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ESTABLISHMENTS MAPPED, SURVEY DESIGNED, GAP ASSESSMENT CONDUCTED AND UPGRADING PLAN DEVELOPED FOR MILK AND MEAT VALUE CHAIN

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Establishments mapped, survey designed, gap assessment conducted and upgrading plan developed for milk and meat value chain

Work package 74, Sub-activity 5.2 & 5.3

1.5.1. Map the establishments that should be assisted in the implementation of food safety systems and in the evaluation of their capacities & 1.5.2. Conduct a gap assessment of such establishments and develop an upgrading or modernization plan to meet their food safety system implementation; Deliverable: Survey designed, gap assessment conducted and upgrading plan developed

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Abbreviations and Acronyms

AMI	Ante Mortem Inspection
AMR	Antimicrobial resistance
BFSA	Bangladesh Food Safety Authority
BSTI	Bangladesh Standards and Testing Institute
CAC	Codex Alimentaria Commission
CA	Competent Authority
CC	City Corporations
DLO	District Livestock Officer
GDP	Gross Domestic Product
DLS	Department of Livestock Services
ETP	Effluent Treatment Plant
FGD	Focus Group Discussions
GAHP	Good Animal Husbandry Practices
GHP	Good Hygiene Practices
HACCP	Hazard Analysis Critical Control Point
LDDP	Livestock and Dairy Development Project
MoFL	Ministry of Fisheries and Livestock
MMT	Million Metric Ton
MRL	Maximum Residue Level
MO	Market Operator
PPE	Personal Protective Equipment
PMI	Post Mortem Inspection
SoP	Standard Operational Procedure
THI	Temperature Humidity Index
UNIDO	United Nations Industrial Development Organization
UHT	Ultra-Heat Treatment
WOAH/ OIE	World Organization for Animal Health (formerly the Organization Internationale des Epizooties)

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EXECUTIVE SUMMARY

Bangladesh has about 24.70 million cattle, 1.50 million buffaloes, and 26.77 million goats along with a large poultry population. It is generally considered that, about 20 percent people are directly and 50 percent people are indirectly employed in this sector. The current annual production of meat is 871MMT; per capita supply is 137.38 gm per day, which exceeds the national target of 120 gm/per capita/per day. Milk production is 13.07 MMT, with per capita supply of 221.89 ml per day, which is near to the targeted 250 ml/per capita/per day. Nowadays with increasing demand for milk and meat production, assuring food safety is the major challenge for the current livestock production system. Contributing factors to this challenge are a lack of good farming practices, underdeveloped processing capacity, insufficient logistical support, and poor enforcement of existing regulatory requirements.

Adherence to safe food production based on the application of precautionary measures along the food value chain could eliminate most of the foodborne diseases and protect the human health. Food safety remains a lower priority however in Bangladesh especially in the case of foods of animal origin. To address the issue effectively, it is essential to identify gaps in food safety practices at the right time and right place. For that, a nationwide value chain-based food safety system needs to be in place.

This report “Establishments of value chain mapped, survey designed, conducting gap assessment and upgrading plan for developing milk and meat value chain” has been prepared following a series of activities, including consultation with experts, a country wide survey of safe food practices using the Kobo Tool Box application, field visits to several establishments and validation workshops. These were undertaken to support the deliverable of the sub-activity 5.1 (establishments mapped) and 5.2 (survey designed, gap assessment conducted, and upgrading plan developed) of the package 74 of UNIDO-LDDP program. Field visits were conducted in different establishments including dairy and beef farms, milk transporters, goyala, chilling facilities, sweetmeat shops, animal traders, transporters, slaughter houses, and meat shops to identify the current level of food safety practices. The visits were conducted in Dhaka city and in areas close to Dhaka district based on a structured checklist.

All of the actors in the value chain need to follow good practice at all levels which must comply with international standards. These must of course align with the regulatory framework in Bangladesh. The overall recommendations have been produced to mitigate gaps in food safety management practices in the production of foods of animal origin and as a signal to government to give attention to the upgrading plan for national investment in the sector.

The Department of Livestock Services is primarily responsible for food safety assurance in the production and primary processing of foods of animal origin. However, food safety is a collective responsibility of all relevant regulatory authorities, producers, processors, and consumers.

MILK VALUE CHAIN

Introduction

Small and marginal farmers across the country produce the largest volume of milk nationally, however, larger scale commercial dairy farms are emerging. Dairy farming is transforming from smaller scale traditional farms to more market-oriented modern farms that are producing closer to consumer demands and with potential to supply at the standards for global markets. Bovine cattle and buffalo comprise the national dairy herd in Bangladesh, however bovine cows are prioritized over other species like buffalo and goat. Nevertheless, buffalos are attracting greater interest as milk-producing animals and are getting momentum due to Government initiatives.

In 2020-21, GDP growth rate in the livestock sub-sector increased to 3.8 percent and the contribution of the livestock sector to agricultural GDP increased to 13.1 percent. About 20 percent of people are directly involved in this sector and 50 percent indirectly. According to the Information of the Department of Livestock Services (DLS,2022), Bangladesh has about 24.70 million cattle, 1.50 million buffaloes, and 26.77 million goats (DLS 2022). Among the 8.72 million milking cows, 4.62 million (53%) of them are indigenous breeds and 4.04 million (47%) are cross-bred cattle. The cross-bred are mostly Holstein Friesian, Sahiwal and Sindhi breeds.

Smart dairy farming is emerging in Bangladesh applying new technologies such as artificial intelligence, robotics, and automation technology. Several mega farms (i.e., Masco Dairy Farm, Dutch Dairy Farm, Nahar dairy, Eon Group) have started to apply smart technology to run farm operations. By using sensors, farms can be monitored in real time for health status, food intake, application of drugs, and breeding. This will enable farmers to produce safe milk to export market standards while fulfilling domestic demand. The Government needs to provide the necessary support to accelerate smart dairy by establishing a legal framework. The Bangladesh government is formulating the Dairy Development Board Act, 2022 to overhaul the dairy sector of the country. Under this Act, a Dairy Development Board will be formed which will take policy-making decisions regarding the development of this sector.

However, small holder farmers dominate the dairy sector. More than 70% of dairy farmers are smallholders and produce amount 70-80% of the total milk, with the remainder of the milk (30-20%) produced on commercial dairy farms (Uddin et al. 2020). Bangladesh produces 13.07 million metric tons (MMT) milk against the annual requirement of 15.67 MMT and the deficiency is about 16% (DLS, 2022). Nowadays with increased milk production, the safety of milk is a new priority in the milk value chain. Therefore, to eliminate these risks, all actors in the value chain need to follow good practices, as all of the actors in the milk value chain are closely interrelated. Moreover, all of those good practices need to comply with international standards, that will align with the country's policy framework.

In this context, under an agreement (Package 74) with Livestock and Dairy Development Project (LDDP) of Department of Livestock Services, UNIDO is working to formulate ways to improve policies and regulations of DLS to improve the food safety of food of animal origin in Bangladesh. As a part of this activity, sub-activity 1.5.1: Map the establishments that should be assisted in the implementation of food safety systems and in the evaluation of their capacities and 1.5.2: Conduct a gap assessment of such establishments and develop an

upgrading or modernization plan to meet their food safety system implementation to develop the deliverables, i.e., establishments mapped; Survey designed, gap assessment conducted and upgrading plan developed. To conduct those sub-activities, a series of works were undertaken including visits to several establishments in different segments of the milk value chain.

Mapping the milk value chain in Bangladesh

In Bangladesh, generally, two different types of milk marketing chains are seen in dairy sector. One is the formal and the other is the informal marketing sector. In the informal sector, milk is transferred from one to another as either raw status or as basic dairy products. In the formal sector, milk is processed and processed milk is marketed. Several dairy processing entrepreneurs are involved in milk processing, producing Ultra-Heat Treated (UHT) and pasteurized milk for retail sale. However, butter, ice cream, ghee, sweetmeat, and yogurt are also produced for this formal channel. Sweetmeat shops are the major dairy market outlet in Bangladesh but are supplied mainly from the informal market.

The value chain generally starts with the raw materials supply at the farm level and ends with consumers who make the choice to buy, or not to buy, the finished product. Value chains have several links between the farm and the consumer including procurement, transportation, processing, commodity storage, packaging, distribution, retailing, and other services. Milk is processed through cooling technologies and transported by refrigerated van to the processing plant. After processing, it is marketed to retailers/supermarkets. In Bangladesh four types of dairy farms have been seen based on herd size; these are illustrated below:

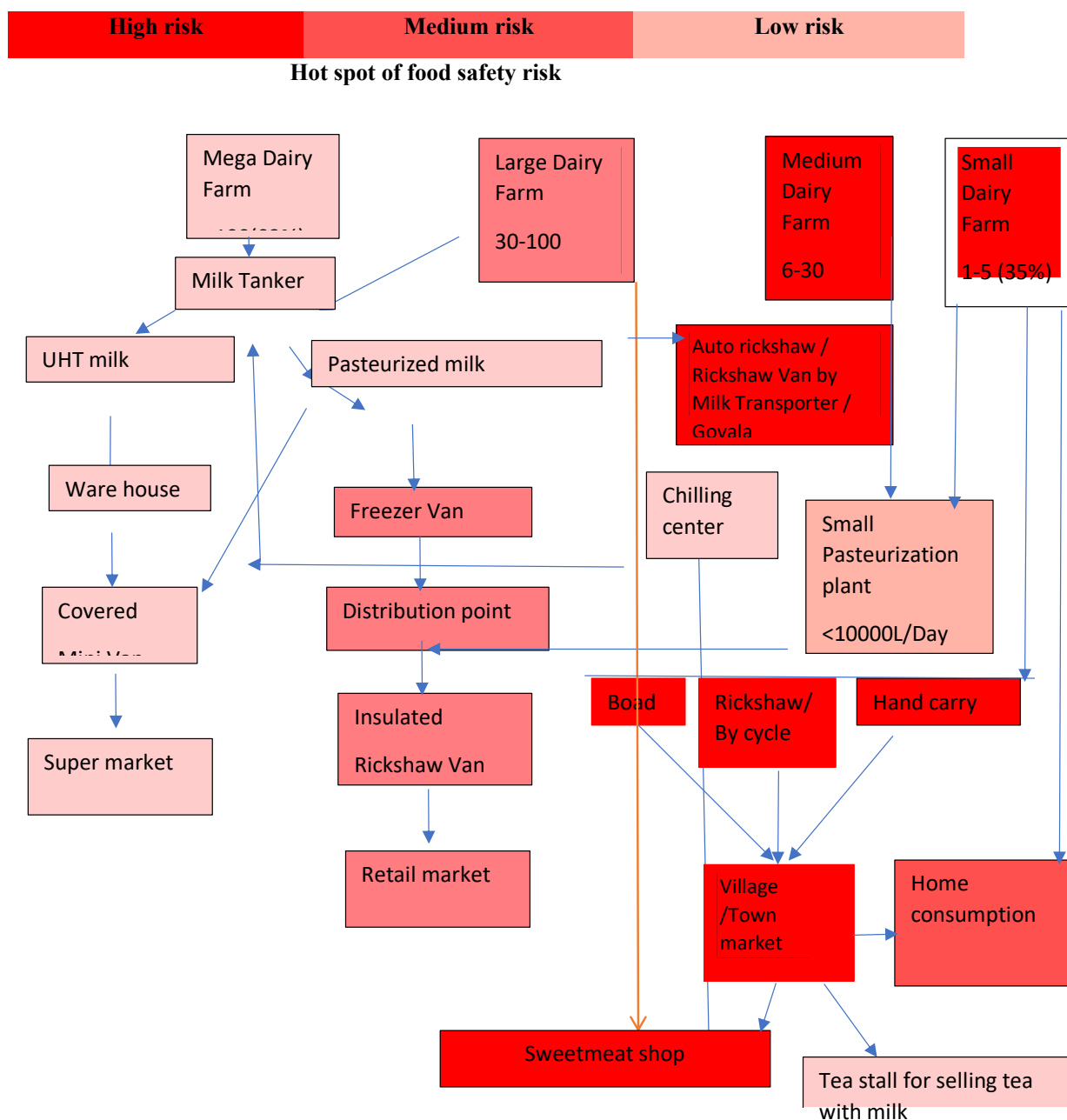
Mega Dairy Farm (>100;02%): Consisting of more than 100 dairy cattle which represents 2% of total dairy farms in the country. This type of dairy farm utilizes modern technologies and some are engaged in retail milk packaging. Mega dairy farm in the country maintains good practices and operate to a low level of food safety risk. Milk value chain of mega dairy farms is:

- Channel I: Own farm → Processing plant for value added products/Pasteurized/UST plant → Retailer/Supermarket → Consumer.

Large dairy farm (30-100;18%): Consisting of 30 to 100 dairy cattle which represents about 18% of total dairy farms in the country. This type of dairy farm uses different modern equipment and tools as well as engaging paid labor. Large dairy farms in the country maintain good practices in management of the farm and operate to a medium level of food safety risk. Milk mapping of the milk value chain for large dairy farms are:

- Channel I: Farmer → Goyala/Milk transporter /Collector → Sweetmeat shop → Consumer
- Channel II: Farmer → Goyala/Milk transporter /Collector → Chilling plant → Big processing plant / Pasteurised/UHT/Value added milk products → Supermarket → Consumer.
- Channel III: Farmer → Goyala/Milk transporter /Collector → Chilling plant → Big processing plant / Pasteurised/UHT/Value added milk products → Retailer → Consumer.

Figure 1: Mapping of milk value chain in Bangladesh and level of food safety risk



Medium dairy farm (6-30;45%): Consisting of 6 to 30 dairy cattle which represents about 45% of total dairy farms in the country. This type of dairy farm does use modern equipment and operates farm by both paid and family labor. Medium-type dairy farms in the country maintain few good practices for the management of the farm and are associated with a medium level of food safety risk. Milk mapping of medium dairy farm value chain is illustrated below

- Channel I: Farmer→ Local Consumer (home delivery)
- Channel I: Farmer→ Local tea stall

- Channel III: Farmer → Goyala/Milk transporter /Collector → Sweetmeat shop → Consumer
- Channel IV: Farmer → Goyala/Milk transporter /Collector → Small chilling/Pasteurised plant → Consumer

Small dairy farm (01-05;35%): This type of dairy farm comprised 1-5 dairy animals and represents about 35% of total dairy farms in the country. This type of dairy farm does not use any modern equipment and operates farms mostly with family labor. Small-type dairy farms in the country do not follow good practices for management of the farm and have a high level of food safety risk. Milk mapping of small dairy farm illustrated below:

The value chain starts from dairy producers then collector/milk transporter/ goyala/ middleman and finally retailer who adds value to the marketing channel of milk.

