

# Training Manual for Milk Cottage Processors

*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 Cottage Processors**

**Ram Pratim Deka, Baban Bayan, Naba Kumar Das,  
Iddo Dror, Delia Grace Randolph**

**By**

**INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)**

**ILRI**

INTERNATIONAL  
LIVESTOCK RESEARCH  
INSTITUTE



## 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 the Directorate of Dairy Development (DDD) and AHVD and concerned officials of the ARIAS Society without which preparation of this training module would not have been possible to complete.

We are grateful to all of the District Dairy Officers (DDD), 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 cottage processors who immensely contributed by supplying the necessary information during Training Need Assessment (TNA) surveys and providing observation on the content of the draft manual in separate FGDs conducted in selected districts along with supporting in collection of images of specific cottage product making activities to present the ground realities of the business in the state.

At last but not the least we express our sincere thanks to all those ILRI and other partner colleagues who contributed in drafting closely related manuals of milk processing based on which this customized 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**



## Rajesh Prasad, IAS

Principal Secretary to the Government of Assam  
Agriculture, Irrigation Department and  
Agriculture Production Commissioner, Assam  
Chief Executive officer, MMS-CMSGUY



Assam Secretariat (Civil) Dispur,  
3rd Floor, Block-C, Guwahati-781006  
Tele : +91 361 2237006  
E-mail: tsmassam@gmail.com,  
agriculturedepartmentassam@gmail.com

### Foreword

Dairy cottage product making is a tradition business of some dairy value chain actors in Assam. The business is not widely present across the districts but in certain locations where there is surplus milk for sale. Many of these dairy cottage product making areas earned good name and fame for producing such products in the past and still found to assume reputations as producer of these. To boost for increased demand of these products, hygiene and quality improvement at various stages of its preparation need to be emphasized. These cottage processors, although presently constitute a small group in the entire project districts, the potential for a spike in numbers and business is quite clear if they are properly trained on clean and hygienic practices and quality outputs are produced and marketed. International Livestock Research Institute (ILRI) has come up with this comprehensive training document prepared under the Assam Agri-business and Rural Transformation Project (APART) with support from concerned officials of Dairy Development, Assam, Animal Husbandry and Veterinary Department (AHVD) and ARIAS society.

The manual covers broad topics like site selection for setting up of cottage unit and considerations for infrastructure and equipments; germs as an agent of milk spoilage and disease and basic tests to determine the milk quality; good and hygienic processing practices, product preparation, value addition and diversification; product handling, packaging and dispatching; record keeping and business development plan; understanding the prevailing rules and regulations for cottage product making unit; and effort to improve environmental protection and to increase fuel efficiency. I truly believe that if this knowledge is adequately disseminated through trained resource persons to the cottage processors concentrated in some selected locations of the APART project districts, this would facilitate in bringing radical change in the cottage product making practices.

I consider that the development of this training manual is timely and need based and has been done for the first time in India and perhaps in the world under the initiative of ILRI as knowledge partner for Dairy Development, Assam. This training document will remain as an important asset added in the repository of knowledge products of this kind those may be used for future under any government supported scheme. I wish the team of ILRI and its stakeholders a great success in conducting the training programme.

  
(Rajesh Prasad)





**LAYA MADDURI, IAS**  
STATE PROJECT DIRECTOR  
ARIAS SOCIETY



**ASSAM RURAL INFRASTRUCTURE AND  
AGRICULTURAL SERVICES SOCIETY**  
(AN AUTONOMOUS BODY OF THE GOVT. OF ASSAM)  
KHANAPARA, GUWAHATI-781022,  
Tele: 0361-2332125, E-mail: spd@arias.in

## Preface

The cottage processors play an important role in providing nutritional support to a large milk and milk product consuming population of Assam. The demand for these cottage products, in turn, increases the need for raw milk, which indirectly leads to the growth of dairy farming activities. Therefore, efforts laid for the growth of the cottage product making business will open up livelihood opportunities for aspiring dairy entrepreneurs, by making the business more lucrative. The need of the hour is to skill up the knowledge and practices of clean and hygienic production of cottage products to replace the traditional method that is widely practised.

Therefore, the “**Training Manual for Cottage Processor**” that is developed by the International Livestock Research Institute (ILRI) and Dairy Development Department, Assam under the Assam Agribusiness and Rural Transformation Project (APART) is a much-needed initiative. The content of the manual is prepared to help those who are in the business in upscaling their knowledge and practices and eventually bringing about a change in the entire dairy production process.

( Laya Madduri )



## List of content

Particulars	Page no.
<b>Abbreviation</b>	ix
<b>Proposed training schedule</b>	xi
<b>Cottage processor: A background</b>	xiii
<b>Session 1: Introduction to the Training</b>	1
1.1 Why cottage processors are important	1
1.2 Changing consumers' behavior, institutional requirements and relevance of training	2
1.3 How the training will help you?	2
1.4 What would you learn from the training?	3
<b>Session 2: Setting up of Cottage Product Making Unit Including Infrastructure and Equipments</b>	4
2.1 Measures to be taken in and around the cottage product making unit	4
2.2 Points to be considered for various parts of the housing infrastructure	5
2.3 Utensils and appliances	9
2.4 Precautions in cottage product making factory against fire hazards	11
<b>Session 3: Milk and Cottage Product Quality, Germs as an Agent of Milk Spoilage and Disease and Basic Tests to Determine the Milk Quality</b>	13
3.1 What are good quality cottage products?	13
3.2 What is the quality of raw milk that the cottage processor should have?	13
3.3 Average chemical composition of raw milk	13
3.4 Factors contributing to variation of milk composition	13
3.5 What is germs and how it spreads diseases?	15
3.6 Ensuring milk quality and safety and testing for detecting adulterants	18
3.7 Traditional method of testing milk/milk products	23
<b>Session 4: Good and Hygienic Processing Practices</b>	25
4.1 Importance of good hygienic processing practices	25
4.2 Five rules for good hygienic practices	25
<b>Session 5: Product Preparation, Value Addition and Diversification</b>	35
5.1 Types of indigenous products in Assam	35
5.2 Milk Product preparation practices – Techniques of production	36

<b>Session 6: Product Handling, Packaging and Dispatching</b>	45
6.1 Product handling	45
6.2 Product packaging	46
6.3 Product dispatching	48
6.4 Disposal of leftover products	49
<b>Session 7: Record Keeping, Stock Management, Networking, Personal Behavior and Business Development Plan</b>	51
7.1 Simple business records	51
7.2 Business development plan	54
7.3 Other requirement for business development	56
7.4 Networking with other agents (for input and output)	57
<b>Session 8: Understanding the Prevailing Rules and Regulations Applicable for Cottage Product Making Unit</b>	59
8.1 Present Indian law for foods	60
8.2 Child Labour Law and Regulations in India	63
<b>Session 9: Effort to Improve Environmental Protection and to Increase Fuel Efficiency</b>	64
9.1 The need for environmental preservation	64
9.2 How a cottage processor can influence the environmental protection	64
Reference	67
Annexure-I	68

## Abbreviation

AHVD	:	Animal Husbandry & Veterinary Department
APART	:	Assam Agribusiness and Rural Transformation Project
APC	:	Agriculture Production Commissioner
ARIASS	:	Assam Rural Infrastructure and Agricultural Services Society
BIS	:	Bureau of Indian Standard
CLR	:	Corrected Lactometer Reading
DDD	:	Directorate of Dairy Development
FGD	:	Focus Group Discussion
FMD	:	Foot and Mouth Disease
FSSA	:	Food Safety and Standards Act
FSSAI	:	Food Security and Standard Authority of India
GHP	:	Good Hygienic Practices
ILRI	:	International Livestock Research Institute
PFA	:	Prevention of Food Adulteration Act
SNF	:	Solid Not Fat
TNA	:	Training Need Assessment
VO	:	Veterinary Officer



## Proposed training schedule

	Registration		Time
Day 1		Registration	10:30 – 11:00 am
	Session 1	Introduction to the training	11:01 – 11:45 am
		Pre training status evaluation	11:46 am – 12:00 pm
	Session 2	Setting up of cottage product making unit including infrastructure and equipments	12:01 – 2:00 pm
Day 2		Participants' reflection of Day 1	
	Session 3	Milk and cottage product quality, germs as an agent of milk spoilage and disease and basic tests to determine the milk quality	11:00 – 2:00 pm
Day 3		Participants' reflection of Day 2	
	Session 4	Good and hygienic processing practices	11:00 am – 1:00 pm
	Session 5	Product preparation, value addition and diversification	1:01 – 2:00 pm
Day 4		Participants' reflection of Day 3	
	Session 6	Product handling, packaging and dispatching	11:00 am – 12:30 pm
	Session 7	Record keeping, stock management, networking, personal behaviour and business development plan	12:31 pm – 2:00 pm
Day 5		Participants' reflection of Day 4	
	Session 8	Understanding the prevailing rules and regulations applicable for cottage product making unit	11:00 am – 12:30 pm
	Session 9	Effort to improve environmental protection and to increase fuel efficiency	12:31 – 1:30 pm
		Post training status evaluation	1:31 – 2:00 pm

**Note:** The suggested training schedule is only indicative; facilitator may modify the training 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: 5 days**

**Total time: 15 hours**





## Cottage Processor: A Background

Milk based cottage product making is a peculiar household level milk processing business in Assam run mainly based on family labour. Cottage processors serve as one of the important milk value chain actors in the state. They mainly use milk produced in their own farms and/or procure milk from other milk producers when demand for finish products increases. Various cottage products that they produce include *channa* (cottage cheese), *khowa*, curd, cream, paneer, ghee and couple of popular sweets (most commonly Rasgolla and Lalmohan). Additionally, they are also found to sell on demand from the consumers. Cottage products such as Channa and khowa are procured by sweet makers to produce milk sweets out of it. The cottage product making business is seasonal in nature with earning of super-normal profit during festive months of the year and have normal sale of products in remaining months. During the festive months, price of these products shoots up. Cottage products are generally carried and sold in urban centers. They also produce bulk quantity of cottage products (curd, cream etc.) based on order received for some social occasions like marriage, etc. which are very much seasonal in nature. Some cottage products (e.g. paneer, channa, khowa) are also regularly transported to 100s of miles away from the production area to supply to sweet makers regularly. Unlike sweet makers, cottage processors are concentrated in some area only with traditionally inheriting the business from their ancestors. These areas have gained geographical popularity as producers of specific items (e.g., Dahi of Sarabhog and Barpeta). Some districts are not even found to have a single cottage processor and consumers' demand for such items in such places is met by sweet makers only.

Most of these cottage processors do not possess any retail outlet. They are also not found to use hired workers and may, at best, have one or two casual workers only as most of the cottage product making businesses are run on family labour. Unlike sweet makers, cottage product making business is usually carried out on a minimum infrastructure (relatively poor housing structure and drainage system) and use of lesser number of appliances (most of them have a cream separator only). The cottage processors do not possess any formal training on clean and hygienic practices of handling milk and cottage products. They are found to run the business based on their age old knowledge. They do not have exposure to any formal training on improved production and business management practices making them remain in a subsistence status for years together.



## SESSION 1: Introduction to the Training

### Introduction to the training

The training facilitator will introduce the training by following the sequence as stated below-

**Welcome address:** Facilitator will welcome the participants and explain the objectives of the training.

**Self-introduction:** Facilitator will ask the participants to state their name, primary occupation, and years of experience on cottage product making business.

**Expectation from the training:** Facilitator will ask the participants to explain their expectations from the training. Facilitator will write down the key points in a flipchart/whiteboard/black board in order to revisit the same at the end of the training.

**Pre-training status evaluation:** Facilitator will distribute the pre-training evaluation form among the participants. Facilitator will ask them to put tick marks in the appropriate boxes (Agree/Disagree/Don't know). After the evaluation, s/he will collect the forms and use the same to put tick mark at the end of the training to compare the differences before and after the training.

**Ground rules:** Facilitator will ask the participants what general behavior (e.g. switching off the mobile during training, coming to the training all for five days on time, leaving the training after completion, no gossiping during the time of training delivery etc.) he expects to experience in order to run the training smoothly and effectively, s/he will list all suggestions in a flip chart and post the flipcharts where it is visible throughout the training.

**Content:** Importance of the cottage processor, changing consumers' behavior, relevance of the training, benefits of the training, what participants would learn from the training etc.

### Session Objectives

At the end of the session participants will be able to explain

- The role of the cottage processors in the society
- How changing consumers' preference, behaviour, evolving business practices and new regulatory environments may shape the business in future.
- How this training programme will benefit them to overcome the emerging challenges.

### 1.1 Why cottage processors are important?

Cottage processors-

- Add value to raw milk by converting the same to different cottage products;
- Increase shelf life of raw milk from 5-6 hours to more than 48 hours by making cottage items;
- Provide market access to milk producers and traders;
- Helps consumers in meeting their consumption needs of cottage products;
- Helps by supplying cottage products in bulk at the time of various social ceremonies/rituals;
- Gives feedbacks to milk producers/traders (about the quality of milk in terms of yield of mawa/curd/cream/ghee or any visible dirt seen in the milk) produced/traded by them for the sake of supplying quality cottage products to consumers.

## 1.2 Changing consumers' behavior, institutional requirements and relevance of training

- No-one wants to eat cottage products that have been prepared in an unhygienic way. A customised training will help cottage processors to understand the good hygienic practices that are to be followed in the process of cottage product making, storing, handling and marketing.
- With increase in income, consumers are ready to pay more for quality cottage products.
- With the emergence of different food borne and zoonotic diseases, consumers are more concerned about the safety (e.g., germs, antimicrobial residues, pesticide residues etc.) of the produce that they consume.
- With the growing presence of various readymade packaged cottage products (e.g. curd, cream, paneer) marketed by big industrial houses that can be preserved for long, has increased consumers' convenience and accessibility of buying those products.
- Use of cottage products has been increasing.
- Consumers are more interested to buy milk products that are packaged, and sold in hygienic way.
- Government is framing new food safety regulations (e.g. Food Safety & Standard Act, 2006), business policies (e.g., investment policies, ease of doing business etc.), local legislations (e.g., municipality trade licenses, FSSAI registration etc.) etc. that may influence the change of traditional cottage product making business.
- Availing training on relevant business has become more important to get access to institutional services like credit, insurance, trade license etc.

## 1.3 How the training will help you?

By participating in the training you will learn on-

- Hygienic production and handling of cottage products that will help in reduction of milk wastage and spoilage, increase quality and safety of cottage products and increase consumers' confidence on it;
- Minimum basic requirements of infrastructure, equipments and utensils for producing quality and safe cottage products;
- Standard process of making some cottage products to help you in keeping quality and efficient use of raw materials;
- Better handling, packaging and dispatching practices which will help you ensuring better presentation of your products making it more appealing and a large number of customers would be attracted to buy your produce;
- Food safety regulations, new business policies and local legislation and compliance with the same that will help you to run your business complying with the prevailing policies and practices;
- Good business and behavioural practices that may enable you to communicate with your target customers and input suppliers more effectively and convincingly;
- Importance of branding your unit/produce that may help in increasing the volume of your business.

