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POLICY PAPER WITH PROPOSED ACTION PLAN AND FRAMEWORK FOR RECORDING AND DATA MANAGEMENT SYSTEM

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Policy Paper with Proposed Action Plan and Framework for Recording and Data Management System

Work Package 74, Sub activity 3.5

Draw an action plan and framework for recording and a data management system for trend analysis and decision making based on occurrence patterns, causes and wider social implications in livestock sector

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DISCLAIMER

Abbreviations and Acronyms

AMR	Antimicrobial Resistance
AMU	Anti-microbial use
BAHIS	Bangladesh Animal Health Intelligence Service
DLS	Department of Livestock Services, within the Ministry of Fisheries and Livestock
FBO	Food Business Operator
GAHP	Good Animal Husbandry Practice
GMP	Good Management Practice
HACCP	Hazard Analysis and Critical Control Point
LDDP	Livestock and Dairy Development Project
MoA	Memorandum of Agreement
MoFL	Ministry of Fisheries and Livestock
PoAO	Products of Animal Origin
PKSF	Palli Karma Sahayak Foundation
RMP	Residue Monitoring Plan
SPS	Sanitary and Phytosanitary Agreement (WTO)
UNIDO	United Nations Industrial Development Organization
WOAH	World Organisation for Animal Health (formerly OIE)
WHO	World Health Organization
WTO	World Trade Organization

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BACKGROUND

1. Project Context and Deliverable

This report is prepared as a contribution towards the formulation of recommendations for strengthening the Food Safety Management System related to Products of Animal Origin (PoAO) in Bangladesh and is one component of UNIDO's engagement with the World Bank funded Livestock and Dairy Development Project (LDDP) within the Ministry of Fisheries and Livestock (MoFL).

The interventions of UNIDO focus on two outputs, with the specific objecti e to improve the food safety systems for the protection of public health along the livestock value chains. UNIDO's response supports Bangladesh in applying food safety and quality control measures in the livestock sector and thus, improving public health through basic food safety standards.

There are two key outputs identified

- **Output 1:** ***Food assurance and public health systems designed along livestock value chains;***

- **Output 2: Antimicrobial resistance** ***(AMR) surveillance and risk mitigation program as well as surveillance and monitoring of microbial chemical and residual hazards are developed.***

The Policy Paper presented here contributes towards the achievement of **sub-component C2 of Output 1 - On food safety and public health by addressing food safety and quality assurance:**

Deliverable - Sub-activity 1.3.5:

"Draw an action plan and framework for recording and a data management system for trend analysis and decision making based on occurrence patterns, causes and wider social implications."

2. Strategic Objectives and Activities

More specifi ally, this Policy Paper follows on from two earlier papers prepared by UNIDO experts and submitted to the LDDP and the Department of Livestock Services (DLS). The fi st of these, entitled "A Draft Proposed Livestock Development Policy Framework and a Food Safety of Animal Products Policy", (dated November 2022) describes a list of proposed strategic objectives under the Food Safety Policy which are now further reinforced through the action plan and policy framework described in this Policy Paper as follows:

Under the proposed Livestock Development Policy Pillar 1:

Management and Organisation of Veterinary Services in relation to Food Safety of Animal Products:

Three important pre-requisites for advancing the development of an expanded digital data

and information management system fall within the overall strategic objectives listed for the proposed Livestock Development Policy and include, fi stly, inter-agency **dialogue and clarification of respective roles and responsibilities** of Competent Authorities with shared or overlapping responsibilities for implementing food safety management regulatory functions; secondly, **strengthening capacity** of all actors at each administrative level within the DLS to perform their functions more effectively and, thirdly the **review and revision of legislation to reflect agreed responsibilities** as an outcome of inter-agency dialogue and Memoranda of Agreement and revised normative Rules to define s andards to be maintained by food business operators (FBOs) from the farm to the fork to ensure the safety and quality of animal products destined for human consumption.

Strategic Objectives to strengthen Management and Organizational capacities:

1.1 Improve the structural organisation and institutional management of the Department of Livestock Services to allow effective implementation of a food safety management system from farm to fork.

1.2 Strengthen capacity (staff numbers and resources) and capability (competency) of the Department of Livestock Services to allow effective implementation of its legal mandates to regulate the safety of products of animal origin.

1.3 Ensure policies, legislation and guidelines are suitable to allow efficient and ef ective control of food safety at all levels along each of the major animal product value chains.

1.6 Develop a communications system that supports interagency collaboration, based on an integrated database of veterinary medicines, disease incidence and registered users; and now:

- To develop the infrastructure for data led policy development in the regulation of food safety of PoAO which can, in the long term, provide the foundation for the development of an export strategy for Bangladesh.

Under proposed Livestock Development Policy Pillar 4: Veterinary Public Health

More specifi ally within the Food Safety Policy the following strategic objective refers specifically to strengthening data and information management systems, which can then be used to inform risk assessment and the formulation of risk-based decisions for food safety management:

2.3 Strengthen data management system to allow analysis of records of food safety incidents and inform risk assessment of hazards along major animal product value chains.

In addition, this Policy Paper follows directly on from a series of studies undertaken by UNIDO experts to determine the current level of practices within the DLS regarding the reporting, recording and documentation of the implementation of regulatory functions, and specifi ally those related to incident detection and management along each of the major livestock value chains, responding to:

Key Activity 1.3 Develop baseline data on current level of food safety in relevant value chains.

This includes following sub- activities:

1.3.1. Conduct a desk-review of the existing framework for recording food safety incidents in the country (Woodford & Mehedi).

1.3.2. Undertake consultations with various ministries involved in food safety to consider such records and systems in place. (Mehedi – Report of Visits to Border Posts to fill in Questionnaire to Assess Border and Import / Export Control Practices related to Food of Animal Origin and Veterinary Support Products).

1.3.3. Evaluate and conduct a gap assessment of food safety incidence recording and reporting systems between different ministries. (Woodford - Gap assessment on food safety incidence recording and reporting system of competent authorities – November 2022).

We will now consider: **Sub-activity 1.3.5**:

"Draw an action plan and framework for recording and a data management system for trend analysis and decision making based on occurrence patterns, causes and wider social implications."

3. Rationale

The development of an expanded data management system is being proposed to provide a means of recording data derived from food safety management controls in such a way that the data can be analysed to provide information to inform future risk-based management decisions.

The proposed data management system will allow DLS Directors and food safety managers within the Veterinary Public Health section of the DLS to monitor all food safety management control activities and to plan future activities according to defined timelines

Ultimately, the data records will include the identifi ation of individual animals or groups of animals (poultry, small ruminants) at the location where they are being raised together with all animal movements, thereby providing a system which allows accurate traceability of animals and animal products back to the farm of origin.

The proposed data management system starts with recording the physical location of premises along each of the animal product value chains. Thus, the recording system starts with registered livestock farms and then moves along the value chain to record the location of other premises that are integral components of the animal product distribution and processing systems, including animal markets, licensed / registered milk collection centres, slaughter facilities, wet markets and milk processing facilities up to retail outlets for the sale of food products of animal origin. The location of other important premises which can affect food safety, such as animal feed manufacturing premises will also be recorded, since compliance with defined s andards as conditions of licencing will need to be verified through inspections or audits and annual renewal of licence visits.

The individual identifi ation of selected animals has the added benefit of enabling the monitoring of animal disease prevention activities such as pre- and post-vaccination

sero-surveillance, as well as progeny performance testing used in conjunction with breed improvement schemes.

The traceability of animals and animal products will ultimately greatly enhance Bangladesh's access to higher value export markets for live animals (day-old chicks), hatching eggs, meat and other animal products.

The proposed data management platform is to be offered as a pilot exercise in a simplified orm to allow the DLS to evaluate its performance in the short-term by recording and analysing data to support the introduction of an antimicrobial resistance (AMR) surveillance system as well as possibly, a Residue Monitoring Plan.

Subsequently, should the DLS find that the p atform provides them with a useful, user-friendly data management system, it may be expanded to incorporate the recording of additional parameters which require digital analysis.

4. Preliminary indings - Summary

In addition to the sub-activities mentioned in Part 1.2, above, the International Expert on Database and Information Management Systems, working in collaboration with the national and international AMR Experts and the International Expert on Food Safety (Livestock Value Chains), was tasked with reviewing the current data management activities related to the Bangladesh Animal Health Intelligence System (BAHIS) of the Department of Livestock Services (DLS) (see Annexes 1 and 2 for Itinerary taken and persons met).

The BAHIS comprises the DLS central animal health data recording and analysis system. To this end, during a mission conducted in June 2023, BAHIS members of staff and Deputy Director (Animal Health) were interviewed in order to learn more about the current extent of the BAHIS data and information management programme and the areas of expansion already being planned.

The aim of the study was to review the available data and provide advice on whether the current reporting and data collection activities are (i) adequate for regulatory decision-making related to AMR and food safety surveillance and (ii) how they might be amended and/or strengthened. Interviews were also held with the Director, (Animal Production), and the Deputy Director Farms. The Deputy Director Farms is the custodian of registration records of registered livestock farms and licensed FBOs (commercial feed mills).

Important points noted during these discussions included:

1. Data held in the BAHIS database are largely based on observations of clinical suspicion of disease made in the Upazilla Veterinary Hospitals. The recording of associated treatments with these clinical events is particularly valuable for providing information on Anti-microbial usage (AMU) and use of other medicines. BAHIS is thus a useful source of antibiotic distribution by public sector Veterinary Hospitals.

2. Data from poultry farms on biosecurity and antimicrobial usage are regularly collected through a structured survey questionnaire and entered into the BAHIS data base.

3. A participatory livestock assessment (PLA) in operation to assess disease prevalence in backyard poultry and livestock by Upazila Livestock Offi es in limited scale. This data is also entered into the BAHIS data base regularly.

4. Paper based clinical disease reports are currently aggregated on a monthly basis at the district level and then reported upwards through the Division level to the Epidemiology Cell and the Director of Extension at DLS headquarters.

5. Each of the 492 Upazilla offi es have a computer for reporting to BAHIS. As the system develops, it is planned to move to real time, rather than monthly, paper based reporting.

6. The clinical disease reports cover 25 prioritised notifiab e livestock and 22 poultry notifiab e diseases. The number of follow-up confirma ory tests was not clear, but it is evident that the majority of the reports forwarded to BAHIS are based on clinical observations, rather than any laboratory confirma ory diagnostic test result.

7. With the exception of observations of the clinical suspicion of HPAI, Anthrax and Rabies, disease reports are not routinely followed up with outbreak investigation involving sample collection and laboratory confirmation. The m jority of recorded notifiab e disease events are thus based on clinical suspicion with limited epidemiological importance.

8. A parallel Veterinary Public Health project supported by US CDC with the Ministry of Health under the One Health approach has provided case definitions and esources for outbreak investigations for suspected cases of HPAI, Anthrax and Rabies. The EMPHNET project, which has now been completed, supported the investigation of Anthrax in only one district.

9. A government Veterinary Public Health project actively involves investigation and follow-up of four diseases, Anthrax, Tuberculosis, Brucellosis and Rabies, in 201 Upazillas across the country.

10. Animal disease reporting is based on a passive reporting system of disease reports submitted by individual DLS offi ers. This can result in bias since it depends on the level of activity of individuals, some of whom may not actively reporting all disease incidents.

11. Registered farm details are so far recorded at Upazilla level. It was reported that details exist of over 70,000 registered cattle farms, although the level, detail and accuracy of the recorded data at individual farms was not clear as this data is not yet recorded in the BAHIS dataset. These details are passed to the Deputy Director Farms at DLS. Many of the larger commercial and semi-commercial poultry farms are also now registered. Data is held in Word document tables by the Deputy Director of Farms.

12. Some data is also collected through milk collection centres, especially those linked to cooperative systems, ending where the milk is delivered to one of the several large milk processing facilities.

13. Almost all commercial feed manufacturing businesses are now licenced and registered with the DLS. Lists of licensed feed manufacturers are held by the Deputy Director of

Farms.

14. Vaccination monitoring and post vaccination sero-monitoring is in the process of being implemented on a regular basis.

15. Sample submission for laboratory confirmation of the clini al suspicion of notifiable diseases is undertaken on a voluntary basis, except for HPAI where sample collection, submission and laboratory confirmation is obli atory. Avian Influen a reporting is compulsory in all areas. An inspection report is intended to be generated following a report of all suspected outbreaks of AI.

16. Receipt of disease diagnostic data by BAHIS directly from the central and field investigation laboratories is currently under development.

17. Reporting of all notifiab e diseases is compulsory.

The current emphasis of the BAHIS system is on disease reporting. Considerable progress has been made in collecting and graphing data obtained from Upazilas.

While some pilot sampling for AMR is being undertaken with support from FAO and the Fleming Fund, there is no official programme for the collection of samples and testing for AMR or for residues relating to food safety.

REVIEW OF DOCUMENTATION OF DATA AND INCIDENT MANAGEMENT RECORDS AND THE BAHIS

1. Overview of findings relating to documentation of food safety regulatory functions, incident detection, recording and management.

Reference is made to the desk study conducted by UNIDO national and international staff (sub-activity 1.1.3), a series of consultations undertaken using a Questionnaire by the UNIDO National Expert on Inspection and a Report entitled: “Gap assessment on food safety incident recording and reporting system of Competent Authorities”, prepared and submitted to LDDP / DLS by the International Expert Food Safety (Livestock Value Chains in November 2022).