- Channel I: Farmer → Local Consumer (home delivery)
- Channel II: Farmer → Goyala/Milk transporter /Collector → Sweetmeat shop → Consumer
- Channel III: Farmer → Goyala/Milk transporter /Collector → Small chilling/Pasteurised plant → Consumer

Small dairy producers utilize milk for home consumption and sale to different actors. When milk is transferred to wholesalers (milk collector/Goyala, middle man), they either sell it to retailers or traditional processors (who make sweetmeat, yogurt and other value-added milk products) or to distant larger wholesale market (city town) for urban consumers. Milk mapping of milk value chain for different dairy farming system is demonstrated in Figure 1.

Level of food safety compliance along the value chain

The level of food safety risk was determined in several actors along the milk value chain through an expert panel discussion. High, medium and low risk were analyzed for all actors, i.e., dairy farm, milk transporter/goyala, chilling plant and sweetmeat shop. The level of food safety risk, reason of risk and its mitigation measures is described in the following Table.

Actors: Dairy farm		Levell of food safety risk: High
Reason for food safety risk	👍	Poor hygienic management
	👍	No isolation and quarantine of diseased animals from healthy animals
	👍	Poor recording system
	👍	Poor vaccination coverage
	👍	Limited disease reporting and diagnostic facilities
	👍	Feeding of fodder contaminated with heavy metals
	👍	Misuse and overuse of the antimicrobials
	👍	
Measures to be taken	👍	Good hygienic management, SOPs and practices
	👍	Isolation and quarantine of diseased animals from healthy animals
	👍	Organized farm recording system
	👍	Improved vaccination coverage
	👍	Organized disease reporting and diagnostic facilities
	👍	Avoiding feeding of heavy meatal contaminated fodder through proper residue testing
	👍	Avoiding misuse and overuse of the antimicrobials
	👍	

Actors: Goyala/Milk transporter	Levell of food safety risk: Medium
Reason for food safety risk	👍 Poor hygienic practices 👍 Poor health of the Goyala 👍 Poor handing practices 👍 Uncontrolled temperature of product 👍 Uncontrolled fly and insect movement 👍 Poor control of dust 👍 Poor waste management facilities 👍 Poor use of personal protective equipment (hand gloves, caps, apron)
Measures to be taken	👍 Good hygienic practices 👍 Sound health of the Goyala 👍 Good handing practices 👍 Controlling of temperature 👍 Control of fly and insect movement 👍 Good control of dust 👍 Good waste management facilities 👍 Using of personal protective equipment during selling and handling (hand gloves, caps, apron)
Actor: Chilling	Levell of food safety risk: Medium
Reason for food safety risk	👍 Contaminated and unclean tank 👍 Inappropriate temperature 👍 Dirty environment 👍 Poor data recording 👍 Lack of standard operating procedure
Measures to be taken	👍 Clean and decontaminated free tank 👍 Maintenance of proper temperature 👍 Proper data recording 👍 Standard operating procedures
Actors: sweetmeat shop	Levell of food safety risk: High
Reason for food safety risk	👍 Reluctant to use Personal Protective Equipment (Caps, hand gloves, apron) 👍 Poor hygiene of the shop 👍 Don't maintain shelf life of the product 👍 Improper preservation facilities 👍 Free movement of flies, and insects
Measures to be taken	👍 Strict uses of PPE 👍 Hygienic handing of the products 👍 Standard operating procedures 👍 Proper temperature management 👍 Proper recording of the product

Way forward to improve food safety along the milk value chain

The below initiates should be followed for improving food safety along the milk value chain.

- Identify the food value chain actors
- To identify their challenges and provide support for the improvement of food safety

- To initiate in DLS a regulatory enforcement body to address food safety and other legal issues
- To develop a regulatory set up in DLS to inspect, supervise and monitor safety of food of animal origin in production and primary processing level
- To develop food safety guidelines for different actors along the milk value chain
- To train actors and entrepreneurs to comply with the guidelines
- To enforce inspection procedures
- To certify quality products to support value addition
- To support infrastructural development to create environment for more investment if producing value added safe products

Survey designed to measure the food safety management practice and gaps in different actors of milk value chain

Building a healthy nation, drinking a glass of milk every day for a man is a slogan of Bangladesh; for this, we indeed need safe milk to be available. The government alone cannot boost the dairy industry to ensure safe milk. All the operators along the milk value chain e.g., farmers, milk collectors/goyala, milk traders, sweetmeat shops, dairy processors, supporters of livestock service providers, livestock health workers, input suppliers, government and non-government institutions should work together for safe and sustainable milk production. There are structural challenges in the milk value chain, with risks associated with food safety practices, that hamper safe milk production. UNIDO undertook work on milk value chains to identify the gaps in existing food safety systems and practices; i.e., milk value chain: dairy cattle and buffalo farm, chilling centers, milk collectors and sweetmeat shop. UNIDO rolled out a nationwide survey (06 districts considering 05 respondents in each actor) in potential dairy hub through Kobo Tool Box to assess current on-farm and food processing practices in terms of food safety in the milk supply chain. Apart from this debriefing session, a zoom meeting with experts, and two stakeholders meeting were followed to validate and harmonize the collected food safety practice data with 70 participants considering different actors of milk value chain.

Besides this study, a field visit was done to identify different actors in the chain, to observe their food safety related practices and their interactions in relation to communication of forward and backward food safety related information. To achieve the aim of the study, different establishments including, Dairy farm, Goyala/milk transporter, Chilling facilities, sweetmeat shop were visited close to Dhaka based on the prescribed inspection checklist (Annex-I).

Primary data was obtained through the use of questionnaires and Focus Group Discussions (FGD) which were collected from actors including dairy cattle producers, milk transporters, chilling facilities, traditional sweetmeat shops, and chain shops. Questionnaire/checklist were considered for backward and forward linkages of value chain, sourcing of animals, animal identification, traceability, control of animal diseases, level of practices of biosecurity, hygiene, zoonoses control, environmental control, maintenance of the cool chain for milk products, transport, market and preservation etc., in different stages of the value chain in context of international standards. Secondary data was also obtained from many sources, such as censuses

from government departments, internet searches by Google search engine, project reports, journals, newspapers and magazines. Four different questionnaires were used which were developed for field visit based on above parameters for different actors of milk value chain, i.e., Dairy farm, Goyala/milk transporter, chilling facilities and sweetmeat shop. The area selection and number of respondents could not be considered statistically due to unavailable resources and time constant, therefore UNIDO's intent was to learn about food safety conditions along the value chain, which might not represent the nation status.

Finding the field visits, identified food safety gaps were presented in a day long workshop on "Milk value chain" followed with five groupwork (Annex-II) with aims to determine good safety gaps, map the milk value chain & level of food safety risk, resource/support required to mitigate food safety hazard in different actors.

Gap assessment of establishments

UNIDO has developed the inspection checklist (Annex-1) based on the international standards of food safety management systems for milk value chain actors i.e., dairy farms, milk transporters/collectors/ Goyala, chilling plants, and sweetmeat shop that can assess the food safety gaps in those actors. In addition, field visits based on the prescribed inspection checklist for the different establishments i.e., dairy farm, Goyala/milk transporter, Chilling point, sweetmeat shop were undertaken close to Dhaka. Based on the findings of the field visit, workshop findings, personal observation, and secondary review, identified gaps in the food safety management system for different milk value chain actors were presented for discussion with the expert panel in the milk value chain workshop discussed in the next section 5.

Existing gaps in dairy farm facilities

- Farm registration: medium and marginal farms are registered with DLS but family farms are not..
- Biosecurity measures: i.e., Foot bath facility is not present.
- Farmers are not aware about pest control programs in the dairy farm facilities.
- Keeping a record of animal movements on and off the farm is not practiced.
- Soil and water test of pasture fields is not practiced
- Records for sick animals treated by Veterinarians are maintained but when it is treated by another paraprofessional, records are not maintained.
- A written program to control possible heat stress (following THI card in the shed) is not followed. Few of farms followed auto showering 4-5 times in day during hot summer days.
- Records are not kept for purchasing of feed/feed ingredients and used on the farms
- Isolation and quarantine area in the farm is maintained in the large and medium scale farm but not present on small farms
- Record of diseases and treatment are not maintained
- Use of antibiotics is not recorded

- Training record for farm staff is not kept
- Welfare of Farm workers (i.e., health checkup, dress code, working hour) yet to be adopted
- Farm staff facilities (i.e., Toilets, canteen) need to be maintained in all farms.
- A disposal pit for a dead animal needs to be far away from farm premises
- Records for disposed farm materials i.e., used syringes/needles/vials/ remaining drugs are not kept
- Large farms use animal marking for individual animal identification (i.e., ears tag, tattoo, microchip or any other kind of identification system) but most of the medium scale and small farm are not followed.
- Record of animals' identification are not maintained.

Existing gaps in Milk collector/Goyala

- Registration with DLS yet not started
- An up-to-date listing of milk suppliers and their registration numbers is not maintained
- No system in place for the detection of adulterants including antibiotics and other contaminants.
- Declarations about preservatives while carrying milk are not retained.
- A small number are using stainless steel container for carrying milk
- Few keep records for amount of milk purchased, sold or spoiled milk
- No recording of temperature of milk at collection
- Hygiene and sanitation measures for milk transporter /Goyala at a minimum level
- Some have some washing facilities with clean water (cleaning regime exists/transport and others)
- Maintaining any dress code during milking and transport not adopted
- Health checkup of milk collector not adopted
- Cool chain facilities to keep the milk in good condition is not maintained.
- Records on the temperature of milk during storage, before and after processing are not kept.
- Cleaning and disinfectant of premises not always followed.
- No evidence of training certificates for personnel.
- Record milk temperature at time of delivery not recorded.

Existing gaps in chilling point/plant facilities

- Records of previous inspections from competent authorities need to be maintained.

- Traceability records are not retained
- Gaps identified in cleaning regime.
- Equipment validation (Service & maintenance, validation, third party audits etc.) not followed.
- Training records not maintained
- In frequent checking of the condition of milk on arrival (Temperature, foreign matter, smell, color, Test results, test frequency).
- Records of treated wastewater not maintained.
- Need to improve for testing record of milk for Farm Cooling Tank (FCT) (Fat, CLR, Sugar, Oil, Soda etc.)
- Need to document and follow SOP for Cleaning in Place (CIP)
- No records kept of where rejected milk is consigned
- Health checkup of staff not adopted
- Written record of inspection of the hygienic status of the premises not maintained.
- Plan for staff development initiatives exist not yet practiced.

Existing gaps in sweetmeat shop facilities

- Legal permission from competent authorities. Trade license, Sanitary license, Fair license are evident but no evidence of Department of Livestock Services approval.
- Traceability record of milk sourced is not maintained.
- Low level of hygiene and sanitation practices observed in both manufacturing and outlets areas.
- No records kept on water quality tests
- Insufficient storage facilities for milk products
- Unclear plan for managing rejected products and few with segregation and disposal facilities for spoiled milk / milk products.
- Microbiological and chemical testing not undertaken.
- Records of milk analysis not kept.
- Cool chain facilities and record of temperatures not maintained
- Health checkup of staff not adopted
- Emergency backup and electric supply facilities not evident
- Dress code of staff of sweet meat shop and manufacturing unit not always evident.
- Training facilities and record not maintained.

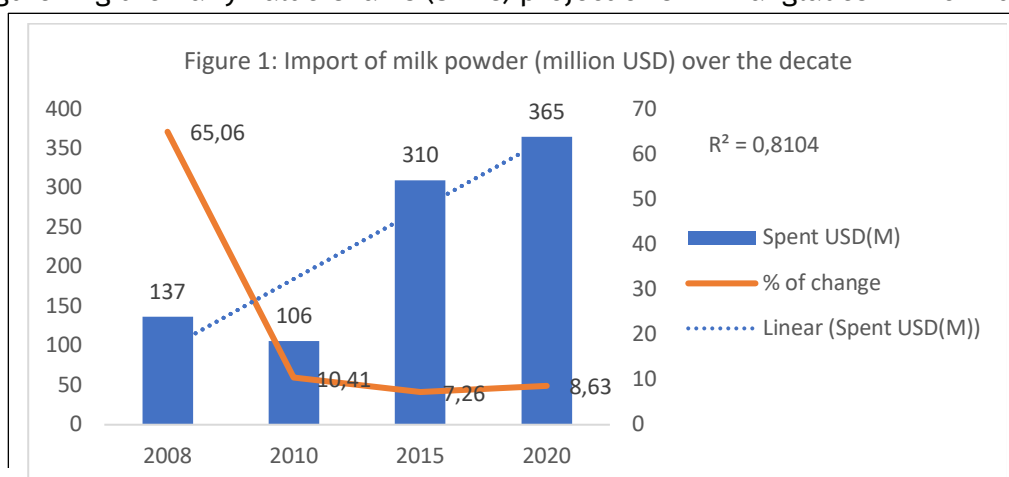
- Poor staff facilities (i.e., separate Toilets, canteen, cleaning space)

Upgrading plan developed for investment in the milk sector

The government has taken far-reaching initiatives for sustainable milk production. These initiatives include cattle breeding development, selecting for adaptation for local climate; improving market management for milk and milk products, ensuring quality control and availability of milk; and promoting the habits of drinking milk through a milk school program and observing a national Milk Day. Milk production is increasing and has grown from 1.08 MMT in 1971 to 11.98 MMT in 2021 which is nearly eleven times higher. Milk production increased four fold over the ten years (11.99MMT in FY 2020-21; 2.95 MMT in FY 2010-2011). This has been made possible through initiatives such as expansion of artificial insemination technology, breed development programs for productivity enhancement, and involvement of youth in the dairy sector. This has been matched by a strong demand for milk and milk powder and soft loans from Bangladesh Bank, that has led to a numerical growth of dairy stock and accordingly, milk production over the past decade. Demand for dairy products like pasteurized and powdered milk, yogurt, ghee cheese, and butter in Bangladesh continues to grow. Bangladesh imports powdered milk due to low domestic production, local supply constraints, and lack of optimal quality. It spent US\$ 365 million on milk-powder imports in 2020, an increase from \$310 million in 2015. Despite the growth in domestic production, the money spent (USD in Million) on the importation of milk and milk products has increased over the decades (Figure 1).

The size of the milk market in Bangladesh is \$2.47 billion which is expected to grow over 5.0 percent annually in the coming years (Hossain,2022). This is of sufficient size to attract local and foreign investment. Female entrepreneurship has been socially and economically empowered and female ownership of dairy cows has increased by 116%. This has been helped through

the Strengthening the Dairy Value Chains (SDVC) project of CARE Bangladesh which has been



operating since 2007 with the support of the Bill and Melinda Gates Foundation (The Daily Star 2016). The livestock sector as a whole received a bigger allocation of the Government Budget for FY 2020-21 than the previous years. The government has proposed Tk1,813 crore for the fisheries and livestock sector in the national budget for the 2023-24 fiscal year.