- Additionally, having the training certificate-
- May ease your access to institutional credit, insurance and other services that will help you in scaling up your cottage product making business;
- May make you eligible to avail project benefits (e.g., milk utensils, badge, logo, uniform, etc.), if any;
- May help you to increase your social status, recognition and brand value of your produce.

### **1.4 What would you learn from the training?**

You will specifically learn the followings in the training-

- Minimum basic infrastructural requirement, required characteristics of equipment, utensils and appliances used (Session 3).
- Maintenance of quality of raw materials and finish products and reducing spoilage of cottage products (Session 3).
- Five important rules of good hygienic practices for processing milk (Session 4).
- Product specific standard method to produce cottage products (Session 5).
- Good practices of product handling, packaging and dispatching (Session 6)
- Keeping proper records of daily milk purchase, daily net returns from the business , etc. (Session 7)
- Improving your business development and management skill (Session 8).
- How the activities of cottage processors will remain concerned with environmental safeguards and make efficient use of fuel (Session 9).

### **Summary**

1. A cottage processor adds value to the raw milk by converting it to cottage products and thereby increases its value, shelf-life, serve consumers meeting their consumption needs and helps in improving milk quality of producer/trader through the tests and feedbacks.
2. There are visible changes of consumers' behaviour in terms of their inclination to demand and pay more for quality cottage products with attractive packaging and display and with range of diversified products available in the markets. Along with these the various institutional regulations and age-old milk business has led to the relevance of this training programme.
3. Participating in the training programme will provide a range of benefits to the cottage processors right from product quality improvement to earning social status and recognition.
4. The training is expected to help participants to learn a wide range of hygienic milk processing practices, business development skills, and knowledge on ways to adopt environmental safeguards.

## SESSION 2: Setting up of Cottage Product Making Unit Including Infrastructure and Equipments

### Session objectives

This session is designed to build your capacity on the followings-

- Taking appropriate measures in and around the cottage product making unit
- Points to be considered for different parts of the housing infrastructure
- Points to be considered in buying necessary equipments and utensils for a cottage product making unit.

### Training Methods to be followed

- Participatory discussion
- Exposure visit to a modern cottage product making unit
- Distributing photographs and illustrations

### Training Materials

- Laptop, LCD projector and screen,
- Whiteboard and markers (multiple colour)
- Manual and handouts

### 2.1 Measures to be taken in and around the cottage product making unit

Cottage products are generally made in the premises of the farmer or at the home of any individual engaged in making cottage products. Therefore, no requirement of any major infrastructure is suggested in this session. Cottage processors should mainly focus on certain basic requirement as stated below to run the unit successfully.-

- The unit should preferably locate in an area which is connected by all-weather road with good electricity connection.
- Having easy access to market, bank and insurance company are the added advantage.
- The cottage product making unit should be an independent house little away from residential house and relatively away from farm house in order to maintain the quality and safety norms of cottage products.
- Clean drinking water should be available for cleaning of utensils and product making.
- The unit should be away from open sewage, drain, public lavatory, industrial unit or anything that produces/releases obnoxious gases/odours;
- Should not create any nuisance to neighbour.



*Product preparation surface of a cottage unit*

## 2.2 Points to be considered for various parts of the housing infrastructure

### Floor, water and drainage system

- The height of the floor should be sufficiently more than the level in the courtyard to avoid flooding or damp floor during the rainy season;
- The floor should be clean and should invariably be of concrete with smooth surface;



*The floor is of concrete topped with good quality tiles*

- Any cracks and crevices are observed in the floor it should be repaired immediately for continuous maintenance of smooth floor;



*Stagnation of wastes on an uneven floor*

- Take care that floor always remain clean and dry. Do not put gunny bag on the floor for long to absorb water or dirty materials. Swipe any falling liquid material (e.g. water, milk, curd etc.) immediately and allow the floor to dry.

- Have sufficient space in your unit for preparing and storing of different types of cottage products keeping in mind the requirement during pick of the season;
- Cottage product making should not be carried on a very low height platform (e.g. *peera*) as dust, dirt etc. may contact with the food during preparation. Construct a raised platform/ surface (say table height) over the floor preferably made of concrete with granite at the top to make it easier to clean the surface;
- Construct a concrete space for cleaning and drying of utensils, appliances and clothes;
- Arrange the waste disposal sufficiently away from the cottage product making unit. If the size of land is less in your residential premises contact with the waste pickers (if any) for regular disposal of wastes;
- Drainage system should be efficient with sufficient gradient to expel out the liquid waste quickly;
- The drainage system should connect to a pit which needs to be cleared at regular interval.

### Ceiling, walls, windows and doors

- Concrete wall is preferred. If construction of concrete wall is not possible, construct the wall with good quality locally available materials, plastered with clay and white wash the same. Never, prepare cottage products in a house made up of *Tarza* wall (as shown in photograph). It accumulates, dust, germs, paste etc. which is difficult to clean and may make your product hazardous to your consumers.



*Bamboo walls with wholes in a cottage processing unit*

- Walls should be maintained in free of cracks, broken plasters to prevent accumulation of dust and shredding of particles;
- Ceiling should preferably be smooth disallowing much accumulation of dirt, dust etc. and harbour pests;





*Ceiling with chance of falling particle/dust on finished products/raw materials*

- All interior structures should preferably be constructed of materials that are durable and impervious to food particles;
- Hollow space and gaps are minimized and all edges should preferably be rounded off;

#### **Windows and ventilator**

- There should be adequate ventilator to facilitate free circulation of air;
- Should have wire netting in the windows and ventilator to protect against entry of rodents, insects, birds, animals, fly, etc.;
- Windows should preferably of glass covering to allow sufficient sunlight inside the cottage product making unit.
- Ensure sufficient lighting in the unit;



*Netting in the ventilation*

#### **Store/godown**

- Stainless steel big covered container should be used for storing some raw materials like flour, sugar etc. instead of storing in gunny bags which are prone to get infested by insects, flies, etc.



*Use of container with closed lids instead of gunny bags*



*Commonly available storage containers in markets*

- Should have a refrigerator (bigger size, vertical type for commercial use) for storing milk products until dispatched.
- Arrange/create separate space or room for keeping/receiving raw milk and stocking other raw materials (e.g. milk, flour, maida, sugar etc.) to avoid keeping them with the finished items.

- Have adequate provision for keeping the source of fuel (LPG cylinder/ firewood/husk/ charcoal) safely;

*Try to keep the food containers 30 cms above the floor.*

### **Toilets and wash basins**

- The toilets, stores and habitations of family members are built sufficiently away from processing area;
- Washing area (pre-installed wash basins if any) should be separate from the processing area
- Entry restriction signs are to be fixed for customers/strangers and family members (not engaged in processing work) to disallow entering directly in to the processing hall.

### **2.3 Utensils and appliances**

Try to use equipments/utensils/containers that-

- Are non corrosive/rust free/smooth/free of sharp corners, preferably of stainless steel/ aluminium except some big iron pans (*kerahi*) that are essential for cottage product making;



*Stainless steel/aluminium utensils and containers*

- Facilitate easy maintenance, cleaning, disinfecting, etc.;
- Are not defective, unsuitable or unsanitary having hard stains on it;
- Have cover or tight lid to prevent exposure of raw milk and finished cottage products to contaminated air and dust;
- Instead of using bowl to transfer cottage products such as curd from one container to the other or for packaging, use long handle scoop to avoid fingers coming into contact with the curd.



*Carefully open the parts of cream separator and clean thoroughly after every use*

**Additionally also try to have the following-**

- Use dustbins for throwing away the used disposables and kitchen wastes. Dustbin should be cleared every day to avoid odour, over flowing and accumulation of pests;



*Covered dustbins should be used*

- Commercially available insect killers should be used if the processed items are kept openly (i.e., in racks, on table etc. (other than in fridge);
- Adequate and appropriate first aid equipments (mostly and importantly for burn and scalding injury) are to be kept in a box inside the unit.

## 2.4 Precautions in cottage product making factory against fire hazards

In the cottage product making unit, use of fire is an essential practice. Common sources of fire used by cottage processors include fire wood, rice husk and LPG. In addition, electricity is an essential part of any cottage product making business. Since most of the time fire is used for preparing cottage products, cottage processor should be well prepared to fight against fire in the event of any outbreak.

In order to fight against fire, cottage product making unit should be equipped with the followings:

### 2.4.1 Infrastructure/facilities required for firefighting in factory

- Keep provision for an emergency exit;
- Have adequate ventilation to maintain normal temperature inside the factory;



*Keeping adequate ventilation in the cooking room*

- Ensure that there is an approach road for entry of fire brigade vehicle in outbreak of fire;
- Keep a ready to use fire extinguisher at a handy place;
- Keep a drum filled with sand;
- Use high quality wiring materials for electricity connection;
- Keep the contact no. of Fire Brigade and Police Station displayed at an appropriate place for quick view.

### 2.4.2 Regular preventive practices against outbreak of fire

- Stock the source of fire (fire wood, paddy husk, LPG cylinder, kerosene, etc.) away from the kitchen in a separate area/chamber;
- Check the electricity connection, switch board etc. at regular intervals. Any indication of electric short circuit should be addressed immediately without delay;
- Do not keep LPG gas stove open when not in use;
- Do not ignore, if any leakage of LPG gas is suspected;
- Clean the LPG stove immediately if it is blocked because of overflow of milk, tea etc.;
- Do not keep the fire wood/husk get burning when it is not in use;
- Check the source of fire every day at the end of day's work;
- Never smoke inside the unit;
- Replace/fill the fire extinguisher at regular interval;

#### **Exposure visit Learning from a modern cottage product making unit**

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

Ask the training facilitator to identify one modern cottage product making unit (if any) in the locality having improved infrastructure. Request the owner to allow the participants to enter the cottage product making premise following proper hygienic measures and to explain the participants about the advantages/ disadvantages of various infrastructure facilities put by him/her in place. Allow the participants to interact with the owner freely.

#### **Key recommended practices of the session**

- Establish your cottage product making unit away from open sewage, drain, public lavatory, business/factory, etc.
- Ensure availability of clean and potable water for operational needs.
- Construct the floor of concrete with smooth surface. Repair immediately if any cracks and crevices are noticed on the floor .
- Keep the floor always clean and dry; and do not put gunny bag on the floor for long to allow absorbing water or dirty materials.
- Ensure adequate ventilation in the cottage product making unit and fix an exhaust fan preferably over the oven.
- Fix wire netting in the windows and ventilator.
- Keep a ready to use fire extinguisher and a drum filled with sand at a handy place.
- Keep one first aid box containing all the essential items for first aid care.

## SESSION 3: Milk and Cottage Product Quality, Germs as an Agent of Milk Spoilage and Disease and Basic Tests to Determine the Milk Quality

<b>Session objectives</b>
This session is designed to build your capacity on the followings:
<ul style="list-style-type: none"><li>• Germs that cause milk spoilage and diseases</li><li>• Method for prevention of spread of germs</li><li>• Various myths that you are pursuing and reality countering those myths</li><li>• Test procedure of few important but easy milk quality tests</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion</li><li>• Group discussion</li><li>• Practical demonstration</li></ul>
<b>Training Materials</b>
<ul style="list-style-type: none"><li>• Laptop, LCD projector and screen</li><li>• Whiteboard and markers (multiple colours)</li><li>• Manuals and handouts</li><li>• Talcum powder</li><li>• A packet of pasteurised milk</li><li>• 2 numbers of 10 ml plastic sample tubes for each student</li></ul>

### 3.1 What are good quality cottage products?

Cottage products are perceived as good quality by the consumers, if-

- They find freshness on its visual appearance;
- The texture is of normal and acceptable appearance and shape;
- It conforms to the most common and acceptable colour of similar item (The colour of ghee should be like the ghee only);
- Free from any foreign particles/dirt (e.g. hairs, flies, sack of dung etc.);
- Free from any bad smell/odours;
- Do not taste sour;
- Feels softness after putting in the mouth.

In order to ensure quality in cottage products, cottage processor should first ensure the quality of raw milk. For this, cottage processor should know the average composition of raw milk, factors contributing to the variation in the composition of milk and the quality attributes of milk before bringing the same for processing. These have been discussed below:

### 3.2 What is the quality of raw milk that the cottage processor should have?

Quality of cottage products and economics of cottage product making unit depend on quality

of raw milk used for preparing cottage items. Good quality of cottage products can only be produced from good quality milk. Milk is considered as good quality if it-

- Does not contain any adulterant (e.g. water);
- Does not contain any dirt (e.g. straw, hair, particle of dung etc.);
- Fat and Solid Not Fat (SNF) content in its normal range;
- Is yellowish white in colour, with no off-odour;

Further, milk safety (safer to consume) can be assessed in laboratories based on some parameters as stated below.

- Milk that does not contain germs beyond the acceptable limit (less than 50,000/ml);
- Milk that does not contain any residues (antibiotic residues, pesticide residues etc.) beyond an acceptable limit;
- Milk that does not contain any toxic or poisonous substance (aflatoxins, phytotoxins etc.);



*Milk containing dirt*

### 3.3 Average chemical composition of raw milk

Before processing to make cottage products the raw 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.

**Average composition of milk**

Type of milk	Fat %	SNF %
Cow milk	3.5- 4.5	8.37 - 8.83
Buffalo milk	5-7	9.04 - 9.68

**Source:** Kapadiya et al. (2016)

### 3.4 Factors contributing to variation of milk composition

The composition of milk varies due to several of factors. Having knowledge of the cottage processors on this may enable them either to accept the natural variation or to instruct the suppliers of milk to take corrective measures. The factors causing variations are:

- **Type of dairy animal:** Buffalo milk is much higher in fat than cow milk.
- **Lactation period:** Fat content is higher after giving birth, decreases to a minimum during the first month of lactation and then gradually increases during the remaining periods of lactation.
- **Time of milking:** Milk obtained in the evening is richer in fat than that obtained in the morning
- **Nutrition:** Underfeeding reduces both fat and SNF. Diets low in dry fodder and green fodder will reduce fat.