The overall findin s of this Report were that the keeping of records relating to veterinary regulatory controls and the detection, recording and management of food safety incidents or non-compliance with regulatory standards along each of the animal product value chains was found to be much lower than expected. A number of reasons for poor levels of data recording were identified, including the ollowing:

- Absence of livestock sector / veterinary policies providing a framework for planning,

investment and implementation of food safety of animal product controls;

- Inherent weaknesses in the chain of command brought about by existing structural and organisational systems in place within the DLS management structure;

- Insufficient numbe s of suitably trained personnel deployed at all levels within the DLS hierarchy , many of whom are multi-tasking, who are unable to effectively manage the introduction of food safety regulatory controls;

- Insufficien ly well-trained personnel deployed at the fie d and higher administrative levels within DLS with responsibility for carrying out inspections, collecting, reporting, recording and making use of data generated through implementation of food safety regulatory controls;

- No Job Descriptions provided to personnel at all levels of the DLS relating specifi ally to food safety regulatory control responsibilities;

- Failure of managers to enforce record keeping and reporting by the staff directly under their supervision;

- Lack of Standard Operating Procedures and Guidelines detailing requirements for collection of data or record keeping by inspectors and FBOs respectively.

Despite the shortcomings identified during this study, there are some areas within the veterinary domain where digitised technology has been introduced and where datasets are beginning
to be built and used effectively. Amongst these is the BAHIS within which clinical records of veterinary interventions made by fie d personnel are being entered into a database by fie d level operatives and transferred to the Epidemiology Cell at DLS headquarters. This data is now being used to generate information on the range and quantities of antimicrobials being used by DLS fie d personnel in the course of managing the day to day treatment of routine clinical cases seen at veterinary hospitals throughout the country, and in turn the information is now being used to inform risk assessment of antimicrobial usage (AMU) and will help the senior management within DLS to make important decisions on possibly limiting the use of certain antimicrobials which appear to be being used either excessively or inappropriately as well as to help in the design of an AMR surveillance strategy.

Furthermore, the introduction of a laboratory information management system in the key laboratories providing veterinary diagnostic and analytical services offers an opportunity to start to build datasets on disease diagnostic and analytical results which can be linked to case data held by the BAHIS database.

As and when programmes for monitoring veterinary drug and chemical residues and antimicrobial resistance (AMR) are introduced, these data management systems will come into their own in offering opportunities for risk assessment of antimicrobial and other chemical usage in the fie d and thus the development of (AMU) risk management strategies.

One of the most important findin s of the study on record keeping and documentation undertaken during this analysis has been the somewhat unexpected distribution of responsibilities for food safety and other controls amongst the existing workforce of the DLS. For

instance, the Deputy Director of **Human Resources**, working under the Director of Administration, has responsibility for the issuance of import permits and export certifi ation for animals and animal products (see Annex 4).

Furthermore, the existing organisational structure of the DLS does not reflect the importance of Veterinary Public Health and the food safety of animal products as key operational areas of a modern Veterinary Authority. At present there are no offi ers appointed within the DLS structure below the Divisional level who have dedicated responsibility for carrying out or supervising food safety regulatory functions. Field staff at the District and Upazilla levels are expected to be a "Jack-of-all-trades", with responsibility for combining the coverage of routine clinical cases either on the farm or at clinical centres; reporting of suspected notifiab e disease events; outbreak investigation of suspected Avian Influen a and in some areas Brucellosis, Tb, Anthrax and Rabies; registration of farms; inspection of meat processing facilities; ante- and post-mortem inspection of animals and meat; licensing and inspection of feed mills and a host of other tasks.

Perhaps unsurprisingly, none of these tasks are being carried out fully comprehensively. Records of non-compliance or food safety of PoAO incidents are almost non-existent.

2. Registration of livestock farms

The legal basis for registration of livestock farms is found in the Diseases of Animals Act (2005) and the conditions to be met for registration of various categories of premises are defined in Schedule 7 of the Diseases of Animals Rules (2008). However, there are currently no criteria or conditions for the registration of cattle (dairy or beef) or small ruminant premises defined in the existing Rules.

The Deputy Director of Farms, working under the Director of Administration, is responsible for keeping records of registered livestock farm premises.

Registration is being carried out by District Livestock Offi es deployed at the District and sometimes Upazilla levels.

As yet, the registration of livestock farms (cattle, small ruminant and poultry) has not been undertaken through any systematic process.

2. 1 Registration of Cattle / dairy farms

There are currently approximately 71,950 dairy farms registered.

The main criterion for registration of dairy farms is that there should be a minimum of 3 animals held. Other descriptive criteria allowing a subjective judgement on compliance related to the quality of infrastructures are provided in Schedule 7 of the Diseases of Animals Rules (2008) but these are not normative.

The largest category of cattle farms is the group having 3- 10 animals with approximately 90% of the total cattle population falling within this category.

It is estimated that there may be in excess of 60,000 farms with 0 – 3 animals and possibly around 100+ farms with greater than 500 animals.

The City Corporation Act (2009) requires any private milk production or milk product, marketing or processing facility located within a City Corporation or Municipality jurisdiction to be licensed. No Rules relating to such licensing were made available to the Expert teams during this assignment.

There is no national system of animal identifi ation in Bangladesh for allocating a unique offici l identifier to individual animals, particularly cattle. This will be a prerequisite for future implementation of reliable animal movement and disease traceability.

2. 2 Registration of small ruminant farms

Registration of small ruminant farms has been started by District/Upazila Livestock Offi ers at District / Upazilla levels as directed by the government.

2. 3 Registration of commercial / semi-commercial poultry farms

Most commercial/semi-commercial poultry farms are registered, with lists held by the Deputy Director Farms, under the Director of Administration. Registration of poultry farms is being undertaken by District Livestock Offi ers on the basis of conditions defined in the Diseases of Animals Rules, although not necessarily always applied. There are no periodic inspections thus no records maintained regarding non-compliance with defined s andards or conditions.

3. Licencing of animal feed businesses

The legal basis for the licensing of animal feed businesses is provided in the Fish Feed and Animal Feed Act (2010), the Animal Feed Rules (2013) and the Animal Feed Production and Marketing Guideline (2020).

The Rules require that all animal feed manufacturers (and importers & exporters) shall be licenced by the Licencing Authority of the DLS. Licencing is subject to the following very broad but, in some cases, not well-defined cri eria:

(A) Has to have an updated Income Tax Certifi ate proving tax compliance.

(B Has to have Technical Staff. (Qualifi ations and number not defined

(C) Must have Factory, Machineries, Equipment and Tools (Types of equipment and technical specifi ations not defined).

(D) Has to have a Quality Control Laboratory. Has to have SOP, GMP, HACCP, etc. if necessary. (precise requirements for each category of premises not defined)

(E) Has to have information on Animal Feed production, processing and preservation powers.(required information not defined

(F) Has to have information on Packing and Labelling. (packing and labelling standards not defined)

(G) Factory shall be outside densely populated area but should have enough transport facilities. (precise distances not defined)

(H) Has to have waste and sewerage system. (capacities not defined

(I) Has to have an Income Tax and Trade License (updated).

The Deputy Director of Farms, working under the supervision of the Director of Administration manages the licencing of feed businesses and maintains a list of licensed feed mills. There are currently 315 feed mills in Bangladesh that are licenced through the DLS. Licences need to be renewed annually. The issuance and renewal of licences has recently changed so that it is carried out by the District Livestock Offi e. The renewal requires an inspection of the mill. It was reported that a signifi ant number of the feed mills fail the renewal inspection, commonly due to shortcomings of laboratory facilities for internal quality controls. A failure results in issuance of an improvement notice followed by a re-inspection.

Occasional spot checks of mills are triggered by complaints from clients, usually related to claims of poor quality of purchased feed products. There is currently no routine structured mechanism for ad hoc inspections or audits in place.

4. Registration of slaughter facilities and ante- / post-mortem inspection

City Corporations and Municipal authorities have established abattoirs owned and operated by the local authorities. Ante- and post-mortem inspection is carried out by veterinarians, either directly employed or provided on deputation from the DLS. No records of ante- and post-mortem findin s are reported to DLS and there is no established system of random testing.

There are large numbers of privately owned and operated small-scale slaughter and meat retail outlet facilities, registered by the local authority. Ante- and post-mortem inspection is sporadic without any maintenance of records. Small-scale privately owned slaughter facilities are subject to inspection from local authority hygiene inspectors. Non-compliance with hygiene standards is investigated and where necessary sanctions are imposed by mobile courts. Documentation of non-compliance and sanctions are maintained by the local court but are not available to DLS.

Poultry meat is mostly available at Wet Markets. Wet Markets are not routinely inspected by any veterinary inspectors but are subject to some hygiene controls enforced by Local Authority Hygiene Inspectors. A survey of Wet markets was undertaken in Dhaka from January 2016, in Chattogram from January 2017 and in Rajshahi from October 2022. The data identifying and providing geo-positioning information collected at the time of these surveys could be very useful in helping to design future sampling strategies for AMR and veterinary drug residue surveillance and monitoring.

Some DLO's maintain lists of slaughter facilities within their respective jurisdiction. Recording of monthly records of the numbers of animals slaughtered are at best patchy.

Paper records of registration of slaughter facilities at District/Upazilla level, disaggregated by category (based on size/daily throughput / species slaughtered) are kept by District Livestock Offi ers and forwarded to the Deputy Director of Animal Health at DLS headquarters.

Monthly records of animals slaughtered at the District and Upazilla levels are forwarded to the Division Director.

At some, but not all, District levels and below, slaughter facilities ante- and post-mortem inspection is sometimes undertaken. No records of ante and post-mortem inspection findin s or partial/total condemnations are recorded. There are no records of ante- and post-mortem inspection being kept at the Division level. Some records of ante-and post-mortem inspections are being made at City Corporation abattoirs but are not being forwarded to DLS or being utilized.

5. Summary of existing records and documentation of food business operators

FBOs include livestock and poultry farms, feed manufacturers, milk marketing / processing value chain actors and red meat slaughter / processing facilities.

- 71,000 dairy farms are listed at DLS headquarters (Deputy Director Farms) and registered at district and Upazilla level.
- A list of most commercial/semi-commercial poultry producers is held by the Deputy Director of Farms , DLS.
- A list of 315 licenced feed mills is held by the Deputy Director Farms.
- A number of slaughter facilities are registered with City Corporations, Municipal authorities at District / Upazilla levels. The DLS is not involved in registration at any level.
- No ante- and post-mortem findin s are being reported to DLS.

MAJOR GAPS AND CHALLENGES IN THE RECORDING OF REGULATORY CONTROLS ALONG THE MAJOR LIVESTOCK VALUE CHAINS

1. Farm level recording

At present livestock keepers are not obliged to maintain any records of animal movements (births, deaths, sales or other forms of offtake); animal disease events or health interventions;

(treatments given to their animals or vaccinations).

There is no national animal identifi ation and registration system in place for individual animals, neither individually (cattle) or in groups (poultry and small ruminants). This precludes recording of individual animal production as well as movement and traceability of animals and animal products to their farm of origin.

2. Transporters and transportation of animals and animal products

There is currently no licencing of transporters of live animals in Bangladesh although Diseases of Animals Rules includes some conditions relating to disinfection of vehicles and cold chain requirements for perishable goods. There is some legislation governing the animal welfare of animals being transported in the Animal Slaughter and Meat Quality Control Rules, 2021 (Section 18).

3. Milk collection and processing

There is no registration or licencing of value chain actors involved in the dairy sector from harvesting of milk, through its distribution to retail outlets, collection centres and processing facilities. The authority for registration and inspection of milk producers, traders and processors lies with the Deputy Director of Animal Health under the Director of Administration in DLS.

4. Slaughter facilities and abattoirs – ante- and post-mortem inspection

Current legislation provides for the registration of slaughter facilities to two separate Competent Authorities, DLS and City Corporations / Municipal authorities. There is a lack of coordination between City Corporations/Municipalities and DLS. Ante- and post-mortem inspection of animals and meat is not being carried out in any systematic way. No ante- and post-mortem records are being forwarded to DLS.

FRAMEWORK AND ACTION PLANS FOR STRENGTHENING DATA RECORDING AND DOCUMENTATION OF FOOD SAFETY REGULATORY CONTROLS

1. Pre-requisite programme

Prior to embarking on expanding the documentation and recording of food safety regulatory

controls in an expanded database, in the short to medium term (2025 to 2030), there is a need to address some of the fundamental gaps and challenges that have been identified in p evious Reports prepared under the UNIDO / LDDP programme.

These gaps relate principally to the current institutional, organizational and management system in place within the DLS and between the DLS and its external partners. Secondly, there is a serious lack of sufficient numbe s of adequately trained personnel to manage food safety regulatory functions effectively at each level of administration within the DLS, from the Headquarters, through the Divisional, District and Upazilla levels down to the fie d.

There are fi e important Competent Authorities having shared responsibility for implementing regulatory functions. As has been mentioned in previous reports, there is a very poor level of coordination and communication taking place between each of these Competent Authorities with the result that there are overlaps and gaps in the implementation of many important food safety regulatory functions. These issues have now been openly discussed during a series of Workshops organized by the UNIDO / LDDP project over the past two years.

