by farmers and milk sold to his clients/customers.

- **Purchase record:** This record should indicate the name of the supplier, volume of milk supplied, mode and cost of transportation, cost of labour, date and time the milk was purchased, rate per litre, lactometer reading (if it was used) price paid for the milk, balance / credit.
- **Sales record:** This record should indicate name of the customer, volume of milk delivered, mode and cost of transportation, cost of labour, rate per litre, channa/mawa yield of the milk supplied (if a hotel supply), payment received, surplus / wastage if any, net total milk sold, balance credit.

**Table 2: Milk Purchase record**

Sl. No.	Date	Name of the farmer	Volume purchased	Price/lit	Payment made	Balance (if any)
1	11/04/2020	Hari	5	38/-	-	190/-
2	11/04/2020	Jadu	10	35/-	-	350/-
3	11/04/2020	Madhu	25	39/-	500/-	475/-

**Table 3: Sales record**

Sl. No.	Date	Name of customer	Volume sold (lit)	Price/lit	Total amount	Payment received	Amount due
1	11/04/2020	Kalita sweets	20	45	900/-	900/-	0
2	11/04/2020	Madhuban sweets	10	50	500/-	500/-	0
3	11/04/2020	Dibakar das	30	43	1290	600/-	690/-

**Practical exercise****Role play: Conflict resolution**

**Instruction for the Resource Person:** Create a conflicting situation and by dividing the participants into two groups-

- Ask two participants to play the role of a trader and a customer by each and ask them to discuss a conflicting issue related to milk quality.
- Ask two participants to play the role of a producer and a trader and ask them to discuss a conflicting issue related to milk price.

**Questions for discussion in reference to the role play**

- Was the problem resolved?
- For the people in conflict, to what extent are short-term gains, as opposed to long term gains, important?
- Who would gain if the matter is not resolved?
- What role does personal integrity play in each conflict and resolution?
- In each case, who would you buy from/sell to one day next week?

**Experience sharing: Real life challenges of a trader**

**Instruction for the Resource Person:** Ask the participants to share their experience on real life challenges and how they can overcome these (preferably in groups). For example:

- A customer is unhappy with the price.
- A customer believes that the milk is adulterated.
- You identify a new market opportunity- new customers or new products.
- A customer is very late in paying his account.
- You are unhappy with the quality of milk supplied.
- You are sick and unable to work for some days.
- You want to expand your business.

### **Key messages of session 7**

- The traders should behave with personal integrity for a better business outcome
- The trader should try to attract customers by passing messages about milk quality and through better presentation of his product.
- Milk trader should always maintain purchase and sale records in the given formats for better business planning
- Always keep close watch on the available govt. schemes and try to access those in the eligibility condition.

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## **Performance Indicator-Training of Milk Traders**

<b>Sl No.</b>	<b>Performance Indicator</b>	<b>Expected performance</b>	<b>Achieved Performance</b>	<b>Remarks</b>
1	Quantity of milk sold per day	25% increased than before training		
2	Increased in income	20% increased		
3	Amount of milk (cow) required to produce 1 kg chana	6 ltrs		
4	Visible dirt in milk	Nil		
5	Added water in milk	Nil		
6	Complain from customer on milk quality	Reduced by 70%		
7	Personal hygiene and cleanliness	Improved visibly		
8	Throw away of milk per month in ltrs	0 ltrs.		
9	Shelf life of raw milk (depending on temperature)	4-6 hours		
10	Municipality license	Yes		
11	FSSAI registration	Yes		
12	Passed in Food Safety Inspector's inspection	Yes		
13	Wear of uniform/logo/badge	Yes		
14	Social recognition/ honour	Increased		







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