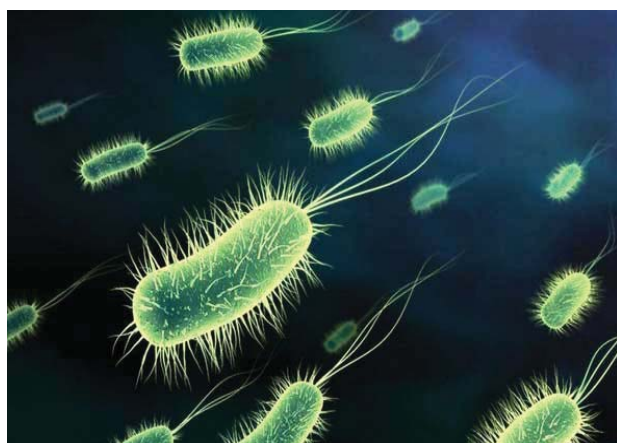


- **Disease:** Mastitis causes reduction in fat and SNF content in milk. The milk should be rejected if the cottage processor knows that the animal from which the milk is collected is diseased (mastitis) or under medication (e.g. with antibiotics).

### 3.5 What is germs and how it spreads diseases?

People may get sick from the food they eat. This sickness is called food borne disease and is caused by dangerous germs or chemicals present in food.

Germs are tiny living creatures and are present everywhere more particularly in dirt, faeces, 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 (e.g. mastitis), there is chance of higher microbial load in milk. Immediately after milking germs start multiplying and pace of multiplication increases with the increase in time, temperature and degree of dirtiness in milk and its surrounding. If milk is kept in normal room temperature, it gets spoiled after 5-6 hours. If milk is kept in a warm place then the germs will multiply rapidly and soon milk will get spoiled. Similar to milk, milk products made of poor quality milk may also get spoiled early. To make sure that milk and milk products remains fresh for longer time, one should ensure that hygienic practices are followed during milking, transportation, storage, handling and processing.

#### 3.5.1 Type of germs

Two types of germs are present in milk and milk products- 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, diarrhoea, colds, rashes, coughing and other diseases.

### **Food facts that many people do not know**

- Food (including milk sweets) can look and smell good, but still contain germs that may make people sick.
- Boiling does not kill all germs or poisons in food.
- Bad food can also cause paralysis, depression, infertility, abortion, kidney failure, arthritis, and other serious conditions.
- Food which some people can eat without problems, may sometime cause others to become sick after eating the same food.
- Consumption of poor quality food may not cause disease immediately but after a long incubation period

### **3.5.2 Means through which germs spread**

There are various means through which germs are spread:

- Physical contact of one animal/man with other
- Animal excreta and discharges (such as nasal, oral as in FMD, abscess, vaginal, etc.) ear wax, urine, dung, etc.
- Milk utensils
- Water and air
- Milk handlers (mainly through dirty clothes, nails, hairs, sneezing, coughing, etc.)
- Flies, mosquitoes, etc.
- Birds and animals (e.g. rat, dog, cat, etc.)

### **Group discussion: 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

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

Discuss the following myths about milk and milk products. Ask how many people believe the myth. Then give the reason why it is not true. Make participants do a role play in which one participant tries to explain to someone in the community why this myth is false.

**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. 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 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 diarrhoea

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

**Myth:** The faeces of cattle (and children) is harmless

**Truth:** Faeces is the number one cause of diarrhoea! 1 gram 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 non fat, as well as other factors such as presence of adulterants, presence of germs that can make people ill, freshness, taste etc.,

### **Practical Demonstration: How germs make milk spoil**

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

- Ask any of the participants to carefully fill 2 plastic sample tubes/glass with milk.
- Divide participants into two groups
  - Cool temperature milk experiment (Group-1)
  - Warm temperature milk experiment (Group-2)
- In the beginning, participants are asked to put their finger in two sample tubes filled with milk and mark with "X" and "Y" respectively. Explain there are many germs too small to be seen on the surface of our skin
- In the warm temperature milk experiment participants are asked to leave one tube in a warm place (marked with an X) and the other the coolest they can find (marked with an Y). Explain germs grow faster when it is warm
- Participants are asked to take the tubes home and check to see how long they stay fresh for.
- They will report back in the next lesson how long it takes milk to go off

### **3.6 Ensuring milk quality and safety and testing for detecting adulterants**

Most of the cottage processors use their own farm produced milk. These cottage processors buy milk from other producers only during the time of festivals when they can not meet the market demand from their own produced milk. The rest of the cottage processors buy milk from other milk producer regularly. Testing the quality of milk produced in own farm is not essential but, those cottage processors who regularly buy milk from others need to conduct tests for confirming quality. Cottage processors buying milk from others are mostly seen to judge milk quality and fix price in terms of yield of channa/khowa/mawa. This may give him/her a partial indication about the physical quality (fat and SNF %) of milk and adulteration, if done any. For producing quality cottage products there are few simple and rapid tests that the cottage processors can do in their cottage product making unit in order to detect milk quality and safety.

#### **3.6.1 Cottage processors using their own farm produced milk**

If cottage processors use milk produced in his/her own farm, he/she should know the following risk factors arising from the activities of milk production and their control options.

**Antibiotic residues:** Antibiotics are given to the animals to treat infectious diseases and are also, used as growth promoters for the feed that is given to the animals. The particles of these antibiotics slowly come out through milk. Humans get the antibiotic particles through consumption of this milk. The germs present in the human body get exposed to these antibiotic particles present in milk and when they fall sick, use of similar antibiotics for treatment might not work and fail to treat the disease.

Suggestion for milk producers:

- Never try to treat animals on your own.
- Consult veterinarians for treating the animals. Note that all the diseases don't require the treatment by antibiotics.

- The course of antibiotics (5 days) should always be completed.
- Do not consume or sell the milk till two days after the completion of antibiotic course (withdrawal period).

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

Suggestion for milk producers:

- Pesticide cause a wide range of toxic effects in human beings. So, the milk containing particles of pesticide are harmful both for you as well as your consumers.
- Avoid using chemical pesticides on the farm. A number of organic pesticides (like neem oil, mustard oil etc.) can be used instead of the chemical pesticides.
- Avoid giving your animal the feed sourced from an area where pesticides are used in cultivation of feed and fodder.

**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.

Suggestion for milk producers:

- The feed and fodder given to the animals must be stored in a clean and dry place.
- The stored feed must not come in contact with water.
- The storage area must have proper ventilation.

### 3.6.2 Simple tests to detect milk quality and safety

**Few simple tests for assessing raw milk quality by cottage processors when buying milk from others:**

- Sight-and-smell test
- Clot on boiling test
- Fat testing
- SNF testing
- Traditional method of testing milk/ milk products

These tests will help the cottage processors to get a sense of the physical quality of milk based on which he/she can make a decision on source and price of procurement. Also, he/she can express his/her concern on milk quality to the suppliers and can try to motivate the supplier to follow good milk production, handling and marketing practices.

#### **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;
- 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); Check for any foreign bodies or physical dirt;

- Observe any dirt/foreign bodies like cow dung, hair, straw etc.;
- Do not dip your hand or finger into the milk as this will contaminate it;
- Don't taste the milk. Tasting raw milk is not a good practice as raw milk may contain dangerous bacteria/viruses.

### **Interpretation**

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

### **Clot on boiling test**

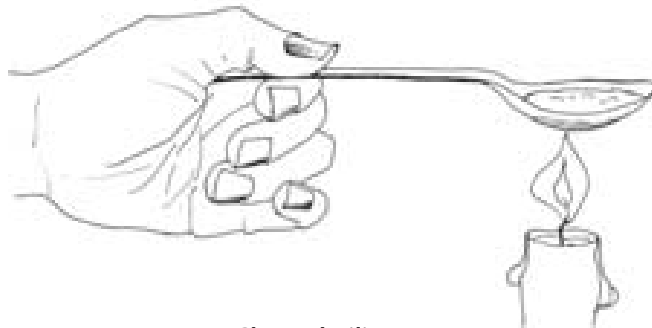
It allows for detection of milk that has been kept for too long without cooling and has developed high acidity. Milk with high acidity is not fit for consumption.

### **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*

### **Fat testing**

Fat % in milk can be assessed by (i) Gerber Method or by (ii) digital milk analyser

#### **(i) Gerber Method**

#### **Equipment and Materials**

- Sulphuric acid (density 1.807 – 1.812 g/ml at 270C, 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 + 2°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 in whole lot of samples.

## Solids Not Fat (SNF) testing

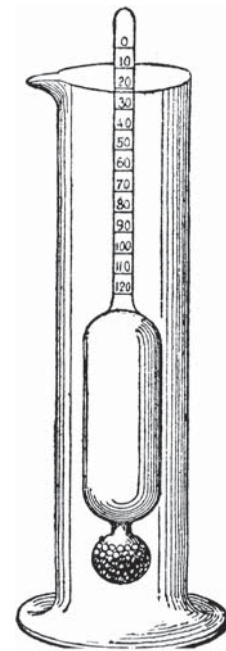
SNF can be assessed by measuring the specific gravity in two methods:

(i) By using a lactometer and (ii) By using a digital milk analyzer

### (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.



A dairy lactometer

## 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.



*Milk is being tested by using manual lactometer*

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

In this case, cottage processors need to buy a digital milk analyser (shown below) that may cost about Rs.40,000/- for quick and accurate testing of milk samples for fat, SNF and added water. For milk testing purpose, the milk sample should be put in a container (supplied with the analyser) and to be placed in the machine. The lactometer will give instant results for SNF, fat percentage and water content.





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

### **3.7 Traditional method of testing milk/milk products**

In addition, there are some traditional methods as explained below to test milk and milk products:

#### **Indigenous method of milk/cottage product testing for physical quality**

- I. If cottage processors use aluminium foil in place of vark (silver covering) in sweets for better look consumption of it may cause stomach infection. To detect if it is aluminium foil, touch the top of the sweet gently with your finger. If it comes out sticking in the finger, chances are that it is not vark.
- II. Paneer, khawa 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 khawa, 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.
- III. To check if the milk has added water, put a drop of milk on a polished slanting surface or on a clean 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: Testing milk for quality and safety**

##### **Instruction for the resource persons:**

- Demonstrate the above tests practically in front of the trainees.
- Allow couple of trainees to try to conduct the tests
- Suggest other trainees to exercise at home/ work station.

## Group discussion

### Instruction for the resource persons:

Present before the participants the images of various milk containers meant for storing milk. Ask the participants to discuss among themselves the advantages and disadvantages of those in term of keeping quality of milk, cleaning and disinfection process, carriage or movement, durability, etc. Always suggest them to use the one which is more advantageous.



## Key recommended practices of the session

- Wash your hands each time before and after handling milk and cottage products, after using the bathroom, after sneezing, coughing or blowing your nose.
- Immediately after receiving the milk see thoroughly for any visible impurities and abnormal colour, smell it for any abnormal odour and, discard if found any.
- Neither dip your hand or finger into the milk nor taste the milk.
- Try to do the test for SNF %, fat %, added water, etc. immediately after receiving the milk, if possible.
- Also practice the traditional method of testing milk/milk products

## SESSION 4: Good and Hygienic Processing Practices

<b>Session objectives</b>
<b>This session is designed to build your capacity on the followings:</b>
<ul style="list-style-type: none"><li>• The five rules of good hygienic practices that a cottage processor should follow</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion</li><li>• Distributing photographs and illustrations</li><li>• Practical demonstration</li><li>• Group discussion</li></ul>
<b>Training Materials</b>
<ul style="list-style-type: none"><li>• Laptop, LCD projector and screen</li><li>• Whiteboard and markers (multiple colours)</li><li>• Manuals and handouts</li><li>• Two metal containers one with smaller and another with bigger mouth</li></ul>

### 4.1 Importance of good hygienic processing practices

It is important to practise a high standard of hygiene whenever you handle milk and other cottage products before and during processing. This will help to increase profit and avoid unnecessary losses due to spoilage and increase profits. All processing products should be manufactured in accordance with good hygienic practices (GHP) as well as good manufacturing practices.

### 4.2 Five rules for good hygienic practices

**Rule 1:** Observe good personal health and hygiene,

**Rule 2:** Thoroughly clean, disinfect and dry utensils, appliances and surfaces,

**Rule 3:** Use safe raw materials,

**Rule 4:** Separate raw from finish products and fresh products from previous days products,

**Rule 5:** Keep cottage products in cool and dry place.

#### **RULE 1: Observe good personal health and hygiene**

##### **Personal health and hygiene is important because-**

- People often carry germs, which are easily spread through food;
- These germs are present in our hands, face, hair, nose and in our mouth and gut;
- There is every likelihood of contamination of milk with germs if the person handling the milk is sick;
- Even the healthiest person may be carrying germs without being sick;
- No customer wants to drink milk that contains dirt from your hands, face, nose or other places.

##### **For good personal health and hygiene, practise the following during milk handling:**

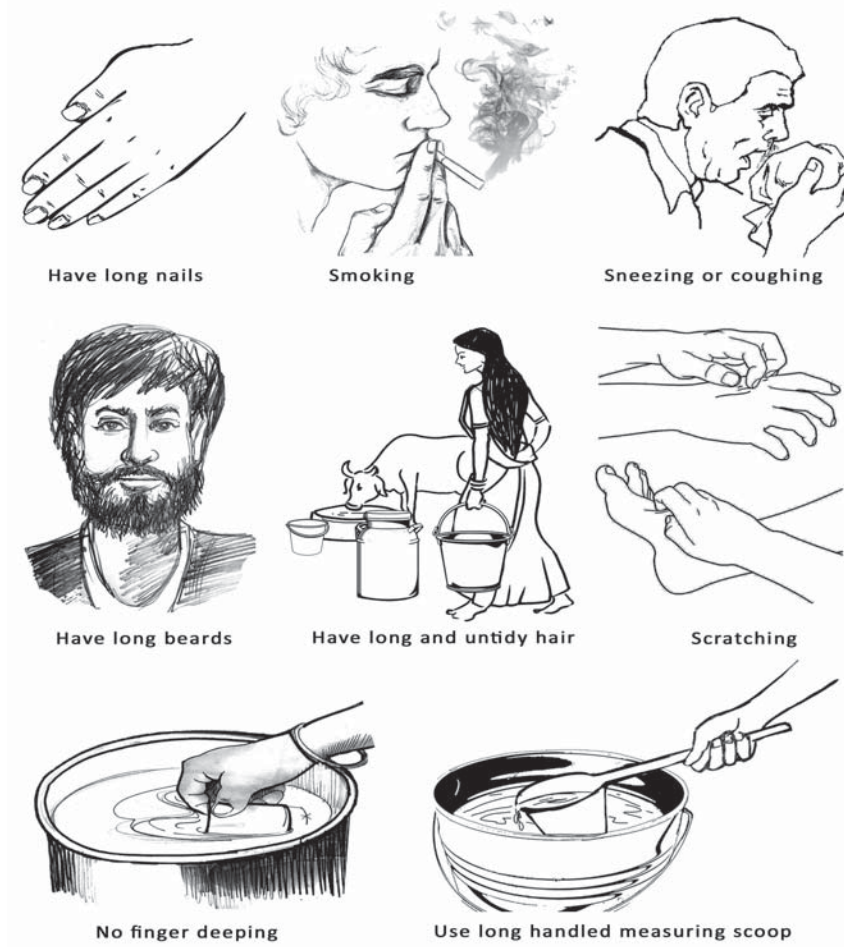
- Do not wear rings, watches, jewellery or other items on hands and wrists;
- Tie back or cover hair;

- Keep finger nails short and clean;
- Keep clothes clean. Light coloured cloths are easier to see if they are clean;
- Cover cuts and sores with a waterproof, brightly coloured plaster;
- Be careful not to cough, sneeze or breath into milk (one should put a mask during cottage product handling);
- When you are ill, never work in the cottage unit;
- Shave/trim/cut your moustache, beard and hair at regular interval;
- Use hair restraint cap.

