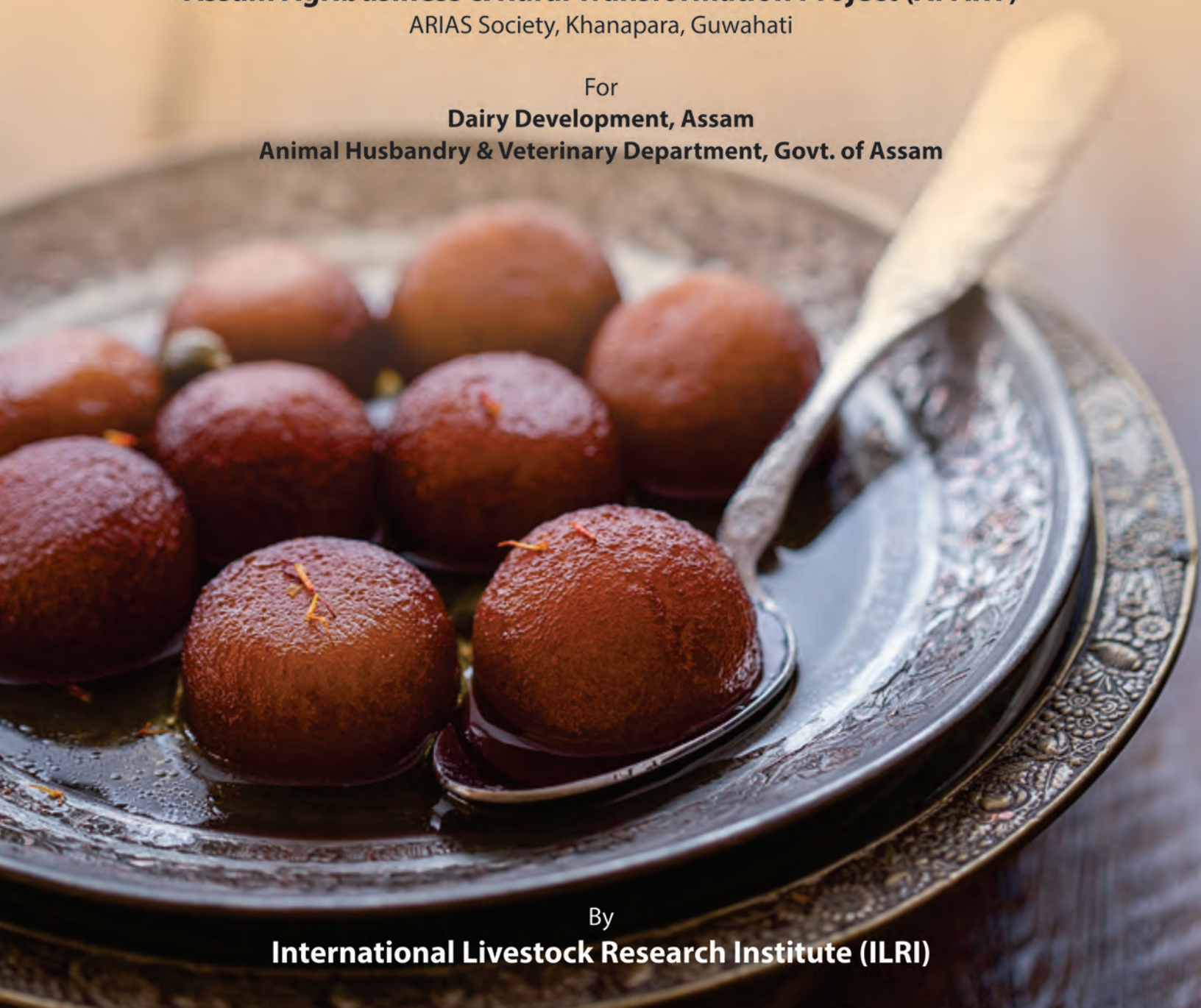


Training Manual for Sweet Makers

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 Sweet Makers

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By

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

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Acknowledgement

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 and completion of this training module would not have been possible.

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 sweet makers 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 in selected districts along with supporting in collection of images of specific sweet making/selling 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 this training manual.

**Team Leader and Resident Consultant, ILRI-APART
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Foreword

Sweet making is an important traditional business in Assam, similar to rest of India, and contributes significantly towards value addition, milk product marketing and employment generation. By converting raw milk into milk sweets, it helps in increasing self-life of milk and promotes consumption of milk in the form of milk products among the consumers who are not habitual milk drinker. However, the quality aspects of milk sweets is an important concern as sweet quality significantly vary across different sweet makers. Besides, product safety is another important issue which may arise because of poor microbial quality which is mainly the results of poor and unhygienic production, handling, storage and selling of milk sweets. For improving the quality and safety of milk sweets improved clean and hygiene with adequate infrastructure and skilled manpower are required. Since, there is no existing training curriculum to impart training to this important group of milk value chain actors, the traditional practices still prevail. I am happy that based on the felt need, International Livestock Research Institute (ILRI) has come up with a very 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. I have learned that during formulation stage of this manual, it was consulted with the sweet makers in some representative locations of few project districts, and thus likely to reflect the perceived training need of the sweet makers of the state. The manual covers broad topics like site selection for setting up of sweet making 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 sweet making unit; and effort to improve environmental protection and to increase fuel efficiency.

I am confident that proper dissemination of the above knowledge to the sweet makers spread over the APART project districts would facilitate in bringing tangible change in the sweet making practices and on resultant product quality. Also, the development of this training manual is timely and need based and being this to be an unprecedented work for the Dairy Development, Assam, this will remain as an important asset in the knowledge repository for future use under any government supported scheme. Overall this training manual will contribute for realizing an improved sweet business in the perspective of food safety concerns and exploitation of the market for quality sweets.


(Rajesh Prasad)

LAYA MADDURI, IAS
STATE PROJECT DIRECTOR
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Preface

The sweet making business is spread across the state of Assam. It is a source of livelihood for a large number of people and has a widespread presence; the consumption of milk sweets is also high, having wider implications for its quality, safety and business development. Therefore, it is of utmost importance that the knowledge and skill of the sweet makers are being upgraded; clean and hygienic measures introduced and proper assessment of raw milk; storage, packaging and marketing of milk sweets are being taken up, besides record keeping, business management and communication skill and care for the environment.

The “**Training Manual for Sweet Makers**” has been prepared by the International Livestock Research Institute (ILRI) with support from Dairy Development Department (DDD), Assam and different stakeholders. All aspects of sweet making have been considered and customized to the local conditions, after conducting the Training Need Assessment (TNA) survey of the sweet makers. ILRI has also conducted field testing of the manual, to make the content user friendly and acceptable to the targeted groups.

I congratulate the sincere efforts put in by ILRI and DDD in bringing about this much-needed training manual which aims not only to train those in the sweet making business but also bring about a behavioural change in the production of quality and safe sweet products.

(Laya Madduri)

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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 Standards
CLR	:	Corrected Lactometer Reading
DDD	:	Directorate of Dairy Development
ECF	:	Elemental Chlorine Free
FGD	:	Focus Group Discussion
FMD	:	Foot and Mouth Disease
FSS	:	Food Safety and Standards Act
FSSAI	:	Food Safety and Standards Authority of India
GHP	:	Good Hygienic Practices
LDPE	:	Low Density Polyethylene
PFA	:	Prevention of Food Adulteration Act
SNF	:	Solid Not Fat
TNA	:	Training Need Assessment

Proposed training schedule

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

Duration of training: 5 days

Total time: 15 hour

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 sweet 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, he/she 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 phone during training, coming to the training all for five days on time, leaving the training hall after completion only, gossiping during the time of training delivery etc.) he/she expects to experience in order to run the training smoothly and effectively. He/she will list all suggestions in a flip chart and post the flip charts where it is visible throughout the training.
Content: Importance of the sweet maker, 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 acquire knowledge on:
<ul style="list-style-type: none">• The role of sweet makers 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 sweet makers are important?

Sweet makers-

- Add value to raw milk by converting the same to different milk sweets;
- Increase shelf life of raw milk from 5-6 hours to more than 24 hours by making milk sweets;
- Provide market access to milk producers and traders;
- Help consumers by supplying different milk products to meet their consumption needs;
- Help by supplying sweets in bulk at the time of various social ceremonies/rituals;
- Give feedbacks to milk producers /traders about the quality of milk (in terms of yield of *channa/mawa* or any visible dirt seen in the milk) produced/traded by them for the sake of supplying quality sweets to consumers.

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

- No-one wants to eat milk sweets that have been prepared in an unhygienic way. A customised training will help sweet makers to understand the good hygienic practices that are to be followed in the process of sweet making production, storing, handling and marketing.
- With increased in income, consumers are ready to pay more for quality sweets.
- 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 sweets marketed by big industrial houses, that can be preserved for long, has increased consumers' convenience and accessibility of buying those products.
- With the use of various coloring agents/new non-milk ingredients/ shapes/size/flavour/ texture, consumers' preferences are changing towards buying of more such products.
- Use of milk sweets has been increasing in different socio-religious ceremonies leading to the rise in its demand.
- With greater commercialization and higher investment on milk sweet business, consumers are more interested to buy milk products that are packaged, displayed and sold in an attractive 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.) that are shaping the regulatory environment of sweet making business.
- Since sweet making business is running based on age-old practices, training for sweet makers (owners/workers) becomes inevitable to face the emerging challenges, to meet the consumers' preference and need and to comply with regulatory environment.
- 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

- Hygienic production and handling of milk sweets that will help in reduction of milk wastage and spoilage, increase quality and safety of milk sweets and increase consumers' confidence of milk sweets.;
- Design and infrastructural requirements of sweet making unit, selection of site and buying of appropriate equipments and utensils that will help you to have a sweet making unit that is more worker and environment friendly, lesser hazardous (fire, disease etc.)and more attractive to consumers;
- Standard process of sweet making including use of colouring agents, non-milk ingredients etc. that will help in improving the quality of your milk sweets;
- Better handling, packaging, displaying and dispatching practices which will help to attract

more customers 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 in accordance to the prevailing policies and practices.
- Good business and behavioural practices (negotiation skill to deal with buyers and input suppliers, personnel integrity etc.) that may enable you to communicate with your target customers and other clients 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 sweet 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:

- Selection of suitable site, 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 milk sweets (Session 3)
- Five important rules of good hygienic practices for processing milk. (Session 4)
- Product specific standard method to produce milk sweets (Session 5).
- Good practices of product handling, packaging and dispatching milk sweets (Session 6)
- Keeping proper records of daily milk purchase, product wise milk allocation, monthly milk spoilage, daily net returns from the business , etc. (Session 7)
- Improving your business development and management skill, where you would learn on dealing with customers and other clients of the business, personal integrity, comparing business with others (benchmarking), innovating and diversifying products, undertaking promotional activities and standardization(Session 8).
- How the activities of sweet makers will remain concerned with environmental safeguards and make efficient use of fuel (Session 9).

Summary

- A sweet maker adds value to the raw milk by converting it to milk sweets and thereby increases its value, shelf-life. He/she also serves consumers meeting their consumption needs and helps in improving milk quality of producer/trader through the tastes and feedbacks.
- There are visible changes of consumers' behaviour in terms of their inclination to demand and pay more for quality sweets. Various institutional regulations and age-old milk business has led to the relevance of this training programme.
- Participating the training programme will provide a range of benefits to sweet makers right from product quality improvement to earning social status and recognition.
- The training is expected to help participants to learn a wide range of hygienic milk processing practices, business development skills, adherence to prevailing regulations and knowledge on ways to adopt environmental safeguards.

SESSION 2: Setting up of Sweet Making Unit Including Infrastructure and Equipments

Session objectives
This session is designed to build your capacity on the followings:
<ul style="list-style-type: none">• Selection criteria of a suitable site for establishing a sweet making unit• Points to be considered in infrastructural design and layout for a sweet making unit• Points to be considered in buying necessary equipments and utensils for a sweet making unit.
Training Methods to be followed
<ul style="list-style-type: none">• Participatory discussion• Exposure visit to a modern sweet making unit• Distributing photographs and illustrations
Training Materials
<ul style="list-style-type: none">• Laptop, LCD projector and screen,• Whiteboard and markers (multiple colour)• Manual and handouts

2.1 Site selection

To run milk sweet making business successfully, it should preferably be established in an area that satisfy the following criteria-

- Away from open sewage, drain, public lavatory, business/factory that produces/releases obnoxious odour, fumes, dust, smoke, chemical or biological emissions;
- Elevated land to avoid flooding or damp floor during the rainy season;
- Better road connectivity;
- Better electricity connection and availability of source of fuel (LPG dealership);
- Clean and potable water availability for operational needs;
- Provisions for waste disposal at little extra cost;
- A major milk sweets consumption centre nearby;
- Availability of raw milk and other inputs in the areas which are easily accessible from the sweet making unit;
- Availability of institutional services like banks, insurance, etc.;
- Sufficient space for suitability to future expansion of the sweet making unit.