The dairy sector needs to get sufficient support to unlock the current barriers along the milk

value chain. These barriers include shortage of feed and fodder; lack of access to veterinary services; inadequate training of staff due to lack of necessary funds; limited access to financial services; lack of working capital; low liquidity; no subsidy; and no financial incentives from the government. Current high costs of production are ultimately resulting in poor milk product quality and low milk production yields. However, in FY2023-24, the Government target is to increase the daily per capita availability of domestically produced milk to 236gm, to produce 46 lakh levels of semen in cattle breed development and conservation to artificially inseminate 42 lakh cows/calves across the country. UNIDO has proposed investment priority areas following consultation with different stakeholders working in private-public sectors under milk value chain described as below¹.

Scope: Dairy Farm; Dispatch of Milk to Milk Chilling Centre (MCC) or Processor

1. Animal identification; Using any mark for individual animal (ears tag, tattoo, microchip or any other kind of identification system)
2. Hygiene and sanitation measures in the milking Parlor
3. Having farm registration from the competent authority

Scope: Transporter/Goyala; Collection of Milk from Farms / MCC for delivery to Milk Processing Facility

4. Registration of transporter/Goyala,
5. Has an up-to-date listing of milk suppliers
6. Recording the amount of milk purchased, milk sold and details of disposal of spoiled milk
7. Recording temperature of milk at collection
8. Washing facilities with clean water
9. Having stainless steel container for carrying milk
10. Milk Hygiene Training

Scope: Chilling facility; Receipt of milk from farmers; Dispatch of Milk to Milk Processor

11. Legal registration from competent authority
12. Electricity Supply and back-up facilities
13. Records of temperature of milk when accepted to facility
14. Records of temperature of milk when shipped from facility
15. Checking of condition of milk on arrival (Temperature, foreign matter, smell, colour, Test

¹ Work Package 74 Sub-activity 1.3 “Food Safety Regulatory Landscape Study and Investment Plan”

results, test frequency)

Scope: Processor/sweetmeat shop; Food Processing and Food Retailing

16. Sweetmeat shop registered with competent authority/DLS
17. Having traceability records (milk/product comes in and goes out from the facilities, coding of the product/levelling)
18. Food products for laboratory tests
19. Having cool chain facilities
20. Staff training HACCP

MEAT VALUE CHAIN

Introduction

Food safety is a value chain issue. Specifically the animal origin food value chain is a very complex system in the context of assuring the safety of animal origin food. Human health hazards may enter into the food chain at any stage from production in the farms to consumption. This is a risk in countries like Bangladesh with a very high human and animal population density. Bangladesh has an area of 147,570 sq Km, and the total projected population of 172,95 million in mid-2023 (1329 per sq Km), and also a dense animal population. The ruminant population is 5713.30 million (387.22 per sq. Km) and poultry population is 442.85 million (3000 per sq Km) in 2023 (DLS statistics 2023).

Not only the dense human and animal population, the livelihood of human and animal population is also unique. A majority of animal population is free ranging. Most of the commercial animal farms are small and medium and are situated in home yards. Assuring farm biosecurity and hygiene, considering environmental issues with a view to improving food safety considerations, is a challenge in this situation. The conventional way of animal transport, trading, and slaughtering practices are all in a very traditional way; however the situation is improving gradually but not at a desirable pace.

There are some good initiatives both from public and private sectors for improved standards of practice in production, and in processing interventions but are not progressing quickly enough. A good number of regulations have been developed in the recent past, however their enforcement is not initiated in a planned or structured way. Therefore, certification of quality and safe products is not in place.

Despite the limitations, the productivity of meat, milk and egg is in a good position in Bangladesh. As per DLS Statistics 2023, the production of meat, milk and egg are 871.00 MMT, 1407 MMT and 2,3376 million per annum. Bangladesh is exporting meat products to countries like

Dubai, Maldives, UAE etc. To further develop export markets, improvement of the food safety situation is an obligatory pre-requisite. Bangladesh is keen to improve the food safety situation to increase its export potential.

In this context, under an agreement (Package 74) with Livestock and Dairy Development Project (LDDP) of Department of Livestock Services, UNIDO is working to formulate ways to improve policies and regulations of DLS to improve the food safety situation of foods of animal origin in Bangladesh. As a part of this activity, there is an activity in the UNIDO-LDDP Package, under Key activity 1.5. “Support the establishment of quality assurance schemes for the livestock sector (GAHP, GHP)”: 1.5.1. “Map the establishments that should be assisted in the implementation of food safety systems and in the evaluation of their capacities through conducting visits to establishments based on a checklist”.

To conduct this activity, a number of establishments in different segments of the meat value chain were visited by the national inspection expert of UNIDO to map the value chain and assess current practices in the context of food safety and information were collected in a structured questionnaire and analyzed in the context of international standards. This area of the study is limited to the beef value chain only.

Mapping of the meat value chain in Bangladesh

Value chain analysis helps in understanding the connection among actors in the value chain and the way practices or trades take place. An agricultural value chain is considered as an economic unit of analysis of a particular commodity or group of related commodities that encompass a meaningful grouping of economic activities that are linked vertically by market relationships (Getachew, 2012). The first step in value chain analysis is mapping of the core processes and activities in the chain (Mmasa and Msuya, 2012). Value chain mapping is the process of developing a visual depiction of the basic structure of the value chain. A value chain map illustrates the way the product flows from raw material to end markets and presents how the industry functions (McCormick and Schmitz (2001). Visualizing networks will give a better understanding of connections between actors and processes in a value chain, demonstrate interdependency between actors and processes in the value chain and create awareness of stakeholders to look beyond their own involvement in the value chain (Michael et al., 2010). The philosophical importance of the categorization that was described above was based on the need to identify primary activities that were core in order to gain the competitive advantage and secondary activities that would be the drivers in attaining these advantages, such as competencies and assets (Sanchez & Heene, 2004).

This study was done to identify different actors in the chain, to observe their food safety related practices and their interactions in relation to communication of forward and backward food safety related information which is very important to assure sustainable food safety of animal origin food in a transparent way. All of the main actors in the beef value chain were contacted to assess their interactions as well as food safety practices.

A value chain map has been developed which is shown in the diagram below:

Beef value chain mapping

Regarding the mapping of the value chain, it was found through interview that beef cattle are reared both by mixed (dairy and beef) and specialized beef farmers. Mixed farmers get some of their animals from their own farm and buy some from the market. The specialized beef farmers

buy all their animals from market. They sell their animals to cattle traders, slaughterers and a considerable number directly to the consumers in the festival of Eid ul Fitr, Eid ul Azha, Shab e Barat etc.

The traders buy animals directly from farms or from any cattle market and sells the animals in the market to slaughter houses, road side meat shoppers, other traders, animal farmers, food chain shoppers, or to common people on the event of any festival or family program. The traders have almost no linkage with DLS. So, no question of registration or compliance for trading.

per animal as a contribution towards the cost of waste disposal. They generally supply meat to common people and hotels.

The formal slaughter houses are required to comply with the regulatory provisions for slaughterhouses. However Bengal Meat Processing Industries is considered to be the only compliant slaughter house at present. They contract farmers to supply safe and quality cattle according to their specifications. In the slaughter house they have an efficient lairage, a high quality slaughter and processing facility, good effluent and waste disposal facilities, skilled manpower, and a traceability system in place. This slaughterhouse sources animals both from contract farmers and the open market, selling their product to some of the retail chains, grocery shops and directly to consumers through their own outlets.

Slaughter houses like Sadeek Agro have limited compliance standards, slaughtering animals from their own farm. They supply to hotels.

Local government organizations are responsible for establishing slaughter houses by law [Local Government (City Corporation Act-2009) and Local Government (Municipality Act-2009)]. They are trying to develop slaughter houses in different locations. In Dhaka, one in Hazaribag and another in Mahakhali are built but could not be operationalized. The one visited by UNIDO, is a very primitive one, where food safety measures were not evident. Along with local government organizations, DLS is solely responsible for meat inspection. It is their dual responsibility to establish and enforce a standard slaughter procedure.

For religious festivals, mostly in the Eid-ul-Azha, a huge number of cattle, buffalo and goats are slaughtered. It is a general assumption that 50 percent of annual cattle slaughter takes place during this festival. Most of the animals are slaughtered at this stage are slaughtered in home yards. That presents a considerable food safety issue. DLS may suggest a modality for this event to assure minimum safety.

Survey designed to measure food safety management practices and gaps in different actors of meat value chain

This study was done to identify different actors in the chain, to observe their food safety related practices and their interactions in relation to the communication of forward and backward food safety related information which is important to assure the safety of foods of animal origin in a transparent way. Key actors in the beef value chain were contacted to assess their food safety practices.

The study was carried out in Dhamrai Upazila of Dhaka district and the Dhaka city. The Dhamrai Upazila was chosen for primary producers and animal transporters and traders as well as road side meat sellers because of its status as one of the primary cattle rearing and trading areas in the country. Considerable numbers of beef cattle are reared in this Upazila because it is a rural area where spaces are available for animal farming and considerable cultivated lands are available to grow forages for cattle. It is very close to Dhaka city, the biggest market of beef cattle. The capital city Dhaka was chosen for slaughter, meat processing and marketing, because it is the central place for such activities in the country.

Primary data were obtained through the use of a pre-tested questionnaire and Focus Group

Discussions. Primary data was collected from actors along the value chain including beef cattle producers, traders, transporters, traditional roadside slaughter/meat shop, formal slaughter houses and retail chain shops. The primary data collected include: backward and forward linkages; sourcing of animals and animal products; backward and forward information (animal identification and traceability, animal disease) sharing; biosecurity; hygiene; zoonoses control; environmental measures, and maintenance of the cool chain in the transport of animal products at different stages of the value chain. These were done with a view to establishing baseline status from which to focus on gradual improvement in the context of international standards within a specific time frame.

Six different inspection checklists (Annex-I) were developed for different actors of the value chain as follows :

- a. Beef cattle producer
- b. Beef cattle trader
- c. Beef cattle transporter
- d. Traditional roadside slaughter/meat shop
- e. Formal slaughter house
- f. Food chain shops selling meat

The number of interviewees and area coverage were not big enough due to time constraints. Detailed discussions were had with the interviewees along with relevant people that were encountered during the site visits. The experience of previous UNIDO activities and visits, in addition to the expertise of UNIDO experts in this area were considered when preparing this document. At a previous workshop, UNIDO expert Mr. Michele Gallo presented standard good practice guidelines for different actors in the value chain. In formulating the questionnaires, that document was considered in addition, to relevant Codex Alimentarius Commission guidelines.

A workshop was also organized on 'Milk and Meat Value Chain' by UNIDO-LDDP Project from October 2-3, 2023 in Hotel Pan Pacific Sonargaon, and attended by representatives of different value chains, regulators, academia researchers, and national and international experts of UNIDO. In this workshop, meat value chain issues were discussed (Annex-II).

Gap assessment of establishments

During the visits a considerable number of gaps were identified in food safety practices, at each stage of the value chain including beef farms, beef cattle trading, transport, slaughtering and marketing.

In the following areas, the compliance level was not at an acceptable standard. Some good practices were observed, but in general, the compliance level was not satisfactory and most likely due to a lack of, or insufficient training, guidance, follow up and monitoring along the chain including beef farmers, beef animal transport and trade, road side slaughter and meat selling, formal slaughter house and meat shops.

Compliance actions required at each level of the value chain.

a. Beef farmer

- Farm registration and compliant with all requirements
- Adequate personal hygiene and sanitary facilities are provided on the farm.
- Adequate personnels and visitors' hygiene protocol is in place.
- The farmer provides the correct PPEs and enforces Biosecurity protocol for any person entering the farm.
- Adequate vehicle and equipment hygiene and disinfection protocol is in place to avoid spreading disease and pests inside and outside the farm.
- Adequate procedures are in place to control pests and prevent wild and domestic animals from having access to places where the animals are kept.
- Biosecurity measures for the animals and their facilities.
- Cleaning and disinfection programs are established to ensure the correct hygiene standards are met for the animals and their facilities
- Has appropriate containers or suitable waste storage area. All wastes are eliminated in a hygienic and environmentally friendly way.
- Ensure a good protection from disease to the animals.
- Record all vaccinations
- Record all animal specific treatments
- All the animals are clearly identifiable using a clear animal Identity system (ears tag, tattoo, microchip or any other kind of identification system) with unique identification numeric or alpha-numeric number

b. Beef animal transport

- Vehicles/drivers are licensed for animal transport
- Animals are healthy and fit for transport
- Soiling and cross-contamination with faecal material is minimised
- New hazards are not introduced during transport
- Consideration is given to avoiding undue stress through avoiding to overcrowding, giving feed, drinking water and rest in long distances

- Animals can be loaded, unloaded and transported easily and with minimal risk of injury;
- Use of floor gratings, crates or similar devices limits soiling and cross-contamination with faecal material;
- Cleaning and sanitizing are practiced
- Animal identification as to the place of origin is maintained

c. Beef animal traders

- Animal trader is licensed for animal trading
- Soiling and cross-contamination with faecal material is minimised
- Animal identification as to the place of origin is maintained
- Health check done before buying and selling
- Disease or treatment information collected from seller and provided to buyer
- Animals with specific disease conditions or recent administration of veterinary drugs are not loaded for transport to the market/abattoir.

d. Traditional roadside slaughter/meat shop

- Licensing (on hygienic ground) for meat selling from DLS (Slaughter to be stopped)
- Assure minimum hygienic practice as assigned during licensing
- Environment-friendly disposal facility
- Equipment and premises cleaned before and after days operation
- Meat is not kept open for a long time in ambient temperature for sale
- Prevent open air shops due to risk of dust and contamination
- Workers are trained on GHP, cleaning and disinfection, disposal practices

e. Slaughtering practices

- Principles of meat hygiene applying to animals presented for slaughter
- Principles of meat hygiene applying to establishments, facilities and equipment of slaughterhouses
- Design and construction of lairages
- Design and construction of slaughter areas:

- Stunning and bleeding areas are separated from dressing areas
- Special facilities to slaughter and dress “suspect” or injured animals.
- Design and construction of areas where bodies of animals are dressed or meat may otherwise be present
- Design and construction of equipment where bodies of animals are dressed or meat may be present
- Clean water supply
- Facilities and equipment for personal hygiene are in place
- Process control systems are implemented
- HACCP is implemented
- Regulatory systems (e.g. recall, traceback, product tracing, etc., as appropriate) and requirements, e.g. training, knowledge, skills and ability of personnel
- Hygiene requirements for slaughter and dressing
- Post-mortem inspection is carried out
- Hygiene requirements for process control after post-mortem inspection are implemented

f. Meet shop

- The production site is of a suitable size, location and construction, and maintained to reduce the risk of contamination and facilitate the production of safe and hygienic finished product
- Provide Potable water for cleaning, disinfection and handwashing
- Adequate personal hygiene and sanitary facilities are provided on the premises
- All wrappers, containers and packaging material are of food grade material which will not contaminate food.
- Established cleaning and disinfection programs to ensure the correct hygiene standards are implemented to reduce the risk of a food borne outbreak
- Adequate procedures are in place to control pests
- Appropriate food safety measures are applied during handling, storage and transportation
- Food is protected from contamination during all stages of purchase, transport, storage

and sale

- Food is protected from hazards related to contamination from air, soil, water, feed, fertilizers, pesticides, biocides, veterinary drugs, faecal contamination and cleaning and disinfection agents
- Food items are physically separated from non-food items during transport
- Temperature throughout the food chain is monitored and verified to ensure that the food is safe and being maintained at the correct temperatures
- Have effective recall procedures to stop the delivery, sale and consumption of suspect products
- An appropriate product identification system is implemented, connected to the animal identification system used by slaughter houses and farms
- Food Handlers maintain a high degree of personal cleanliness
- Food handlers are medically fit to work and provide a medical fitness certificate
- all food handlers are trained as applicable to their assigned tasks and have the necessary skills to enable them to handle food hygienically

Upgrading plan developed for the meat sector

Most of the above-mentioned practices are interpreted in a very traditional way with safety and hygienic practices are not prioritized. To bring the actors up to an acceptable level of compliance, an integrated approach is required. Not only Department of Livestock Services, but other relevant regulatory authorities, and especially local government organizations must be involved in this process. To assure a good transport facility for animals, the Bangladesh Road Transport Authority (BRTA) may be needed to be involved. Of course, to assure food safety in production and primary processing (slaughtering), the primary responsibility rests with DLS.