**While handling milk in the cottage product making unit, avoid the following:**

- Touching parts of your body (especially your face, nose, ears, mouth, gut, etc.);
- Wiping off sweat with bare hands;
- Coughing or sneezing over the milk or cottage products;
- Smoking or chewing *paan*/betel nut/tobacco;
- Putting your hands or fingers in milk;
- Touching any other item except for the clean, disinfected milk equipment.

**Don'ts during milking (Personal hygiene)**



**Don'ts in raw milk/cottage product handling**

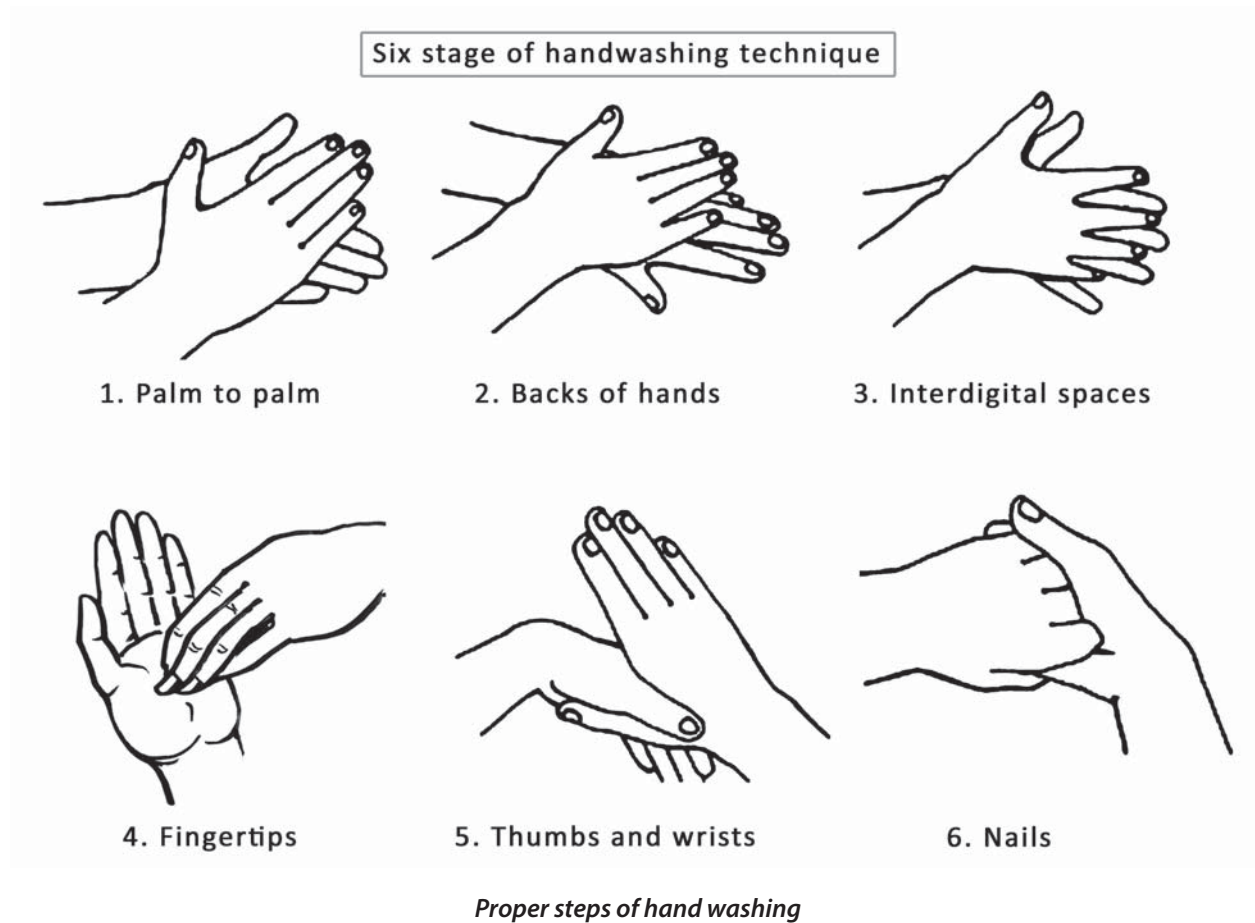
## Keeping hands clean

Washing hands is one of the most important ways to keep germs away.

Be sure to wash your hands:

- Before and after handling milk or cottage products or eating;
- After using the bathroom for any reason;
- After sneezing, blowing your nose or coughing;
- After touching a cut or open sore;
- After working outside;
- After handling rubbish or anything dirty;
- Every time you enter the cottage product making unit from the outside.

## Correct method of hand washing



## Wearing of disposable gloves:

Wearing of disposable gloves in product handling is essential to avoid contact between your hand and product. Ideally you should use disposable hand gloves during handling of milk and cottage products



*Disposable hand gloves*

## **RULE 2: Thoroughly clean, disinfect and dry utensils, appliances and surfaces**

All utensils, appliances and surfaces used for production, handling and transportation of cottage products should properly be cleaned and disinfected to keep the germs away. This is because milk provides an ideal medium for growth of germs. One should always keep food containers at least 30 cms above the floor.

There are four steps of cleaning:

- First clean with soap or detergent and water;
- Next rinse with clean water to remove residues of detergent from contaminating food;
- Then disinfect to kill the germs that cause spoilage and disease;
- Rinse again with clean water if any chemical disinfectant is used;
- Next dry thoroughly under the Sun.

There are special commercial soaps and detergents for cleaning food equipment. You can also use ordinary soap or soap powder/liquid used for cleaning domestic utensils. Cleaning with soap and water can remove the visible dirt but not the germs. To reduce/eliminate germs, milk utensils should be disinfected with appropriate disinfectants (e.g. hot water, bleaching powder, commercially available disinfectant).



*Commercial soap, liquids and disinfectants for cleaning utensils and appliances*

Cleaning agents should be stored properly and handled with care because some of them may be irritant and corrosive to the skin. It should be away from reach of children. Always follow the manufacturer's instructions for proper use of detergents.

### Keeping food containers clean

#### Method of cleaning clay pots (the most common type of container of cottage processor):

- Heat the used earthen pot over a fire. Pour water on it and leave it for some time;
- Then, rinse the earthen pot with detergent or soap (using hand brush over scouring pad) and then wash it with clean water;
- Dry the earthen pots in inverted position on a clean rack in the open.
- Do not cover the earthen pots with wet cloths/banana leaves etc. rather use aluminum foil to cover it. It will improve appearance and safety;
- Keep the rack neat and clean when the earthen pots are positioned for storing the processed cottage products.

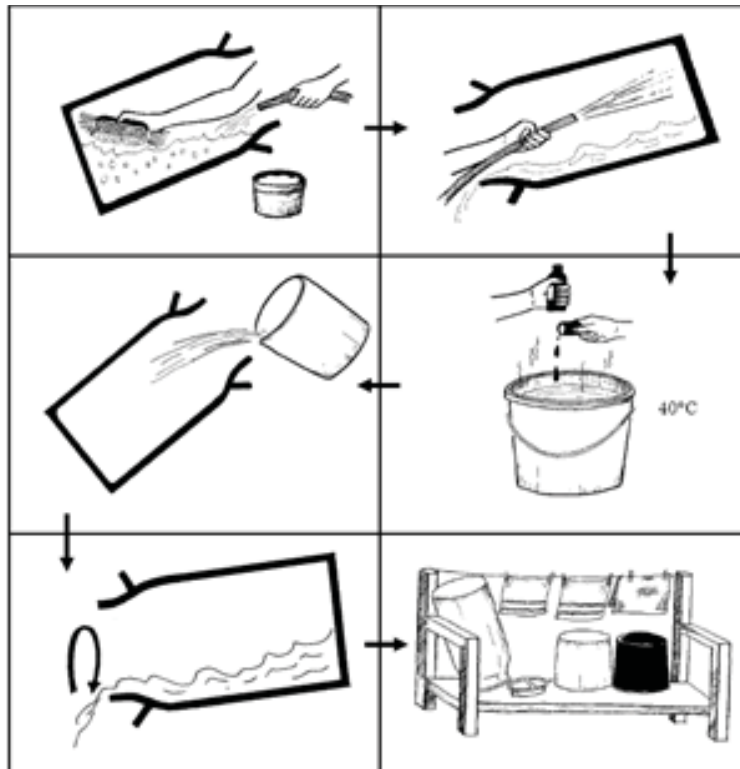


*Clay pots kept in an unclean rack or over the ground*

#### Methods of cleaning metal containers (Aluminium/stainless steel)

- Rinse the container immediately after use;
- Thoroughly scrub (using a stiff bristled hand brush or scouring pad) the container with detergent or soap;
- Rinse the container in clean water;
- Dip-rinse the 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;
  - OR If you do not have boiling water you can leave disinfectant in the container for at least 10 minutes;
- Add 1 teaspoon bleach (5ml) to  $\frac{3}{4}$ th of a litre of water (750 ml) and wipe the surface or containers with this solution to kill germs (disinfect).
- Then turn the container upside-down so that it can drain out the water on its surface. If any smell of disinfecting agents prevails, rinse again with clean water;

- Dry the utensils under the sun;
- Once it is perfectly dry, store in a clean, cool place with the cover on.



*Method of cleaning cloths that is used for straining milk/channa/other uses*

Cottage processor use white cloth for straining milk, straining channa, transportation of channa etc. Clothes with dirt may pass germs to milk/milk products. Therefore, care should be taken to keep such cloths clean.

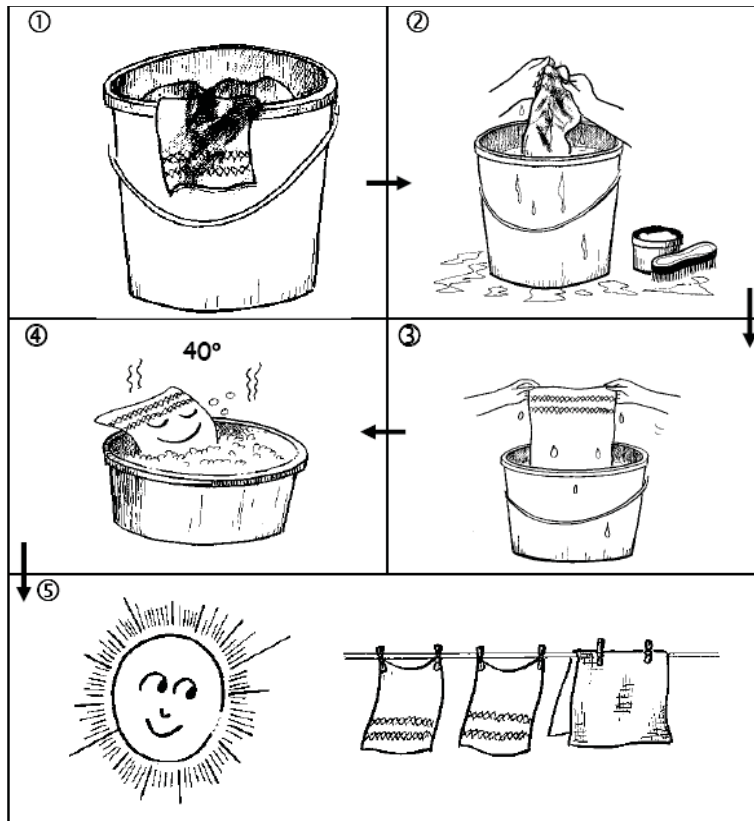


*Use of unclean cloths for straining milk and processed channa*



## Methods of cleaning cloths

- First wash cloths with soap and water;
- Then rinse in clean water;
- Then leave in disinfectant solution for five minutes;
- Then again rinse in a lukewarm water to remove the smell of disinfectant solution;
- Then dry in the Sun.
- Then store in a clean, dry place



*Method of cleaning platform/surface used for cottage product making*

- At the end of the day's work remove all the food particles attached to the working platform/surface;
- Clean the surface with a wet cloth soaked in warm water to remove the remaining particles;
- Rub the surface with a clean dry cloth. Clean the cloth and allow it to dry for next day's cleaning;
- Allow the surface to dry by making upside down (if it is platform type) in slating position;
- Keep all the ants, flies, cockroach, lizard etc. out by taking appropriate pest control measure as follows.

## Pest control measures

- Ensure walls, floor, ceiling, product making surfaces etc. are kept clean and dry;
- Use garbage cans, keep them covered when not in use and remove at regular intervals;
- Inspect raw product, packaging and ingredients for signs of pest infestation;
- Use pesticides and baits, taking great care not to contaminate food;

- For controlling rodents, place traps in areas with frequent passage of rats, mice etc. (never use poisoning).
- Flies are common in a cottage product making unit and the processor should take measures to control flies. If chemicals are used for controlling flies, he/she should take note that it is placed away from the surface for packaging.

### **Rule 3: Use safe raw materials**

#### **Raw milk**

Use clean milk for making cottage products, if the milk is not clean, ask the supplier to follow the practices mentioned below:

- Ask the raw milk suppliers to use clean metal containers (made of stainless steel or aluminium) with covers. Ask the raw milk suppliers to strain milk with a clean strainer or cloth;
- Ask the supplier to deliver milk as early as possible after milking;
- Also ask the milk suppliers to supply milk during cooler hours of the day (early morning or late afternoon);
- When transferring milk between containers, pour the milk instead of scooping.

#### **Water**

- Make provision of storing clean drinking water in a covered container (may use readymade container available in the market), if running water facility is not there;
- Use clean filtered/potable water in cottage products making, if required. Do not use any dirty water.
- Make a provision of a filter in the cottage unit, be it a traditional one (use of sand, rocks, charcoal, etc.) or commercial one;
- Do not use water directly from the source of supply;
- If running water is used clean the water tank (if any) thoroughly at regular interval;
- Keep the water tank covered;
- Use cleaning agent like bleaching powder/ potash in natural source of water (e.g. wells), if need arises. Do not use the same water until the odour of the agents goes off;
- If water filter is not available, ensure that water is boiled before use.

#### **Other ingredients (Sugar, Maida etc):**

- Do not use if they are damaged, dirty, or rotten;
- Do not use if the ingredients are not from certified/trusted source;
- Check the expiry date and throw away if the expiry date is passed.