2.2 Points to be considered for designing a sweet making unit

The building/house of the sweet making unit should have some basic requirements to accommodate different sections of the unit. These are discussed below.

Work station

- Should be of sufficient size to accommodate multiple tasks carried out by multiple workers simultaneously based on type and number of sweets intended to be produced per day;

- Should have adequate space to accommodate utensils, raw materials (e.g. milk, flour, maida, sugar etc.), finished products (e.g. rasgolla, lalmohan etc.), sweet making platform/ surface, oven, wash basins, packaging area, etc.;



Product preparation surface of a sweet making unit

- Should have adequate space for cleaning and drying of utensils, appliances and clothes with adequate provision of running water tap;
- Should have adequate provision for keeping the source of fuel (LPG cylinder/ firewood/ husk/charcoal) safely;
- Should have provision for storing clean drinking water to be used in the unit;
- Should have provision for keeping big refrigerators for storing certain raw materials and finish products.

Floor

- The floor should invariably be of concrete, preferably with marble or good quality tiles;



The floor is of concrete topped with good quality tiles

- Floor should be maintained in good condition and if any cracks and crevices are observed should repair immediately;



- The floor should be free from duckboards, mats, sawdust, etc ;
- The sweet making platform/surface should be of concrete with granite at the top to make the space easier to clean;
- Drainage system should be efficient with sufficient gradient to expel out the waste rapidly.

Ceiling, walls, windows and doors

- Wall should be concrete with glaze tiles in order to clean the wall easily;

- Part of the wall should be covered with glass to allow sufficient sunlight inside the factory;
- Wall should be free from cracks, broken plastered to prevent accumulation of dust, minimize condensation, and shredding of particles;
- Ceiling should be of smooth materials like gypsum, vinyl, fibre-cement etc. that does not allow much accumulation of dirt, dust etc. and resistant to moisture, water condition, fire etc.;
- All interior structures (e.g., ceilings, doors, windows, overhead fixtures, working surface, etc.) should be soundly constructed of materials that are durable and impervious to food particles;
- Hollow space and gaps are minimized and all edges and wall-to-wall and wall-to-floor junctions should preferably be rounded off;
- The doors used in the premises should be smooth, non-absorbent and easy to clean.



Ceiling without any cover with chance of falling particle/dust on finished products/raw materials

Windows and ventilator

- There should be adequate ventilator to facilitate free circulation of air;
- Should have exhaust fan at appropriate place preferably over the oven;
- Should have wire netting in the windows and ventilator to protect against entry of rodents, insects, birds, animals, fly, etc.;
- The frame of windows/ ventilator should be rust proof and water proof (not of iron) and preferably be of aluminium.

Guest room/changing room

- There should be separate provision (a room or an entry space) for sitting of visitors and receiving/dispatching milk sweets;
- Should allow visitors to enter the sweet making unit only when felt utmost necessary, e.g. in case of a visiting Food Safety Officer, and ask him/her to wear cap, mask, shoe cover etc.;



Netting in the ventilation



Visitors should not be allowed to enter inside without mask, cap, apron etc.

- There should be rack outside work station for keeping *Chappals* meant for use by the workers/visitors (there should be separate set of *Chappals*, if necessary, to use inside the work station);
- There should be small changing room for the workers to change and store their cloths and personal belonging. Shall not be allowed to hang their clothes inside the work station.



Clothes of the sweet making workers are hung over the cooking area;



Cabinets have been provided outside and adjacent to the sweet making unit in a separate room for persons to keep cloths and shoes outside and change with the ones to be used inside

Store/godown

- Big covered containers made of aluminium/stainless steel should be used for storing some raw materials like flour, sugar etc. instead of allowing these to store in gunny bags which are prone to get infested by insects, flies, rodents etc.

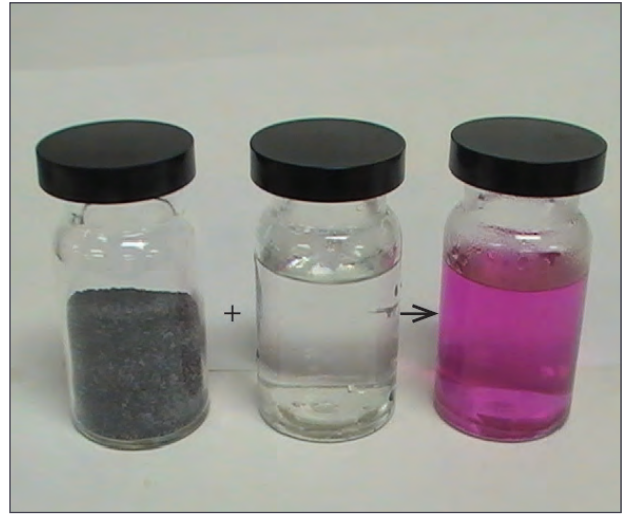


Use of container with closed lids instead of gunny bags



Commonly available storage containers in markets

- For storing small ingredients (e.g. colouring agents), glass covered cabin/glass containers can be used.
- Try to keep the food containers 30 cms above the floor.



Different types of glass and plastic containers for storing small ingredients

Selling outlet

- Appearance of the selling outlet has important bearing on influencing consumer choices;
- Try to make the retail outlet as attractive as possible based on your investment capacity, potential market volume, ethnic composition of the society and standard of outlets of the competitors in the surrounding;
- The retail outlet should have adequate space for displaying milk sweets with provision of heating and cooling facilities as per the requirements;
- Try to arrange the retail outlet in such a way that milk sweets have the maximum exposure to the consumers bearing in mind that it is prevented from direct sunlight affecting the sweet quality;



Display cabinet with cooling facilities

- No display cabinet should have any broken/cracked glasses, if any they should be immediately replaced;
- The trays placed inside the display cabinet where milk sweets are kept should be clean, smooth and rust free;
- All trays should have separate spoon/ tongs of suitable shapes and sizes;



Sweet scoops and tong used for handling sweets

- Avoid using plastic containers for sale/display of sweets like Rasogolla, Gulab Jamun, Gur mithai, etc.;



Do not use of plastic containers for sale/display of sweets

- There has to be sufficient lights inside the cabinet to make the products attractive. There should be insect proof screens in the opening windows which can be easily removed for cleaning.

Toilets and wash basins

- The toilets, stores and habitations of workers are built sufficiently away from milk processing area;
- Wash basin should be outside and adjacent to the sweet making unit;
- Signs are fixed at appropriate places for directing the workers/visitors towards wash basins / toilets / store / hazardous chemicals or consumable.



Wash basin outside and adjacent to the sweet making unit

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 sweet making;
- 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 milk and finished milk sweets to contaminated air and dust.



Stainless steel/aluminium utensils and containers

Additionally also try to have the following-

- Use colour coded dustbins for throwing away the used disposables and kitchen wastes both at the front of the outlet and at the kitchen [Green dustbin to dispose biodegradable wastes (e.g. vegetables), blue for drywaste (e.g. plastic bottle) and red for not useful wastes (e.g. broken glass)].



Colour coded dustbins for disposal of different categories of waste materials



- Ultra-violet insect killer and electronic insect killer should be installed in the kitchen.



An ultra-violet insect killer



An electronic insect killer

- Adequate and appropriate first aid equipments (mostly and importantly for burn and scalding injury) are to be kept in a box inside the premises.

2.4 Precautions in sweet making factory against fire hazards

In the milk sweet making unit, common sources of fire used by sweet makers include fire wood, rice husk and LPG. In addition, electricity is an essential part of any sweet making business. Since most of the time fire is used for preparing milk sweets, sweet makers should be well prepared to fight against fire in the event of any outbreak.

In order to fight against fire, sweet making factory should be equipped with the followings:

2.4.1 Infrastructure/ facilities required for firefighting in the factory

- There should be provision for an emergency exit (labelled EXIT in red) and assembly point for the factory workers;
- Should have adequate ventilation to maintain normal temperature inside the factory;



Adequate ventilation provision in the cooking room

- An approach road for entry of fire brigade vehicle is essential;
- Keep a ready to use fire extinguisher at a handy place;
- Keep a drum filled with sand with proper label;
- Use high quality wiring materials for electricity;
- Keep a First Aid box with ointment for burnt skin;
- Fix smoke detector in the sales outlet and an alarm in the unit for warning in the event of fire. Keep the contact no. of Fire Brigade and Police Station displayed above the fire extinguisher or any other appropriate place for quick visibility.



Placing of fire extinguishers at a handy place like in the entrance

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. regularly. For any indication of electric short circuit should be addressed immediately;
- Do not keep LPG gas stove 'on' when not in use;
- Do not ignore, if any leakage of LPG gas is suspected;
- Clean the LPG stove immediately if it is blocked as caused by 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 factory;
- Replace/fill the fire extinguisher at regular interval;
- The LPG cylinder should preferably be placed outside the preparation unit and be connected through a common gas duct to the burners.



Cylinders are placed outside the preparation unit and connected through a common gas duct to the burners

2.4.3 Practices in the event of fire

- Call the Fire Brigade immediately;
- Switch off the electric main switch;
- Stop the LPG cylinder regulator and shift the LPG cylinder/s to safer place;
- Use plenty of water to extinguish fire if the source is firewood or rice husk. If the source of fire is electricity or LPG gas, use sand stored in/near the kitchen;
- Remove clothes or any combustible materials (e.g., paper, card, plastic, wood, etc.) in and around the factory;
- Remove money, important paper and other valuables;
- If any person is stuck inside the factory, try to take him/her away by wearing a heavy cloth/blanket/ gunny bags/scarf and carrying another piece of cloth to cover the body of the person to be rescued;
- Support Fire Fighters to do their job without causing any disturbance to them;
- In case of burn by flame, wrap the victim with a wet blanket or such heavy material like-gunny bag, etc.;
- In case of scalding by hot or boiling water/oil/syrup, pour plenty of cold water/rub ice on the affected part of the body as soon as possible;
- For minor burns/scalds, apply antiseptic preparation and in major cases, take medical help without any delay;
- Take the victim to the doctor immediately.

Exposure visit

Instruction for the resource person:

Ask the training facilitator to identify one or two modern sweet making units having improved infrastructure. Request the owner to allow the participants to enter the sweet making premise and to explain the participants about the advantages/ disadvantageous of various infrastructures facilities put by him/her in place. Allow the participants to interact with the owner freely.

Key recommended practices of the session

1. Establish your sweet making unit away from open sewage, drain, public lavatory, business/factory.
2. Ensure availability of clean and potable water for operational needs.
3. Construct the floor of concrete, preferably with marble or good quality tiles with sufficiently sloped drainage system.
4. Ensure adequate ventilation in the sweet making unit and fit exhaust fan preferably over the oven.
5. Fix wire netting in the windows and ventilator.
6. Construct a changing room for the workers at the entrance to allow them change and store their cloths, etc. and also place one shoe rack.
7. Construct the toilets, store and workers' shed sufficiently away from milk processing area.
8. Keep one first aid box containing all the essential items inside the unit.
9. Keep a ready to use fire extinguisher at a handy place;

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

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

3.1 What is good quality milk sweets?

Milk sweets 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 (a Kalakand should be like that of a Kalakand only);
- Free from any foreign particles/dirt (e.g. hairs, flies, dirt etc.);
- Free from any bad smell/odours;
- Do not taste sour;
- Feels softness after putting in the mouth.

In order to ensure quality in milk sweets, sweet makers should first ensure the quality of raw milk. For this, sweet makers should know the average chemical 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 sweet makers should have?

Quality of milk sweets and economics of sweet making unit depend on quality of raw milk used for preparing milk sweets. Good quality sweets 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.



Milk containing dirt

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

- Milk that does not contain germs beyond the acceptable limit;
- 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.);

3.3 Average chemical composition of raw milk

Before processing to make milk 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.