The outcome of these Workshop discussions is that it has been agreed that the DLS shall engage in bilateral meetings with each of the respective Competent Authorities with the intention of resolving the issues identified and ultima ely reaching agreement on what the precise respective roles and responsibilities for each Competent Authority shall be in the future, such that overlaps and gaps are fully addressed and an efficient and ef ective food safety regulatory system
can be developed and implemented. In the short term, these agreements shall be defined in Memoranda of Agreement (MoA). In the longer term, as and when the principal legislation can be revised, the new relationships, roles and responsibilities defined in Mo 's between each Competent Authority shall be defined in the elevant legislation administered by each Competent Authority.

Following on from the signing of MoA's, there will be the need to improve the quality of legislation as has been recommended in other Reports, especially, reference is made to the recently submitted "Policy Paper on the Proposed Food Safety Legal Framework for Food of Animal Origin". At present the existing Rules for implementation of the Diseases of Animals Act and the Fish and Animal Feed Act do not have sufficien ly well-defined s andards for ensuring food safety of animal products along each of the major value chains and against which inspections for conformity can be applied. New Rules will need to be developed in order to enforce the Animals and Animal Products Quarantine Act in conformity with international standards (SPS Agreement / WOAH / Codex).

The following steps in the process defining activities, in o der of priority, are recommended to be undertaken in order to put the DLS in a position where it can start to develop an effective management system for implementation of food safety regulatory functions and subsequently strengthen the reporting, recording and documentation of food safety regulatory controls, including incidents of non-compliance / non-conformity with defined s andards:

1 **Bilateral Dialogue** - Engage with partner Competent Authorities to reach agreement on respective roles and responsibilities to address areas of duplication, overlaps and gaps in the performance of food safety regulatory controls.

2 **Review and revise principal legislation** where necessary to reflect agreed roles and

responsibilities of each Competent Authority.

3 **Review and revise Rules and regulations** for food safety controls - quantify and qualify defined s andards.

4 **Workforce Development** - Undertake a systematic review of the DLS workforce and determine numbers of staff required at each level of DLS administration to perform prioritised food safety regulatory functions.

5 **Review and revise the Structural Organisation** of DLS (Organogram based on FUNCTIONS – [See Annex 4]. Such a review needs to take into consideration the roles, responsibilities and functions of a modern Veterinary Authority and the development of an organisational structure allowing the establishment of an effective chain of command between the headquarters, through each administrative level down to the District, Upazila and fie d levels. This would allow for a clearer definition of asks and responsibilities thereby allowing opportunities for strengthening collaboration along the chain.

6 **Formulate Job Descriptions** to accurately define the esponsibilities and reporting requirements of each member of the workforce from headquarters to the fie d.

7 **Undertake a training needs assessment** (TNA) for each level of the workforce to ensure entry level competency of each member of staff to undertake defined esponsibilities related to food safety controls according to Job Descriptions.

8 **Develop training materials, Guidelines, Standard Operating Procedures. Reporting templates/ formats** based on TNA to be used in the operationalisation of a Training Plan to strengthen capacity to perform food safety control functions.

9 **Develop and implement Training Plan** – (1) initial induction training – all personnel – (2) Continuous professional development – selected personnel on the basis of training needs especially on supervision and enforcement of revised rules and regulations.

10 **Identify timebound objectively measurable indicators** to measure progress in implementation of above activities.

11 **Formulate and implement Monitoring and Evaluation** programme to provide feedback to Policy and Planning / modify investment / implementation plans accordingly.

2. Framework and Action plan to strengthen documentation of food safety controls

2. 1 Approach towards development of a digital data and information management system

From the reports, discussions and meetings held to date it is clear that, apart from the clinical records already held within the BAHIS, the existing data collection system focuses on registered (dairy) cattle farms, commercial / semi-commercial poultry farms and all animal feed manufacturers. Details of these, along with lists

of most District / Upazilla level slaughter facilities are held at Headquarters and District Livestock Offi es as Word / Excel Tables / spreadsheets. As yet, food safety incidents, as well as inspections for non-compliance with licencing conditions, or ante- and post-mortem inspection records are not being recorded systematically. However, limited records of non-compliance with licencing conditions do exist but as they are paper-based, no attempt has been made to analyse the data to generate key information leading to risk-based management decisions.

Furthermore, the resources (human and operational) available for data collection and analysis are very limited at the moment and are unlikely to be increased signifi antly in the immediate future. While establishing comprehensive recording is a long-term objective, this would be unrealistic and prohibitively expensive to achieve in the short term. There is also a risk of establishing a system that measures success in terms of data volume rather than data quality and effective use of collected data. The initial emphasis needs to be on setting achievable targets that focus on data quality rather than quantity. Similarly any systems must make use of the data collected for the objectives of improving food safety.

It is therefore recommended to establish a pilot project that focuses attention initially on those areas of the livestock value chains where some records already exist. Bringing these record sources together in to a central database that is accessible to web applications will facilitate the piloting and evolution of data management systems that are appropriate to the resources available in Bangladesh. This will cover both the collection of good quality data from the fie d and its analysis and use for improving food safety. One of the main goals of introducing such a system will be to demonstrate the potential of a simple targeted recording system in support of the planned antimicrobial resistance (AMR) surveillance strategy.

It is intended to deliver a generic system that can satisfy the short-term recording objectives while also highlighting areas that are in need of strengthening. The system will be flexible so it can be tailored to the diverse and changing situations that will be found in the fie d. This will cover both the data collection and delivery of appropriate outputs to stakeholders in the system. Implementing the system in the fie d will provide a clearer understanding of the barriers and solutions to recording for food safety purpose in Bangladesh. The objective of this pilot is to explore the processes involved in the collection and use of data related to food safety. Wherever possible the system will integrate with the existing BAHIS and other recording systems. These findin s can then be fed back to refine those existing processes and systems in Bangladesh.

In the short term - This Policy Framework and Action plan is therefore going to pilot recording and reporting for the following food business sectors:

1 Dairy cattle farms (units of not less than 3- 10 cattle and units of >10 animals
2 Commercial / semi-commercial poultry farms
3 Animal feed manufacturers
4 Wet markets

In the case of dairy cattle farms, commercial and semi-commercial poultry farms and wet markets, the recording of information related to these premises will be of special importance with regard to the development of the planned AMR surveillance programme. Alongside AMR surveillance, the same premises will also be available in the database for trialling of a Residue Monitoring Plan (RMP).

In the case of wet markets, a previous study has already established the GPS

coordinates for all wet markets in Dhaka City. Provided details of any premises type are obtainable in spreadsheet format, it will be possible to import these key data into the database, which will greatly reduce the time taken to start implementing testing.

Using available details on the location of Wet markets in the Dhaka Division as a sampling frame, a statistical sample of sentinel sites will be established for targeted sampling of live birds and poultry meat. AMR surveillance may also be carried out at registered poultry farms, registered dairy farms, milk collection centres, slaughter facilities and larger abattoirs.

In the medium-term, (within fi e years) the data collection and recording system will be expanded to include District level slaughter facilities as well as actors along the milk marketing value chain (gopallas, transporters, milk collection centres, and milk processors of various categories).

In the long term, the goal would be to develop and include a national animal identifi ation and traceability system in the data recording system, allowing the movement of animals to be controlled more efficien ly and the traceability of animal products back to the farm of origin. Such a system will allow the results of the detection of residues and AMR surveillance to be traced back to the farms of origin and thus allow close control of such food safety incidents within the domestic marketplace. Traceability of animal products will also signifi antly improve Bangladesh's access to higher value export markets for live animals and animal products.

With regard to animal identifi ation, it is recognized that some initiatives have already been taken through the pilot introduction of animal identifi ation using novel techniques such as "muzzle-print" identifi ation – (https://www.swisscontact.org/en/news/bangladeshs-fi st-ever-muzzle-based-cattle-identifi ation-system-for-insurance). Under this project, (The Bangladesh Microinsurance Market Development Programme – Surokkha) an innovative method of identifi ation using the "muzzle-print", which is unique to individual animals, was used. The project was finan ed by the Swiss Agency for Development and Cooperation SDC and managed by "SwissContact" in partnership with Syngenta Foundation for Sustainable Agriculture Bangladesh and the Palli Karma Sahayak Foundation (PKSF) and ended / is ending in 2023. A word of caution here, since it has been reported elsewhere that with this method of identifi ation individual records take up considerable data space.

The PKSF had also piloted a livestock production insurance scheme from 2012 - 2013, as a component of the 'Developing Inclusive Insurance Sector Project (DIISP)' with the financi l grant support of the Japan Fund for Poverty Reduction (JFPR) and with the cooperation of the Asian Development Bank (ADB), although the available documentation (https://pksf.org.bd/projects/diisp/) did not reveal any information about individual animal identifi ation in this case.

The DLS should consider negotiating to take forward a joint programme for livestock identifi ation in partnership with microfinan e organisations which have been working with these two projects.

3. Data collection, recording and database entry: – In the short term

A key component of the recommended pilot project would be the implementation of fi e studies, targeting key aspects of food safety along the livestock value chain. Each study will be limited in scope, aiming to demonstrate the potential to record and analyse data to strengthen the monitoring of food safety in Bangladesh. These studies will focus on 5 key areas where signifi ant data is already available or relatively easy to obtain:

- Livestock farms
- Poultry Wet Markets
- Anti-Microbial Residues and residue monitoring
- Animal Feed Manufacturers
- Milk Collection Centres

3. 1 Livestock Farms (Dairy Farms, Commercial / Semi-commercial poultry farms)

It is recommended that District Livestock Offi ers are given a short training to introduce them to the overall objectives and desired outcomes of an expanded data collection and information management system for Livestock Farms.

The training should explain how the data is to be used for future planning of annual renewal of registration of farms as well as the role farm registration will play in planning many other "EVENTS", such as vaccination programmes, farmer training programmes, regulatory controls for food safety of animal products, traceability of animals and animal products, AMR surveillance and residue monitoring plans and control programmes. The training should also cover the use of a web-based Form to be completed at annual farm re-registration which allows for the collection of all relevant information to be recorded in the newly adapted database. The mobile device used to record the data should have GPS capability and will automatically save the GPS coordinates on the Form. The Form should initially include the following information:

1 Date of Registration:..... (dd-mm-yyyy)

2 Name of registered Owner of Farm National Identity Card Number.....

3 Physical address of farm: Plot Number, Village, Upazilla, District, Division

4 Physical address of registered owner, if different from farm address (as above)

5 GPS Coordinates of farm

6 Category of Farm (according to numbers / species of animals kept.

7 Species, Age classes and numbers of animals present on farm

8 Name and Designation of person registering the farm

Step One

The existing register of Farms will be used initially to identify all registered farms to be re-registered and entered into the newly expanded database. A User access to the web-based form will be provided to all District Livestock Offi ers as a mobile device application.

Step Two

Use the database to support the process of notifying registered farm owners and DLO inspectors of timings for annual registration renewals and inspections.

DLOs will then be required to visit each farm at the time when annual renewal of registration is scheduled and collect the required information and enter it into the web-based Form, in the same way that clinical records of suspected notifiab e disease events is being recorded.

Step Three

At a later stage, as and when Rules have been developed that oblige the registered owners of livestock farms to keep additional information as farm records or to be compliant with certain defined standards related to Good Animal Husbandry Practices (GAHP), biosecurity and animal health interventions and animal welfare requirements, the required data records on the Form can be amended at each successive inspection or registration renewal visit. The Form may then be used as a checklist to be used for data recording at the time of annual renewal of registration.

3. 2 Wet markets

In the case of wet markets, a previous study has already established the GPS coordinates for all wet markets in Dhaka City.

Step One

Using available details on the location of Wet markets in the Dhaka Division Record data of each Wet market into the expanded database in a similar manner to that for Livestock Farms;

Step Two

Use the database to support the process of notifying registered managers / owners of wet markets and DLO inspectors of timings for annual licence renewals and routine inspections.

Step Three

Programming ad hoc spot check audits on a small percentage of randomly selected wet markets (statistically selected) as a sampling frame. A statistical sample of sentinel sites will be established for ad hoc inspection of wet markets and targeted sampling of live birds and poultry meat. Licensing Data to be entered into database. (see Annex 5 for a Wet market draft Audit / Inspection checklist)

Step Four

For AMR surveillance / residue monitoring: Repeat previous steps and collect and submit samples to relevant laboratories.

AMR surveillance may also be carried out at registered poultry farms, registered dairy farms, milk collection centres, slaughter facilities and larger abattoirs.

3. 3 AMR surveillance, prevention and control

Within the pilot project, the expanded database with details of dairy farms, commercial / semi-commercial poultry farms and wet markets could be used for development of a sampling frame for AMR surveillance and residue monitoring.

Step One

Samples obtained from the selected Dairy farms, Poultry farms and Wet markets will be submitted for laboratory analysis.

Step Two

Pathogen identifi ation: E.coli, Salmonella spp. and Campylobacter will be the target pathogens.

Step Three

Culture against a panel of selected anti-microbials according to the EU standard.