*Use of non-drinkable water for washing of utensils*

**RULE 4: Thoroughly separate raw from cooked (dirty and clean)**

- Store the raw and finish products separately;
- Do not mix the previous day's cottage product with the fresh ones to prevent temporary loss;
- Do not keep fresh cottage products in previous day's tray without cleaning;
- Keep separate tongs, handler, knife, etc. for handling different types of cottage products;
- Handle product with clean dry gloves or clean dry utensils only.

**RULE 5: Keep cottage products in cool and dry place**

Cottage products will keep for longer if kept cool and dry

- Put sweet curd/paneer etc. always in the refrigerator. Do not overload the refrigerator or do not keep the door of it open;
- Other cottage items that needs no cooling should be kept in metal (stainless steel/ aluminium/glass containers with tight lid and placed on an elevated space.
- The racks where earthen pots filled with curd are placed should be clean and free from cobweb, dust etc. Disposable papers may be used before placing the pots.
- Keep the storage room clean and moisture free.
- Never allow the stored items to get exposed to sunlight.

## Practical Exercise

### Practical Demonstration: Clean suitable equipment

#### Instruction for the resource person:

- Get two metal containers one with small mouth and another with bigger mouth.
- Clean both the container by same person using same process and for same time.
- Check for smell and remaining dirt and waste materials.

Discuss which is easier to clean and why.

### Key recommended practices of the session

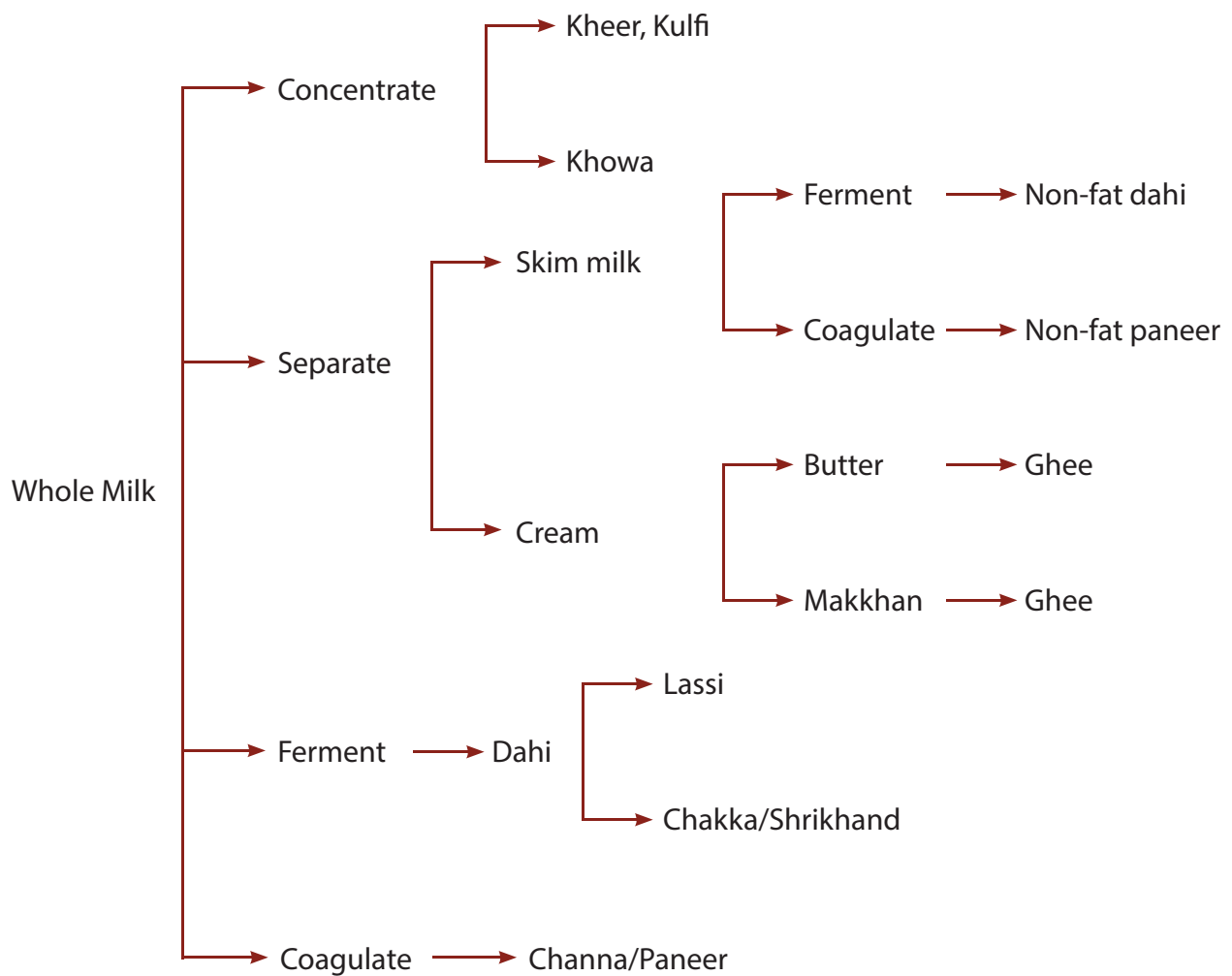
- Do not wear ring, watch, etc. during handling of milk and cottage products.
- Tie or cover hair, cover cuts and sores, if any, wear face mask and clean cloths.
- Always follow the four steps of cleaning utensils and surfaces: clean with soap/detergent and water, rinse to remove residues of detergent, disinfect and finally dry thoroughly.
- Always use stainless steel or aluminium containers with tight lid for storage of milk and cottage products.
- Keep separately the raw milk and finished products and fresh products from previous day's products.
- Always keep the cottage products in dry and cool place. Do not allow these to get exposed to direct sunlight.
- During illness, never work in the cottage product making unit, rather instruct someone else in the family/casual worker to perform the activities.

## SESSION 5: Product Preparation, Value Addition and Diversification

<b>Session objectives</b> This session is designed to build your capacity on the followings:
<ul style="list-style-type: none"><li>• The standard preparation practices of indigenous cottage products</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion</li><li>• Distributing flowcharts</li><li>• Practical demonstration and exercise</li></ul>
<b>Training Materials</b>
<ul style="list-style-type: none"><li>• Laptop, LCD projector and screen</li><li>• Whiteboard and markers (multiple colours)</li><li>• Manuals and handouts</li></ul>

### 5.1 Types of indigenous products in Assam

Several cottage products are produced from milk. Four different methods are followed to convert milk into different primary and secondary products. The methods include: concentration method (by heating of milk), separation method (by separating cream), fermentation method (allowing milk to ferment in presence of good bacteria) and coagulation method (by allowing milk to settle down the solid part). For producing cottage products, milk is first converted into channa by following coagulation method and into khoya by following concentration method which are further processed to produce several products by giving different shapes, sizes and adding colours, new ingredients etc. Milk is also converted to skim milk and cream by separation method while milk is converted to dahi by following fermentation methods. The milk processing methods and the products that are produced by these methods are stated in figure below:



*Different types of milk products/ sweets made through 4 different methods of processing*

## 5.2 Milk Product preparation practices – Techniques of production

The actual preparation practices and the recipes of cottage products varies from cottage processor to cottage processor which largely remain as a trade secret for each cottage processor but the basic principle of preparation, steps and recipes remain largely the same. Every cottage processor should have basic understanding on method of preparation of cottage products in order to guide his/her workers and to make improvement on the quality of the cottage products. The standard methods of preparation of some popular varieties of cottage products are stated below:

**Base material: Khowa (prepared through concentration method)**



**Nutritive value:** Contains all the milk solids in four fold concentration. Contains fairly large quantities of proteins, minerals, fat & lactose. Food and nutritive value of khowa is very high.

**Base material: Channa (prepared through coagulation method)**



**Nutritive value:** Fairly high content of fat & protein, minerals (calcium & phosphorous), good source of fat soluble vitamins & low sugar content.



## Paaner (prepared through coagulation method)

It is a fresh cheese common in the Indian subcontinent. It is an unaged, non-melting soft cheese made by curdling milk with a fruit/vegetable derived acid, such as lemon juice or citric acid.

Take the whole milk in a kerahi/pan and warm under a low flame before reaching the boiling stage, pour lemon juice or previous day's whey, gently stir until the entire milk curdles.

Turn off the stove as soon as the whole pot of milk curdles (Pour some cold water to stop the paneer from cooking further)

Allow the paneer to settle for 1 minute, gently pour entire paneer along with whey to the colander/perforated bowl/cloth.

Rinse it under running water to remove the smell and taste of the lemon juice.

Wring the cheese cloth making a round shape of the paneer, remove the excess whey by squeezing or by hanging the paneer for 30 minutes

Place the cheese cloth on a steel plate along with the paneer, press down it with heavy object for the paneer to set.

After 3-4 hours, remove the cloth and cut the paneer to cubes, ready to sell/supply