The following general principles should be undertaken to improve the practices in along the food chain.

- Ensuring registration of all value chain actors with a minimum level of compliance
- Development of operational guidelines for all different value chain actors
- Capacity building of the value chain actors through training
- Develop of recording systems for food safety practices by the actors
- Development of inspection, supervision and monitoring of practices and compliances systems by competent authorities.
- Regular inspection, supervision, monitoring along the value chain.

- Establish specific regulatory body in DLS
- Ensure a resourced and dedicated skilled regulatory workforce to support enforcement measures.
- Undertake initiatives to implement identification and traceability of animals and animal products at each level of the chain
- Update policies and regulation to align with global standards
- Enforce the Animal Slaughter Act and Rule to stop unauthorized slaughter practices within a planned time frame and develop a slaughter infrastructure in a time frame agreed with local government and other regulators and actors.
- Meat shop hygiene is a big challenge, which needs integrated approach to improve hygiene standards
- Strengthen collaboration with other regulators especially with local government organizations
- Create an environment for incentivizing private sector investment in slaughter, value addition, marketing activities
- Initiate PPP, Infrastructure, logistics etc. in collaboration with other regulators and private sector.

Overall recommendations

- ✓ Develop a food safety inspectorate in DLS for food safety inspection
- ✓ Develop guidelines for farm registration; SOP for Biosecurity, Good Animal Husbandry Practices, Good Hygienic Practices, feeding practice; animal slaughtering and selling etc.
- ✓ Develop formats for on-farm recording of feeding, medication, vaccination
- ✓ Develop training and awareness programmes for all stakeholders
- ✓ Implement regular inspection programmes with follow up monitoring
- ✓ Develop and implement an environmental food hazard control program
- ✓ Set up a time bound program for animal identification and product traceability
- ✓ Update food safety policies for foods of animal origin
- ✓ Update food safety regulations for animal production
- ✓ Develop SoP's for the manufacture and sale of popular value-added milk products, i.e., Yogurt, Ghee, cheese. Fermented milk drink.

- ✓ Support the establishment of a model sweetmeat shop that complies with all standards
- ✓ Support the establishment of a model slaughterhouse that complies with all standards

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ANNEX-I: INSPECTION CHECKLISTS

1.0 Inspection checklists of milk value chain

1.1 Inspection check list of dairy farm facilities

Respondent name:

Address:

Mobile Number (optional):

Attributes	Yes	No	Partial	Remark
Inspection check list of dairy farm facilities				
Having farm registration from competent authority				
Infrastructure and their maintenance				
Well-ventilated Housing				
Separate area for milking cows, pregnant cows and calf pen				
Ventilation facilities				
Bedding area is dry and clean				
Biosecurity measures				
➤ Fencing, Gate				
➤ Foot bath, Gate				
➤ Gate				
➤ No preventive measure				
➤ Wall protected area				
Pest control programs				
Having a record of Animal movements on and off the farm				
GAHP/GHP				
Clean and safe water source				
Clean Water is freely available to animals at all times				
Soil taste in pasture field???				
Record for sick animals treated by				
➤ Veterinarian				
➤ Para-professional				
➤ Quakes				
Written program to control possible heat stress (following THI card in the shed)				
Electricity facilities and Backup support				

Attributes	Yes	No	Partial	Remark
Inspection check list of dairy farm facilities				
Well feeding facilities design and maintenance				
Control/separate storage conditions of animal feed				
Records of feed/feed ingredients purchase and use				
Records of vaccination (i.e., following schedule vaccination)				
Records for anthelmintic/deworming (i.e., following schedule deworm program)				
Cleaning in farm facilities (Equipment, work tools must be cleaned daily and disinfected at least weekly)				
Hygiene and sanitation measure in milking parlor				
Ensure milking routines				
Having isolation and quarantine area in the farm				
Record of diseases and treatment				
Record for using antibiotics				
Training record for farm staffs				
Welfare of Farm workers (i.e., health checkup, dress code, working hour, training)				
Farm staff facilities (i.e., Toilets, canteen)				
Waste management				
Drainage facilities				
Disposal pit for a dead animal far away from farm premises				
Manure heap well separated from the clean areas where animals are kept and feed is stored				
Records for disposed farm materials i.e., used syringes/ needles/ vial/ remaining drug				
Animal identification				
Using any mark for individual animal(ears tag, tattoo, microchip or any other kind of identification system))				
Having Relevant animals' identification documents				
Other				
Having loan agreement with legal authority (Bank/MFI)				
Having accounts register				
Independent audit in the facilities				

1.2 Inspection checklist for Milk collector/Goyala

Respondent name:

Address:

Mobile Number (optional):

Attributes	Yes	No	Partial	Remarks
Having registration or name in the list of DLS				
Has an up to date listing of milk suppliers and their registration numbers				
Have a system in place for the detection of adulterants and antibiotics				
Have a reporting system for suppliers for preservatives found in raw milk during carrying milk				
Having stainless steel container for carrying milk				
Recording for amount of milk purchase, milk selling and about spoiled milk				
Recording temperature of milk at collection				
Hygiene and sanitation measure for milking man/Goyala				
Water availability and quality				
Washing facilities (cleaning regime exists/transport and others)				
Maintaining any dress code during milking and transport				
Health checkup of milk collector				
Having any cold chain facilities to keep the milk in good cool condition				
Observe and record the information on the temperature of milk during storage, before and after processing				
Cleaning and disinfection Routine				
Having training certificate for cow milking and farm management i.e., providing feed/water				
Record milk temperature at time of delivery				
Maintain standard required time for bringing raw milk from the farm house to the market/chilling plant				

1.3 Inspection checklist for milk chilling point

Respondent name:

Address:

Mobile Number (optional):

Attributes/issues	Yes	Not	Partial	Remarks
Legal registration from competent authority				
Having records of previous inspections				
Having traceability record (milk comes in and goes out from the facilities)				
Location details, facilities map				
Biosecurity measures (Operating area, footbaths)				
Supply of potable water (supported by testing documentation) Clean and safe water availability				
Washing facilities (cleaning regime exists)				
Records of temperature of milk at accepted to facility				
Records of temperature of milk when shipped from facility				
Equipment validation (Service & maintenance, validation, third party audits etc.)				
Check whether the gate valve, discharge motor, whip pipe is clean				
Equipment validation (Service & maintenance, validation, third party audits etc.)				
Checking amount of milk volume from scall and Farm Culling Tank (FCT)				
Checking of condition of milk on arrival (Temperature, foreign matter, smell, color, Test results, test frequency)				
Records for followed examination/platform test during the collection of milk				
Checking whether the temperature of the thermometer is correct with the temperature of the FCT				
Check whether the reading of digital machine is correct				
Checking whether FCT, generator, geyser is OK				
Keeping records of treated wastewater that correctly done				
Check whether the fat in the QC register, matches with the final bill register				
Checking the difference between purchased milk fat and fat obtained from QC register center				
Testing record of milk for FCT (Fat, CLR, Sugar, Oil, Soda etc.)				
Checking whether CIP (Cleaning in Place) SOP is being followed				

Attributes/issues	Yes	Not	Partial	Remarks
Rejected product segregation and disposal facilities of spoil milk/milk products				
Have records of where rejected milk is consigned				
Checking milk reject file				
Check of collected milk and chilled milk in the facilities				
Having emergency backup electric supply facilities				
Health checkup of staffs				
Training records exist for staff				
Having the written record of inspector to check the hygienic status of the premises/sweetmeat shop				
Having dress code of workers/staffs				
Having cleaning contract place				
Plan for staff development initiatives exist				

1.4 Inspection check list for sweetmeat shop

Respondent name:

Address:

Mobile Number (optional):

Attributes	Yes	Not	Partial	Remarks
Legal registration from any competent authority				
Sweetmeat shop registered with any competent authority				
Having traceability record (milk/product comes in and goes out from the facilities, coding of the product)				
Separate dedicated space for manufacturing products and outlets				
Hygiene and sanitation measure for cleaning the premises				
Potable water supply				
Records of water test for quality /safety				
Cleaning utensil/tools with standard procedure				
Having storage facilities to keep products in good condition				
Rejected product segregation and disposal facilities of spoil milk / milk products				
Food products for laboratory tests				
Record keeping of tasted samples				
Product segregation facilities				
Labelled milk product package				
Having precautions before receiving milk				

Having cool chain facilities				
Have records of temperatures at cool chain points				
Health checkup of staffs				
Having emergency backup electric supply facilities				
Having the written record of inspector to check the hygienic status of the premises/sweetmeat shop				
Dress code of workers of sweet meat shop and manufacturing unit				
Record for Training of staff and worker				
Staff facilities (i.e., Toilets, canteen)				

1.5 Check list for mapping of milk value chain

Respondent name:

Address:

Mobile Number (optional):

Thematic areas/questions	Description (Yes/Not/ Partial)
• Milk yield (L/day) i) Native ii) Cross iii) High yielding	
• What is the price of milk (BDT/L)?	
• Where have you sold milk?	
• Do you prepare any milk products? If yes; what types of milk products do you prepare? i. Cream ii. Ghee iii. Yogurt iv. Cheese	
• Which milk products are beneficial for you, especially when you could not sell your raw milk? i. Cream ii. Ghee iii. Yogurt iv. Cheese	
• Where do you sell milk? Have you faced any difficulties in selling milk?	
• Do you sell milk by yourself or sell it to a milkman/Goyala?	
• Do you have any obligation to sell milk to a milkman/Goyala?	
• Where does the milkman/Goyala sell the milk which is collected from a farm? i) local market ii) chilling point iii) sweetmeat shop iv) Tea stall	
• Based on the answer, a map will be drawn for the ending destination of milk in percentage (%) following RRA/ participatory discussion (sitting with dairy groups)	
• Does the milkman face any problems to keep milk safe in quality?	
• What measures have been taken during the transportation of raw milk from the farm to market/chilling point?	
• If you(milkman/Goyala) sell milk in the local market, who is taking the milk?	

	What types of risk exist in the local market to sell safe milk? How the raw milk is adulterate in the local market?	
	Do you give the milk to the chilling point/center? / Who gives raw milk in the chilling Centre?	
	How much milk receive in to the chilling point?	
	What type of precaution is taken by the chilling plant during receiving raw milk so that it is safe milk?	

2.0 Inspection check list of meat value chain

Beef Animal Production

Date:					
Beef Farmers Name:					
Name of the farm (if any)					
Address:					
Mobile Number (optional):					
	Farm registration number				
	Animal number in the farm at present				
	Activity	Yes	Partial	No	Remarks
Infrastructure and their maintenance					
	Farms production site is of a suitable size, location, and construction, and be maintained to reduce the risk of diseases and facilitate the production of healthy animals				
	The layout and the animal facilities size of the farm is proportional to the species and the number of animals in order to breed them in a healthy and stressless manner.				
	Materials used for the internal structure of buildings are durable, prevent build-up of dirt, be easy to clean and maintain and safe for staff The farm structure protects the animals from any health and welfare issues.				
	Feeding facilities design and maintenance is				
	Adequate personal hygiene and sanitary facilities are provided in the farm.				
	The premises have good lighting				
	There is adequate natural or mechanical ventilation				

a. Biosecurity and pest control					
	Adequate personnels and visitors' hygiene protocol is in place. The farmer provides the correct PPEs and make aware of Biosecurity protocol to any person entering in the farm.				
	Adequate vehicle and equipment hygiene and disinfection protocol is in place to avoid spreading disease and pest inside and outside the farm.				
	Adequate procedures are in place to control pests and prevent wild and domestic animals (excluding the work animals as the dogs) from having access to places where the animals are kept.				
	Buildings is kept in good repair and condition to prevent pest access and eliminate potential infestation sites				
	Biosecurity measures for the animals and their facilities. Procedure before accommodating new livestock or new-born animals is undertaken				
b. Facility's cleaning and GHP					
	Maintaining all facilities, equipment... vehicle used in connection with primary production and associated operations...in clean conditions and, where necessary, disinfect them after cleaning in an appropriate manner.				
	Activity	Yes	Partial	No	Remarks
	Farms is provided with appropriate facilities and procedures in place to ensure that any necessary cleaning and maintenance is carried out effectively and to an appropriate degree...				
	Cleaning and disinfection programs is established to ensure the correct hygiene standards are met for the animals and their facilities				
	Provide potable water for cleaning, disinfection procedures. Have reliable water services to allow thorough cleaning				
c. Farm Waste management					
	Has appropriate containers and suitable waste storage area. All wastes are eliminated in a hygienic and environmentally friendly way.				
d. GAHP					
	Ensure good fitness and cleanliness of the animals.				
	Ensure a good protection from the disease to the animals.				
	Record all vaccinations				