Step Four

Recording of levels of sensitivity and resistance

Step Five

Analysis of results

The outcome of this study will be a baseline prevalence of anti-microbial resistance across human and animal pathogens against a panel of selected anti-microbial agents. Subsequent rounds of sample collection would inform longitudinal studies.

Samples collected for anti-microbial resistance analysis will be sub-divided for simultaneous submission to The Quality Control Laboratory as a fi st step in establishment of a pilot Residue Monitoring Plan.

3. 4 Animal Feed Manufacturers: Improved quality and safety of animal feed

As shown for Livestock farms and wet markets, using the registration details of Animal Feed Mills throughout Bangladesh:

Step One

Record data of each Animal Feed Business in a similar manner to that for Livestock Farms.

Step Two

Use the database to support the process of notifying owners and inspectors of timings for annual licence renewals and inspections.

Step Three

Programming ad hoc spot check audits on a small percentage of randomly selected feed mills (statistically).

Step Four

Recording of outcomes and findin s of mill inspections.

Step Five

Analysis of results used to inform risk analysis and management of non-compliance and feed safety incidents.

4. Milk collection Centres, milk processing premises, slaughter facilities – in the medium term.

As and when human resources and operational budgets are increased, the collection and recording of data generated through registration / licensing of milk value chain actors and slaughter facilities can be added to the progressively expandable data recording and information management system. Each category of milk value chain actor and meat processing facility may be disaggregated in the database allowing more precise analysis of which type of premises is subject to food safety incidents or non-compliance with standards.

Step One

Registration of Dairy Farms; (already done)

Step Two

Registration / Licencing of gopallas, milk collection centres, milk processing facilities and slaughter facilities;

Step Three

Collection, submission and laboratory testing of AMR / residue samples from each premises, as appropriate to surveillance / monitoring strategies, at the time of registration / licencing;

Step Four

Selection of a statistical sample of Milk collection centres / processing facilities and slaughter facilities for longitudinal surveillance of AMR and veterinary drug / chemical residue monitoring programmes;

Step Three provides baseline prevalence of the selected pathogens and their susceptibility or resistance to a panel of antimicrobial drugs, as well as baseline information on drug / chemical residues.

Step Four is incorporated into the long-term AMR surveillance and residue monitoring strategies.

The study will provide baseline prevalence of residues and other contaminants and AMR across human and animal pathogens against a panel of selected anti-microbial agents. Subsequent rounds of sample collection would inform longitudinal studies.

DATABASE DESIGN AND OPERATION

It is proposed to establish a pilot data and information system that brings together the building blocks of a comprehensive national system of recording food safety regulatory actions and incidents of non-conformity with defined s andards, through the registration, licensing and

monitoring of key components of the major Bangladesh livestock value chains.

The data and information management system will provide the structure required to implement basic food safety monitoring, testing and traceability that will facilitate the process of establishing routine food safety regulatory activities, including AMR surveillance and residue monitoring, from the level of producers of animal products through to processing and retail sale facilities.

Ultimately, the data and information management system will provide the evidence that food safety regulatory activities are being conducted effectively and on a regular basis and will thus provide consumer confiden e in the quality and safety of all livestock products, whether for export or local consumption.

The pilot information system is not intended to replace existing systems in Bangladesh but to identify the key components required for a comprehensive national system. This will bring together the recording and monitoring of business entities including farms, markets and slaughter facilities through to the registration and recording of animals of different species over the full range of livestock production systems.

For instance, where data already exists, such as the registration of all larger cattle farms and commercial poultry farms, these data sources will be used. However, there may be gaps in the information required, for instance GPS coordinates, which will now have to be collected and recorded to complete the required premises level records.

The data management system will provide a platform to schedule future food safety regulatory activities and related data collection and recording.

The pilot system uses a generic livestock information system, InterTrace+. This system was developed by Pan Livestock Services Ltd, (UK) and can be adapted to satisfy the core requirements of a robust food safety management system, as described in the previous chapters, for Bangladesh. The InterTrace+ system has been used for numerous livestock recording applications that range from on-farm herd health management, national disease prevention and control programmes through to multi-species livestock identifi ation, registration of premises and animal / animal product traceability. The system consists of a single core central database which is located on a server where it can receive data from numerous sources ranging from direct entry to data feeds from other systems, such as laboratory information systems, as well as data entry direct from authorised fie d workers via mobile devices over the internet.

The system uses, as examples, the components of the livestock supply chain already discussed where it is anticipated that signifi ant quantities of data will already exist (Figure 1). Additional premises types can be added where appropriate. The example information system is populated initially using made-up data, though this can readily be replaced by importing real data as it becomes available.

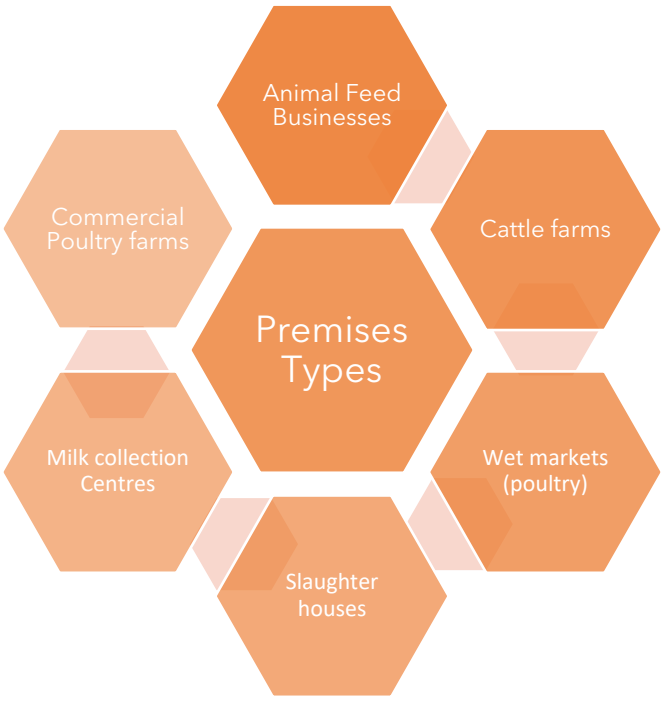


Figure 1. Initial premises types covered by the information system

The system is used to demonstrate the steps involved in establishing and maintaining a credible database of livestock related premises that supports the core requirements for sampling and surveillance for basic AMR and food safety monitoring purposes (Figure 2), below.

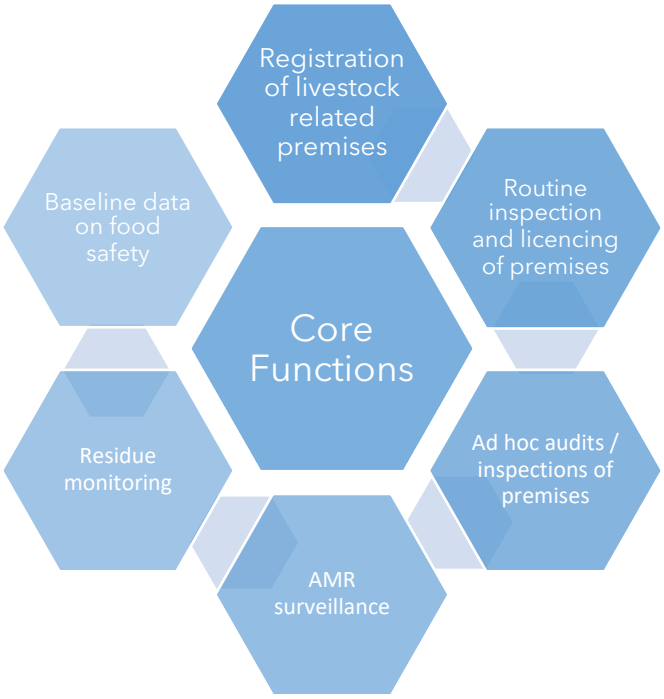


Figure 2 Core functions of a database for food assurance and AMR surveillance along livestock value chains in Bangladesh

The system must cater for the differing needs of a range of users ranging from government offici ls through to fie d workers and researchers (Figure 3).

Figure 3 Potential Users of the information system

The differing roles and data needs of these users requires flexibility in the detail and extent of access to data in the system. All data are stored in one core database which is located on a secure server that can be accessed by multiple users. This will range from data entry by fie d staff via mobile devices through to detailed analysis of the data in the core centratechnicall database by researchers, fie d programme managers and administrators. Where appropriate, data integrity checks are carried out automatically before data is accepted and added to the database.
This ensures users are immediately aware whether their entry of data has been successful or otherwise. (Figure 4).

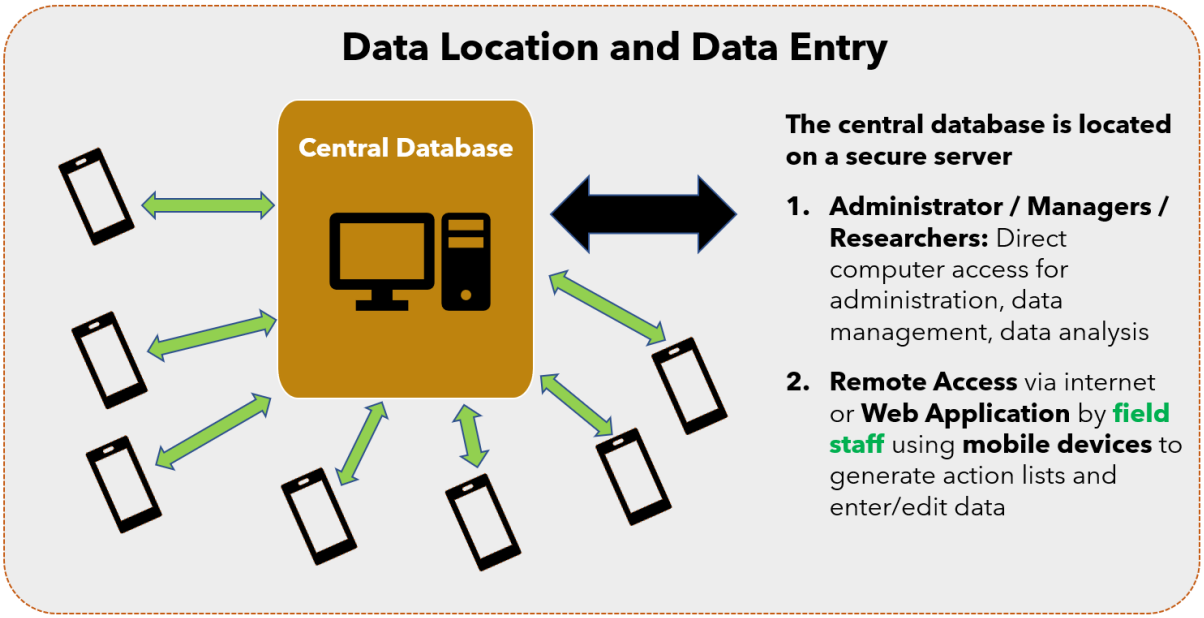


Figure 4 Differing data access needs for users of the system

1. Steps in the establishment of a database for Bangladesh

The process required to generate a populated database suitable for food safety monitoring and AMR sampling is summarised in Figure 5.

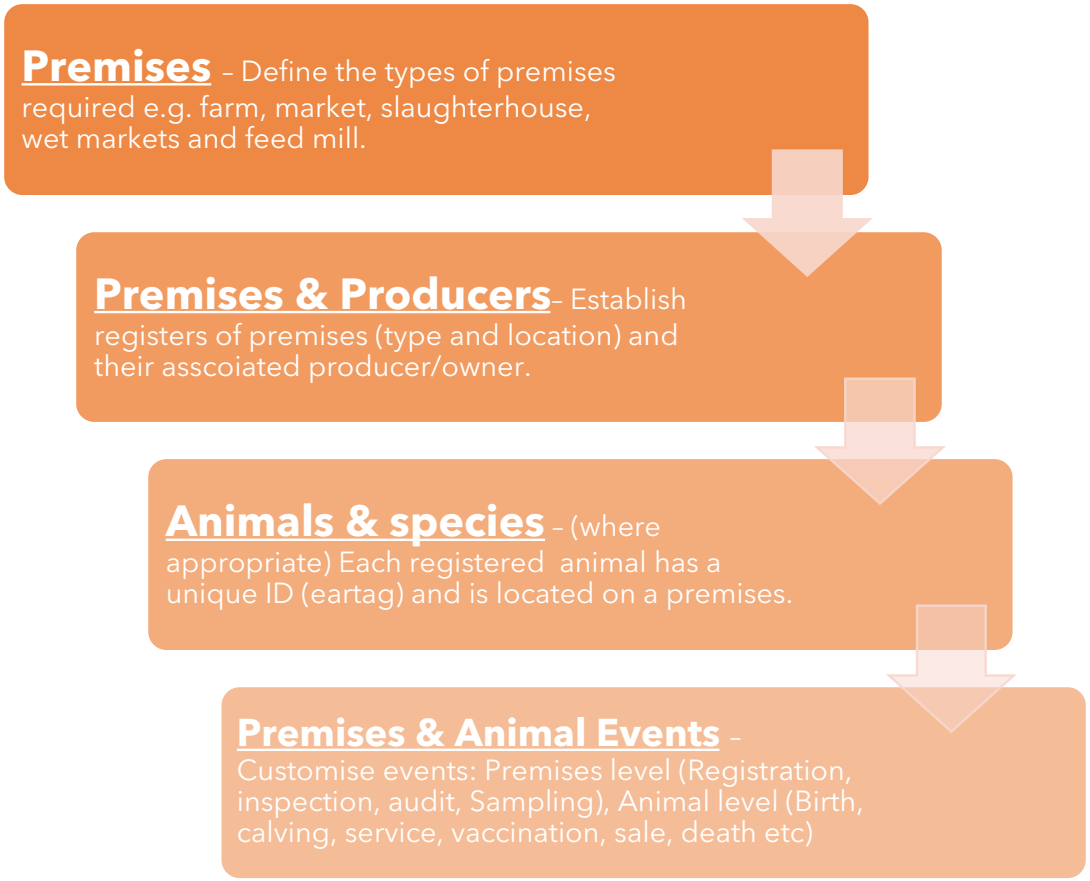


Figure 5. Steps in the development of a food safety monitoring database for Bangladesh

As well as being a repository for a wide range of data, the information system must support the data collection process if it is to be sustainable. This requires a degree of customisation that prompts additional collection as appropriate. This is achieved through the definition of events and variables to reflect the detail of recording that is required. These requirements can be customised by the program managers to accommodate changing needs during the implementation of the system.