*Paneer Vat*



*Paneer Press*



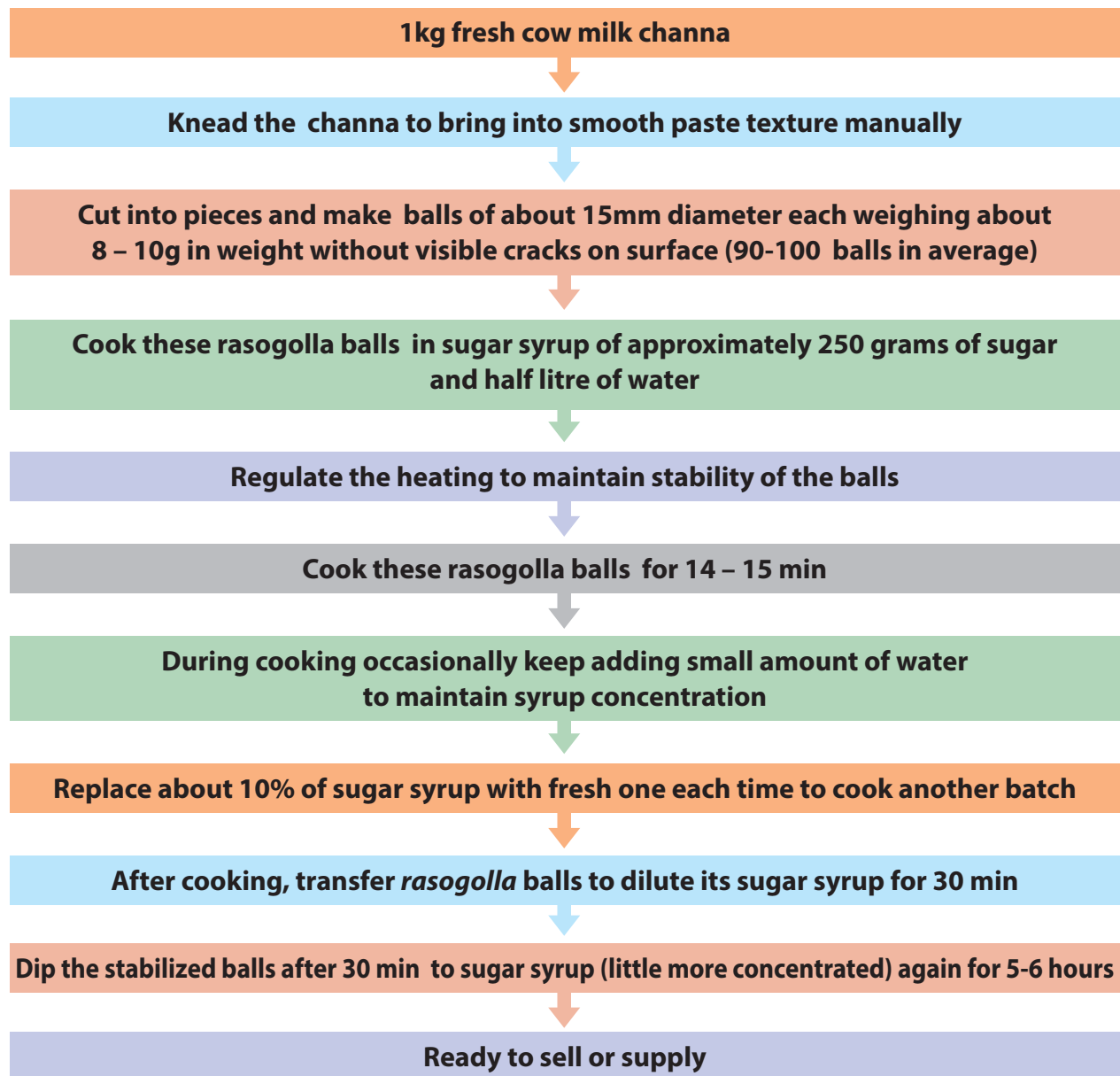
## Cottage items made out of Channa

### Rosgolla

#### Method 1:



## Method 2:



**Nutritive value:** Same as channa & contains sugar.

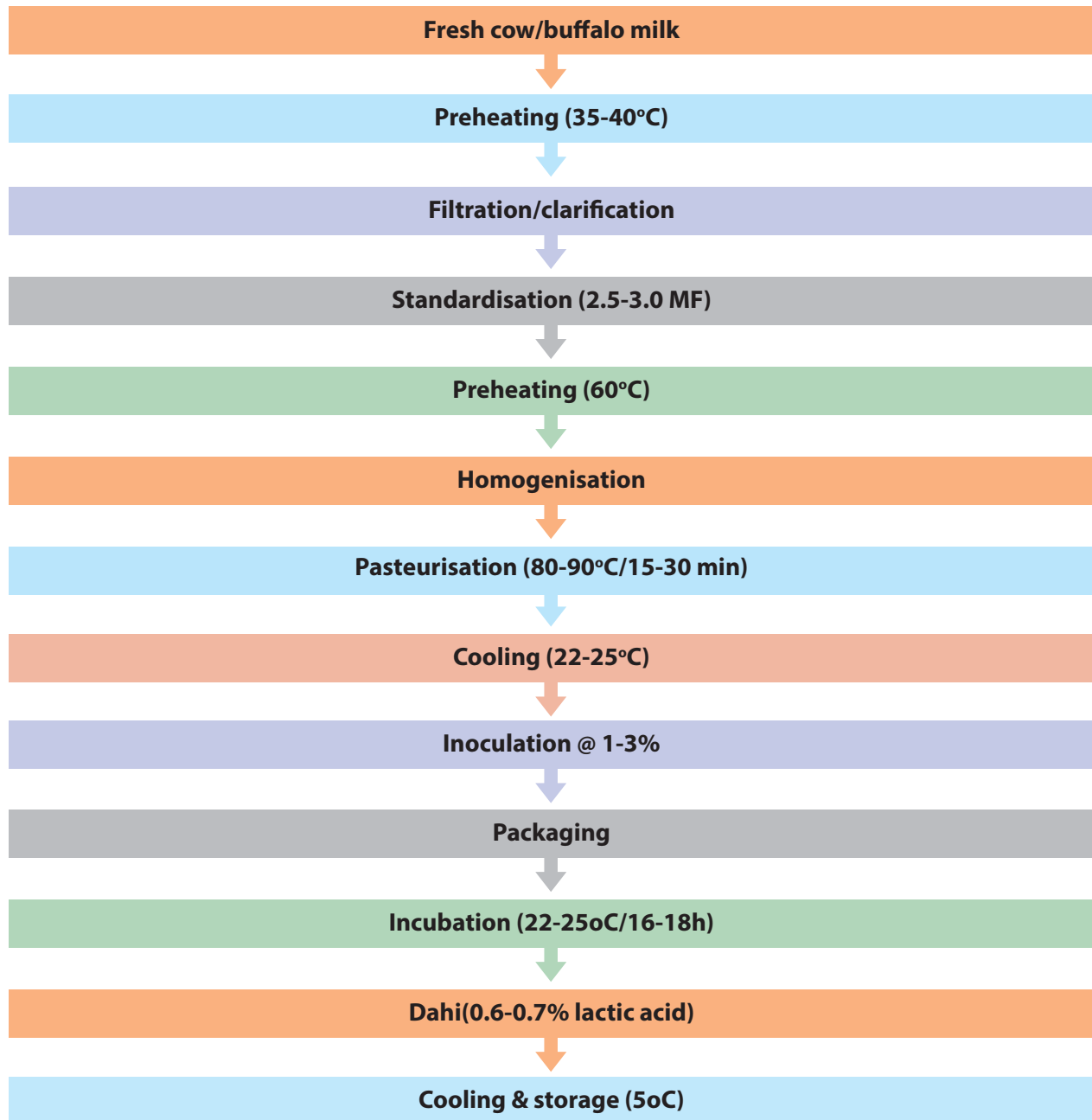
## Gulab Jamun



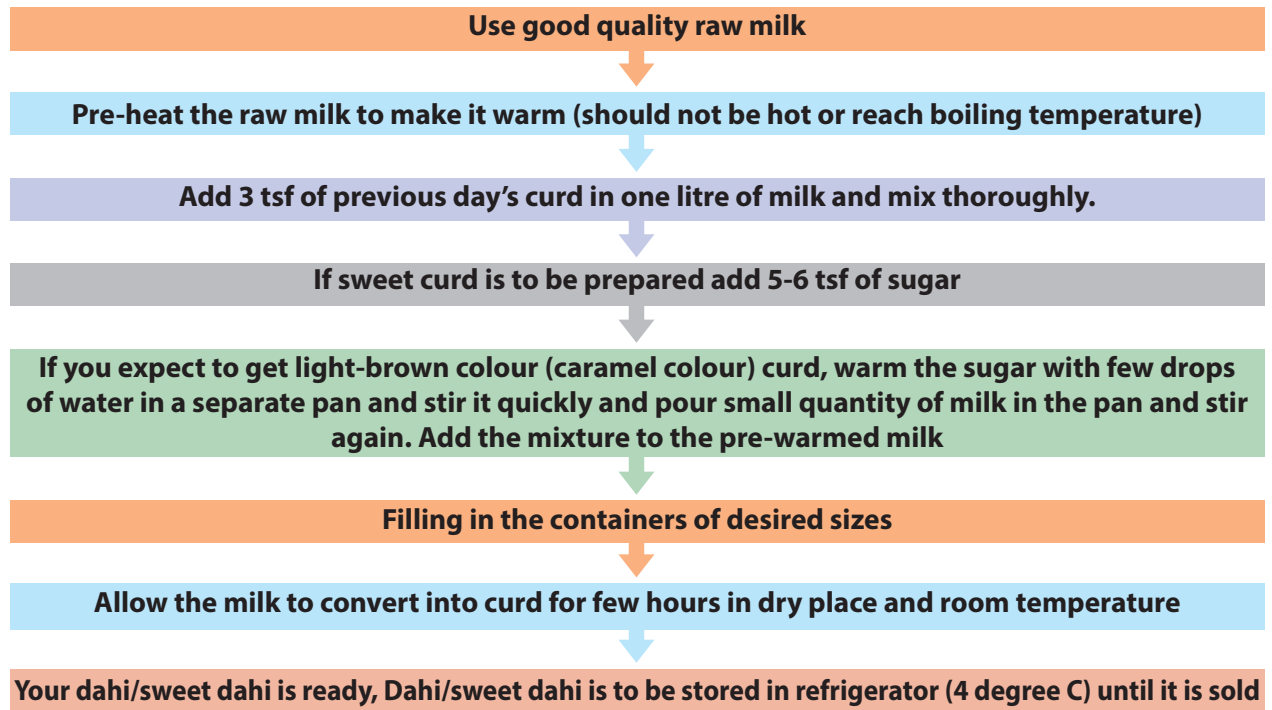
**Nutritive value:** Same as khoa. Also contains sucrose.

## Dahi/ Sweet dahi (prepared through fermentation method)

### Method 1: Under industrial production system



## Method 2: Conventional system



**Nutritive value:** More palatable, easily digested, exerts health beneficial effect

### Summary (session 5)

1. There are broadly 4 different methods of milk product making: concentration, separation, fermentation and coagulation.
2. Milk sweets are basically made from khowa or channa.
3. Cottage product preparation practices may vary but maintaining the standard preparation processes of products help in keeping quality and efficient utilization of inputs.
4. Always try to follow the prescribed product specific mixing of recipes, keeping cooking temperature, maintaining timing etc.

### Key recommended practices of the session

- Have the best knowledge on preparation of all kinds of cottage products.
- Never compromise on quality in buying raw ingredients. Always use the best quality raw materials for getting best products.
- Always try to engage a better skilled cottage product maker for preparing best quality products.

## SESSION 6: Product Handling, Packaging and Dispatching

<b>Session objectives</b> <b>This session is designed to build your capacity on the followings:</b>
<ul style="list-style-type: none"><li>• Handling the cottage products in a clean and hygienic way.</li><li>• What are the permissible level of food additives, packaging materials available and their preferred options?</li><li>• The care to be taken for safe and hygienic dispatching of cottage products</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion</li><li>• Distributing photographs and illustrations</li></ul>
<b>Training Materials</b>
<ul style="list-style-type: none"><li>• Laptop, LCD projector and screen</li><li>• Whiteboard and markers (multiple colours)</li><li>• Manuals and handouts</li></ul>

### 6.1 Product handling

For hygienic handling of cottage products, several important points are to be considered. During processing of milk to make cottage products, the handlers should always follow the personal health and hygiene as indicated in Session 4. There are several other considerations that are to be followed for effective handling of cottage products that will also attract customers to buy it.

- Keep the finished products in containers on an elevated space from the floor;
- If curds are prepared and transported in the same clay pots, the outer side of the pots are rubbed with clean, wet clothes for avoiding dirty appearance.
- If the curds generate water bi-products and cottage processors trying to separate that, he/she should use long handle scoop instead of using a bowl.
- Instead of using banana leaves, newspaper for covering the cottage products during its preparation stage, one should try to use aluminium foil.
- Should store curd, cream etc. in a refrigerator for the sake of safe and longer storage duration rather than keeping the same in an open area like on a table or in a rack.
- The place where products are stored should be clean and dry with sufficient lights
- Containers of others raw ingredients should be kept covered while not in use;
- Always wear disposable hand gloves and mask at the time of handling and packaging of cottage products;
- The cottage products with bare hands;
- Tie your hair up or wear cap while working in the cottage product making unit;
- During summer, the handler may sweat. To avoid chances of falling sweat on milk/finished cottage products, always keep one clean cloth (e.g. *gamosha*) to wipe off at regular interval. Wash the cloths every day (so keep at least two sets of clothes);
- Always wear protective clothing (e.g. apron).

- For an unshaken stand up of the earthen pots filled with cottage items like curd, cream etc., straw made cycle is used. These should be dried regularly and should replace at regular interval to disallow developing fungus in to it due to falling of milk, curd, cream etc.

## 6.2 Product packaging

The primary role of packaging is to protect the product from spoilage and keep it in safe condition without altering its structure/shape, keeping the constituent (e.g. fluid part) intact etc. for displaying/selling/transportation. Suitable packaging is also intended for keeping the product safe from dust and other foreign bodies and avoiding contamination from the surface of the packaging material. The packaging material should always be attractive/ appealing for the consumers. No one wants to consume a product packaged in dirty material.

### Characteristics of good quality packaging materials:

- Bio-degradable;
- Safer, i.e., do not carry any toxic agents/ chemicals in it that itself can contaminate milk/ cottage products and also from outside sources;
- Convenient to handle and carry from one place to another;
- Preferably it should contains information on product quality, name date of manufacturing, date of expiry (by stamping), address and contact details of the shop to help promoting to brands along with quality. This could be possible when plastic containers are used for packaging curd, cream, paneer etc. by pasting a self-printed stickers containing the information as stated. For selling bulk quantity product in earthen pot, this may not be feasible.
- Economical (the cost of packaging is not that of too high but also meets the other characteristics).

### Packaging materials that should not be used for cottage products

- Ordinary polythene
- Newspaper
- Polythene that was used to package other materials earlier
- Tree leaves

### Recommended type of packaging material

- Always use food grade polythene that is above 50 microns, (government has banned the use of polythene of thickness below 50 microns);
- Use recycled good quality paper board boxes;
- Use paper bags/ pouch for packaging dry items.
- Use injection moulded containers for packaging of curd, cream, paneer etc.
- Earthen pots for short duration transportation and where careful handling is possible

### Precautions to be taken in packaging

- Leaves, newspaper, ordinary polythene, etc. do not provide sufficient protection to the product from contamination and manual handling; Instead of using these, one may think of using aluminium foil or vegetable parchment paper for covering the earthen pots or injection moulded containers
- Always maintain the packaging surface clean and dry;



Follow the following packaging materials for the category of products mentioned in the table below:

Product	Packaging material
Khoa	3-ply laminate made of paper/aluminium foil/LDPE*
Butter	Vegetable parchment paper/ suitable glass bottle for butter in liquid form
Liquid milk	Tetra packs/ food grade plastic
Cream	Food grade plastic containers with air proof lid
Curd/sweet curd	Earthen pots or Food grade plastic containers with air proof lid
Indigenous products	Injection moulded/ thermoformed containers
Sweets for bulk transportation	Big tins of mustard oil with half cut mouth on top

\*Low density polyethylene

### Various packaging options for cottage products

	<p>Injection moulded containers for packaging cream, curd, paneer etc.</p>
	<p>Hard earthen pots for packaging curd, cream etc.</p>
	<p>Good quality paper board cartoons</p>

	<p>Aluminium foil for packaging khowa</p>
	<p>Vegetable parchment paper for packaging butter</p>
	<p>Tin for packaging and transportation of sweets in bulk</p>

### 6.3 Product Dispatching

In order to dispatch cottage products, the cottage processor should take the following precautions:

- For dispatching of bulk quantity cottage products (curd, sweets) use metal containers (e.g. tin) that are properly cleaned and disinfected.

- Try to transport the cottage products from the work station to the consumers as early as possible and during cooler hours of the day.
- If transported in bulk, private vehicles may be hired. He/she should ensure that the vehicles used for cottage product transporting should be maintained in good condition and kept clean.
- The vehicle should be selected keeping in mind that it is used mainly for this purpose. The carrier should preferably be fully covered in order to prevent from dust, fumes, obnoxious odour, etc. Also the vehicle used for transporting should not have any obnoxious odour in itself.
- Traditional system of transporting such as hanging two sets of earthen pots in both sides of a stick to reach to customers in walking distance should be avoided as it will consume time texture of the product may be affected.
- Accessing commercial vehicles which are not meant for transportation of milk products alone should be washed and disinfected prior to using. Keep the products fully covered and put a covered over the carriage to prevent from sunshine, dust, fumes and heat.
- Some cottage processors generally transport cottage products in goods carriage section of a public bus to get customers of major urban centres. Since, he/she does not have control on this section as other goods may also be kept here, he/she, along with few other cottage processor, may join hands to transport in an hired vehicle.
- Roads which are smooth/jerking free should be preferred over poor quality road. This will help to keep the shape and texture of the cottage products intact.



*A covered van for transporting cottage products*

#### **6.4 Disposal of leftover products**

- Check the quality of all left over products at the beginning of each day's work. If any product is found that has started to deteriorate, transfer and dispose it immediately following hygienic practices.
- By selling poor quality milk products, a cottage processor can avoid short term loss but in the long run his/her business will largely suffer. So, he/she should not do that. Some permanent customers may stop procuring cottage products from him/her.
- Never allow the garbage bins to overflow with left over products. Move overflowing wastes to other bins.
- Always use a garbage liner for garbage containers. This is a good way to ensure that the garbage container is kept as clean as possible and that harmful germs do not have time to grow inside of the unit itself.



*Garbage liner*

- The stalled left-over products have to be disposed off in a pit sufficiently away from the cottage product making unit and having lesser contact of human habitations, animals etc.

#### **Key recommended practices of the session**

- Always use protective clothing (e.g. gloves, face mask, apron, etc.) during handling of milk products/ cottage products. Never touch the cottage product with bare hands, always use tongs, spoon, etc. or use gloves
- Keep the finished products in containers on an elevated space from the floor..
- Tie your hair up or wear cap while working in cottage product making unit.
- Always do packaging of cottage product in bio-degradable and non-toxic, food grade packaging materials, never use ordinary polythene or newspaper.
- Try to transport the cottage products from the work station to the consumers as early as possible during cooler hours of the day.
- The vehicles used for transporting cottage products should be solely for the same purpose only and cleaned daily.
- Dispose the stale, left-over products in a pit sufficiently away from the cottage product making unit

## SESSION 7: Record Keeping, Stock Management, Networking, Personal Behavior and Business Development Plan

### Session objectives

The session is designed to build your capacity on the following:

- Importance of record keeping
- Various record keeping formats (e.g., milk/channa/khowa purchase, product preparation and sales, other expenses etc.)
- Inventory/stock management for raw materials and finished products
- Important considerations for dealing with customers, suppliers of milk, maintaining personal integrity, business ethics and conflict management.
- Adoption of business development techniques such as product innovations, product diversifications, and standardizing of product preparations
- Networking with input suppliers and output marketing agents

### Training Methods to be followed

- Participatory discussion
- Distributing various record keeping formats
- Role play
- Practical experiment

### Training Materials

- Laptop, LCD projector and screen
- Whiteboard and markers (multiple colours)
- Manuals and handouts

## 7.1 Simple business records

### 7.1.1 Why record keeping is important?

- Record keeping helps cottage processors to track sales, expenses incurred, profits made and other issues and thus ease in making business forecasting/planning.
- Well-kept records help in making wise decisions for a well-managed business and also may facilitate business expansion.