	Maintain general animal husbandry practices				
	Good quality and enough feed and water is provided in order to fatten the ungulates and reach the highest weight possible as soon as possible.				
	Management and treatment of sick and injured animals				
	Record all animal specific treatments				
e. Animal identification					
	All the animals should be clearly identifiable using a clear animal Identity system (ears tag, tattoo, microchip or any other kind of identification system) with unique identification numeric or alpha-numeric number				
• Animal sells to					
	➤ Slaughterer				
	➤ Animal Trader				
	➤ Another animal producer				
	➤ Any other (please mention)				
	• Where the animal is taken from the farm (place/distance)				
	• Animal carried by	Truck/Van/Boat/walking/other			
	• Any disease or treatment information asked by the buyer	Yes		No	
	• Animals with specific disease conditions or recent administration of veterinary drugs are not loaded for transport to the market/abattoir.	Yes		No	
	• Any feedback about any problem from buyer	Yes		No	
Source of investment					
	➤ Self				
	➤ Bank Loan				
	➤ Any other (Please specify)				
	➤ Profit/Loss				

Animal Transport

Date:					
Name of the Animal Market:					
Transporters Name:					
Address:					
Licensing/Registration:					
Mobile Number (optional):					
	• Animal collected from whom for transport?				
	• Average number of animals transported per market day				
	• Number of vehicles in possession				
	• Vehicle is owned by businessman or hired?				
Animals carrying					
		➤ From (mention place)			
		➤ To (mention place)			
		➤ Distance (Km)			
		➤ Animals handed over to whom			
		Yes	Partial	No	Remarks
	• Vehicle/driver specialized for animal transport				
	• Soiling and cross-contamination with faecal material is minimised				
	• New hazards are not introduced during transport				
	• Animal identification as to the place of origin is maintained				
consideration is given to avoiding undue stress					
		➤ Avoid overcrowding			
		➤ Given drinking water if necessary			
		➤ Given rest for long distance			
	• animals can be loaded, unloaded and transported easily and with minimal risk of injury;				
	• animals likely to cause injury to one another, are physically separated during transport				
	• use of floor gratings, crates or similar devices limits soiling and cross-contamination with faecal material;				
	• ventilation is adequate; and				
	• cleaning and sanitizing are practiced				
	• Source of investment				

	➤ Self
	➤ Bank Loan
	➤ Any other (Please specify)
	➤ Profit/Loss

Animal Trader in market

Date:		
Name of the Animal Market:		
Name of FBO:		
Address:		
Licensing/Registration:		
Mobile Number (optional):		
	• Source of animal	
	• Average number of animals sold per market day	
	Self-farm	
	Purchased for business	
	• If purchased	
	➤ Purchased from farm	
	➤ Purchased from another trader	
	➤ Purchase through middleman	
	➤ Know the address of the owner	
	➤ Know any disease/treatment information	
	• How the animals are taken to the market	
	➤ Walking	
	➤ Through a vehicle	
	➤ Vehicle is owned by businessman or hired?	
	➤ Distance travelled on an average	
	• How many hours generally animals stay in the market	
	• If animals get sick, are they treated to heal or sold	
	• To whom animals are generally sold	
	➤ Slaughterer	
	➤ Animal Trader	
	➤ Another animal producer	
	➤ Any other (please mention)	
	• Soiling and cross-contamination with faecal material is minimised	

	• Animal identification as to the place of origin is maintained
	• Any health check done before selling
	• Any disease or treatment information asked by the buyer
	• Animals with specific disease conditions or recent administration of veterinary drugs are not loaded for transport to the market/abattoir.
	➤ Avoid overcrowding
	➤ Given feed/drinking water if necessary
	➤ Can rest for long stay
	• Source of investment
	➤ Self
	➤ Bank Loan
	➤ Any other (Please specify)
	➤ Profit/Loss

Traditional roadside slaughter/meat shop

Date:		
Traditional slaughter/meat shopper's name:		
Name of the shop (if any)		
Address:		
Licensing/Registration:		
Mobile Number (optional):		
	• How many workers work in the meat shop	
	• How much (KG) meat sold on average per day	
	• Source of meat: slaughter/purchase meat to sale	
	If purchase meat:	
	➤ where from it comes	
	➤ Distance	
	• Through which transport, it is carried	
	• Meat transported open or covered	
	• Transport vehicle cleaned before/after loading meat/not	
	• If slaughtered:	
	➤ Number of animals slaughtered per day	
	➤ Where from the animal is collected	
	➤ How transported	
	➤ Any health check done	
	➤ How long get rest before slaughter (hour/s)	
	➤ How and where the liquid and solid wastes disposed	

	• Animal slaughter per day				
	• Equipment and premises cleaned before and after days operation				
	• How many hours meat stay in the market in ambient temp.				
	• Meat kept open/ covered for sale				
	• Unsold meat management				
	• Freezing facility available/not				
	• What to do with meat unsuitable for human consumption				
	• Open air/closed room shop				
		Yes	Partial	No	Remarks
Follow good hygienic practice (GHP)					
	➤ Got any hygienic training				
	➤ Cleaning and disinfection				
	➤ Solid disposal facility				
	➤ Liquid disposal facility				
	➤ Supply water available for cleaning				

Formal Slaughterhouse

Date:	
Name of the slaughterhouse	
Name of FBO:	
Address:	
Licensing/Registration:	
Mobile Number:	
• Source of animals (tick please):	
Own farms/ Contract farmers/ Open market/Any other (please mention)	
• Traceability assured/not	
• Product type (Please describe):	
• Marketing channel (Please describe):	
• Source of investment	
➤ Self	
➤ Corporate	
➤ Bank Loan	
➤ Any other (Please specify)	

➤ Profit/Loss				
Activities	Yes	Partial	No	Remarks
PRINCIPLES OF MEAT HYGIENE APPLYING TO ANIMALS PRESENTED FOR SLAUGHTER				
Animals presented for slaughter are sufficiently clean so that they do not compromise hygienic slaughter and dressing.				
The conditions of holding of animals presented for slaughter are minimum cross- contamination with food-borne pathogens				
Slaughter animals are subjected to science- and risk-based ante-mortem inspection, with the competent authority				
Relevant information from primary production where available and results of ante-mortem inspection are utilised in process control.				
PRINCIPLES OF MEAT HYGIENE APPLYING TO ESTABLISHMENTS, FACILITIES AND EQUIPMENT OF SLAUGHTERHOUSES				
Establishment is located, designed and constructed so that contamination of meat is minimised to the greatest extent practicable.				
Facilities and equipment are designed, constructed and maintained so that contamination of meat is minimised to the greatest extent practicable.				
Establishments, facilities and equipment are designed to allow personnel to carry out their activities in a hygienic manner.				
Facilities and equipment that are in direct contact with edible parts of animals and meat, are designed and constructed so that they can be effectively cleaned and monitored for their hygiene status.				
Water is potable except where water of a different standard can be used without leading to contamination of meat.				

DESIGN AND CONSTRUCTION OF LAIRAGES				
animals can be held without overcrowding or injury, and are not exposed to climatic stress;				
there are appropriate layout and facilities for cleaning and/or drying of animals;				
ante-mortem inspection is facilitated;				
there is an adequate supply of clean water for drinking and cleaning, and facilities are provided for feeding where necessary;				
there is a physical separation between lairages and areas of an abattoir where edible material may be present;				
“suspect” animals can be segregated and inspected in separate areas				

there is an adjacent area with adequate facilities for cleaning and sanitation of transport vehicles and crates, unless there are facilities within close distance that are approved by the competent authority.				
Special facilities to handle condemned animals.				
DESIGN AND CONSTRUCTION OF SLAUGHTER AREAS				
Stunning and bleeding areas are separated from dressing areas				
Special facilities to slaughter and dress “suspect” or injured animals.				
DESIGN AND CONSTRUCTION OF AREAS WHERE BODIES OF ANIMALS ARE DRESSED OR MEAT MAY OTHERWISE BE PRESENT				
All areas and facilities where bodies of animals are dressed or meat may be present are designed and constructed so that they facilitate GHP, and contamination of meat is minimised to the greatest extent practicable				
DESIGN AND CONSTRUCTION OF EQUIPMENT WHERE BODIES OF ANIMALS ARE DRESSED OR MEAT MAY BE PRESENT				
All equipment used facilitate good hygienic practices (GHP)				
Contamination is minimised				
Meat is not allowed to contact the floor and walls, or fixed structures				
designed to effectively clean and sanitise the particular equipment;				
WATER SUPPLY				
Adequate facilities are provided for monitoring and maintaining potability, storage, temperature control, distribution of water and for the disposal of waste water.				
FACILITIES AND EQUIPMENT FOR PERSONAL HYGIENE				
changing rooms, showers, flush toilets, hand-washing and hand-drying facilities in the appropriate locations, and separate areas for eating;				
protective clothing that can be effectively cleaned and minimises accumulation of contaminants.				
supply water at an appropriate temperature, and are fitted with dispensers for liquid soap or other hand cleansing agents;				
PROCESS CONTROL SYSTEMS				
A documented process control system to describe the meat hygiene activities applied (including any sampling procedures), performance objectives or performance criteria (if set), verification activities, and corrective and preventative actions.				

HACCP				
Microbiological testing for verification of HACCP systems, e.g. for verification of critical limits				
REGULATORY SYSTEM				
Regulatory systems (e.g. recall, traceback, product tracing, etc., as appropriate) and requirements, e.g. training, knowledge, skills and ability of personnel				
Undertake specified meat hygiene controls e.g. official sampling programmes, those aspects of ante and post-mortem activities specified by the competent authority, or official certification.				
Carry out enforcement actions as necessary.				
HYGIENE REQUIREMENTS FOR SLAUGHTER AND DRESSING				
Only live animals intended for slaughter are brought into the abattoir, with the exception of animals that have undergone emergency slaughter outside the slaughterhouse and have appropriate veterinary documentation.				
An animal is allowed to be slaughtered or dressed only when a competent person is available to undertake ante- and post-mortem inspection.				
POST-MORTEM INSPECTION				
Post-mortem inspection occurs as soon as is practicable after slaughter of animals. Inspection takes into account all relevant information from the level of primary production and ante-mortem inspection.				
Carcasses and other relevant parts condemned by the competent person undertaking post-mortem inspection, as unsafe or unsuitable for human consumption are identified as appropriate and handled in a manner that does not result in cross-contamination of meat from other carcasses and relevant parts.				
The reason for condemnation is recorded, and confirmatory laboratory tests are taken when deemed necessary.				
HYGIENE REQUIREMENTS FOR PROCESS CONTROL AFTER POST-MORTEM INSPECTION				
Meat passed as safe and suitable for human consumption are:				
removed without delay from the dressing area;				
handled, stored and transported in a manner that will protect it from contamination and deterioration;				
held under conditions that reduce its temperature and/or water activity as quickly as possible				
held at temperatures that achieve safety and suitability objectives.				

Sale of Meat Retail Outlets

Date:					
Name of the chain shop					
Name of FBO:					
Address:					
Licensing/Registration:					
Mobile Number (optional):					
Source of animals (tick please):					
Own farms/ Contract farmers/ Open market/Any other (please mention)					
Traceability assured/not					
Product type (Please describe):					
Marketing channel (Please describe):					
Source of investment					
➤ Self					
➤ Corporate					
➤ Bank Loan					
➤ Any other (Please specify)					
➤ Profit/Loss					
	Structure - Premises and equipment	Yes	Partial	No	Remarks
	The production site is of a suitable size, location and construction, and maintained to reduce the risk of contamination and facilitate the production of safe and hygienic finished product				
	The layout of the food premises permit good food hygiene practices, including protection against cross contamination, pest access and infestation				
	Materials used for the internal structure of buildings are durable, prevent build up of dirt, easy to clean and maintain and safe for staff				
	Working Surfaces in food contact area are made of washable corrosion resistant and non-toxic material and maintained in a sound condition, durable and allow for easy cleaning and disinfection				
	Provide Potable water for cleaning, disinfection and handwashing				
	<i>Adequate personal hygiene and sanitary facilities are provided in the food premises</i>				
	<i>Adequate natural or artificial light provided</i>				
	<i>There are adequate natural or mechanical ventilation</i>				
	Food are maintained at correct temperatures				
	<i>The premise have reliable services to ...support the cold chain</i>				

	<i>Where necessary equipment are moveable or capable of being disassembled to allow for maintenance, cleaning, disinfection, monitoring and inspection for pests</i>				
	Every vessel containing food or ingredient are covered all the time with a tight-fitting cover, lid or gauze in order to protect the food				
	All wrappers, containers and packaging material are of food grade material which will not contaminate food.				
	machinery [and equipment] comply with sanitary design standards				
	<u>Systems</u>				
	Sanitation				
	established cleaning and disinfection programs to ensure the correct hygiene standards are met to reduce the risk of a food borne outbreak				
	Proper cleaning and disinfection of food preparation areas				
	Correct cleaning and disinfection (where necessary) of equipment, machinery and utensils used in food preparation and sale				
	Pest control				
	Adequate procedures are in place to control pests				
	the layout of the food premises permit good food hygiene practices, including protection against cross contamination, pest access and infestation				
	Purchase/transport/storage/sale				
	Appropriate food safety measures are applied during handling, storage and transportation				
	Transport of food are carried out in such a way to prevent any contamination of the food, maintain its integrity and at appropriate temperatures				
	Food is protected from contamination during all stages of purchase, transport, storage and sale				
	food is protected from hazards related to contamination from air, soil, water, feed, fertilizers, pesticides, biocides, veterinary drugs, faecal contamination and cleaning and disinfection agents				
	Conveyances and any form of transport protect the food from any contamination, including dust and fumes				
	Containers and conveyances are kept clean and are able to be effectively cleaned and where necessary disinfected between batches				
	Food items are physically separated from non-food items during transport				
	Ready to eat foods and raw foods transported in the same vehicle are adequately separated to avoid cross contamination				
	Temperature throughout the food chain is monitored and verified to ensure that the food is safe and being maintained at the correct temperatures				
	Raw materials or ingredients are inspected and sorted on purchase or delivery				

	Traceability				
	Have effective recall procedures to stop the delivery, sale and consumption of suspect products				
	An appropriate product identification system is implemented, connected to the animal identification system used by slaughter houses and farms				
	Personnel				
	Food Handlers maintain a high degree of personal cleanliness				
	Food handlers wear suitable clean and protective clothing while handling food				
	Food Handlers refrain from any behaviour that may risk contamination of the food				
	Food handlers suffering from any disease that can be transmitted through food are prohibited from handling food until clear of the disease				
	Food handlers with cuts, sores, wounds or boils cover the relevant area with suitable water proof dressings or, if this is not possible, refrain from handling food.				
	Food handlers wash and disinfect their hands , as appropriate				
	Food handlers are medically fit to work and provide a medical fitness certificate				
	Training				
	All food handlers are trained as applicable to their assigned tasks and have the necessary skills to enable them to handle food hygienically				
	Those who handle strong cleaning chemicals or other potentially hazardous chemicals are instructed in safe handling techniques				
	All employees are provided with training in an understandable language				
	Casual workers or temporarily employed staff also receive relevant training on food hygiene				

ANNEX-II: MILK AND MEAT WORKSHOP

Milk and Meat Value Chain in Bangladesh

2-3 October 2023

Organized by

UNIDO and LDDP, DLS

Proceedings of the workshop on ‘Milk and Meat Value Chain’ organized by UNIDO-LDDP Project on October 02-03, 2023 in the hotel Pan Pacific Sonargaon, Dhaka

A two-day long workshop on ‘Milk and Meat Value-Chain’ was organized by United Nations Industrial Development Organization (UNIDO) and Livestock and Dairy Development Project (LDDP) of Department of Livestock Services (DLS) in Hotel Pan Pacific Sonargaon, Dhaka on 2nd and 3rd October 2023. The 1st day of the workshop was discussed on milk value chain and 2nd day discussed on meat value chain. About 35 participants were attended, representing public and private sectors including academia, researchers, extension personnel, scientist and professionals. The workshop was inaugurated and opened by Director General of Department of Livestock Services, Dr. Md. Emdadul Haque Talukder and chaired by Dr. Ainul Haque, National Project Coordinator of UNIDO-LDDP Project. Mr. Anwer Hossain, Joint Secretary, Ministry of Fisheries and Livestock attended as the special guest.