For each of the example components, the information system is designed to undertake the key functions described in Section 4.3. These can be summarised as follows:

Definition of Premises Types: Starting with the target premises types, each premises type is designated a unique Premises type code (Figure 6). Additional premises types can be added when required.

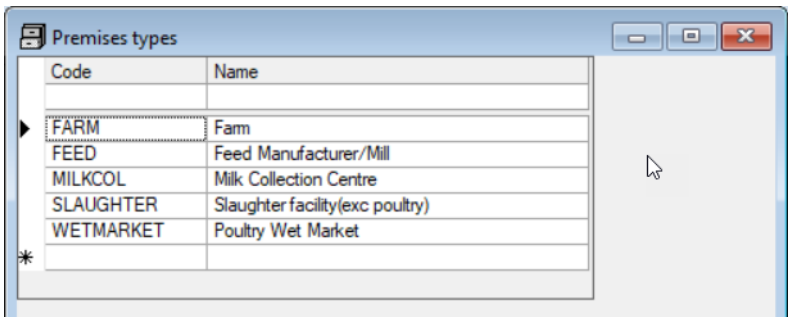


Figure 6 Definition of p emises types

Step One: Registration and Recording at the Premises-level: The key data for registering any premises can either be entered manually or imported from existing lists/spreadsheets. The key data will include the **administrative** and **physical location**, including latitude and longitude, as well as the identity of the **person/business responsible** for the premises (Figures 7 and Figure 8).

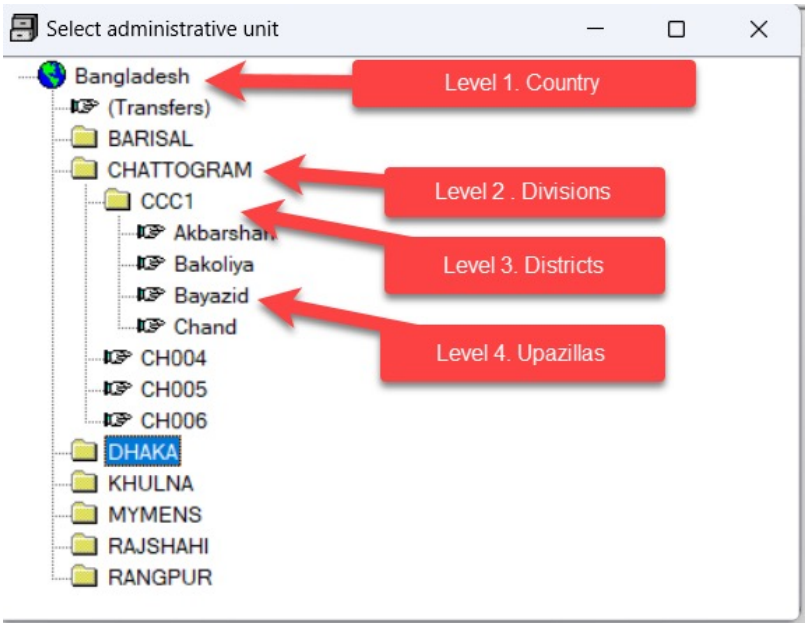


Figure 7 Definition of administ ative units

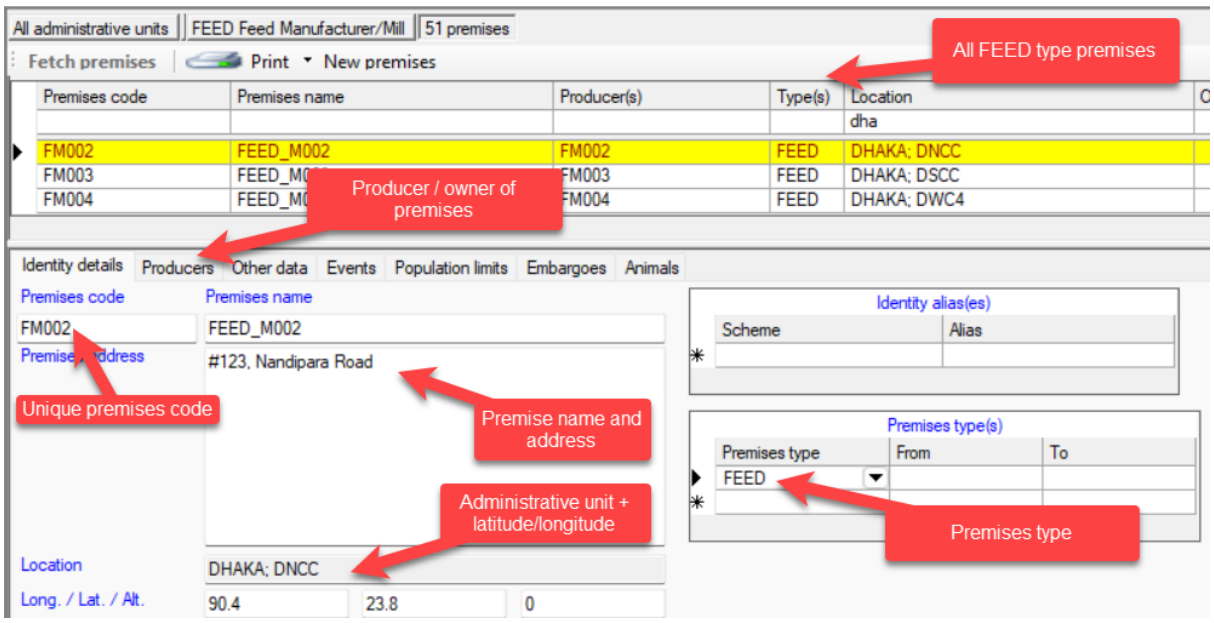


Figure 8 A Premises Register

For each registered premises, additional data will be required that can vary considerably according to the needs and objectives of the system. Data needs will change over time as any project evolves so the variables recorded will need to be customisable. The recording also needs to distinguish between data items that are fi ed characteristics from data items that may change over time.

Premises-Level Variables: Premises variables are used for specific cha acteristics related to a premises. These variables do not change over time, covering data items such as a licence number or category of operation (Figure 9):

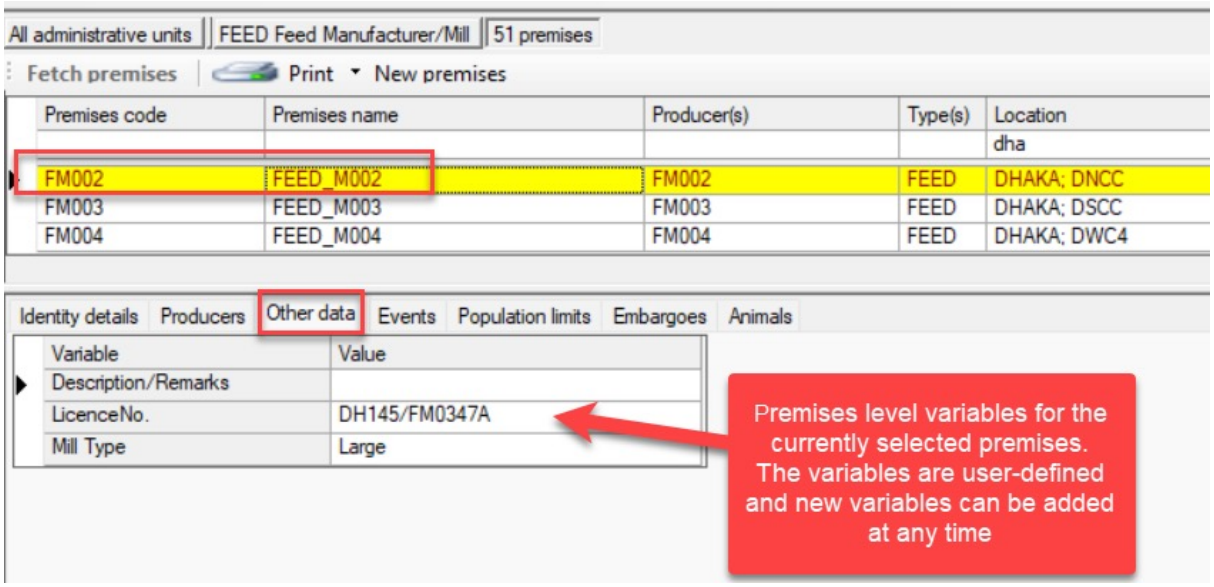


Figure 9 Premises level variables

Premises-Level Events and Event Variables: Other variables may change over time. These data items require the definition o **premises events** which record the data on a specific date. Repeated recording thus provides a measure of change over time.

These premises events must also be customisable by the user to allow for adjustment as the data collection process evolves to the local situation. In the Bangladesh system the **Premises events** will cover activities like “Initial Registration”, “Renewal of Licence to Operate”, “Audit/ Spot Check Findings”, “AMR Sampling”.

In addition to the date when the event occurred, each event recorded will have a result (outcome) and can be assigned to a specific fi d worker (operator). The data (variables) associated with the event are recorded as event variables (Figure 10). The definition of vent variables must also be user-defined to facilitate the addition of new variables when appropriate. The REG_FEEDMILL event in Figure 10 records 8 variables. Their definition in the entral database makes them available to the mobile application used by fie d workers who have the appropriate permissions to enter premises events.

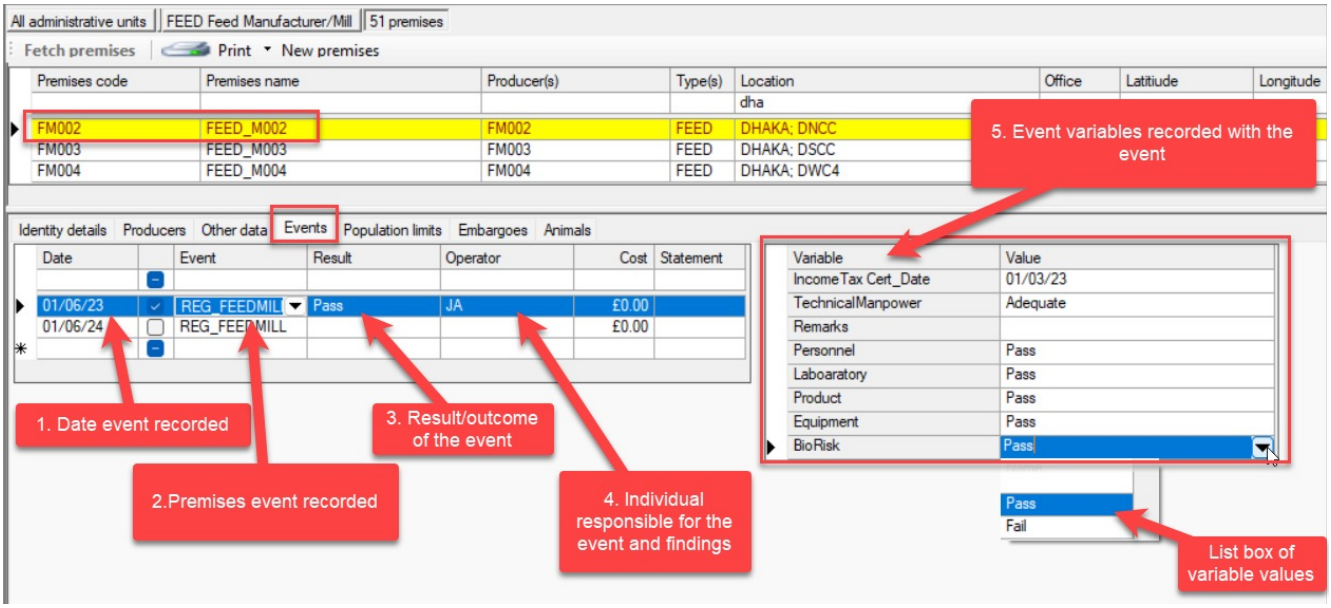


Figure 10 Example of premises events and premises event variables

Scheduling of Events to Support Management of Field Activities: The ability to schedule events to specific da es or after an appropriate delay is essential to make an active information system that supports day to day management and monitoring of the data collection process. For example, the outcome of a premises inspection that detects problems (Fail) will schedule a follow-up inspection much sooner than for a premises where no problems (Pass) are found. This involves the development of an event structure tailored to the outcomes required with the results of one event scheduling the timing of future events.