### 7.1.2 The records that the cottage processor should keep

- **Milk procurement record:** An accurate daily record of the volume of milk from each supplier is necessary for daily/weekly/monthly payments.
- **Product preparation and selling record:** The cottage processor should keep record of how much cottage products he/she produced per day, how much sold, and how much earned. This will give him an idea to what extent he/she is earning profit.
- **Other expenses record:** A cottage processor spends money on payments to casual workers/ sales men, house rent, water, electricity, transporter etc. He/she should keep appropriate record of all those that helps him/her to avoid any potential conflict that may arise because of forgetting something by either party.

- Make monthly summaries of your records in the way that it enables you to take certain crucial decision for the subsequent month.

**Daily milk procurement record (if milk is purchased from other producer farmers):**

Date	Supplier name	Volume	Rate per unit	Total cost	Payment Done	Balance if any
04-01-2020	S. Talukdar	100 lt.	Rs. 45 per lit	4,500/-	3000/-	1500/-
04-01-2020	T. Kalita	50 lt	Rs. 40 per lit	2000/-	1500/-	500/-
04-01-2020						
TOTAL	2 suppliers	150 lit	----	6500/-	4500/-	2000/-

**Product preparation and income record:**

Date	Distribution of milk	Produced/day	Sold/ day	Price per unit	Total income
4/1/'20	Paneer/ Channa	10 kg	8 kg	800/kg	
4/1/'20	Cream	4 kg	3 kg	500/kg	
4/1/'20	sweets	100 piece	80 piece	12/piece	
4/1/'20	Curd	100 kg	80 kg	100/kg	
			--		
			--		
Total					

**Other monthly expenses record:**

Date	Cost on raw ingredients	Payment to casual worker	Transporter	Electricity	Local taxes	Others*	Total
4/1/'20	2000	4000	3000	1000	200		

\* Others may include cost on transportation, packaging materials etc.

## An example of working out expenditure and income of cottage processing unit

### Example of working out the record of profit and loss/day of a typical cottage processor:

#### Cost side

##### Raw materials

- Raw milk purchased = 100 litre @ Rs. 45/litre (Rs. 4500.00)
- Maida = 5 kg @ Rs. 50/kg (Rs. 250.00)
- Sugar = 10 kg @ Rs. 40/kg (Rs. 400.00)

##### Others

- Electricity (monthly bill/30 days) = 1200/30 (Rs. 40.00)
- Hired labour (avg. monthly payments X number of workers /30 days) = (8000 X 4/30) = Rs. 1067.00
- House rent (monthly rent/30 days) = (5000/30) = Rs. 167.00
- Miscellaneous/day = 100.00

Total cost = Rs. 6524/-

#### Revenue side

##### Items sold and revenue earned per day

- Cream = 4 kg @ 450/kg = Rs. 1800/-
- Rasgolla = 200 numbers @ Rs. 12/ piece = Rs. 2400/-
- Lalmohan = 250 numbers @ Rs. 10 = Rs. 2500/-
- ghee = 2 kg @ Rs. 500/kg = Rs. 1000/-
- Paneer = 2 kg @ Rs. 400/kg = 800/ kg

Wastage due to note selling = 50 numbers @ Avg. Rs. 10/- = Rs. 500

Total revenue = Rs. 8500.00

Net revenue = Total revenue – wastage loss = (8500-500) = Rs. 8000.00

**Profit/day = Net revenue - Total Cost = (8000-6524) = Rs. 1476/-**

## 7.1.3 Inventory/stock management

### For raw materials:

The cottage processor should plan meticulously how much stock of raw materials he/she should have on every week/month. The stock position depends on the followings:

- The financial investment capacity of the cottage processor.
- The time period for which stocking is required, may vary from a couple of days to months
- Requirement per day
- Stocking capacity in the unit (space for stocking)
- Seasonality (e.g., demand will be more during the wedding seasons)
- Pest and rodent control measures adopted by the cottage products making businessman
- Emerging challenges such as –*Hartal, Bandh*, natural calamities, etc.
- Distance from the source of procurement and volume required

### For finished products:

The cottage processor should make a plan on how much cottage products he/she should prepare for the day and how much he/she should produce to keep in the stock for next couple of days (if possible). This estimate depends on the following factors:

- Trend of demand (based on item wise sale per day/per week)
- Shelf life of the products
- Storage capacity
- Seasonality and environmental temperature
- Emerging risk/opportunities (e.g. *Bandh, hartal*, social event etc.)

## 7.2 Business development plan

Good personal behavior, personnel integrity and better communication practices will help a cottage processor create more confidence amongst their consumers and improve business relations with milk suppliers, consumers and other clients.

### 7.2.1 Dealing with customers

Cottage processor may not face customers on daily basis if he/she does not have any selling outlet. He/she may face few customers every week visiting his/her unit for bulk quantity orders. However, if he/she visits market to sell his produce, he would certainly face some customers. Therefore, a cottage processor should have some basic idea how to deal with a customer.

- The first impression is the best impression. It is important to make an impression that attracts the target customers immediately.
- A cottage processor should always greet the customers with a smile and should always show that he/she is happy to see the customers.
- It is always the customer who ultimately helps in sustaining the business. He/she should always make the customers feel special and important and this will make them loyal.
- A cottage processor should show customers the quality brand if he/she has any. Explain that this brand is followed based on the standard production, hygienic and quality assurance practices learned to prepare through training given to cottage processor.
- A cottage processor should not ignore or be rude to even a single customer as good or bad behaviour of sellers may pass to another 10 customers. Thus, value each and every customer equally and behave cordially.
- It is important to influence the customer with quality assurance, convince them and sell.
- Develop the art of how to manage customers belonging to different sections (caste, creed, ethnicity, etc) in the locality. Read customers accurately. Be soft but steady and handle difficult people smoothly.
- Communicate with confidence keeping in mind the value addition of the service. Confidence comes out of quality product and best possible services to people while making profit in business simultaneously.
- If any complaint from customers on quality is valid, a cottage processor should try to accept it without debating 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. This will build a sustainable trust of the customers on the cottage processor.
- If there are any changes in the usual services, he/she should let customers know in advance.
- Be prompt in serving the customers. There is a saying that 'supply creates its own demand.' So you should focus on producing high quality cottage items which will attract a larger group of consumers in the locality to buy it and also to make them habitual consumers.



### **Additional Tips:**

- The cottage processor should keep pace with the latest available production techniques or equipments to prepare quality products at minimum cost.
- Rather than increasing profit margin by selling to few customers at a higher price, you should adopt the technique of slightly lowering the price and enlarge the size of the number of customers to arrive at higher profit in total.

### **7.2.2 Dealing with suppliers of milk and other inputs**

- Keep in mind the quality and price, collection and delivery time, payment mode, maintenance, and additional services provided by the supplier. Build a good and long term relations with the suppliers of milk conforming good qualities in him and his product.
- You need to understand how crucial your raw milk orders are for the supplier.
- Be careful of driving a hard bargain with your suppliers. It can make the supplier offended. Suppliers are also same as customers that help your business sustain for long term.
- State your needs clearly to the suppliers (if there is prior order for milk products to you) and pre-fix price, quantity, quality, date of delivery, mode of payment etc. to avoid any post supply disagreement on any of these issues.
- Be open, courteous and firm with your suppliers, and they will respond in kind. Tell them what you need and when you need it.
- Have a specific understanding about the cost per unit, and expect delivery on schedule. Keep in touch with your suppliers to avoid possible delays, poor quality etc.
- If possible emphasize on starting/maintaining own dairy farm for having in-house supply of milk to minimize cost on accessing raw milk.
- Keep constant network with the banks and insurance service providers for accessing their services at the hours of need;
- Overall, try to establish a durable contact with the suppliers of raw milk and inputs like earthen pots, milk containers etc. to get those as and when needed;

### **7.2.3 Personal integrity**

For practicing better personal integrity by a cottage processor, he/she should-

- Keep interaction with everyone related to your business (input suppliers, customers, cottage product making unit workers, landlords, etc.) respectfully.
- Maintain relationship with local bodies, civil society organization, etc.
- Show willingness to understand others' problems or issues that connects with your business.
- Maintain emotional control even when feeling tempered.
- Communicate honestly and openly.
- Express your concerns constructively.
- Try to be objective as far as possible.
- Improve your personality, appearance and body language.
- Look for solutions that meet mutual needs of everyone in the event of any dispute or disagreement.
- Keep your word or promise.

## 7.2.4 Conflict management in cottage product making business

- **Do not try winning or being right:** The only victory when it comes to dealing with conflict at work (with customers or input suppliers) is a mutual one, that results in de-escalation, new common ground, and resolved conflict.
- **Assess your own emotions before meeting:** We're humans and tend to be imperfect and irrational. Taking a step back to figure out how we're really feeling is one of the best things when handling conflict with any of the cottage product making business associates, customers or input suppliers.
- **Keep conversation goal-oriented:** Keeping things goal oriented to resolve problems at workplace is what matters the most rather than making it emotionally focused.
- **Meet face to face:** Meeting in person is of utmost importance to show directly your own emotions to show that you are part of the problems and for the greater interest of the business and of both parties, you stand with them.
- **Find opportunity to admit you were wrong:** Instead of arguing and thereby offending the other party, try to find opportunity that things could have been better or admit that you were wrong.
- **Conversation:** Create space for conversation and have open channels to address conflict.

## 7.2.5 Business ethics

- Always try to ensure quality and to supply good quality products to the customers.
- Always try to win and maintain trust of customers.
- Customers' satisfaction should supersede over your profit.
- Always try to indulge in a healthy competition with the other cottage product making businessmen in the locality by constantly pursuing endeavour to increase your business performance rather than trying to bring the other's business down.
- Try to learn from each other's best practices and try for building a geographical brand to attract outside customers.
- Never involve in maligning reputation of other cottage processors.

## 7.3 Other requirement for business Development

### 7.3.1 Benchmarking

Benchmarking is comparing your business with others to understand your current position and to learn from it.

You can visit other businesses with proven track record and observe:

- Their premises,
- Their products and prices,
- Customer services,
- Negotiation quality with input suppliers

This may give you ideas on how to improve your business.

### 7.3.2 Innovate and diversify

Increase the range of products you sell. When stocking new products:

- Try and ensure that they have longer shelf-life.
- Tell your customers that you have something new.
- Make a special offer or discount for the new products for its increased diffusion among customers;
- Adopt the practice which has optimized the demand for your product or profit.
- Make personalized products for parties or events (e.g., special color or shape).

### **Diversifying the product range**

Try doing something different with traditional cottage products (e.g. an extra ingredient, or different colour) and see if it can promote demand.

- Have some special products to build reputation of your business.
- Make sure that the information about availability of these products easily reaches out to customers through listing in a notice board overbally intimating to some of the regular customers. These specialty products could include:
  - Products that are typical of a certain geographical area;
  - Healthy products that are low in sugar and fat;
  - Organic products that does not have any antibiotics, pesticides etc. (in milk);
  - High quality and price products for special occasions and for specialized customers
  - Low price products to cater to the needs of economically weaker customers.

You may also try innovating in your manufacturing processes. Try changing the recipe or process in ways that will save inputs (also money) or increase quality. Please take note that too much deviation in the standard process of manufacturing (as pointed out in session 6) may decrease its quality/safety. Try the experiment in a small batch so that if it doesn't work the loss of input and time is not high. Also try to innovate in your product placement. Try and identify other outlets for your products.

## **7.4 Networking with other agents (for input and output)**

To have a best performance of your business, networking with the clientele groups is very important. This will facilitate the ease of accessing inputs and other services and marketing of your finished products. In order to involve in a best business you may practice the following:

### **Networking with input suppliers**

- Always maintain cordial working relation with input suppliers and be loyal to get quality input regularly at right volume, at competitive price and on time.
- Try to maintain long term relationship with input suppliers with loyalty.
- Always make timely payments to suppliers of raw milk and other supplier agents of inputs, behave with them cordially and stand by them at the hours of their crisis.
- Try to have trustworthy and cordial relationship with the banks and insurance service providers for easy access of credit and insurance services.

### **Output marketing**

- Always supply quality products to the retail outlets and on time

### **Role play: Dealing with difficult customers**

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

Select any two of the participants and ask one of them to act as an offensive customer and the other as a cottage processor and let them to play the role. Cottage processor will try to handle the customer to convince about the quality of the product and their best effort to provide a promising customer service to him.

### **Key recommended practices of the session**

1. For understanding the day to day business performances and undertake better business decisions keep everyday records of milk allocation to different products, net returns from business and monthly records of the value of milk sweets spoilage.
2. Always value each and every customer and greet him with a smile and show that you are happy to see him. Try to remember their names and their favourite purchases.
3. Try to build a cordial and long term relations with the suppliers of milk. Never involve in a hard bargain with any of the suppliers as it may make them offended with you.
4. Always try to maintain emotional control even when feeling tempered. Look for solutions that meet mutual needs of either parties (customers and cottage product makers/input suppliers and cottage product makers)
5. Try to have some speciality products such as product typical of certain geographical area/ healthy products (low in sugar and fat)/organic product/high or low priced products as per customers' group to build reputation of your business.

## SESSION 8: Understanding the Prevailing Rules and Regulations Applicable for Cottage Product Making Unit

### Session objectives

#### This session will build your capacity on the followings:

- Information on obtaining business license and permits
- Complying with business laws and regulations enacted by local body (e.g. municipality, panchayats, etc.), state (e.g. Pollution Control Board, Health Department, Labour Department) and centre (child labour laws)
- Existing rules and regulations help you to face any untoward incidents or harassment

### Training Methods to be followed

- Participatory discussion
- Experience sharing

### Training Materials

- Laptop, LCD projector and screen
- Whiteboard and markers (multiple colour)
- Manuals and handouts

A wide range of traditional/indigenous dairy products are being produced for consumption. The Bureau of Indian Standards (BIS) has worked out standard specifications for the quality of khowa, shrikhand, burfi, rasgollas and gulabjamuns, and those for other products are being worked out.

#### Participants need to learn about the following:

- Know existing rules and regulations enacted by concerned authorities including municipal body and the state for cottage product makers. These may vary from area to area. However, broadly these may include:
  - a. Certificate from the Labour Department
  - b. Trade license from the municipal authority in urban areas
  - c. Trade license from the Panchayat authority in rural areas
  - d. Registration under Food Safety & Standard Authority of India (FSSAI) under Food Safety and Standard Act (FSSA)
  - e. Following regulations/ instructions of local food safety officers of the Health Service Department who act under FSSA.
  - f. Child labour laws
- Possible consequences of violating the existing rules and regulations.
- Probable intervention areas where the health department may interfere.
- Code of hygienic practice and any other laws that relate to milk hygiene e.g. approved milk containers, use of chemical preservatives, medical examinations for milk handlers, environmental management and waste disposal, etc.