Table 1: 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 large number of factors. Having knowledge of the sweet makers on this may enable the sweet makers 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 sweet shop owner knows that the animal from which the milk is collected is diseased (mastitis) or under medication (e.g. with antibiotics).

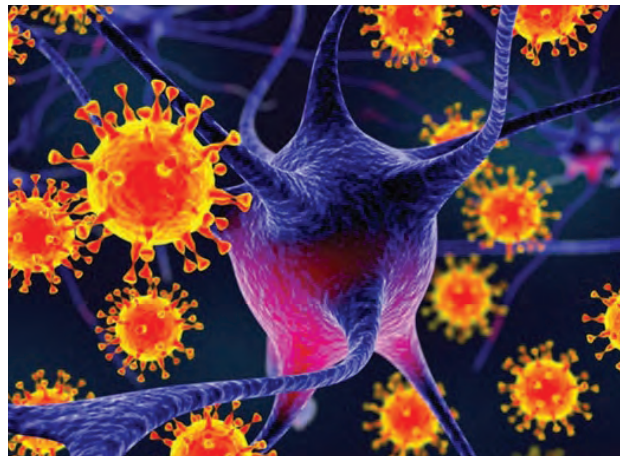
3.5 What is germs and how it spreads diseases?

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



Bacteria



Virus

heard of '**bacteria**' or '**viruses**' – these are types of germs.

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 very fast and soon milk will get spoiled early. 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 exercise: How germs spread disease

Instruction for the resource person:

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

3.6 Preventing germs

Hand washing is the most effective way to prevent spreading of germs.

Wash your hands:

- Before and after handling milk and milk sweets;
- After using the bathroom for any reason;
- After sneezing, blowing your nose or coughing;
- Before and after handling animals or animal waste;
- After working outside or touching soil;
- After handling rubbish or anything dirty;
- When you come in the house from the outside.

Six stage of handwashing technique



1. Palm to palm



2. Backs of hands



3. Interdigital spaces



4. Fingertips



5. Thumbs and wrists



6. Nails

Proper steps of hand washing

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 may spoil milk

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
 - o Cool temperature milk experiment (Group-1)
 - o 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 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

3.7 Simple tests to detect milk quality and safety

Milk quality is mostly seen to be judged and price is fixed by sweet makers in terms of yield of channa/khawa/mawa. This may give you a partial indication about the physical quality (fat and SNF %) of milk. For producing quality milk sweets there are few simple and rapid tests that the sweet makers can do in their sweet making unit in order to detect milk quality and safety.

Few simple tests that could be used for assessing raw milk quality by sweet makers:

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

These tests will help the sweet makers 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.

3.7.1 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 can contain dangerous bacteria/viruses.

Interpretation

- The milk should be discarded if it has a foul smell, smells slightly sour or has foreign odours.
- 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.

3.7.2 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

3.7.3 Fat testing

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

Equipment and materials

- Sulphuric acid (density 1.807 – 1.812 g/ml at 27°C, colourless),
- Amyl alcohol,
- Butyrometers: 6%, 8% and 10% scales depending on fat content,
- Stoppers and shaker stands for butyrometers made from a suitable grade of rubber or plastics,
- 10 ml Acid pipette for sulphuric acid (with rubber suction device),

- 10 ml pipette for milk,
- 1 ml pipette for amyl alcohol,
- Centrifuge, electric or hand driven,
- Water bath at $65 \pm 2^{\circ}\text{C}$.

Procedure

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

Interpretation

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

3.7.4 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

By using a lactometer:

Materials required

Lactometer

Cylinder

Dairy thermometer

Procedure

Mix the sample of milk well. Pour it into a dry cylinder which enables the lactometer to float without touching the sides.

Put the lactometer into the cylinder. Take the reading from the lactometer as soon as it becomes stationary.

Note the corrected lactometer reading (CLR).

Calculation

Specific gravity = $1 + \text{CLR}/1000$

For cow milk, Lactometer reading is taken at 21°C.

The SNF is calculated using the formula.

$$\% \text{ SNF} = \text{CLR}/4 + 0.21 \times F + 0.14$$

CLR means Corrected Lactometer Reading at 21°C

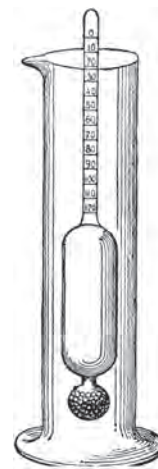
F = % of Fat in milk

Testing of milk fat, SNF and added water by using a digital milk analyzer (modern method):

In this case, sweet makers need to buy a digital milk analyser (shown below) that may cost about INR 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.

3.8 Traditional method of testing milk/milk products

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



A dairy lactometer



Milk is being tested by using manual lactometer



Milk is being tested by using a digital Milk Analyzer

Indigenous method of milk/milk sweet testing for physical quality

- I. Some of the sweetsmakers use vark (silver covering) in sweet for better look. However, some sweet makers use aluminium foil in place of vark; consumption of which may cause stomach infection. To detect if it is aluminium foil, touch the top of the sweet gently with your finger. If it comes on to your finger, chances are that it is not vark (fake).
- II. Paneer, khowa 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 khowa, 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/milk sweets

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: Selection of suitable milk container

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

1. Wash your hands each time before and after handling milk and milk sweets, after using the bathroom, after sneezing, coughing or blowing your nose.
2. Immediately after receiving the milk, see thoroughly for any visible impurities/abnormal colour and smell for any abnormal odour, discard if found any.
3. Neither dip your hand or finger into the milk nor taste the milk.
4. Try to do the test for SNF %, fat %, added water, etc. immediately after receiving the milk, if possible.

SESSION 4: Good and Hygienic Processing Practices

Session objectives This session is designed to build your capacity on the followings:
<ul style="list-style-type: none">• The five rules of good hygienic practices that you should follow
Training Methods to be followed
<ul style="list-style-type: none">• Participatory discussion• Distributing photographs and illustrations• Practical demonstration
Training Materials
<ul style="list-style-type: none">• Laptop, LCD projector and screen• Whiteboard and markers (multiple colours)• Manuals and handouts• 2-3 sweets• Two metal containers one with smaller and another with bigger mouth

4.1 Importance of good hygienic processing practices

It is important to practise a high standard of hygiene whenever you handle milk and other milk sweets 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 finished products and fresh products from previous days products,

Rule 5: Keep milk sweets 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 most 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 handling);
- When you are ill, never work in the sweet making unit (for a worker suffering from any disease, the manager/owner should send him/her on a sick leave);
- Shave/trim/cut your moustache, beard and hair at regular interval;
- Use hair restraint cap.

While handling milk in the sweet 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 milk sweets;
- 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.



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 milk sweets 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 sweet making unit from the outside.

Ideally you should use disposable hand gloves during handling of milk and milk sweets.

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

All utensils, appliances and surfaces used for production, handling and transportation of milk sweets 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 to avoid spread bacteria to the processed foods.

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).



Disposable hand gloves



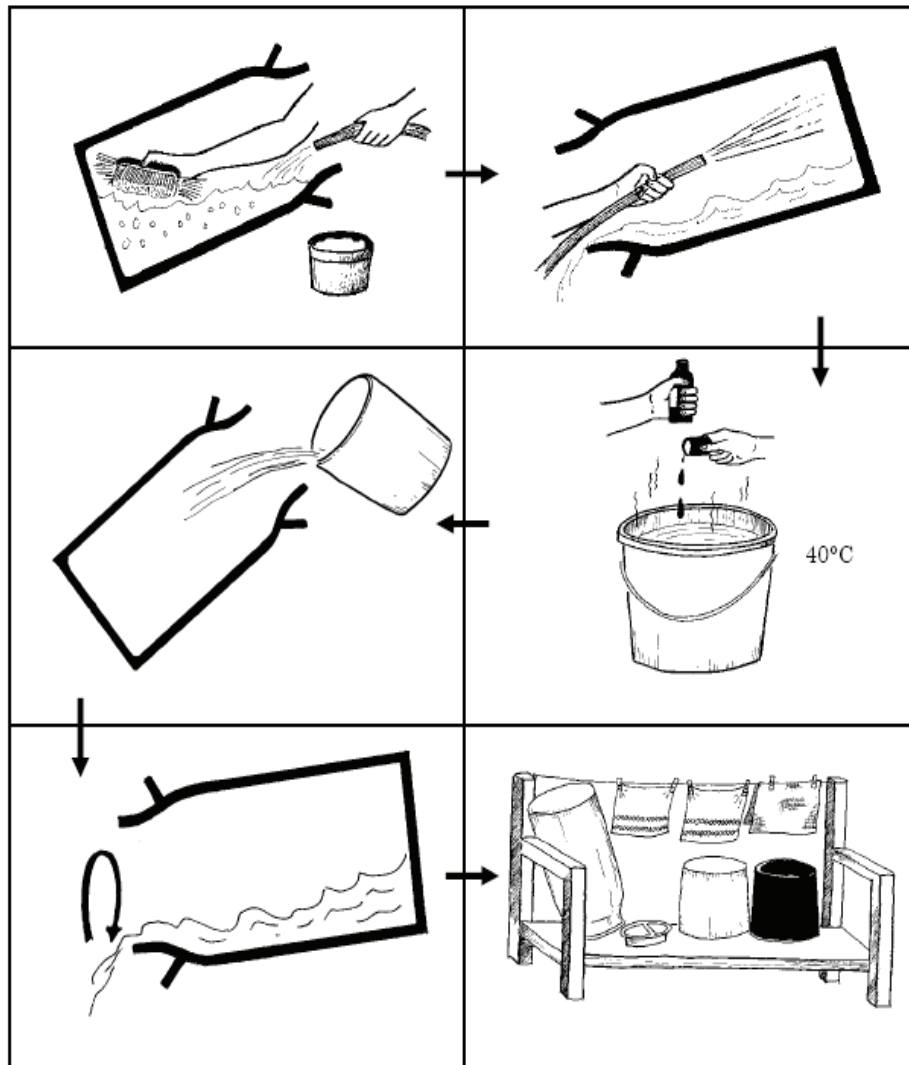
Commercial soap, liquids and disinfectants for cleaning utensils and appliances

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

Keeping food containers clean

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 liter 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 clay pots
- 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.;
- Keep the rack neat and clean when the earthen pots are positioned for storing the processed milk sweets.

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

Sweet makers use white cloth for straining milk,



Clay pots kept in an unclean rack

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.

Methods of cleaning cloths

- First wash cloths with soap and water;

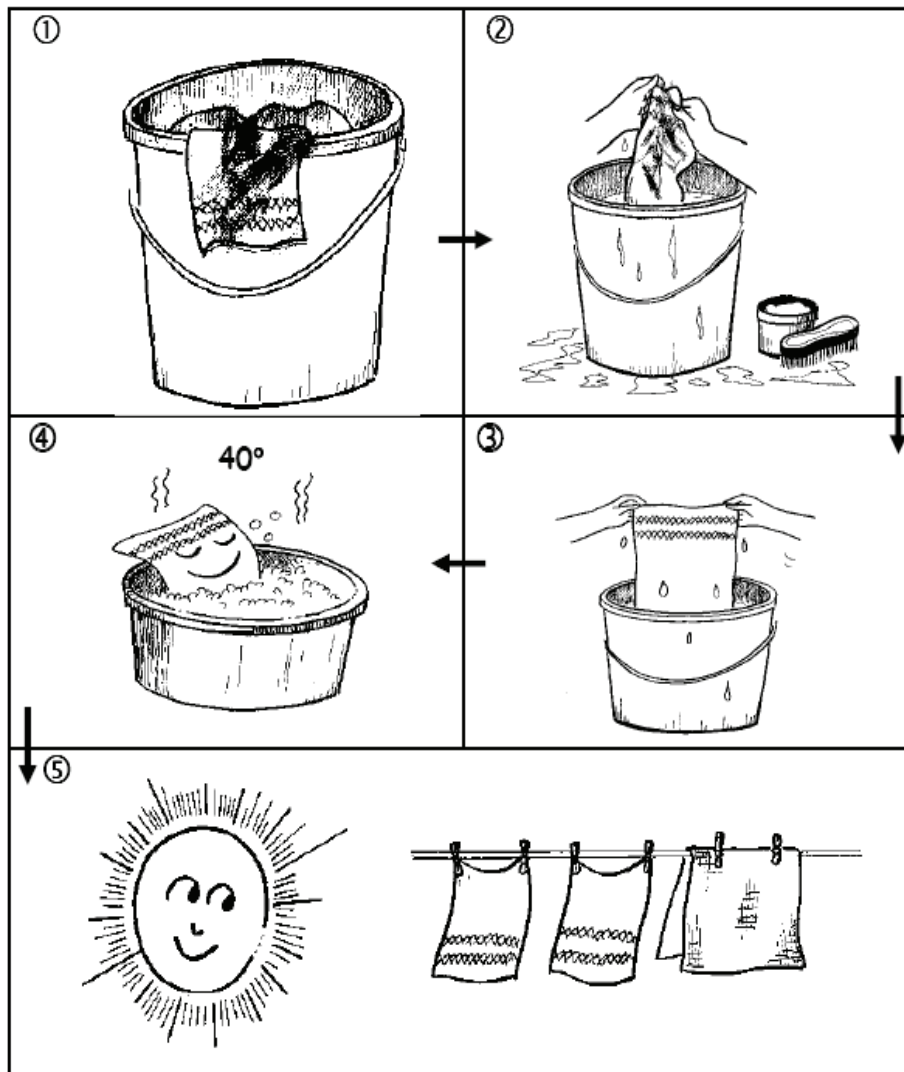


Use of unclean cloths for straining milk and processed channa

- 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 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).