Activities of 1st day

Milk Value Chains link the actors and activities involved in delivering milk and milk products to the ultimate consumer; with each activity the product increases in value. A milk value chain can involve production, transport, processing, packaging, storage and marketing. Milk value chain analysis refers to different stages where the dairy products pass from farm to consumer.

The foremost objective of the milk value chain workshop was;

- a) To mapping the different stages of milk value chain;
- b) To have a look into expected and existing measures in place for safe milk production at different actors to identify the gaps; and
- c) To focus on areas of resources investment needed by different stakeholders to improve food safety compliance.

The 1st presentation was delivered by S M Rajiur Rahman, National Livestock and Dairy Expert, on existing milk value chain. His major discussant points were: i) Food safety hazards in milk, ii) Mapping of milk value chain in Bangladesh and level of food safety risk, iii) Good Practice (GAHP) in entire value chain. 2nd presentation was presented by Michael James Barry, International Expert, UNIDO on compliance and challenges within the Milk Value Chain infrastructure in

Bangladesh. Business modeling with responsibility and accountability of milk value chain was discussed in his speech. After lunch Michael shared a success story of a dairy industry, Carbery Group of Ireland.

The 1st day group works on production, regulation and compliance where participants was divided in to five groups on a) Dairy farm facility; b) Milk transporter/ Goyala; c) Milk Chilling plant; d) Sweetmeat shop; and, e) Mapping of milk value chain.

Recommendations from the group discussions were;

- Identify the major Milk Value Chain actors;
- Commercial dairy farms should be under registration;
- A distinct wing or desk should create to look after the dairy sector;
- Established a regulatory body in DLS to address food safety and other legal issues;
- Established dairy diseases control program to reduce dairy cattle mortality and safe dairy products;
- Several SOPs should be developed, such as, GFP, Farm biosecurity, GMP; Food safety guidelines, etc;
- Climate smart animal house focusing the biological system engineering should be developed;
- Forage based (Low cost) feeding system for dairy should be developed from available source;
- Policy, rules and regulations should be upgraded according to the demand;
- Backward and Forward linkage should be developed focusing the food safety issue for dairy sector;
- Established a dairy data base and upgrade frequently;
- Collaborate with DAE to give importance as agricultural byproducts are used as dairy feeds;
- Established chilling center in Chare Area;
- Create Laboratory testing facilities for sweetmeat producers;
- SOP for sweetmeat production; and valueadded popular milk products, i.e., yogurt, ghee, cheese, fermented milk.
- Support the actors providing continues training on different value chain.

The 1st day of the workshop was closed by giving the summary exploration of the entire day's

activities.

Activities of 2nd day

In the second day, the work shop was on Meat Value Chain. An 'Overview of Meat Value Chain in Bangladesh' was presented through power point presentation by Dr. Md. Mehedi Hossain, National Inspection Expert of UNIDO. In his presentation, he compared the overall existing food safety practices in Bangladesh with the Codex Alimentarius Commission standard. In his presentation, he demonstrated some pictorial evidences of practices in Bangladesh, which he captured while visiting different actors of the value chain.

Through his presentation, he showed strengths and weakness of the practices. He showed that there are some satisfactory progresses in beef farming practices, animal transports in some cases. In his deliberation, he mentioned that, there are a few slaughter houses and chain shops, who maintain international standards.

In general, there are considerable gaps in practices, which was presented and discussed.

Major gaps, he identified were:

- Operational guidelines for value chain actors
- Capacity building through training
- Develop recording systems in field level
- Traceability at each level
- Establish specific regulatory body in DLS
- Assure dedicated skilled regulatory workforce
- Regular inspection, supervision, monitoring
- Updating policies and regulation
- Unorganized slaughter facilities and practices
- Enforcement of animal slaughter act and rule
- Meat selling with almost no hygiene of safety practices, etc.
- Strengthen collaboration with other regulators especially with local government organizations
- Create environment for private sector to invest in slaughter, value addition, marketing etc.
- Initiate PPP, Infrastructure, logistics etc. in collaboration with other regulators and private sector.

He also described the value chain mapping as he found during his field visit.

Participants mostly agreed with his findings. There was a good discussion about operationalization of the slaughter houses built or under construction by different local government organizations which are not in operation. It was discussed in detail. Some mentioned that, the site selection of the slaughter houses may not be suitable for the butchers to bring their animals there. There were also questions about, structural efficiency of the slaughter houses, motivational activities to bring butchers to the slaughter house and most of all, technical capability of the establishment and commitment of enforcement. All agreed that, bringing road-side butchers to the slaughter house, who generally buy mostly one cattle, slaughter either beside his shop or in a nearby informal slaughter place, is a big challenge due both to cost and time factor.

In general, animal slaughter takes place in a very unhygienic situation without any pre- or post mortem inspection, which is a big public health challenge.

Bengal Meat processing Industries Ltd. representative Mr. Sayadyl Haq Bhuyan mentioned that they have an ISO certified slaughter facility covering the whole segments of the value chain from animal farming to marketing outlets. They also buy cattle from open market, whenever needed. They have outlets in 15 Major districts including capital city Dhaka. They also export meat to some countries.

Chain shop SWAPNO representative, Mr. A. K. Azad mentioned that they maintain cool chain and proper cleaning and hygiene practices once the meat product comes to their system. But up to animal rearing and slaughter they have no control. They have more than 350 outlets, majority in Dhaka.

Considering the challenges of bringing animals to formal slaughter house by the individual butchers, in his presentation, International Expert of UNIDO, Michael James Berry proposed a new modality. He proposed that, the slaughter house may bring animals to the slaughter house through their own initiative either directly from contract farmers or through animal traders, slaughter the animals and sell whole or quarter carcasses to the butchers. The price of the carcass may be based on carcass quality assessed through a specific formula. In this modality, the butcher has not to go to the cattle market or face the Hassle of slaughtering animals in undesirable places and manage wastes, for all of which, need costs. In this case, only a suitable carcass transfer facility may make the whole process much more hygienic. To make this system effective, road-side slaughter should strictly be restricted through enforcement of law.

Participants showed interest in this modality. But they said, to implement such a quite new idea, it needs thorough policy level dialogue and motivation.

Participants were engaged in a group work, where they were asked to exercise a time frame (short, mid and long term) to enforce food safety regulation and implementation procedure level through a structured questionnaire. They were also asked to identify what sort of support may be needed to implement the procedures. The group works were presented and discussed in the full forum.

The groups agreed that to enforce the food safety regulatory activities, formulation and distribution of food safety guidelines to the actors in different stages of the value chain, training

of actors, implementation of traceability and zoonotic disease control program, compliance verification by skilled inspectors, coordination with other regulators, development of a dedicated food safety regulatory body in DLS, etc. are to be conducted by the regulatory bodies in some agreed timeframe. The groups worked out timeframes for different activities.

Similarly in compliance level, registration and licensing, improvement of biosecurity and hygiene, animal and product traceability, recording of vaccination, medication, disease, feeding, staff training, etc. are to be conducted by actors of different segments of the meat value in some given time frame. The groups worked out timeframes for different activities.

The groups suggested, to execute such regulatory activities, as well as field level implementation activities, the groups suggested some supportive requirements, like resources for developing, printing, distributing biosafety guidelines, funds for conducting stakeholder and regulator training, motivation and awareness program for policy, implementation and consumer level, increasing number of dedicated inspectors, involving laboratories for hazard identification, infrastructure and logistic support were identified.

In execute food safety practices in implementation level, guide books, training and providing record books/formats are to be assured. Registration/licensing issuing/renewing are to be followed up. Stakeholders awareness, regular inspection, follow up, sampling, testing and corrective measures are to be conducted to uphold food safety compliances.

Recommendations meat value chain workshop

A. Food safety

- Ensure chiller room at slaughterhouse
- Prime and retail cut with packing, storage and Chiller van for transport
- Appoint meat quality inspection officer
- Develop SOPs/guideline to maintain HACCP (Hazard Analysis Critical Control Points)
- SOP/guidelines for live animal transport; restriction of sick animals movement;
- Dedicated vehicles designed for live animal transport;

B. Beef farming

- Select Beef breed for commercial beef farmer
- Beef farm should be under registration
- Regulatory support for animal identification and traceability
- Develop SOPs/ guideline for Farm registration, Farm biosecurity, GFP,etc;
- Develop animal diseases control program/strategies;

- Ensure endemic diseases vaccines for cattle to reduce the zoonotic diseases and confirm safe meat;

C. Slaughter house

- Develop guideline for smart slaughter house operation considering HACCP
- Develop slaughter house with necessary facilities and equipment's;
- Training for the operators of the slaughter for safe food processing;
- Develop guideline for Anti and postmortem inspection;
- Ensure cool van for meat transport to the retail outlets.

D. Meat Shop

- Meat shops (meat processor) should be in under regulations;
- Develop SOPs/guideline for meat processors, meat inspector;
- Chilling facilities for meat shop
- Arrange Training for meat processor
- Regular inspection in slaughter house and meat shops.

The last presentation of the workshop was by Michael James Barry, International Expert, UNIDO, on investment plan on milk and meat industry. A standard meat industry with backward and forward linkage was recommended from the participant's to ensure safe food of animal origin which will be open the window of global export market.

The workshop was closed by giving thanks to all participants from Dr. Ainul Haque, National Project Coordinator.

ANNEX III: PRESENTATION “AN OVERVIEW OF MILK AND MEAT VALUE CHAIN IN BANGLADESH”

Workshop on Milk value Chain

S. M. Rajiur Rahman, Ph.D
National Livestock and Dairy Expert

Meghna Hall, Pan Pacific Sonargaon, Dhaka
02 October 2023

United Nations Industrial Development Organization (UNIDO)

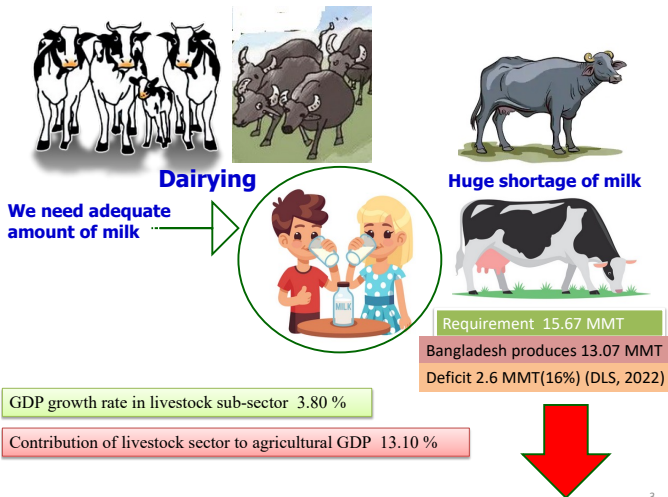
Introduction

Milk value chain in Bangladesh is very complex that consist with several actors/stakeholders. All of those actors interrelated to each other's.

The value chains starts from milk production and passes through transport, processing, marketing, and ends with household/institutional consumption.

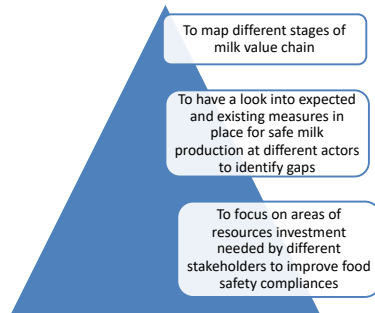
Occasionally addressed safe milk and milk products for human consumption.

2



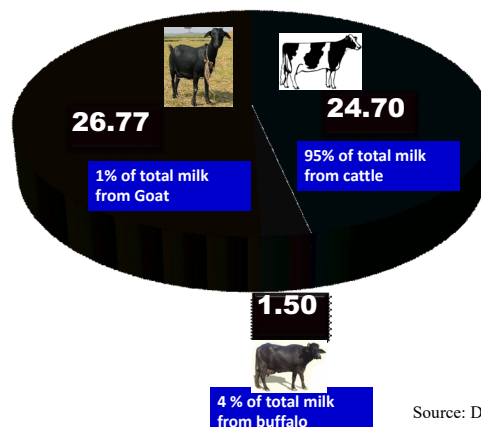
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Objectives of the session



4

Present population and contribution of dairy animals in Bangladesh (Million)



Source: DLS 2022

5

Food safety hazards in milk

The quality of milk can be affected by such factors:

- Pathogen contamination and growth
- Chemical additives
- Environmental pollution and
- Nutrient degradation

Hazards	
Microbiological hazards	<i>Salmonella</i> , <i>Escherichia coli</i> O157:H7, <i>Listeria monocytogenes</i> , <i>Staphylococcus aureus</i> , <i>Yersinia enterocolitica</i> , <i>Bacillus cereus</i> , <i>Clostridium botulinum</i> , <i>Mycobacterium bovis</i> , <i>Brucella abortus</i> and <i>Brucella melitensis</i>
Chemical hazards	Detergents, teat disinfectants, dairy sanitizers, anti-parasitics, antibiotics residue , heavy metal, herbicides, pesticides and fungicides.
Physical hazards	Foreign objects, insects, hair, nails, plastics, metal and fabric

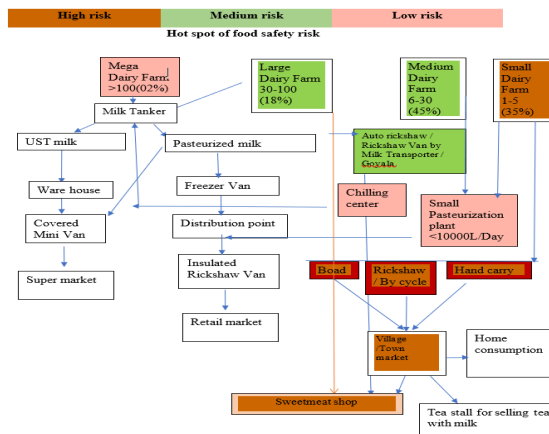
6



Food safety is vital for achieving many of the SDGs, including

- ❑ Ending poverty and hunger : SDG GOAL 1 and GOAL 2
- ❑ Promoting health and well being: SDG GOAL 3
- ❑ Public – private partnerships in the countries SDG GOAL 17
- ❑ Industry, Innovation and Infrastructure SDG GOAL 9

Mapping of milk value chain in Bangladesh and level of food safety risk



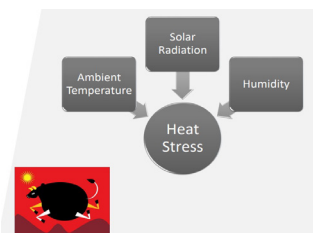
Good Practice (GAHP) entire value chain could eliminate food safety-derived challenges.