This process is illustrated in Figure 11 for the initial registration of feed mill premises. The Inspection EVENT is defined with two po sible results (outcomes). If the inspection result is a PASS then the next inspection is SCHEDULED **one year** ahead. If, however, the outcome of the inspection was a FAIL then a further inspection is SCHEDULED for 3 months ahead.

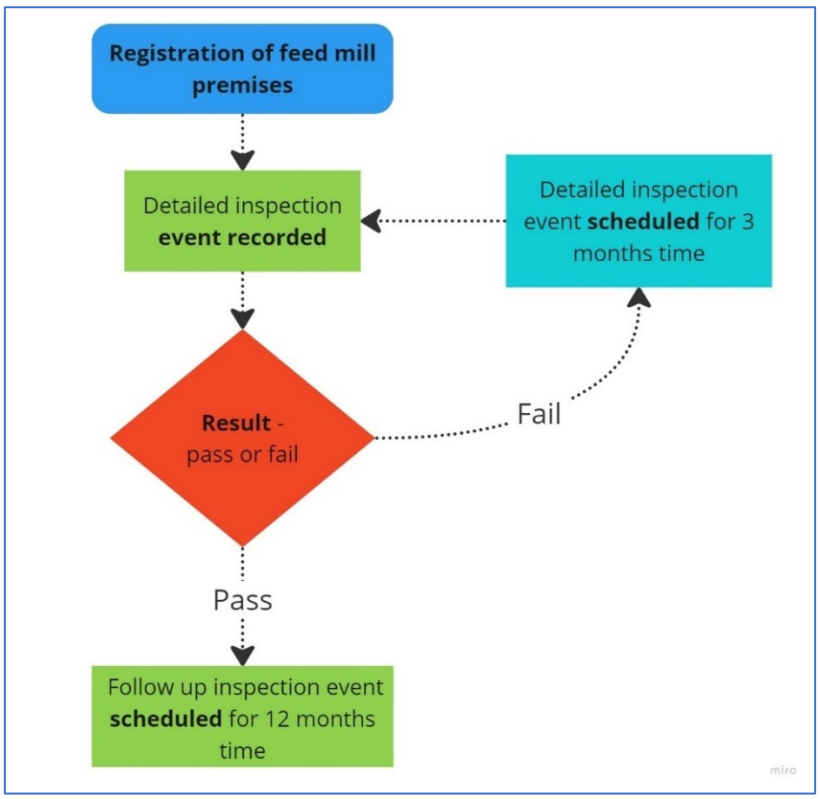


Figure 11 Process of differing event results determining the scheduling of follow-up events

Once the process of recording and scheduling of events is established the management of the data collection process is greatly simplified. A list of schedu ed events that are due or overdue becomes available.

1. **Action Lists of Scheduled Events for Field Workers:**

   Field workers allocated appropriate permissions (controlling premises types, events, locations of premises) can access action lists via the Web application that they view on mobile devices.

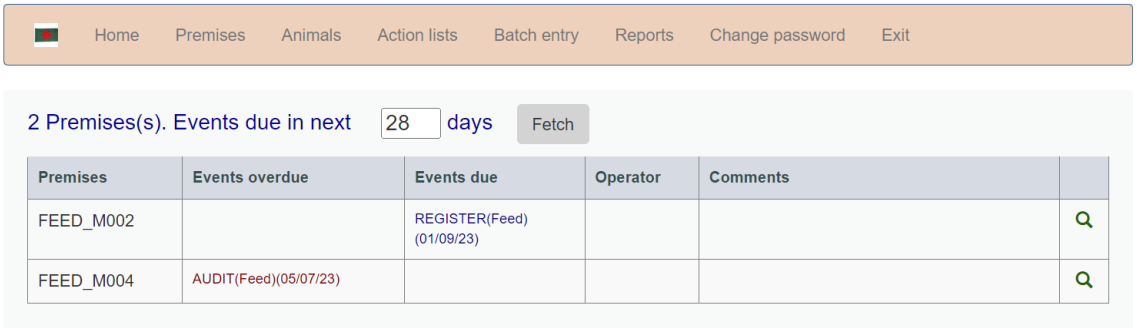
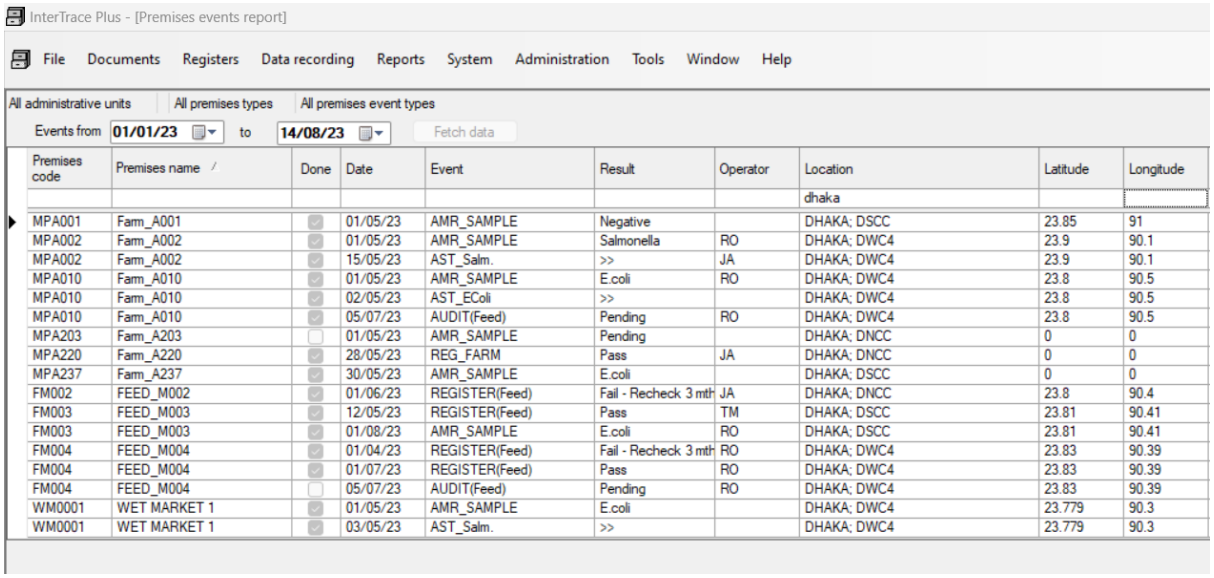


Figure 12 Action list of premises events that are due or overdue via the WebApp on mobile devices

2. **Comprehensive Lists of Events (scheduled and completed) by Premises for Programme Managers:**

The central database will contain all events recorded and scheduled relating to all users of the system. This allows rapid monitoring and analysis of different data recording initiatives (Figure 13).



Premises code	Premises name	Done	Date	Event	Result	Operator	Location	Latitude	Longitude
							dhaka		
MPA001	Farm_A001	☑	01/05/23	AMR_SAMPLE	Negative		DHAKA; DSCC	23.85	91
MPA002	Farm_A002	☑	01/05/23	AMR_SAMPLE	Salmonella	RO	DHAKA; DWC4	23.9	90.1
MPA002	Farm_A002	☑	15/05/23	AST_Salm.	>>	JA	DHAKA; DWC4	23.9	90.1
MPA010	Farm_A010	☑	01/05/23	AMR_SAMPLE	E.coli	RO	DHAKA; DWC4	23.8	90.5
MPA010	Farm_A010	☑	02/05/23	AST_EColi	>>		DHAKA; DWC4	23.8	90.5
MPA010	Farm_A010	☑	05/07/23	AUDIT(Feed)	Pending	RO	DHAKA; DWC4	23.8	90.5
MPA203	Farm_A203	☐	01/05/23	AMR_SAMPLE	Pending		DHAKA; DNCC	0	0
MPA220	Farm_A220	☑	28/05/23	REG_FARM	Pass	JA	DHAKA; DNCC	0	0
MPA237	Farm_A237	☑	30/05/23	AMR_SAMPLE	E.coli		DHAKA; DSCC	0	0
FM002	FEED_M002	☑	01/06/23	REGISTER(Feed)	Fail - Recheck 3 mth	JA	DHAKA; DNCC	23.8	90.4
FM003	FEED_M003	☑	12/05/23	REGISTER(Feed)	Pass	TM	DHAKA; DSCC	23.81	90.41
FM003	FEED_M003	☑	01/08/23	AMR_SAMPLE	E.coli	RO	DHAKA; DSCC	23.81	90.41
FM004	FEED_M004	☑	01/04/23	REGISTER(Feed)	Fail - Recheck 3 mth	RO	DHAKA; DWC4	23.83	90.39
FM004	FEED_M004	☑	01/07/23	REGISTER(Feed)	Pass	RO	DHAKA; DWC4	23.83	90.39
FM004	FEED_M004	☐	05/07/23	AUDIT(Feed)	Pending	RO	DHAKA; DWC4	23.83	90.39
WM0001	WET MARKET 1	☑	01/05/23	AMR_SAMPLE	E.coli		DHAKA; DWC4	23.779	90.3
WM0001	WET MARKET 1	☑	03/05/23	AST_Salm.	>>		DHAKA; DWC4	23.779	90.3

Figure 13 Summary of all premises events completed/scheduled via the central database

Step Two: Registration and Recording at the Individual Animal Level: If longitudinal monitoring or sampling of individual animals on farms is planned it will be essential to uniquely identify both the animal of interest and the premises where it is located. The monitored animals must be registered with a unique identifi ation (eartag or microchip) and assigned to an already registered premises and owner. Where existing records already exist of adequate quality these could also be imported into the database.

The InterTrace+ database was originally designed as on-farm software supporting the day-to-day management of dairy cattle so it contains any functionality that is likely to be required. In a similar way to that described for premises, animal recording can also be tailored to the precise data variables and events required. If appropriate, this can include key fertility measures (dates of calving, service, pregnancy diagnosis, sale, movement, ancestry etc) and production events (daily milk yields, body weights, weight gain). Additional events related to sampling for AMR and other food safety measures could be readily added to these.

When animals are registered and an appropriate event structure is in place, fie d workers will be able to record key data and events supported by action lists of scheduled events. Figure 14 shows an example list of animals across a number of farm premises, with the associated events that are due, including one AMR Sample event.

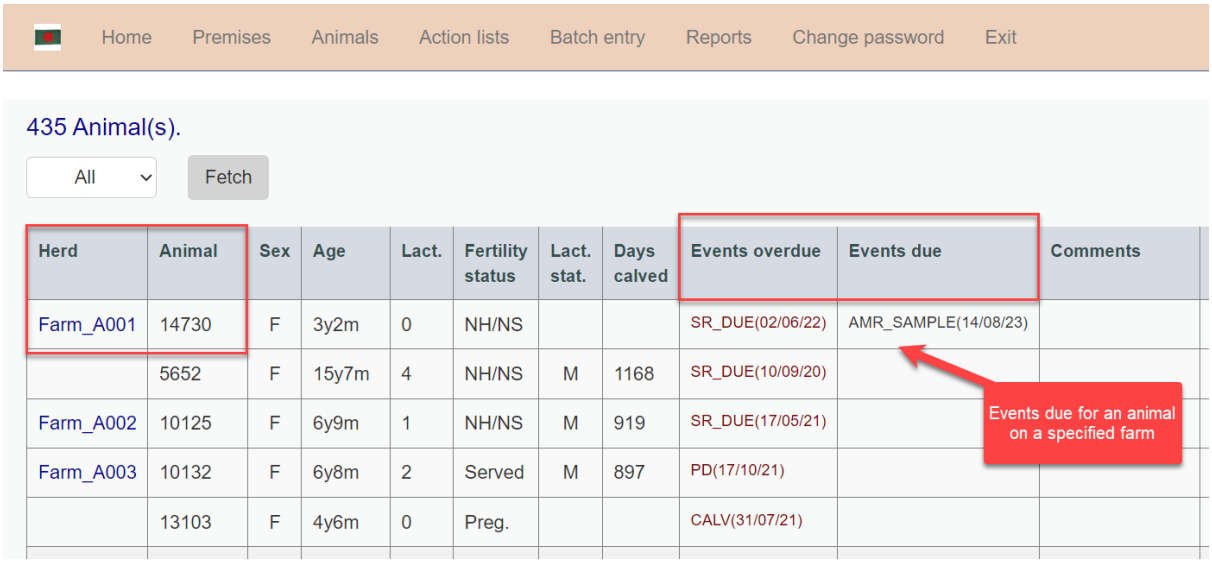


Figure 14 Webapp Action list of animal events that are due/overdue by farm premises

B. Analysis of the Central Database

The recording of the results and findin s of the licencing, inspection and monitoring visits are all recorded from the fie d into the core central database. For users in the field, access to the database is through mobile devices with the content controlled through permissions controlled by data administrators. Data from other sources, including laboratory analysis, may also be added to the central database.

The contents of the database can be analysed to generate any number of reports related to the premises, animals and events that it contains. Figure 15 shows a list of events recorded into the database. The total list of events can be readily broken down by premises type, time period, location etc providing considerable flexibility in potential analysis. Figure 16 analyses the same data by result (outcome) of the premises events.