Rule 3: Use safe raw materials

Raw milk

Use clean milk for making sweets, 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

- Use clean filtered/potable water for making milk sweets. Do not use any dirty water in sweet making;
- Make a provision of a filter in the sweet making unit. The filter may be traditional one (use of sand, rocks, charcoal, etc.) or commercial one (e.g. RO filter, water filtration apparatus to put in the water tap etc.);
- Do not use water directly from the source of supply;
- Clean the water tank 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 (colouring agents, food additives etc.)

- Use colouring agents, preservatives etc. of high quality under permissible limit;



Use of non-drinkable water for washing of utensils in a sweet making unit

- 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 good quality colouring agents and food additives

- A variety of food additives are added to milk sweets and each of them are used for specific purposes which are described below:
 - Colouring agents or colors: used to add attraction to the customers.
 - Colouring agents are of two types: Natural colors and Synthetic colors.
 - Examples of natural colors are: –Riboflavin, Annatto, Saffron, etc.
 - Examples of synthetic colors are:-Ponceau 4R, Carmoisine, Erythrocin, Tartrazine, Sunset Yellow, Indigo Carmine, Brilliant blue, FC, Fast green FC, etc. which are permissible under FSSAI
- Antioxidants- used as food additives to help guard against food deterioration i.e. as preservatives.
Examples are – Tocopherol, Butylated hydroxyanisole (BHA), Tertiary butyl hydroquinone (TBHQ),



Different quality food colours are available in the markets

etc.

- Emulsifiers/ Stabilisers-allow water and oils to remain mixed together in an emulsion, as in mayonnaise, ice cream, and homogenized milk while Stabilizers, give foods a firmer texture. While they are not true emulsifiers, they help to stabilize emulsions.*
Examples are - Methyl cellulose, Carboxymethyl cellulose, etc.

- Artificial Sweeteners-are low calorie sweetening agents which can replace sugar from the milk sweets and diabetic or heart patients too can consume the sweets. It also reduces the chance of gaining extra weight.

Examples are –

- Aspartame- no calories and also almost 200 times sweeter than natural sugar.
- Acesulfame K- calorie-free sweetener which is 200 times sweeter than the natural sugar
- Saccharin sodium-It is the oldest artificial sweetener discovered in 1879. Due to its stability and low cost, it is still an important low-calorie sugar substitute even today. Saccharin sodium is about 300-400 times as sweet as natural sugar.

- Sucralose- It is calorie free artificial sweetener derived from sucrose and is up to 650 times sweeter than natural sugar. Sucralose does not have any appreciable effects on blood glucose levels and can be used by diabetics.
- Preservatives are substances or chemicals that are added to products in order to prevent decomposition by microbial growth or by undesirable chemical changes.

In milk sweets, two types of preservatives are generally used-

- **Sorbic acid:** It is effective against growth of numerous Moulds and Yeasts, harmless to humans, animals and the environment and has high processing and storage stability.
- **Benzoic acid:** Benzoic acid has effective antimicrobial action against yeasts, food poisoning bacteria and spore-forming bacteria.

Table 2: Various food additives recommended by FSSAI with details

Permitted food additives	Common name	Permitted level
Colours Natural colours Riboflavin Annatto Saffron		GMP
Synthetic colors Red Yellow Blue Green	Ponceau 4R Carmoisine Erythrocin Tartrazine Sunset yellow Indigo Carmine Brilliant blue FCF Fast green FCF	Not more than 100 ppm of the final product
Antioxidants: Tocopherol Butylated hydroxyanisole(BHA) Tertiary butyl hydroquinone (TBHQ)		GMP 200 ppm *max 200 ppm max
Emulsifiers/ Stabilisers Methyl cellulose Carboxymethyl cellulose		0.5% max 0.5% max
Preservatives Sorbic acid Benzoic acid		100 ppm max 300 ppm max
Artificial Sweeteners (Singly) Aspartame Asesulfame K Saccharin sodium Sucralose		200 ppm max 500 ppm max 500 ppm max 750 ppm max

Flavours: Natural flavours & flavouring substances, nature-identical flavouring substances and Artificial flavouring substances can be used but they should be of food grade type.

only food grade ingredients should be used

* 100 ppm (parts per million) = 100 mg/ltr or kg

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

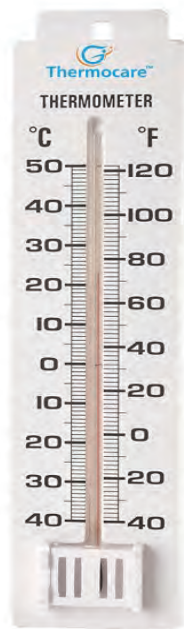
- Store the raw and finish products separately;
- Do not mix the previous day's sweet with the fresh ones to prevent temporary loss;
- Do not keep fresh sweets in previous day's tray without cleaning;
- Keep a separate provision in the display cabinet for dry and wet sweet items. The liquids of wet sweet items coming into contact with dry items may spoil the later;
- Keep separate tongs, handler, knife, etc. for handling different types of sweets;
- Handle product with clean dry gloves or clean dry utensils only.

RULE 5: Keep milk sweets in cool and dry place

Sweets will keep for longer if kept cool and dry

- It is advisable to keep two types of display cabinet or same cabinet with parts (cooling cabinet and normal) in the sales outlet;
- Put curd/paneer etc. always in the refrigerator. Do not overload the fridge or do not keep the door of the refrigerator open;
- Keep milk sweets in display cabinet that is appropriately placed to prevent direct sunlight over it;
- Try to buy a display cabinet with inbuilt cooling facilities.

Practical Exercise



Thermometer for checking temperature

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

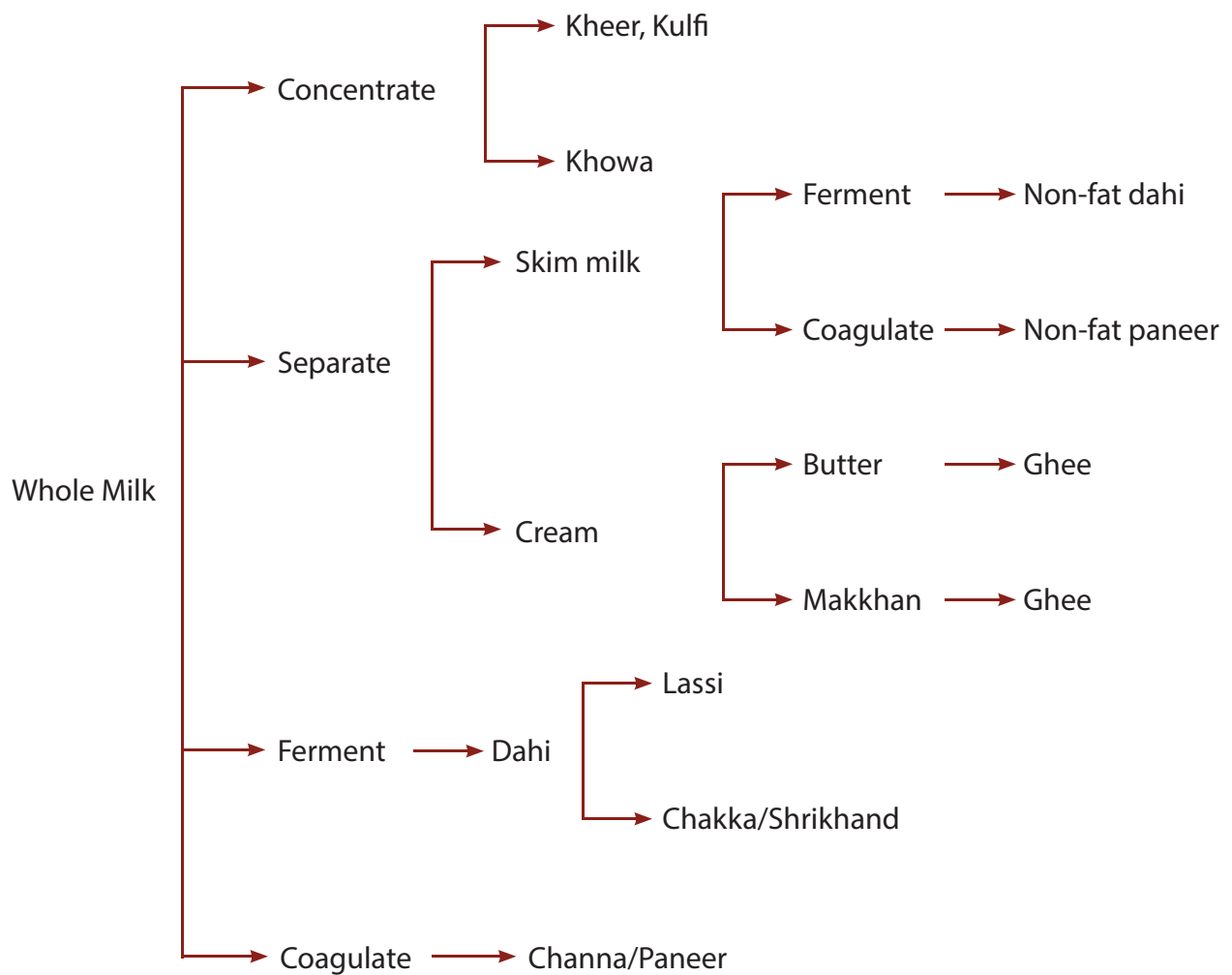
1. Do not wear ring, watch, etc. during handling of milk and milk sweets.
2. Tie or cover hair, cover cuts and sores, if any, wear face mask and clean cloths.
3. Always follow the four steps of cleaning utensils and surfaces: clean with soap/detergent and water, rinse to remove residues of detergent, disinfect and finally dry thoroughly.
4. Always use stainless steel or aluminium containers with tight lid for storage of milk and milk sweets.
5. Always use safe and certified/branded raw materials for colouring, sweetening, garnishing, etc.
6. Keep separately the raw milk and finished products and fresh products from previous day's products.
7. Transfer ready to consume milk sweets immediately to the display cabinet and the curd, paneer, etc. to the refrigerator.
8. Never allow any of the workers to work in the sweet making unit if found sick.