## 8.1 Present Indian law for foods

- Present Indian law for foods is contained in the (Indian) Food Safety And Standards Act, 2006, (FSSA). Prior to the FSSA, manufacturers had to comply with the Prevention of Food Adulteration Act, 1954 (PFA) and rules framed there under.
- Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations, 2011 (FSS Regulations) formulated under the FSSA is the new rule. It also mandates for compulsory registration by any food business operator with the Foods Safety and Standards Authority of India (FSSAI).
- These regulations may be called the Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011.

### Milk Products Standards as per FSSA:

The following milk products are not allowed to be sold to a customer

- 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 following milk products must conform to the parameters as given below for sale to customers:

### Channa or Paneer

- Moisture not more than 70.0 percent
- Milk fat not more than 15.0 percent of dry matter:

Provided, further, that such low fat paneer/channa shall be sold in sealed package only and shall bear proper label declaration {as provided in regulation 2.4.5 (39) of Food Safety and Standards (Packaging and Labeling) Regulations, 2011}.

### Howa

- The milk fat content shall not be less than 30 percent on dry weight basis of finished product.
- It may contain citric acid not more than 0.1 per cent by weight.
- It shall be free from added starch, added sugar and added colouring matter.

## Offences and penalties under FSSA- chapter IX

### General provisions relating to offences

- a. A person may render any article of food injurious to health by means of one or more of the following operations, namely,
  - Adding any article or substance to the food;
  - Using any article or substance as an ingredient in the preparation of the food;
  - Abstracting any constituents from the food; or

- Subjecting the food to any other process or treatment, with the knowledge that it may be sold or offered for sale or distributed for human consumption.
- b. In determining whether any food is unsafe or injurious to health, regard shall be to–
- The normal conditions of use of the food by the consumer and its handling at each stage of production, processing and distribution;
  - The information provided to the consumer, (on the label, or other information of avoidance of specific adverse health effects to both present and subsequent generations);
  - The probable cumulative toxic effects;
  - The fact where the quality or purity of the article has fallen below the specified standard or its constituents are not present in specified limits of variability, which are solely due to natural causes and beyond the control of human agency, then such article shall not be considered unsafe or sub-standard or food containing extraneous matter.

**Penalty for possible offences:**

- Penalty for selling food not of the nature or substance or quality demanded;
- Penalty for sub-standard food;
- Penalty for misbranded food.

The Adjudicating Officer may issue a direction to the person found guilty of an offence under this section, for taking corrective action to rectify the mistake or such article of food shall be destroyed.

- Penalty for misleading advertisement.
- Penalty for food containing extraneous matter.
- Penalty for failure to comply with the directions of Food Safety Officer.
- Penalty for unhygienic or unsanitary processing or manufacturing of food.
- Penalty for possessing adulterant.

For the offences committed, the person or group of persons are liable to get a penalty from a few thousands up to ten lakhs. It is to be mentioned here that for the offences done by the Karigar” (cottage unit worker), the owner of the cottage unit will be held responsible equally.

**Guwahati Municipal Corporation Bye-Laws**

- Every cottage product maker has to obtain a sanitary certificate from the health officer or other officer appointed by the commissioner. The certificate shall remain valid for one year. No fee is charged for obtaining the certificate.
- Every place where articles intended for human food are kept for the purpose of sale shall be kept in a clean and sanitary condition with effectual drainage, prevention from exposure from dust, flies, rats or rodents.
- Every place where articles intended for human food are kept for the purpose of sale shall be away from open drains, dustbins, latrines or public urinals.
- Every person intended to prepare, store or sell articles of food or food intended for human consumption shall prevent contamination in any manner.
- No person shall store any article of food in places where there is likely to absorb noxious gases or vapour.

- No person suffering from any infectious or contagious diseases or from leprosy or open sore shall be engaged in the sale of articles of food intended for human consumption.

**Penalty:** Any person who commits a breach of any of these bye-laws shall be punishable with a fine.

- Cottage product making unit related to manufacture, treatment or storing for sale of cottage items should obtain a licence from the commissioner or other officers appointed or empowered by him and the licence has to be renewed every year.
- While obtaining licence should document the dimension and the purposes for which each room or place in the premise is proposed to be used.
- The licence once granted to any other person.
- Any room used for accommodation shall be kept and maintained in a sanitary condition.
- The premise shall be constructed with durable material and every premise shall contain separate rooms for preparation, storage and service of food.
- No dust or smoke enters the place where storage and service of food is made and that in no case oven or Chula is placed in front of the premise.
- The floor shall be cemented and the premise shall be provided with effectual drainage.
- There shall be suitable washing platform having impervious surface.
- There should be suitable ventilation and lighting arrangement.
- There should be suitable vessels for keeping milk or prepared foodstuff in such a manner so as to prevent contamination thereof by dust, flies, vermin or any other things likely to affect human health.
- There shall be provision for bins of adequate size provided with lid for collection and storage of all refuse, garbage, waste food, etc
- Every part of the internal surface of the wall and ceiling of every building in such premise shall be lime washed at least 4 times in every year.
- No vessel or utensil shall be used which is likely to get corroded or to give a metallic or other unwholesome taste or any way deleteriously affect the quality of such article of food.
- Foods intended for human consumption shall not be touched by hand and only clean spoon and other cutleries shall be used for serving them.
- All papers used for wrapping shall be clean and stored in clean racks or boxes
- No part of the building shall be used at any time for the purpose of habitation unless such building is sufficiently detached.
- Persons employed in the manufacture, preparation or handling of food items shall wear clean clothes.
- The licensee shall arrange vaccination of its employees and shall report to the commissioner of any infectious diseases or contagious diseases such persons are suffering from.
- No impediment or encroachment shall be made on the footpath or road or overdrain by placing thereon benches, tables or other articles for the use of the shopkeeper or his customer.
- The licensee shall keep a complain book for entering remarks by the customers.



- A copy of the bye-laws shall be put up in a conspicuous place of the premise.

**Penalty:** Any person who commits a breach of any of these bye-laws shall be punishable with a fine.

## 8.2 Child Labour Law and Regulations in India

Child labour deprives children of their childhood and is harmful to their physical and mental development.

- Hiring children below the age of 14 years for any kind of work, other than in certain family-based work, is a cognizable offence and will attract a jail term of up to 2 years also be fined an amount of Rs.20,000 to Rs.50,000..
- Adolescents between the age of 14 – 18 years cannot be employed in any hazardous occupation.
- Under the Child Labour (Prohibition and Regulation) Amendment Bill, 2012, the parents of the underage child employed can be penalized as well.

However, this restriction will not apply if a child helps his/her family or family enterprise (which is not a hazardous occupation), after his/her school hours or during vacation. Family in relation to a child means his/her father, mother, brother, sister and father's sister and brother and mother's sister and brother.

### **Experience sharing: Compliance with the regulations**

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

Select two among the participants, one almost having compliance with the prevailing rules and regulations and another one who is not complying to all/most of the regulations. Ask them to explain their experience (both positive and negative) of complying/not complying the regulations in terms of disturbance, penalty, mental harassment or tensions and attitude of customers/inspectors (including his/her own employees) towards the business. Let other participants to interact with both the presenters.

## SESSION 9: Effort to Improve Environmental Protection and to Increase Fuel Efficiency

<b>Session objectives</b> <b>This session will build your capacity on the followings:</b>
<ul style="list-style-type: none"><li>• The ways of making your unit environmentally sound and non-polluting</li><li>• The efficient utilization of fuel</li></ul>
<b>Training Methods to be followed</b>
<ul style="list-style-type: none"><li>• Participatory discussion</li><li>• Practical exposure</li></ul>
<b>Training Materials</b>
<ul style="list-style-type: none"><li>• Laptop, LCD projector and screen</li><li>• Whiteboard and markers (multiple colour)</li><li>• Manuals and handouts</li></ul>

### 9.1 The need for environmental preservation

- We need to know our environment better. We have to protect and preserve it for our future generation. The issue of environmental degradation has been a matter of serious concern. We must be aware of keeping our environment clean and healthy.
- Use of fire wood/paddy husk/ charcoal (koila) in preparation of cottage products produces lot of smoke that pollute the air. Polluted air cause harm to the plants and animals including human, more particularly to the factory workers. Therefore, the cottage processor should try to use LPG gas and/or electric oven in place of fire wood/husk/charcoal.
- Efficient use of fuel can reduce the cost of production. When cost of production comes down, it will have a positive impact on earning more profit from the same amount of cottage product production.
- The leftover/ spoiled milk, cottage products etc. neither shall be allowed to go to natural water bodies that may pollute the water nor shall be allowed to remain stagnant in a place that increase off odour, flies, insects, microbes etc. Cottage processor should try to keep the environment clean by proper disposal of leftover.

Try to use packaging material of plastic as less as possible to protect the environment from becoming hazardous as it does not decompose in the environment.

### 9.2 How a cottage processor can influence the environmental protection

- Proper effluent management
- Water management
- Management of proper environment inside the cottage product making unit
- Fuel efficiency

#### 9.2.1 Proper effluent management system

- Proper disposal of the garbage and waste-materials.
- Recycle waste products if and wherever possible.
- Install proper drainage system in the factory campus.



*Common and improper drainage system of cottage product making units in Assam*

- Never drain out the solid waste materials to a river/pond/water bodies with aquatic lives and which is of environmental significance.
- Use bio-gas or commercial LPG (liquefied petroleum gas) cylinder instead of fuel-wood/ kerosene to avoid excessive smoke.

### **9.2.2 Water management**

- Make sure that water is efficiently used. Water is invaluable and thus always take care that it is not wasted.
- Make sure that the drinking water is pure and does not cause any health hazard.
- Those who can afford may opt for installing rain water harvesting system as an alternative water-system. This preserved water though not to be used for mixing with the products without filtration, they can be used for initial wash of utensils, floors and to clean drains etc.
- A tap water purifier can be used to purify the water where running water is available.



*A tap water purifier*

### 9.2.3 Management of proper environment inside the cottage product making unit

- There should be a regular cleaning and disinfection schedule for the cottage product making unit.
- The chimneys and the smoke emitters are cleaned at regular interval (if they are used).
- Preferably use improved *chullas*.

### 9.2.4 Fuel efficiency

- Match the cooking method to the amount of cottage products. Prior to cooking, plan the process of cooking method systematically and make everything ready. Proceed for cooking only after that. It is always advisable to keep pans of different sizes to match the same with amount of cottage products to be cooked.
- Match the pan size to the burner. Do not use pans that are smaller than the burner. A 6" pan on an 8" burner wastes over 40% of the heat produced by the burner. Buy sturdy and flat-bottomed cookware. The ideal pan has a slightly concave bottom.
- Preferably one should use high-conductivity modern materials instead of traditional cookware if afforded.
- Keep your stove-top clean and shiny. Make sure that all the holes of the burner are cleared of any jam on a regular interval.
- Reduce your cooking time through best utilization of fuel. Regulate the fuel as per the cooking stage. When the ingredients come to the fully boiled stage, reduce the fuel to a sim mode.
- If locally available fuels are used, replace the conventional chulas with improved ones.



*Rice bran commonly used as fuel in the cottage product making unit in Assam*

### **Practical Exposure:**

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

Ask the training facilitator to identify one or two model units of bio-gas user and a cottage product making unit using improved chulas/LPG/diesel stove burner and ask him to communicate with them preferably on the previous day for the next day's visit. Make sure that the training facilitator clearly explains the purpose of the visit and also understand for any bio-security provision of the units. Next day, take the participants to these units for a practical exposure.

### **Key recommended practices of the session**

- Try to use LPG gas (or diesel stove burners if can be afforded) in place of fire wood/husk/charcoal.
- Neither throw the leftover/ spoiled milk, milk milk cottage product, etc. to natural water bodies nor allow it to remain stagnant in a place. Dispose into a deep and covered pit.
- Construct appropriate drainage system in the factory campus and keep them clean.
- Make sure that the drinking water is potable and does not cause any health hazard.
- Regulate fuel in the burner as per the cooking stage
- Always use sturdy and flat-bottomed cookware and match the pan size as per the amount of cottage products to be cooked
- Appropriately segregate the garbage and waste materials as biodegradable and non-biodegradable and properly dispose.

### **References**

FSSAI (2017), "Training manual food safety supervisor course special (Level 3): Manufacturing milk and milk product" Food Safety and Standard Authority of India", Ministry of Health and Family Welfare, Govt. of India

FSSAI (2018), "Food Industry guide to implement GMP/GHP requirements for milk and milk products", Food Safety and Standard Authority of India", Ministry of Health and Family Welfare, Govt. of India

Kapadiya, D.B., Prajapati, D.B. Jain, A.K. et al. (2016), "Comparison of surti goat milk with cow and buffalo milk for gross composition, nitrogen distribution and selected minerals content," *Veterinary World*, Vol. 9, No. 7, Pp. 710-716

Kurwijila, L.R. (2006), "Hygienic milk handling, processing and marketing: Training guide for trainers of small-scale milk traders in Eastern Africa", ILRI (International Livestock Research Institute), Nairobi, Kenya

Pandey, G.S. & Voskuil, G.C.J. (2011), "Manual on milk safety, quality and hygiene for dairy extension workers and dairy farmers", Golden Valley Agricultural Research Trust, Lusaka, Zambia

### Performance Indicator: Trained Cottage Processor

Sl. No.	Performance Indicator	Performance (put tick mark)		Score within 0-5 *
		Yes	No	
1	All the products are prepared in a clean and hygienic environment			
2	All utensils used in the cottage processing unit are cleaned and disinfected			
3	Practice of washing hands before and after use of raw milk/ milk sweets			
4	Changing of cloths and chappals before entering the unit			
5	Staying away from work in the milk cottage product making unit during illness			
6	Milk and milk cottage product handlers trim hair and beard, cut finger nails short			
7	Wear hair restraint cap, face mask and hand gloves during milk and milk cottage products handling			
8	Keeping separately the raw milk and finished products and fresh products from previous day's products			
9	Avoid use of non-food grade packaging material such as ordinary polythene, newspaper, tree leaves, etc.			
10	Use of potable quality drinking water			
11	Maintaining up-to-date record of milk procurement, product preparation, selling and other expenses			
12	Proper disposal of the left over and stale products in a pit sufficiently away from the sweet making unit.			
13	Increase in yield of products such as curd, cream, ghee, etc.			
14	Overall increase of business volume by			
15	Increase in shelf life of products by			
16	Improvement in behaviour and approach to customers			

\* Score is 0-5; where 0 for complete non-adoption, 5 for complete adoption

#### **Performance evaluated by**

Signature:

Name and designation:





**International Livestock Research Institute (ILRI)**