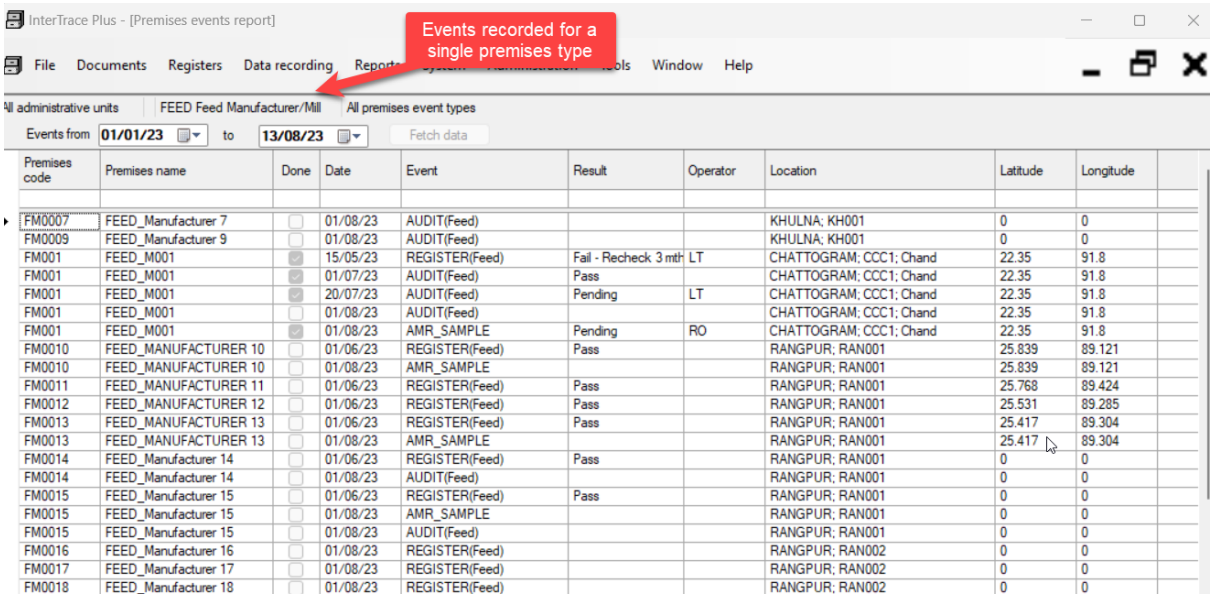


Figure 15 Events recorded in the central database for a single premises type

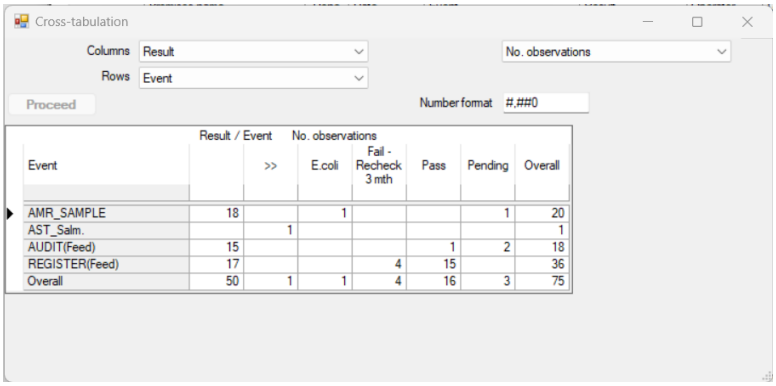


Figure 16 Summary statistics of results of premises events

C. Implementation of Spot Checks / Audits of a Random Sample of Premises.

Once a framework of premises (farms, feed mills, wet markets etc) and animals is in place the database can then support the implementation of a programme of active surveillance appropriate to the different premises and food safety objectives.

These might include, for example:

- Audits of a small percentage of feed mills/slaughterhouses/wet markets to confirm the level of compliance;
- AMR testing at a selection of farms, markets or animals;
- Testing for heavy metals and other residues from a sample of farms in a region.

The database can be used in a sequence of steps to generate a sample of the total premises/ animals that will be representative of the overall population. Events can then be scheduled against the premises/animals that specify the actions required in the fie d. Field staff will see the necessary actions through the webapp on their mobile devices.

1. Selection of a random sample of the target premises type. The sample size will be determined by the resources of the investigation/study. Figure 17 shows the selection of a sample of Farm premises types

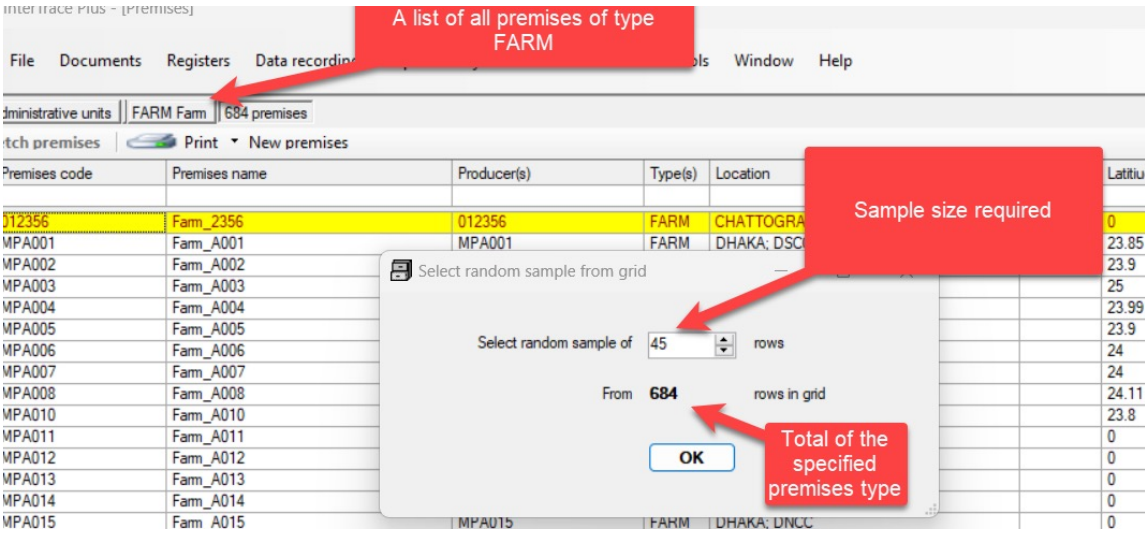


Figure 17 Identifi ation of a random sample of premises

2. The randomly selected premises are then allocated a SCHEDULED event for the test/audit required. Figure 18 shows the process of allocating a scheduled event to the selected premises types.

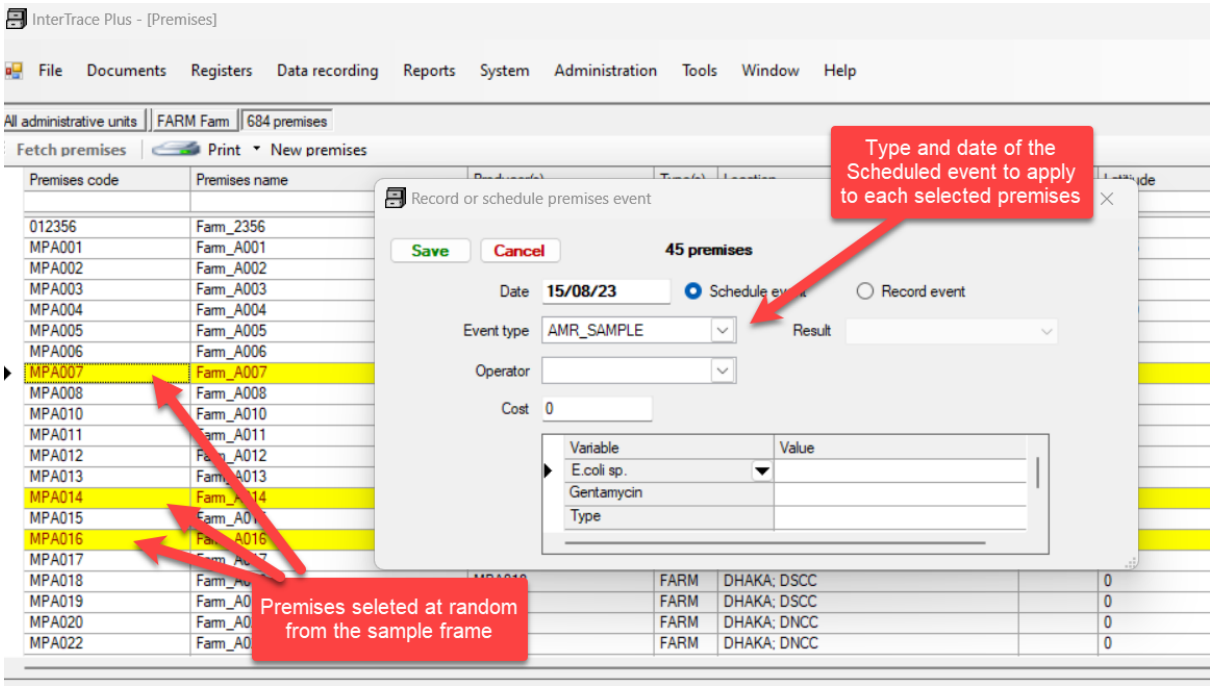


Figure 18 Allocation of a scheduled event to the randomly selected premises

3. The Web application obtains the data directly from the central database and so will immediately display the newly scheduled event as due on the premises where it was allocated (Figure 19).

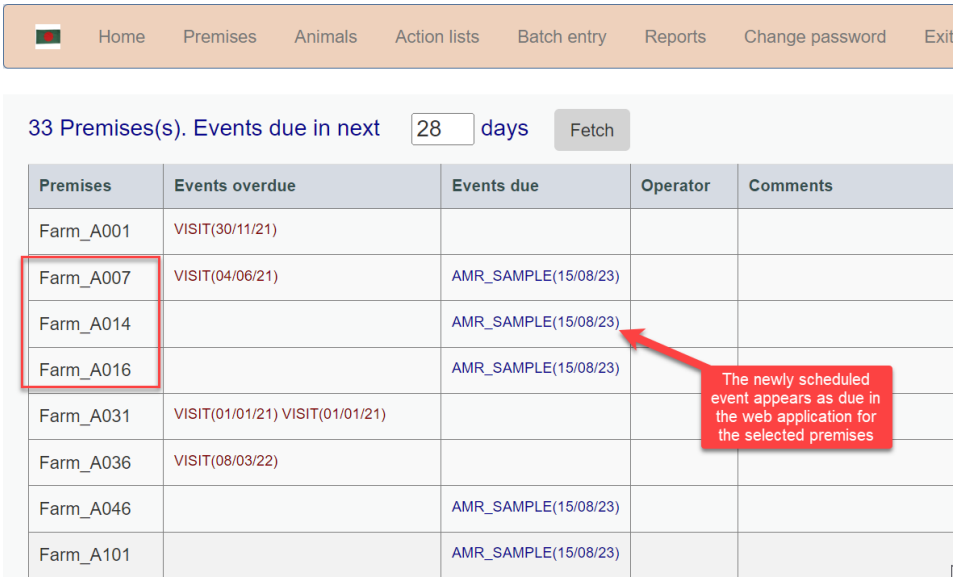


Figure 19 WebApp action list containing the sampling events scheduled on selected premises

2. Conclusions

The data recording and information management system as described above can and should provide a focal point for many of the statutory activities of livestock and veterinary services, around which the regulation of food safety of animal products and AMR surveillance are prioritised.

The proposed data and information management system builds on existing data recording activities which have already been initiated by the DLS including for instance, the registration of cattle and poultry farm premises. The system facilitates the recording and analysis of future regulatory actions and outcomes as they are implemented. Amongst the next steps to be taken, would be the collection of GPS coordinates and information on compliance with defined conditions of registration based on GAHP guidelines already being developed. Thereafter, the database can be used to develop scheduled regulatory events at each of the different categories of registered premises.

Analysis of records of non-compliance of premises with food safety standards will allow the DLS to start to build up the necessary information to establish a risk-based approach towards food safety management decisions.

AMR surveillance and residue monitoring can be readily incorporated into the data recording system from the very beginning. The data management system can then be used as a tool to support the process of strategic planning of these important veterinary public health regulatory functions to be addressed in the coming years.

Once key businesses and animals are registered and licensed it is relatively straightforward to maintain and expand into other areas of the veterinary domain. The registration of inseminations or vaccinations and distribution of medicines or other key supplies can be readily added. The selection of premises for audits or spot checks are readily obtainable.

Overall, the introduction of a robust food safety data and information system will help the DLS to manage its regulatory mandate more efficiently. Fundamentally, it will also lead to growing confidence of consumers in the safety and quality of animal products being placed on both the domestic and export markets. Bangladesh will thus be in a position to progressively penetrate a wider international market for its animal products and generate important foreign exchange income.

ANNEX 1

Itinerary taken by Expert Team during May / June Mission to Dhaka

The International Expert on Database Development and the Senior Food Safety Expert (Livestock Value Chains) visited Dhaka from 25th May to 2nd June 2023.