SESSION 5: Product Preparation, Value Addition and Diversification

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

5.1 Types of indigenous products in Assam

Several milk sweets 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 milk sweets, milk is first converted to channa by following coagulation method and to khawa 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 the above process

A. Milk products prepared through concentration method (Khowa based products):

1. Khowa
2. Gulab Jamun
3. Peda
4. Burfi
5. Coconut Burfi

B. Milk products prepared through coagulation method (Channa based products):

1. Channa
2. Paneer
3. Rosogolla
4. Sandesh
5. Kalakand
6. Rosmolai

C. Milk products prepared through fermentation method (Dahi based products):

1. Dahi

D. Milk products prepared through separation method (Cream based products):

1. Cream

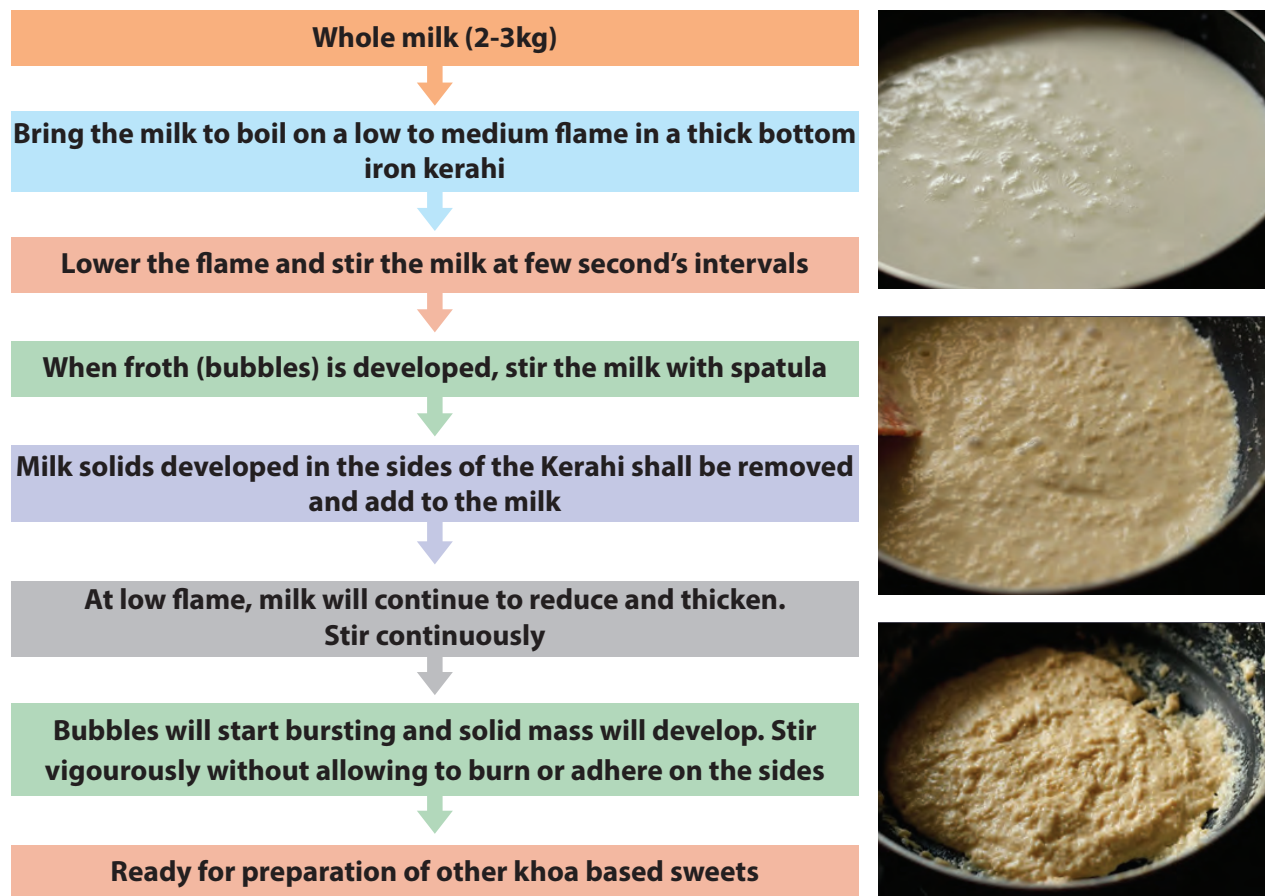
5.2 Milk Product preparation practices – Techniques of production

The preparation practices and the recipes of milk sweets varies from sweet maker to sweet maker which largely remain as a secret for the sweet makers but the basic principle of preparation, steps and recipes remain almost the same. Every sweet makers should have basic understanding on method of preparation of sweets in order to guide his/her workers and to make improvement on the quality of sweets.

The standard method of preparation of some popular varieties of milk sweets are stated below:

A. Concentrated products (Khowa based products):

A.1 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.

A.2 Gulab Jamun



Nutritive value: Same as khoa. Also contains sucrose.

A.3 Peda

Method 1:



Nutritive value: Contains all the milk solids in four fold concentration. Also contains fairly large quantities of protein, minerals, fat, lactose & sugar. Food and nutritive value of peda is very high

A.4 Burfi (plain, made from khowa)

Take 1 Kg khowa and make tiny and uniform pieces of it by rubbing against a metallic grinder plate

Put the bits of khowa in a kerahi/pan and add 300 g sugar (6-8 cups) into it

Mix the above by continuous stirring in a low flame. It will start melting.

Keep stirring till the mixture turns into paste texture and continue cooking in low flame till getting lump with smooth consistency

After about 15 minutes it will change colour and then slightly start thickening.

Add cardamom powder of 1/2 tsf (optional), mix well and transfer to a squared size pan/tray and level up

Evenly spread chopped pistacios of 4 tsf (optional) and gently press with a spatula

Carefully cut into pieces of desired size and shape

Carefully cut into pieces of desired size and shape

Burfi is ready to sell or supply



Nutritive value: Same as khowa. Also contains sucrose.

A.5 Kaju Burfi

Take 10 cups good quality cleaned kaju, 5 cups sugar and 2.5 cups water

Roughly grind the kaju in a mixtur grinder (lower speed intermittently for 2-3 times)

Strain the kaju using a fine metallic strainer and unstrained kaju grind and strain again.

Put a thick bottom kerahi on medium flame, pour the cups of sugar and water to make sugar syrup.

Keep boiling the sugar syrup and put flavoury agent such as 1/2 tsf of rose water (optional) over the sugar syrup

Put the strained kaju on the sugar syrup and about 1.5-1.7 cups of milk powder. Keep stirring the mixture on a low flame and put 5 tbs (75 g) of ghee and mix again.

A paste like texture will be seen, allow it to cool for 10 minutes.

Put in a sheet of food grade polythine paper and knead by hand for 2 minutes

Using a belna spread uniformly the mixture of desired thickness and put good quality vark on top and carefully cut into pieces of kaju burfi

Ready to sell or supply



Nutritive value: Same as khowa. Also contains sucrose

B. Coagulated products (Channa based products):

B.1 Channa



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

B.2 Paneer

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.

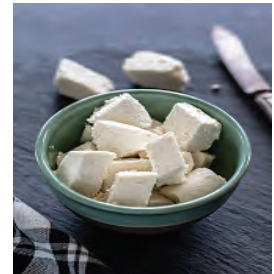
After 3-4 hours, remove the cloth and cut the paneer to cubes, ready to sell/supply



Paneer Vat



Paneer Press

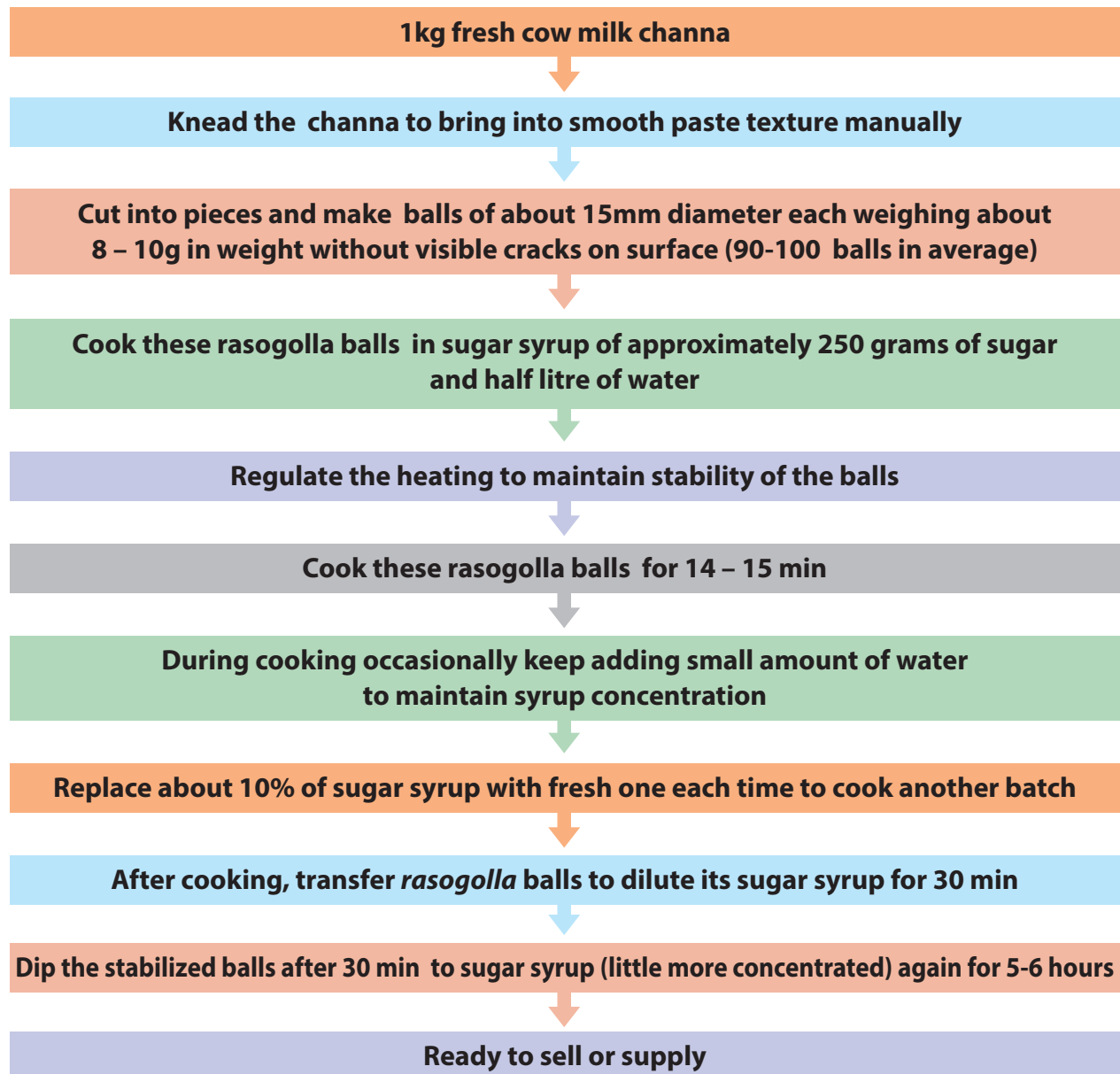


B.3 Rosgolla

Method 1:



Method 2:



Nutritive value: Same as channa & contains sugar.

B.4 Sandesh

Break freshly made channa Take 1 Kg freshly made channa, break into small and uniform bits and mix with 300 g sugar

Cook the mixture in a Kerahi by continuously stirring on low flame till observed the mixture becoming sticky

After seeing that mixture get uniform thick consistency and it leaves the sides of Kerahi, remove it from the flame

Allow to cool down and then with the heel of palm/base of flat metal bowl mash the mixture to a uniform paste

Knead for few minutes to form a smooth dough/lump and divide in equal parts to make small lemon size ball.

Roll each part of the balls between palms, press gently between palms to form thick circular shape.

Make a light dent in centre of the circle by gently pressing with thumb.