Steps to be considered to mitigate food safety gap in dairy Farm facilities

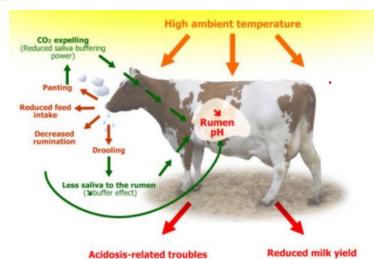
Expected as per international standards , i.e. WOA, CAC	Existing in dairy Farm facilities
Farm registration	Continuing by the DLS, Gradually improving the situation. Medium and marginal farm having registration from DLS but family farms are ignoring those practices
Biosecurity measures reduce the likelihood of the introduction of hazards	Insufficient infrastructure i.e., Foot bath facility, gate, fencing
Pest control programs	Farmers are not aware of pest control programs
Keeping a record of animal movements on and off the farm is not practiced; record of treatment, Good Hygiene Practices(GHP)	Few farmers take the initiatives
Soil and water test of pasture fields	Soil and water test of pasture fields is not practiced

10



How to reduce heat stress

- Provide a cooler environment
- Cool the cow



COOL THE COW



12

Expected as per international standards , i.e. WOA, CAC	Existing in dairy Farm facilities
Control and monitoring of zoonotic diseases	Irregular initiatives, specially during disease outbreak
Record for sick animals treated by Veterinarian or any para professional;	Record for sick animals treated by Veterinarian is maintained sometimes but when it is treated by another paraprofessional are not maintained.
follow Isolation and quarantine area; disposal pit	Maintained in the large and medium scale farm but not able to maintain in small farm
A written program to control possible heat stress (THI card in the shed)	Few farms followed auto showering, and few shower 4-5 times in day during hot summer days to mitigate heat stress.
Records keeping for purchasing of feed/feed ingredients	Records are not kept for purchasing of feed/feed ingredients and used in the farms
Animal identification	Large farms use animal marking for individual animal identification (i.e., ears tag, tattoo, microchip or any other kind of identification system) but most of the medium and small farm are not followed; means no successful practice is visible.
Welfare of Farm workers (i.e., Training, health checkup, dress code, working hour) ; Animal welfare	Need to be considered

13

Steps to be considered to mitigate food safety gap in sweetmeat shop facilities

Expected as per international standards , i.e., CAC, HACCP	Existing in sweetmeat shop facilities
Legal permission from competent authorities.	Trade license, Sanitary license, Fair license would be seen but not any linkage with Department of Livestock Services.
Traceability record	Traceability record (milk/products comes in and goes out from the facilities, coding of the product) not followed in all facilities, however some renowned sweetmeat shop practiced for their few products. Most of the sweetmeat shop ignore the traceability record.
Hygiene and sanitation measures for cleaning both manufacturing and outlets areas.	Need to maintained hygiene and sanitation measures for cleaning both manufacturing and outlets areas.
Records keeping for water test for quality /safety	Need to be followed
Storage facilities to keep products in good condition	Having storage facilities to keep products in good condition
Good plan about rejected products segregation and disposal facilities of spoil milk / milk products	Harmonize good plan need to be considered

14

Expected as per international standards , i.e., CAC, HACCP	Existing in sweetmeat shop facilities
Health checkup of staffs	Need to be considered, where applicable
Laboratory tests of value added products; Record keeping of tested result	Products for laboratory tests i.e., microbiological and chemical test and record keeping need to be ensured.
Standard precautions before receiving milk by the sweetmeat shop	Maintained standard precautions before receiving milk by the sweetmeat shop
Cool chain facilities, record of temperatures	Maintained cool chain facilities and record of temperatures at cool chain points
Emergency backup electric supply facilities	Need to be considered, where applicable
Written record of inspector to check the hygienic status of the premises/sweetmeat shop	Need to be followed
Dress code of staffs of sweet meat shop and manufacturing unit	Need to be considered
Training facilities and record keeping for Training of staffs and workers	Need to be adopted

15

Steps to be considered to mitigate food safety gap in milk transporter/Goyala

Expected as per international standards , i.e., CAC, HACCP	Existing milk transporter/Goyala
Registration with DLS/ Name in the list of DLS	No visible practice
An up-to-date listing of milk suppliers and their registration numbers needs to keep	Need to be considered
Have a system in place for the detection of adulterants an antibiotic	Need to be adopt, where applicable
Declaration about preservatives while carrying milk and kept the record.	Need to be adopt, where applicable
Using stainless still container for carrying milk	Almost no regular initiative to all
Recording for amount of milk purchase, milk selling and about spoiled milk	Need to be ensured
Recording temperature of milk at collection	Need to be adopt, where applicable
Hygiene and sanitation measure for milk transporter /Goyala	Need to be improved
Washing facilities with clean water (cleaning regime exists/transport and others)	Limited practice, need to be improved.

16

Expected as per international standards , i.e., CAC, HACCP	Existing milk transporter/Goyala
Maintaining dress code during milking and transport; Health checkup of milk collector	Need to be considered
Maintain cool chain ; Observe and record the information on the temperature of milk during storage, before and after processing	Need to be improved
Cleaning and disinfectant of premises	Need to be ensured
Having training certificate for cow milking and farm management i.e., providing feed/water	Need to be adopt, where applicable
Record milk temperature at time of delivery	Need to be adopt, where applicable
Maintain standard required time for bringing raw milk from the farm house to the market/chilling point.	Need to be ensured

17

Steps to be considered to mitigate food safety gap in milk chilling center

Expected as per international standards , i.e., CAC, HACCP	Existing milk chilling center
Legal permission	Need to linkage with DLS
Keeping records of previous inspections from competent authorities	Need to be ensured
Traceability record (milk comes in and goes out from the facilities)	Need to be ensured
Supply of potable water (supported by testing documentation)	Need to be confirmed
Washing facilities (cleaning regime exists)	Need to be confirmed
Records of temperature of milk at accepted to facility and when shipped from facility	Need to be confirmed
Equipment validation (Service & maintenance, validation, third party audits etc.)	Should be adopted
Check whether the gate valve, discharge motor, whip pipe is clean	Need to be ensured
Checking of condition of milk on arrival (Temperature, foreign matter, smell, color, Test results, test frequency)	Should be adopted
Keeping records of treated wastewater that correctly done (Having ETP facility)	Need to be adopted, if applicable

18

Expected as per international standards , i.e., CAC, HACCP	Existing milk chilling center
Testing record of milk for Farm Culling Tank (FCT) (Fat, CLR, Sugar, Oil, Soda etc.)	Need to adopt
Checking whether SOP of Cleaning in Place (CIP) is being followed	Need to be considered
Have records of where rejected milk is consigned	Need to be considered
Health checkup of staffs	Need to be considered
Having the written record of inspector to check the hygienic status of the premises.	Need to adopt
Having dress code of workers/staffs	Need to adopt
Plan for staff development initiatives exist	Need to be considered
Training records exist for staff	Need to be considered

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Recommendation

Why should we follow Good Animal Husbandry Practice (GAHP), in the farm

Good Animal Husbandry Practice (GAHP), could eliminate food safety-derived challenges.

১)খাদ্য নিরাপত্তা ও মান নিশ্চিত করতে/To ensure food safety and quality

এটি খামারের উৎপাদিত পণ্যের ভেত, জৈবিক ও রাসায়নিক ঝুঁকি কমাতে সাহায্য করে, যা মানব স্বাস্থ্যের জন্য ক্ষতি হতে পারে।

২)প্রাণী কল্যাণ রক্ষা ও উন্নীত করা /To protect and promote the welfare of animals

এটি প্রাণী খামারে প্রাণীদের খাদ্য প্রদান,স্বাস্থ্যসেবা, চিকিৎসা ও রোগ প্রতিরোধের নিরাপদ মানদণ্ড প্রকাশ করে এবং প্রাণীদের স্বাধীনতার পাশাপাশি তাদের প্রতি নিষ্ঠুরতা,দুর্ব্যবহার বা অবহেলা না করার নিশ্চয়তা প্রদান করে।

৩) প্রাণী খামার শ্রমিকদের স্বাস্থ্য ও নিরাপত্তা উন্নত করা/To promote health and safety of farm workers

এটি খামারে একটি নিরাপদ এবং স্বাস্থ্যকর কাজের অবস্থা প্রদান করে সম্ভাব্য বিপদ চিহ্নিত করে এবং ঝুঁকি ত্রাস করে।

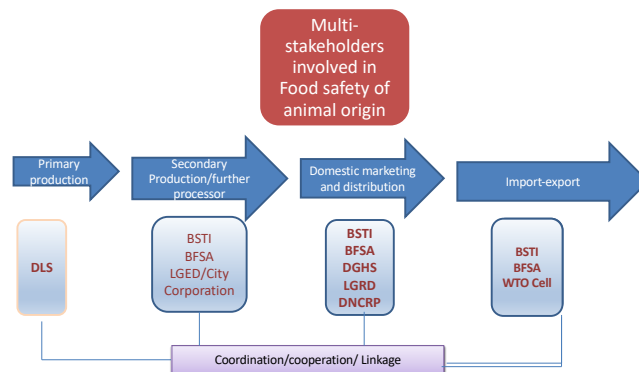
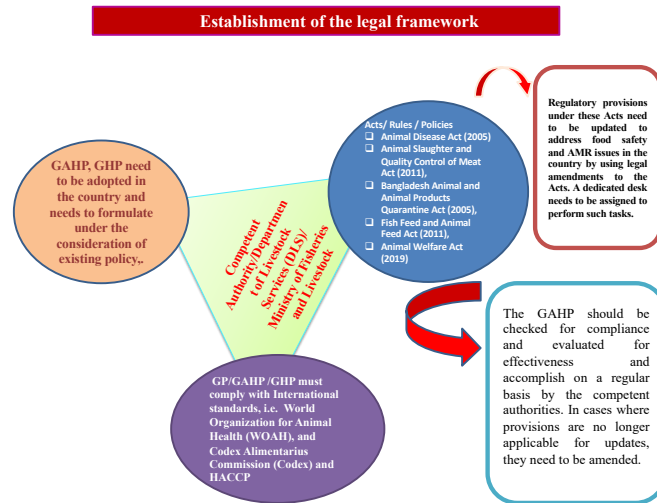
৪)পরিবেশ ব্যবস্থাপনায় সহায়তা করা/To support environmental management

এটি পরিবেশের বিরূপ প্রভাব কমাতে সহায়তা করে যেমন ক্ষতিকর গ্রিন হাউস গ্যাস নির্গমন রোধ করা ; মিথেন, কার্বন-ডাই-অক্সাইড এবং অন্যান্য গ্রীন হাউজ গ্যাস নিঃসরণ কমানো, ভূমি ও পানি দূষণ রোধ করা।

20

Establishment of the legal framework for safe milk production in Bangladesh



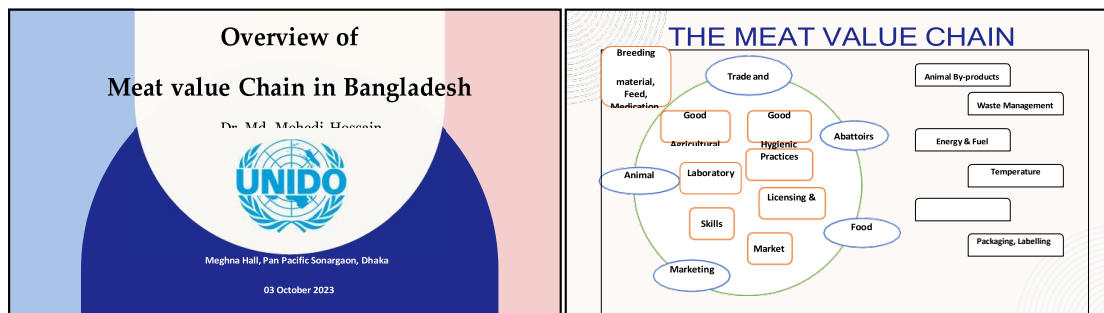


Group work

- Four groups
- 1) What is the timeframe for different activities?
 - 2) What types of resource/support needed to implement the activities?
- Group 1: Dairy farm facility
 - Group 2: Milk transporter/Goyala
 - Group 3: Milk Chilling plant
 - Group 4: Sweetmeat shop
- Working paper will be provided to all groups.