During the stay the Experts attended a number of meetings and sessions of the **Validation Workshops on GAHP and GHP at a ruminant farm, transport and live animal market** which ran from Sunday 28th to Wednesday 31st May. In addition, the Experts attended the following meetings:

28th May 2023 - Epidemiology Cell, Department of Livestock Services : Meeting with fi e DLS staff of the Epidemiology Cell / BAHIS database managers.

29th May 2023 - Farm Management Services, Department of Livestock Services: Director Production, DLS on farm data maangement

30th May 2023 - Bi-lateral meeting between DLS and Dhaka North City Corporation

4th June 2023 - Bilateral meeting between DLS and BFSA

5th June 2023 – Bilateral meeting between DLS and BSTI.

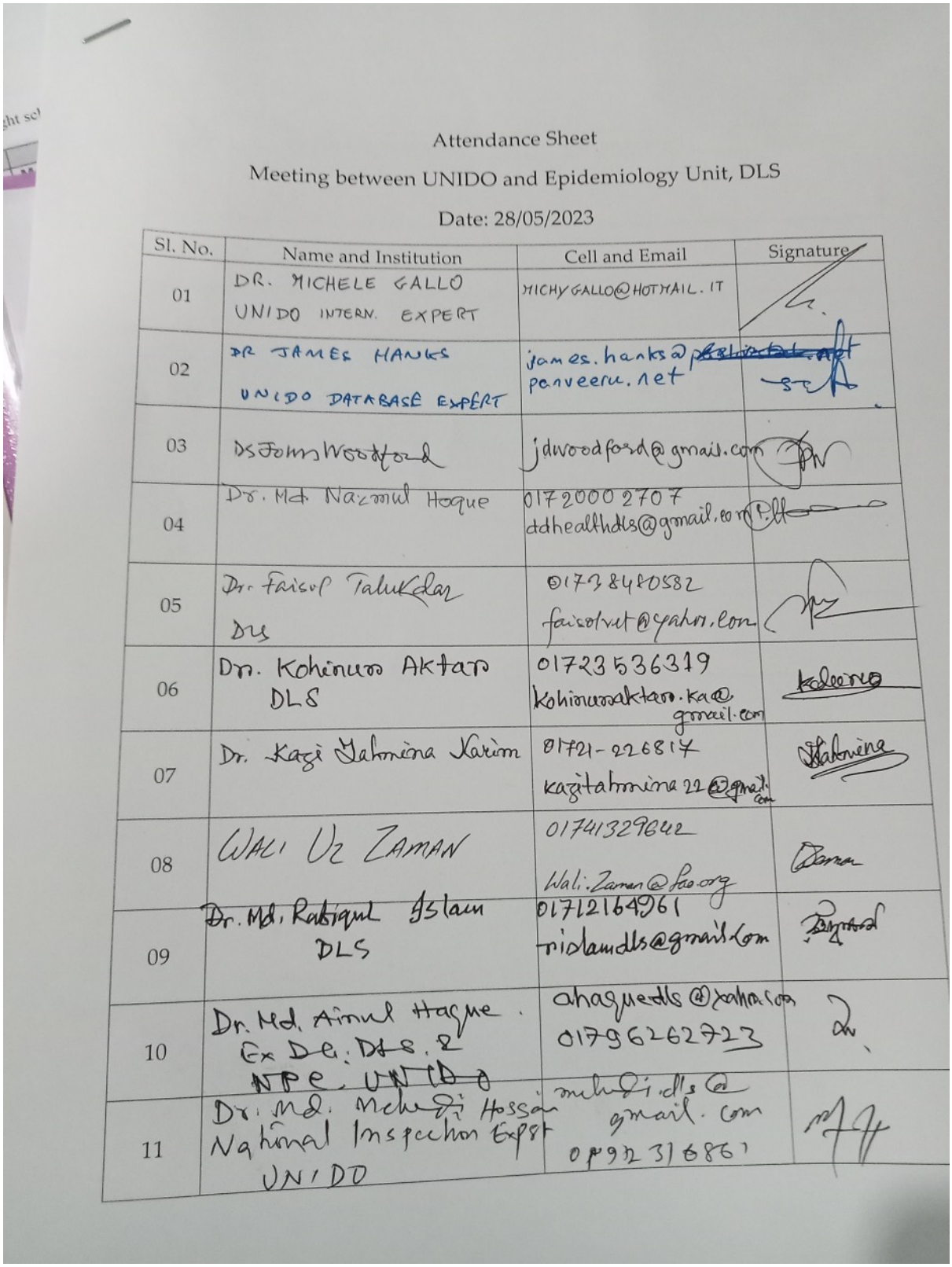
ANNEX 2

GAP Analysis, November 2022 – NO RECORDS OR DOCUMENTATION OF REGULATORY FUNCTIONS

Regulatory function	What data is collected by DLS ?	Is data recorded ?	How / to whom data reported?	Where is data stored?	Analysis of records made?	Information derived from food safety data analysis?	Food safety information being used for any purpose?	Data on prevalence of food-borne zoonotic diseases?
Issuance of Animal Movement permit	NONE	NONE	N/A	N/A	N/A	N/A	N/A	N/A
Registration / licensing / inspection of milk traders, milk collection centres at City, Municipality, District / Upazila levels.	NONE	NONE	N/A	N/A	N/A	NONE	NONE	NONE
Registration / licensing / inspection of rendering plants	NONE	NONE	N/A	N/A	N/A	NONE	NONE	NONE
Registration / licensing/ inspection of animal transporters	NONE	NONE	N/A	N/A	N/A	NONE	NONE	N/A
Hygiene inspection at local authority slaughter facilities by DLS	NONE	NONE	N/A	NONE	Not done	NONE	NONE	N/A
Registration / licensing / ante- & post-mortem inspection at local authority abattoirs / slaughter facilities	Lists maintained at District / Upazilla levels)	DLO level	N/A	District Livestock Office	Not done	NONE	NONE	NONE

ANNEX 3

Participants list of different meetings of UNIDO international experts



Attendance Sheet

Meeting between UNIDO and Epidemiology Unit, DLS

Date: 28/05/2023

Sl. No.	Name and Institution	Cell and Email	Signature
01	DR. MICHELE GALLO UNIDO INTERN. EXPERT	MICHYGALLO@HOTMAIL.IT	
02	DR JAMES HANKS UNIDO DATABASE EXPERT	james.hanks@[illegible] panveeru.net	
03	Ds John Woodford	jdwoodford@gmail.com	
04	Dr. Md. Nazmul Hoque	01720002707 ddhealthdls@gmail.com	
05	Dr. Faisol Talukdar DLS	01738480582 faisolvet@yahoo.com	
06	Dr. Kohinoor Aktar DLS	01723536319 kohinooraktar.ka@gmail.com	
07	Dr. Kazi Tahmina Karim	01721-226817 kazitahmina22@gmail.com	
08	WALI Uz ZAMAN	01741329642 Wali.Zaman@fao.org	
09	Dr. Md. Rabiqul Islam DLS	01712164961 rislamdls@gmail.com	
10	Dr. Md. Ainul Haque Ex D.G. DLS. NPC UNIDO	ahaquedls@yahoo.com 01796262723	
11	Dr. Md. Mehedi Hossain National Inspection Expert UNIDO	mehedi.dls@gmail.com 01923168861	

Attendance Sheet in the Bi-lateral meeting in between Department of Livestock Services and Dhaka North City Corporation in the office of DG, DLS, Dhaka on 30 May 2023

Sl No.	Name & Designation	Organization	Email/mobile No.	Signature
1	Md Zobaidur Rahman	CHO DNCC	maj.zobaid@gmail.com	
2	Dr. Md. Reajul Huq Director Admin	DLS	jreajul@gmail.com	
3	Dr. Md. Aiful Haque	UNIDO		
4	Dr. James Hanks UNIDO	UNIDO	james.hanks@panaaeru.net.	
5	John Woodford	UNIDO	jdwoodford@gmail.com	
6	Dr. Md. Shahnur Alam,	DLS	01712539622	
7	Dr. A.B.M. Khalidu Zaman	DLS	01716001137	
8	Dr. Md. Mehedi Hossain National Inspection Expert	DLS	01912-316861	
9	Dr. ABM Mustafiur Rahman DPD LDDP	DLS	01711069508	
10	Dr. Md. Mahbubul Alam Bhuiyan. DD (Ad)	DLS	01711-146012	
11	Dr. MD. Shakhawat Azam, DPD	LDDP, DLS	01712005239	
12	Dr Md. Lutfor Rahman, PHO	DNCC	01521209645	

Attendance Sheet in the Bi-lateral meeting in between Department of Livestock Services and Dhaka North City Corporation in the office of DG, DLS, Dhaka on 30 May 2023

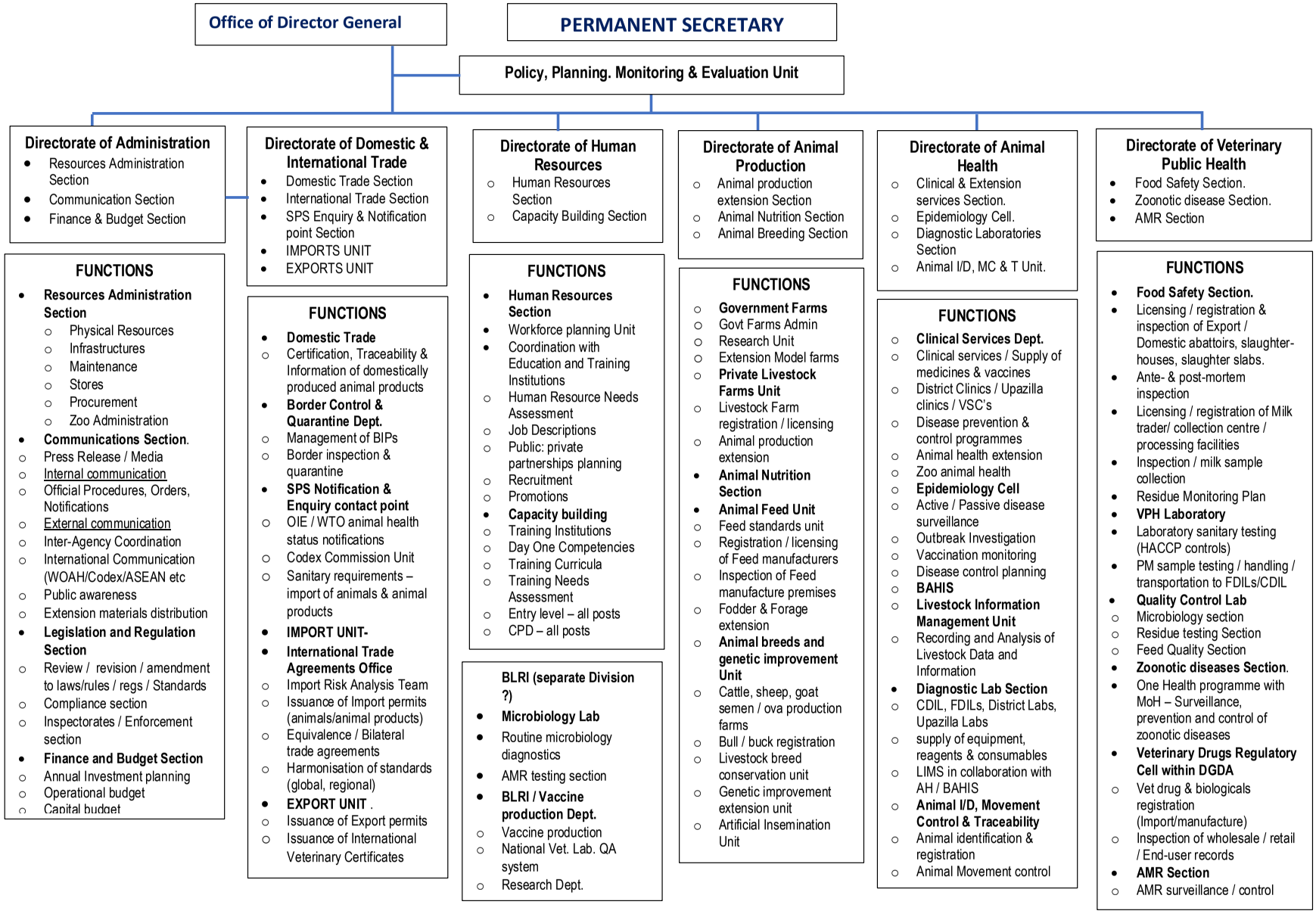
Sl No.	Name & Designation	Organization	Email/mobile No.	Signature
13	DR. Md. Aby Sufian Director	DLS	sufian0@gmail.com	
14	Dr. Sharmin Samad D.D (Risk management)	DLS	akhiarus@gmail.com	
15				

Participants in the meeting of John Woodford and James Hanks with Director Production, DLS on farm data maangement, 29 May 2023

Sl No.	Name	Designation	Organization
	Dr. A B M Khaleduzzaman	Director Production	DLS
	Md Shariful Haque	Depoty Director Farms	DLS
	Dr. Md. Ainul Haque	National Project Coordinator	UNIDO
	Dr. Md. Mehedi Hossain	National Expert	UNIDO
	Dr. John Woodford	International Expert	UNIDO
	Dr. James Hanks	International Expert	UNIDO

ANNEX 4

Proposed Structural Organisation and Functions - Directorate of Livestock Services



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