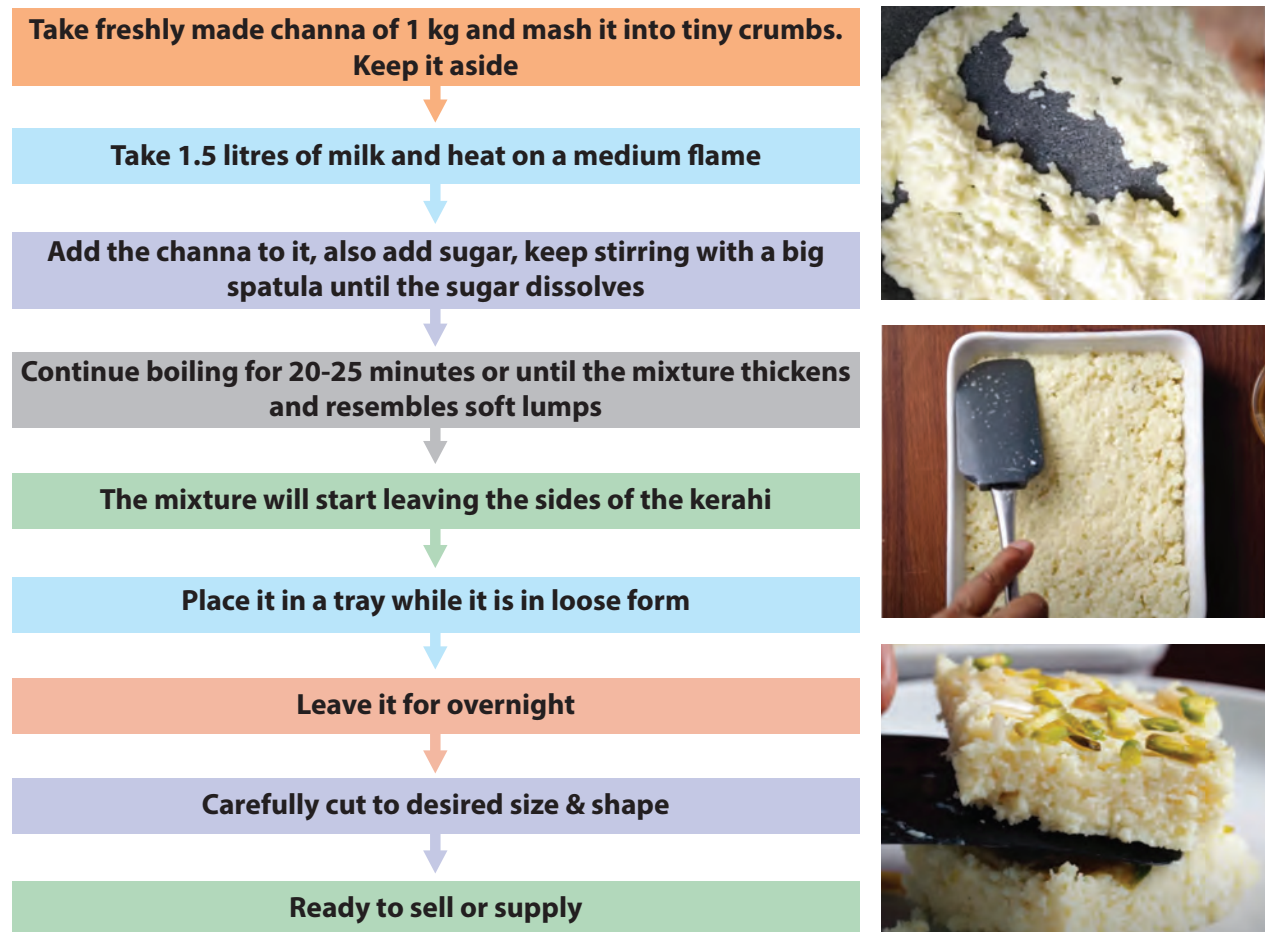
Sandesh is ready to sell/supply



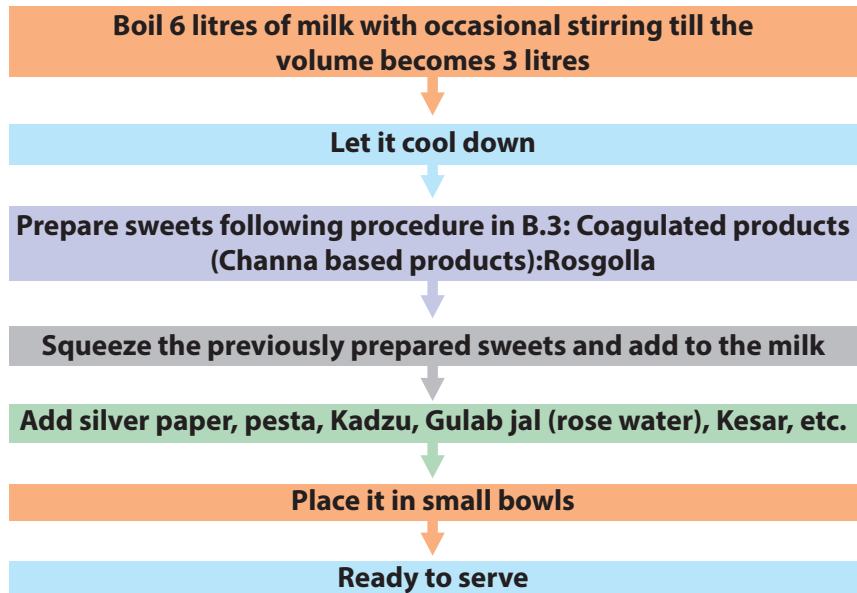
Nutritive value: Same as channa, contains sugar.

Other milk sweets that could be made from Channa following the similar process

B.5 Kalakand



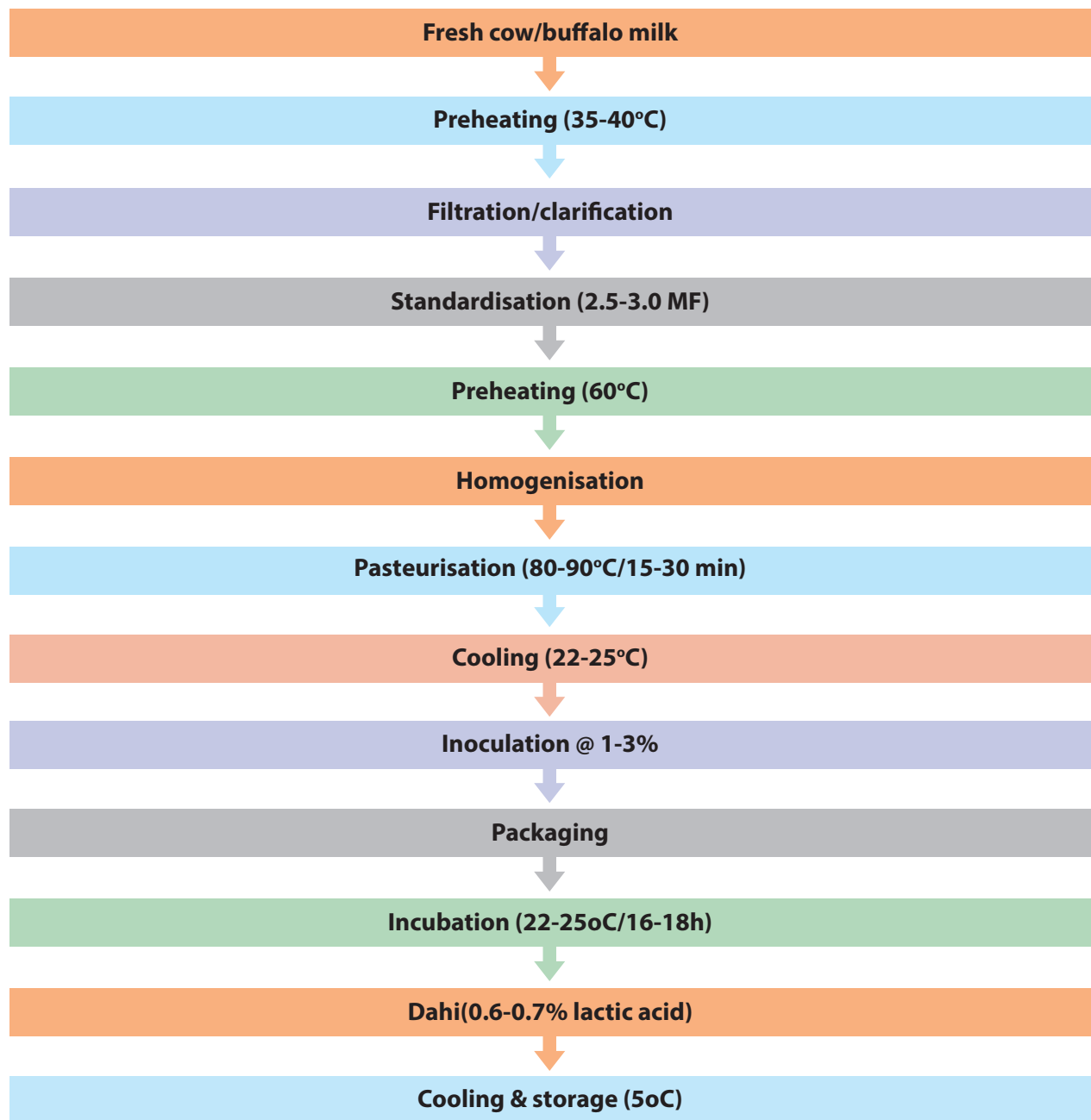
B. 6 Rosmolai



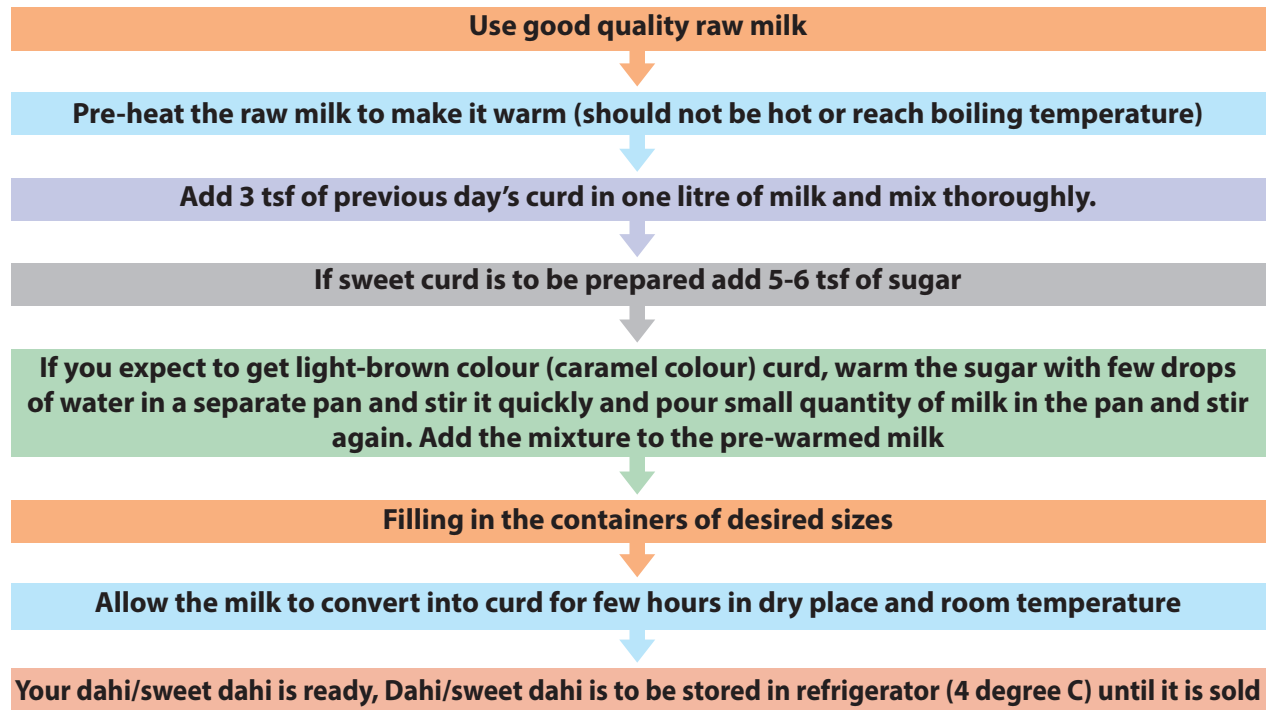
C. Fermented products (Dahi based products):

C.1 Dahi/ Sweet dahi

Method 1: Under industrial production system



Method 2: Conventional system



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

D. Separated products (Cream based products):

D.1 Cream

Cream is separated by using a cream separator under hygienic condition.

Key recommended practices of the session

1. Have the basic knowledge on preparation of all kinds of milk sweets.
2. Never compromise on quality in buying raw ingredients; always use the best quality raw materials for getting best products..
3. Always try to engage a better skilled sweet maker for preparing best quality products.

SESSION 6: Product Handling, Packaging and Dispatching

Session objectives

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

- Handling the milk sweets in a clean and hygienic way.
- What are the permissible level of food additives, packaging materials available and their preferred options?
- The care to be taken for safe and hygienic dispatching of milk sweets

Training Methods to be followed

- Participatory discussion
- Distributing photographs and illustrations

Training Materials

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

6.1 Product handling

For hygienic handling of milk sweets, several important points are to be considered. During processing of milk to make milk sweets, 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 milk sweets that will also attract customers to buy it.