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INTRODUCTION		2
To meet the demand of a huge human population (around 170 million), considerable amount of meat is produced in Bangladesh		
The value chains starts from animal production and passes through transport, live animal marketing, slaughtering/processing, meat marketing/selling and ends with household/institutional consumption.		
Safety and quality issues of meat for human consumption is rarely addressed		

FOOD SAFETY HAZARDS IN GENERAL						5
Parasites	Bacteria/Fungus	Mycotoxins and other	Heavy Metals	Residues	Pesticides	
		Toxins				
Ascariasis	Anthrax	Aflatoxin	Arsenic	Antimicrobial	Carbamate	
	Brucellosis				Pesticides	
Cysticercosis	Botulism	Cyanide	Cadmium	Anthelmintic	Organophosphat	
	Campylobacteriosis				e Pesticides	
Taeniasis	E Coli	Nitrate	Chromium	Malachite		
	Leptospirosis		m	Green		
Fasciolosis Toxoplasma Giardia	Listeriosis		Copper	Histamin		
	Salmonella		Lead			
	Shigella		Mercury			
	Staphylococcus					
	Tuberculosis					
	Pseudomonas					

1

SESSION OBJECTIVE

- ☐ To map different stages of meat value chain
- ☐ To understand the management practices in place
- ☐ To have a look into expected and existing measures in place for safe meat production at different stages to identify gaps
- ☐ To focus on areas of investment needed by different stakeholders to improve food safety compliances

6

DIFFERENT STEPS OF VALUE CHAIN NEEDS ATTENTION

- PRODUCTION
- TRADE & TRANSPORT

PRIMARY PRODUCTION: STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
PRINCIPLES OF MEAT HYGIENE APPLYING TO PRIMARY PRODUCTION	
• Farm biosecurity to reduce the likelihood of introduction of hazards and appropriately contributes to meat being safe	Gradually improving, specially in organized farms. Insufficient structured approach to train
• System to collect, collate and make available, information on hazards and conditions that may be present in animal populations and that may affect the safety of meat.	Passive information collected through Upazila veterinary hospitals. Dedicated food safety approach is limited
• Control and monitoring of zoonotic agents in animal populations and the environment	Limited regular initiative except the event of major outbreaks

PRIMARY PRODUCTION: STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
HYGIENE OF SLAUGHTER ANIMALS	
primary production so that meat hygiene requirements may be	
• Should have steps to prevent the introduction of new zoonotic agents;	Limited approach
• Animals having presence of specific disease conditions	Such systematic approach is absent

Such systematic approach is absent

PRIMARY PRODUCTION: STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
PRINCIPLES OF MEAT HYGIENE APPLYING TO PRIMARY PRODUCTION	
• Good hygienic practice (GHP), records of treatments, vaccination, feed and feed ingredients and relevant environmental factors.	Very limited structured approach. A few farmers do something on personal initiative
• Animal identification practices to allow trace-back to the place of origin to the extent practicable, to allow regulatory investigation where necessary.	Almost no successful event visible

PRIMARY PRODUCTION: STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
HYGIENE OF SLAUGHTER ANIMALS	
primary production so that meat hygiene requirements may be	
• Should have steps to prevent the introduction of new zoonotic agents;	Limited approach
• Animals having presence of specific disease conditions	Such systematic approach is absent

Limited initiative. Need systematic approach and farmers training

Recorded to a considerable level

Limited initiative.

PRIMARY PRODUCTION: STEPS TO BE CONSIDERED ⁹	
EXPECTED AS PER CAC	EXISTING
HYGIENE OF SLAUGHTER ANIMALS	
Primary producers should record relevant information to the extent possible on the health status of animals	
Systems should be in place for return from the abattoir to the primary producer, of information on the safety and suitability of slaughter animals and meat, in order to improve the hygiene on the farm	

Very limited information available
Such systematic approach

PRIMARY PRODUCTION: STEPS TO BE CONSIDERED ¹²	
EXPECTED AS PER CAC	EXISTING
HYGIENE OF FEED AND FEED INGREDIENTS	
Animals should not be given feed and feed ingredients that:	
- are likely to introduce zoonotic agents (including transmissible spongiform encephalopathies - TSEs) to the slaughter population; - contain chemical substances, (e.g. veterinary drugs,	Considerable level Legal binding, Systematic

PRIMARY PRODUCTION: STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
HYGIENE OF THE PRIMARY PRODUCTION ENVIRONMENT	
Primary production of animals should not be undertaken in areas where the presence of hazards in the environment could lead to an unacceptable level of such hazards in meat. The competent authority should design and administer surveillance programmes appropriate to the circumstances. Cleaning and sanitising is readily achieved Licensing/registration of transporters of live animals to assure welfare	Environmental hazard analysis with an objective to safe animal farming is not in place To be arranged

Also that:

EXISTING

Considered in some places
not everywhere

Use general consensus.
Comfort materials used.

Needs training

Need legal intervention

PRIMARY PRODUCTION: STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
HYGIENE OF THE PRIMARY PRODUCTION ENVIRONMENT	
Systems for active processing and/or disposal of dead animals and waste should not constitute a possible source of food-borne hazards to human and animal health; Chemical hazards required for technological reasons are stored/disposed in a manner so that they do not contaminate the environment or feed and thereby	To be taken care of Need training and awareness
TRADING	
EXPECTED AS PER CAC	EXISTING
TRADING AND TRANSPORT OF SLAUGHTER ANIMALS	
Slaughter animals require transport facilities to the abattoir that ensure that: Soiling and crowding are minimised; New hazards are	

ANIMAL SLAUGHTER: STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
PRINCIPLES OF MEAT HYGIENE APPLYING TO ANIMALS PRESENTED FOR SLAUGHTER	
Animals presented for slaughter should be sufficiently clean so that they do not compromise hygienic Slaughter animals should be subjected to science- and risk-based ante-mortem inspection, with the competent authority Relevant information from primary production (where available and results of ante-mortem inspection should	Generally considered Generally ignored Generally not practiced

ANIMAL SLAUGHTER: STEPS TO BE CONSIDERED	
3	
EXPECTED AS PER CAC	EXISTING
PRINCIPLES OF MEAT HYGIENE APPLYING TO ESTABLISHMENTS, FACILITIES AND EQUIPMENT OF SLAUGHTERHOUSES	
• Establishments should be located, designed and constructed so that contamination of meat is minimised to the greatest extent practicable.	Less considered
• Establishments, facilities and equipment should be designed to allow personnel to carry out their activities in a hygienic manner.	Needs to be considered

Local Government (City Corporation)

Act 2009

Schedule III

19

14. SLAUGHTER-HOUSES- A CORPORATION SHALL PROVIDE AND MAINTAIN AT SUCH SITE OR SITES WITHIN OR WITHOUT THE LIMITS OF THE CORPORATION AS APPROVED BY THE GOVERNMENT ONE OR MORE SLAUGHTER-HOUSES FOR THE SLAUGHTER OF ANIMALS FOR

ANIMAL SLAUGHTER : STEPS TO BE CONSIDERED

22

EXPECTED AS PER CAC	EXISTING
DESIGN AND CONSTRUCTION OF LAIRAGES	Needs to be considered
	Needs to be considered

LOCAL GOVERNMENT (MUNICIPALITY) ACT -2009

20

2nd Schedule

(See Section 50-71)

PUBLIC HEALTH

23. Slaughter houses

A municipality shall provide and maintain at such site or sites within or without the limits of the municipality as the Prescribed Authority may approve one or more slaughter-houses for the slaughter of animals for sale.

ANIMAL SLAUGHTER : STEPS TO BE CONSIDERED

23

EXPECTED AS PER CAC	EXISTING
Slaughtering and bleeding areas should be separated from dressing areas	Needs to be considered
Special facilities may be required to slaughter and dress	Needs to be considered
DESIGN AND CONSTRUCTION OF AREAS WHERE BODIES OF ANIMALS ARE DRESSED OR MEAT MAY OTHERWISE BE PRESENT	
Areas and facilities where bodies of animals are dressed or meat may be present should be designed and constructed so that they facilitate GHP, and contamination of meat is minimized to the greatest	Needs to be considered

ANIMAL SLAUGHTER : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
DESIGN AND CONSTRUCTION OF LAIRAGES	
Lairages should be designed and constructed so that: animals can be held without overcrowding or injury, and are not exposed to climatic stress;	

there are appropriate layout and facilities for cleaning and/or drying of animals;

ante-mortem inspection is facilitated;

there is an adequate supply of clean water for drinking and cleaning, and facilities are provided for feeding where necessary;

Needs to be consideredNeeds to be considered

Needs to be consideredNeeds to be considered

ANIMAL SLAUGHTER : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
FACILITIES AND EQUIPMENT FOR PERSONAL HYGIENE	
Changing rooms, showers, flush toilets, hand-washing	Needs to be considered
Protective clothing that can be effectively cleaned and minimizes accumulation of contaminants.	Needs to be considered
Supply water at an appropriate temperature, and are	Needs to be considered

ANIMAL SLAUGHTER : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
REGULATORY SYSTEM Needs legal reform, national product tracing, etc., as appropriate) and requirements, initiative e.g. training, knowledge, skills and ability of personnel (generally at a national level).	
Undertake specified meat hygiene controls e.g. official	Needs regulatory guidelines.

MEAT SHOP : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
- the layout of the food premises permit good food hygiene practices, including protection against cross contamination, pest access and infestation; - Materials used for the internal structure of buildings are durable, prevent build up of dirt, easy to clean and maintain and safe for staff ;	Need administrative, logistic and infrastructural

ANIMAL SLAUGHTER : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
- Verify that process control systems implemented by the establishment operator meet regulatory requirements - Carry out enforcement actions as necessary.	Needs guidelines, regulatory supervision Need dedicated regulatory body

MEAT SHOP : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
- Foods are maintained at correct temperatures <i>The premise have reliable services to ...support the cold chain;</i> - all wrappers, containers and packaging material are of food grade material which will not contaminate food :	Need administrative, logistic and infrastructural capacity development

ANIMAL SLAUGHTER : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
POST-MORTEM INSPECTION Post-mortem inspection should occur as soon as is	

SANITATION

Proper cleaning and disinfection of food preparation areas;

Correct cleaning and disinfection (where necessary) of equipment, machinery and utensils used in food preparation and sale :

Adequate proc

the layout of thhygiene practiccontamination,

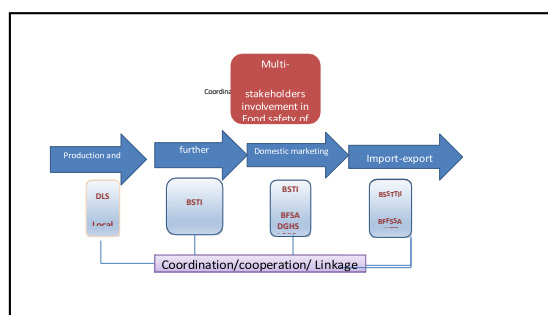


Need administrative, logistic and infrastructural capacity development

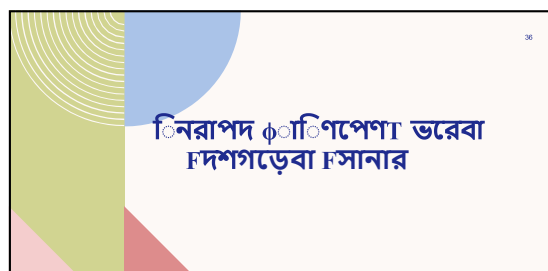
MEAT SHOP : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
SYSTEMS PURCHASE/TRANSPORT/STORAGE/SALE	
- Appropriate food safety measures are applied during handling, storage and transportation appropriate temperatures; - Containers and conveyances are kept clean and are able to be effectively cleaned and where necessary disinfected between batches - Temperature throughout the food chain is monitored and verified to ensure that the meat is safe and being maintained at the correct	Need infrastructural capacity development

MEAT SHOP : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
SYSTEMS TRAINING	
- Meat handlers are trained as applicable to their assigned tasks and have the necessary skills to enable them to handle meat hygienically; - Those who handle strong cleaning chemicals or other potentially hazardous chemicals are instructed in safe	Need HRD planning and implementation

MEAT SHOP : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
SYSTEMS TRACEABILITY	
- recall procedures to stop the delivery, removal of suspect products - product identification system is - Have effective sale and consumption system used by - An appropriate implemented, control system used by	Need administrative, logistic and infrastructural capacity



MEAT SHOP : STEPS TO BE CONSIDERED	
EXPECTED AS PER CAC	EXISTING
SYSTEMS	
- Meat Handlers maintain a high degree of personal cleanliness - Meat handlers wear suitable clean and protective - Meat Handlers refrain from any behaviour that may risk development contamination of the food - Meat handlers are medically fit to work and provide a	Need administrative, logistic and



ISSUES NEED ATTENTION:

- Operational guidelines for value chain actors
- Capacity building through training
- Develop recording systems in field level
- Traceability at each level
- Establish specific regulatory body in DLS
- Assure dedicated skilled regulatory workforce
- Regular inspection, supervision, monitoring
- Updating policies and regulation

TIME FRAME AND INVESTMENT NEED FOR IMPROVEMENT

GROUP WORK

Groups	Area of work
Group-A	Regulatory body, Trade and Transport
Group-B	Beef Cattle Farming
Group-C	
Group-D	Animal Slaughter



ANNEX-IV: SCHEDULE OF THE WORKSHOP ON “AN OVERVIEW FOR DEVELOPING THE MILK AND MEAT VALUE CHAIN IN BANGLADESH”

Developing the Milk Value Chain in Bangladesh

A public / private sector dialogue facilitated by UNIDO

2 October 2023

Dhaka, Bangladesh

9:30 – 10:00	Welcome and Opening
10:00 – 10:30	Break
10:30 – 11:00	An Overview of the Milk Value Chain in Bangladesh (Rajiur)
11:00 – 11:30	Compliance Challenges within the Milk Value Chain infrastructure in Bangladesh (Michael)
11:30 – 12:15	Regulation and compliance (Group work; Facilitated by Rajiur, Mehedi and Michael)
12:15 – 13:00	Road map to overcome the challenges to development of the Milk Value Chain (Group work; Facilitated by Rajiur, Mehedi and Michael)
13:00 – 14:30	Prayers & Lunch
14:30 – 15:00	Identifying Priorities to develop the Milk Value Chain in Bangladesh (Group work; Facilitated by Rajiur, Mehedi and Michael)
15:00 – 15:45	International Case Study – Carbery Group Ireland (Michael)
15:45 – 16:15	Developing Key Workshop Takeaways
16:15 – 16:30	Workshop Closure

Developing the Meat Value Chain in Bangladesh

A public / private sector dialogue facilitated by UNIDO

3 October 2023

Dhaka, Bangladesh

9:30 – 10:00	Welcome and Opening
10:00 – 10:30	Break
10:30 – 11:00	An Overview of the Meat Value Chain in Bangladesh (Mehedi)

11:00 – 11:30	Compliance Challenges with the Meat Value Chain infrastructure in Bangladesh (Michael)
11:30 – 12:15	Regulation and compliance (Group work; Facilitated by Rajiur, Mehedi and Michael)
12:15 - 1300	Road map to overcome the challenges to development of the Meat Value Chain (Group work; Facilitated by Rajiur, Mehedi and Michael)
13:00 – 14:30	Prayers & Lunch
14:30 – 15:00	International Case Study – Kepak Ireland (Michael)
15:00 – 15:45	Identifying Priorities to develop the Meat Value Chain in Bangladesh (Panel Discussion; Mehedi and Rajiur)
15:45 – 16:15	Developing Key Workshop Takeaways
16:15 – 16:30	Workshop Closure



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