- Keep the finished products in containers on an elevated space from the floor;



Finished products are kept in containers in a separate room

- Keep the containers of other raw ingredients covered while not in use;
- Always wear disposable hand gloves and mask at the time of handling and packaging milk sweets;
- Always use tong or long spoon to hold milk sweets for packaging. Never touch the sweets with bare hands;
- Tie your hair up or wear cap while working in sales outlet and sweet making unit;



Hair is covered with a cap inside the sweet making unit

- During summer, the handler may sweat. To avoid chances of falling sweat on milk/sweets, always keep one clean cloth (e.g. gamosha) to wipe off at regular interval. Wash the cloth every day (so keep two sets of clothes);

- Always wear clean cloth/uniform. Uniforms may be of different colours for different types of workers (e.g. workers working in product manufacturing unit and retail unit);
- Always wear protective clothing (e.g. apron).



Uniform for persons engaged at sweet making unit and Uniform for persons engaged at sales counter

6.2 Product Packaging

Proper packaging is very essential for milk sweet/ products. Milk and milk sweets spoil rapidly at temperature above refrigeration. The primary role of packaging is to protect the product in safe condition without altering its structure/shape, keep the constituent (e.g. fluid part) intact, keep the product safe from dust and other foreign bodies and avoid 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 can contaminate milk products/ sweets;
- Convenient to handle and carry from one place to another;
- Attractive to draw customers' attention;
- Contains information on product quality, name, date of manufacturing, date of expiry (by stamping), address and contact details of the shop, certification received from FSSAI etc. to inform the customers about the shop and the sweet quality and to increase brand value of the shop.
- The printing should be of high quality colour printing in order to creates a sense of quality among consumers;
- Economical (the costs of packaging material should not be too high).

Packaging materials that should not be used for milk products/ sweets

- Ordinary polythene;
- Newspaper;

- Polythene that was used to package other materials earlier;
- Tree leaves without proper cleaning.

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 elemental chlorine free (ECF) paper boxes that are environment friendly;
- Use paper bags/ pouch for packaging dry sweets like Peda.

Precautions to be taken in packaging

- Do not use leaves, newspaper, ordinary polythene, etc. These materials do not provide sufficient protection to the product from contamination and manual handling.
- Do not use unskilled worker not having proper sense of clean and hygiene to package sweets.
- Always maintain the packaging areas clean and dry.
- Make sure that the area has sufficient lights to detect any foreign bodies present in the milk sweets prior to packaging and the packaging materials also do not contain any defects.
- Follow the following packaging materials for the category of products mentioned in the table below:

Table 3: Packaging materials for different milk sweets/milk products

Product	Packaging material
Burfi, Peda	Paperboard cartons, paper bags, dhak leaves
Kalakand	Paperboard cartons, dhak leaves
Doodhpeda	Paperboard cartons with paper lining, paper bags, dhak leaves
Khoa	3-ply laminate made of paper/aluminium foil/LDPE*
Butter	Vegetable parchment paper (?)
Liquid milk	Tetra packs/ food grade plastic
Indigenous products	Injection moulded/ thermoformed containers, stand up laminated pouches (?)

*Low density polyethylene



Proper hygienic way of packaging finished products with suitable packaging materials

Various packaging options for milk products

	<p>Injection moulded containers for sweets</p>
	<p>Thermoformed containers</p>
	<p>Stand up laminated pouches</p>



Good quality paper board cartons



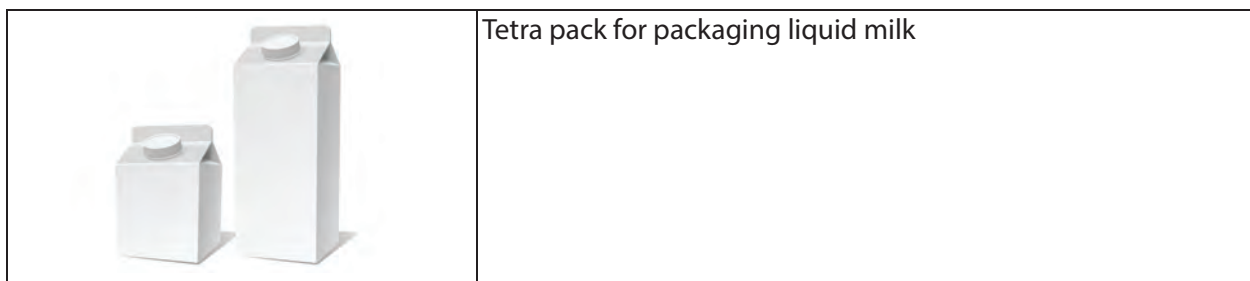
Paper bags for packaging burfi, peda



Aluminium foil for packaging khowa



Vegetable parchment paper for packaging butter



6.3 Product Dispatching

In order to dispatch milk products/ sweets, the sweet makers should take the following precautions:

- For dispatching of bulk quantity milk sweets, use metal containers (e.g. tin) that are properly cleaned and disinfected.
- Try to transport the milk products/ sweets from the work station to the consumers as early as possible during cooler hours of the day.
- The vehicles used for milk sweet transporting should be maintained in good condition and kept clean. It should be used solely for the same purpose only (transportation of sweets). 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.
- Roads which are smooth/jerking free should be preferred over poor quality road. This will help to keep the shape and texture of the milk sweets intact.



A covered van for transporting milk sweets

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 sweet maker can avoid short term loss but in the long run his business will largely suffer, so never do that. Some permanent customers may stop procuring milk sweets 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 bacteria do not have time to grow inside of the unit itself.



Garbage liner

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

Key recommended practices of the session

1. Always use protective clothing (e.g. gloves, face mask, apron, etc.) during handling of milk products/sweets.
2. Never touch the milk sweets with bare hands, always use tongs, spoon, etc. or use gloves
3. Keep the finished products in containers on an elevated space from the floor.
4. Tie your hair up or wear cap while working in sales outlet and sweet making unit.
5. Never use ordinary polythene or newspaper for packaging of sweets.
6. Try to transport the milk products/ sweets from the work station to the consumers as early
7. As possible and during cooler hours of the day.
8. The vehicles used for transporting milk sweets should be solely for the same purpose only and cleaned daily.
9. Dispose the stale, left-over products in a pit sufficiently away from the sweet 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
<ul style="list-style-type: none">• Importance of record keeping• Various record keeping formats (e.g., milk/channa/khowa purchase, product preparation and sales, salary and other expenses etc.)• Inventory/stock management for raw materials and finished products• Important considerations for dealing with customers, suppliers of milk, workers in the factory, maintaining personal integrity, business ethics and conflict management.• Adoption of business development techniques such as product innovations, product diversifications, promotional activities, benchmarking and standardizing of product preparations• Networking with input suppliers and output marketing agents
Training Methods to be followed
<ul style="list-style-type: none">• Participatory discussion• Distributing various record keeping formats• Role play• Group discussion
Training Materials
<ul style="list-style-type: none">• Laptop, LCD projector and screen• White board and markers (multiple colours)• Manuals and handouts

7.1 Simple business records

7.1.1 Why record keeping is important?

- Record keeping helps sweet-makers 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 sweet makers should keep

- **Milk procurement record:** An accurate daily record of the volume of milk/ channa/khowa/ others received from each supplier is necessary for daily/weekly/monthly payments.
- **Raw materials (other than milk) procurement record:** The sweet makers should keep proper record of other raw materials like flour (maida), sugar, colouring agents, packaging materials etc. and payment made to supplier. This record will help the sweet maker to understand how much of other raw materials were procured against how many litres of milk procured or against how many sweets produced. If he/she intends to increase, the scope of business, this will give an idea how much he/she needs to invest on other raw materials for increasing the volume of business

- **Product preparation and selling record:** The sweet maker should keep records of how much milk sweets he/she produced per day, how much sold, how much wasted and how much earned. This will give him an idea to what extent he/she is earning profit.
- **Salary and other expenses record:** A sweet maker spends money on salaries of the workers/ sales men, house rent, water, electricity etc. He/she should keep appropriate record of all those that helps him/her to avoid any potential conflict with suppliers of these that may arises because of forgetting something by either party.
- **Profit and loss record in month/day:** A sweet maker can make records of the total cost incurred and profit made out of the sales of milk sweets
- Make monthly summaries of your records in the way that it enables you to take certain crucial decision for the subsequent months.

Table 4: Daily milk/channa/khowa procurement record

Date	Supplier name	Quantity	Rate per unit	Total cost	Payment Done	Balance if any
04-01-2020	S. Talukdar	10 lt.	Rs.20 per lt	200	150	50
04-01-2020	T. Kalita	5 lt	Do	100	75	25
04-01-2020	R. Saikia	15lt	Do	300	200	100
TOTAL	3 suppliers	30lt	----	600	425	175

Table 5: Product preparation and selling (allocation) record

Date	Distribution of milk	Produced/ day	Sold/ day	Spoiled/ day	Price per unit	Income	Loss for spoiled	Total income
04-01-2020	Paneer/ Channa	10 kg	8 kg	1 kg	500			
	Rasgolla	200	180	10	15			
	GulabJamun	100	90	10	15			
	Kalakand	50	30	5	20			
			--					
			--					
Total								

Table 6: Procurement record of raw materials (other than milk/channa), packaging materials etc.

Date	Item procured	Source of procurement	Quantity/ volume procured	Cost per unit	Total cost	Payment made	Balance of payment
04-01-2020	Flour	D Store	10 kg	50	500	400	100
	Sugar						
	Colouring agent						

Table 7: Salary and other monthly expenses record

Month	Worker A	Worker B	Worker C	Worker D	House rent	Electricity	Local taxes	Others	Total
January	12000	10000	8000	7000	10000	5000	2000		

Example of working out the record of profit and loss/day of a typical sweet maker:

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

- Kalakand = 80 numbers @ 20/piece = Rs. 1600/-
- Rasgolla = 200 numbers @ Rs. 12/ piece = Rs. 2400/-
- Lalmohan = 250 numbers @ Rs. 10 = Rs. 2500/-
- Peda = 100 numbers @ Rs. 10/piece = Rs. 1000/-
- Paneer = 2 kg @ Rs. 400/kg = 800/ kg

Wastage due to not selling = 50 numbers @ Avg. Rs. 15/- = Rs. 750

Total revenue = Rs. 9700.00

Net revenue = Total revenue – wastage loss = (9700-750) = Rs. 8950.00

Profit = Net revenue - Total Cost = (8950-6524) = Rs. 2426/-

7.1.3 Inventory/stock management

For raw materials

The sweet makers 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 businessman;
- The time period for which stocking is required may vary from a couple of days to months;
- Requirement per day;
- Stocking capacity (space for stocking);
- Seasonality. For example, it will be more during the wedding seasons;
- Pest and rodent control measures adopted by the sweet making businessman;
- Emerging challenges such as –*Hartal*, *Bandh*, natural calamities, etc.;
- Distance from the source of procurement and volume required.

For finished products

The sweet maker should make a plan on how much sweets/ 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.).

Risk of theft, sabotage, etc. (for both raw materials and finish products):

- Plan to stock materials as per the security stand point of your premises in terms of theft, sabotage etc.

7.2 Business development plan

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

7.2.1 Dealing with customers

Important things the sweet makers should know:

- The first impression is the best impression. It is important to make an impression that attracts the target customers immediately.
- A sweet maker should always greet the customers with a smile and should always show that he/she is happy to see the customers.
- It is the customer who ultimately helps in sustaining the business. He/she should always make them feel special and important and this will make them loyal.
- A sweet maker 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 sweet makers.
- A sweet maker 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.
- If any complaint from customers on quality is valid, you should try to accept it without debating further and try to replace the product with a better quality one (if possible) or should not charge any money against the sweet/s he consumed. This will build a sustainable trust of the customers on the sweet maker.
- If there are any changes in the usual services, he/she should let customers know in advance.
- Be prompt in serving the customers. Always serve the customers on first come first service basis irrespective of showing any favouritism to anyone.
- This is most often seen that while returning the access amount to customers, it is dashed off fast on the counter. Never do this, instead return the amount with a smile and folded hands or by showing other means of courtesy.

Additional Tips:

- Should keep pace with the latest available production techniques or equipment to prepare quality products at minimum cost.
- Do not target to earn more profit by selling to few customers at a higher price, rather, you should try to sale to more customers at relatively lesser price. By doing this you can earn more profit at the end of the day.

7.2.2 Dealing with suppliers of milk

- You need to understand that your raw milk supplier is as important as that of your customers, so always deal with them sensibly.
- Be careful of driving a hard bargain with your suppliers. It can make the supplier offended.
- 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.

7.2.3 Dealing with workers

- Inform every worker about his/her role that he/she plays for human health and nutrition and motivate him/her continuously to produce, handle and sell the products in the most hygienic way.
- Make each worker clear about his roles and responsibilities. Also, make him/her understand how important he/she is in running the sweet making business.
- Evaluate performance of each individual worker at regular intervals and reward them with

some awards like-best performer of the month/year (as per customers' review), special bonus, etc.

- Support workers at the hour of their need.
- Try to cover the workers under Insurance policy (both health policy and accidental coverage).
- Try to individually interact with everyone among the staff about his/her role, performance, strengths, weakness, etc.
- Have a small budget for employee development. This may include special package (in Diwali, or puja), trainings, field visits, enterprise day celebrations, awards (best performance in the month/year), etc.
- Try to induce the threat of job loss/pay cut on poor performance/misconduct. This may include occasional warnings or behaviour of the owner towards his/her employees reflecting possible threat.
- Explain the employees about the set rules of the sweet making unit. This includes do's and don'ts of the unit. The employees should not be allowed to discuss in groups or with outsiders about any matter that is internal to the unit and may potentially harm the unit's overall business principles.
- Make all the necessary facilities/materials available needed for performing the day to day activities of the sweet making unit and outlets. Materials like cleansing agents and aide, utensils, wardrobe for keeping clothes, chappals for inside wear, etc.
- Inculcate the habit of dealing with employees using both smooth and hard talking based on the suitability of the situation.
- Make payments to the employees on time. Delay in paying the employees may make them unsatisfied and demotivated to sincerely perform their work. Continuous delay in payments may even make them look for exploring other avenues/employers resulting in sudden loss of manpower.
- Celebrate any event if felt necessary/important.
- Don't allow to handle cash counter by someone who is not acquainted with handling cash, behaving with customers and keeping sales records.
- Set up a system of receiving and handing over the cash counter by stating details of items sold and amount earned, inputs received and payments made to input suppliers if any. He/she should keep a notebook to record these on day to day basis.

7.2.4 Personal integrity

For practicing better personal integrity by a sweet maker, he/she should-

- Keep interaction with everyone related to your business (input suppliers, customers, sweet 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.

7.2.5 Conflict management in sweet 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 sweet 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.

7.2.6 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 sweet 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 building a geographical brand to attract outside customers.
- Never involve in maligning reputation of other sweet makers.

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 optimize the demand for your product or profit;
- Make personalized sweets for parties or events (e.g., special color, shape, etc.);
- Place any new products in the area of the display cabinet having quicker visibility of customers.

7.3.3 Diversifying the product range

Try to do something different with traditional sweets (e.g. an extra ingredient, or different colour) and see if it can promote demand. Before releasing the product, allow some customers to taste the product at free of cost.

- Have some specialty 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 or verbally 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 5) may decrease its quality and 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.

7.3.3 Promotional activities

- **Discount for bulk-buy:** Motivate customers to buy more by offering some discount. Write on the special offer in a large card.
- **Promotional offer:** Distribute few cut up pieces of some new products for tasting to few customers who may potentially pass on the information about the quality and tastes to larger number of people in the neighbourhood. This may lead to the chances that more customers may rush to buy it.
- **Special offer:** May offer one high value sweet with every purchase of 20 low value sweets.
- **Seasonal variations, sporting events and special holidays:** You can make special

products for some event (e.g. brightly coloured sweets for holi, heart shaped sweets for valentines' day or birthday scripted sweets to offer on birthday).

7.3.4 Standardizing

Very often it is the natural tendency of most of the customers to stick to the traditional sweets. These customers like to have the best in quality of the existing variety only (*Kalakand, rosgulla, Malay Chumchum, lalmohan, etc.*).

To standardize a recipe-

- Write down all the ingredients that are needed for the product;
- Use containers of known volume to measure the ingredients;
- Write down how many containers of each ingredient is added;
- Write down the different processes which are carried out and the time and conditions for each;
- Taste the finished product to make sure it is satisfactory. Adjust if necessary;
- Measure the volume of output produced/count the number of sweets processed
- Calculate the cost of the recipe;
- Make sure the cook follows the same recipe each time;
- Make sure the ingredients are always of the same quality.

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 relationship with input suppliers and be loyal to get quality input regularly at right volume, at competitive price and on time.
- Try to maintain good working relationship with local administration, municipalities, FSSAI etc..
- 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 sweet-shop owner. The sweet shop owner will try to handle the customer to convince about the quality of the product and his/her best effort to provide a promising customer service to him/her. Other participants will note down the key learning points and mention at the end.

Group discussion: Business development

Instruction for the resource persons:

Ask the participants to form 3 groups. Ask each group to discuss on one of the following three topics.

1. Scope of developing sweet making business in the area
2. Behavioural skill that the sweet makers should adopt in dealing with customers and other clients
3. Scope for introducing new product, new business strategy etc.
4. *At the end of the discussion, one representative of each group will present the key outcome of the discussion. Other participants will contribute in the discussion.*

Key recommended practices of the session

1. For understanding the day to day business performances and to undertake better business decisions sweet makers should maintain certain business records.
2. Always value each and every customer and greet him/her with a smile.
3. Try to build a cordial working relationship with raw milk suppliers, local administration, municipalities, FSSAI, bank, insurance companies etc. to run the business smoothly.
4. Exercise conflict management skill. Look for solutions that meet mutual needs of either parties.
5. Follow certain business development practices like introduce new products, healthy products like low in sugar product, etc.
6. Adopt promotional activities like discount on bulk buy, promotional/special offer, introducing products of seasonal variations, sporting events and special holidays etc.

SESSION 8: Understanding the Prevailing Rules and Regulations Applicable for Sweet Making Unit

Session objectives This session will build your capacity on the followings:
<ul style="list-style-type: none">• Information on obtaining business license and registration• 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 (e.g. FSSAI, child labour laws)• Existing rules and regulations helping you to face any untoward incidents or harassment
Training Methods to be followed
<ul style="list-style-type: none">• Participatory discussion• Experience sharing
Training Materials
<ul style="list-style-type: none">• 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 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 sweet-makers. These may vary from area to area. However, broadly these may include:
 - a. Trade license from the municipal authority in urban areas or from local Panchayat authority in rural areas.
 - b. Registration under FSSAI and compliance with the food safety regulation of the Public Health Services Department monitored by Food Safety officers
 - c. Certificate from the Labour Department and compliance to child labour laws

8.1 Guwahati Municipal Corporation Bye-Laws

- Every sweet 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.

- Sweet shops related to manufacture, treatment or storing for sale of foods 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 over drain by placing there on 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

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.)

8.3 Food safety laws

- Present Indian law for foods is contained in the (Indian) Food Safety and Standards Act, 2006(FSSA).Prior to the FSSA, a manufacturer 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).

This regulation is called the Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011.

Food safety regulations under FSSAI in the state are executed by the Food Safety Officers of the Public Health Services Department

Milk Products Standards as per FSSA:

Under the act, 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

Khowa

- 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.

Under the act, following milk products are not allowed to be sold in the market

- 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.

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 Executing 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.

In a proceeding under sub-section (1), it shall not be a defense that the accused was holding such adulterant on behalf of any other person.

- Punishment for unsafe food may vary based on (i) Failure or contravention does not result in injury;(ii) Failure or contravention results in a non-grievous injury - (iii) Failure or contravention results in a grievous injury - (iv) Failure or contravention results in death - imprisonment not be less than seven years or imprisonment for life and also with fine which shall not be less than ten lakh Rupees;
- Punishment for interfering with seized items. Retains, removes or tampers with any food, vehicle, equipment, package or labelling or advertising material;
- Punishment for false information;
- Punishment for obstructing or impersonating a Food Safety Officer;
- Punishment for carrying out a business without licence;
- Punishment for subsequent offences include (i) twice the punishment; (ii) Fine on daily basis up to one lakh rupees; (iii) his/her licence shall be cancelled;
- Compensation in case injury or death of consumer. Punishment may vary based on, in case of death; in case of grievous injury and in all other cases of injury order for cancellation of licence, re-call of food from market.

It is to be mentioned here that for the offences done by the Karigar” (sweet stall worker), the owner of the sweet shop will be held responsible equally.

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 who is yet to comply with the regulations. Allow them to share the positive and negative experiences of complying/ not-complying the regulations. Allow others to contribute in the discussion.

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

Session objectives At the end of the session your knowledge and capacity will be built on the following
<ul style="list-style-type: none">• Ways of making your unit environmentally sound and non-polluting• Efficient utilization of fuel
Training Methods to be followed
<ul style="list-style-type: none">• Participatory discussion• Practical exposure
Training Materials
<ul style="list-style-type: none">• Laptop, LCD projector and screen• Whiteboard and markers (multiple colour)• Manuals and handouts

9.1 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 for all. We must be aware of keeping our environment clean and healthy.
- Use of fire wood/paddy husk/ charcoal (*koila*) in preparation of milk sweets produces lot of smoke that pollute the air. Polluted air cause harm to the plants, animals and human, more particularly to the factory workers. Therefore, the sweet makers 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 milk sweet production.
- The leftover/ spoiled milk, milk sweets 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. Sweet maker should try to keep the environment clean by proper disposal of leftover.
- Use of plastic make the environment hazardous as it does not decompose in the environment. Sweet makers should try to use paper bags, leaf plates, earthen pot etc., instead of polythene bags, plastic cup, plastic disc etc.
- May try to explore solar power panel to use solar energy for running the retail outlet.

9.2 How a sweet maker can influence the environmental protection

- Proper effluent management,
- Water management,
- Management of proper environment inside the sweet making unit,
- Fuel efficiency.

9.2.1 Proper effluent management system

- Proper disposal of the garbage and waste-materials by accumulating these in to deep and covered pit;
- Recycle waste products if and wherever possible (e.g. by vermicomposting);
- Collecting and segregating it in three colour drums and delivering it to municipalities garbage collection system;
- Constructing appropriate drainage system in the factory campus and keeping them clean;



Common and improper drainage system of sweet 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;
- Preferably, use biodegradable materials instead of plastic carry-bags.

9.2.2 Water management

- Make sure that water is efficiently used. Water is precious 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 sweet making unit

- There should be a regular cleaning and disinfection schedule for the sweet making unit;
- There should be proper ventilation inside the sweet making unit;
- The chimneys and the smoke emitters are cleaned at regular interval.

9.3 Fuel efficiency

- Use bio-gas or commercial LPG (liquefied petroleum gas) cylinder instead of fuel-wood/ kerosene to avoid excessive smoke;
- Match the cooking method to the amount of sweets to be prepared. 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 sweets to be prepared.
- 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.
- Try to use high-conductivity modern cookware instead of traditional cookware. Copper-bottom pans heat up faster than regular pans.



Rice bran commonly used as fuel in the sweet making unit in Assam



A diesel stove burner

- Keep your stove-top clean and shiny. Make sure that all the wholes 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, use improved chulas instead of conventional chulas.
- Use diesel stove burners if it can be afforded.

Practical Exposure:

Instruction for the resource person:

Ask the training facilitator to identify one or two modern sweet making units. Request the owner to allow the participants to enter the sweet making premise and to explain the participants about the measures followed by him/her for efficient management of waste, water and fuel.

Key recommended practices of the session

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

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Performance Indicator: Trained Sweet Makers

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 sweet making unit are properly cleaned and disinfected			
3	Use of covered containers for stocking raw ingredients instead of gunny bags			
4	Use of tongs, spoon, scoop for transferring/packaging sweets and raw milk			
5	Changing of cloths and chappals before entering the unit			
6	Practice of washing hands before and after use of raw milk/milk sweets			
7	Staying away from work in the sweet making unit during illness			
8	Milk and milk sweets handlers trim hair and beard, cut finger nails short			
9	Wear hair restraint cap, face mask and hand gloves during milk and milk sweets handling			
10	Separate raw milk from finished products and fresh products from previous day's products			
11	Keeping the finished products in containers on an elevated space from the floor (preferably by 30 cm above floor)			
12	Proper disposal of the stale, left-over products in a pit sufficiently away from the sweet making unit.			
13	Use of food-grade packaging materials			
14	Possess FSSAI registration			
15	Maintaining up-to-date record of milk procurement, product preparation, sale and, other expenses etc.			
16	Adoption of promotional activities like discount on bulk buy, special offer, introducing products of seasonal variations, etc.			
17	Use of potable quality drinking water			
18	Segregation of the garbage and waste materials as bio-degradable and non-biodegradable for proper dispose.			
19	Overall increase in business volume			
20	Increase in shelf life of products			
21	Improvement in behaviour and approach towards consumer			

* 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)