TERMS OF REFERENCE FOR R&D PROJECT

Food and Agriculture Department

Slaughterhouse and Meat Industry Sectional Committee, FAD 18

1 Title of the Project

Study on Standardization and Validation of Farm-to-Fork Traceability System in Meat Sector.

2 Background

2.1 Traceability is defined as the ability to trace and follow a food, feed, food producing animal or ingredients, through all stages of production and distribution. Meat traceability indicates the ability to trace back the origin of meat up to the level of farm and animal of origin. Complete meat traceability system must enable both forward (tracing the product forward from gate to plate) and backward (tracing back the product to its source i.e. from plate to gate) traceability. Traceability intends to reduce risk and minimize the impact of food borne diseases. Livestock traceability hold potential to bring about a paradigm shift in the animal husbandry sector in the country. It can help address gaps in feeding, breeding, reproduction and quality assurance issues of the sector apart from implementing disease control programs, developmental schemes, livestock insurance and trade. Major steps in meat traceability system are tagging of the animal and collection of information at the farm level, recording the meat quality and certification details at the abattoir level and labelling of the meat packages and provision for tracing back the information using the label information.

2.2 About 40 countries across the world have implemented the livestock traceability system including some developing countries like Brazil and Uruguay. Collection and maintenance of information trail throughout the value chain involve multiple players and layers. Inadequacy at any one level can jeopardize the whole system. While information technology will be the backbone, deploying the adequate number of dedicated manpower and appropriate checks and balances will be the key for the success of the system. Notification of the traceability standards and certification protocols can also help in inculcating the traceability culture in the system.

2.3 Some initiatives have been taken towards implementation of meat traceability by various agencies and research Institutions. Steps envisaged for implementing the meat traceability include strengthening of livestock tagging and data collection, providing online module interface for maintaining traceability information, designing of meat food recall module, development of voluntary traceability standards for livestock and meat traceability, development of techniques for traceability verification, factoring in requirements of different meat animal species and visualizing and factoring-in challenges which may be faced during implementation. Further, after development of the process, national standard on livestock and meat traceability needs to be developed which will help in uniform implementation of livestock meat traceability across the sector. Hence, there is a need to undertake a research project to validate the existing traceability systems which will lead to development of national standards for implementing livestock and meat traceability.

2.4 Considering the importance of the subject and non-availability of National Standards for implementing livestock and meat traceability in India, it has been decided by the Sectional Committee to conduct a detailed study on meat traceability based on the established facts and information including principles, legal requirements, methodologies, procedures, best practices, documentation and evaluation during traceability system development and R&D work under as part of this study.

3 Objective of the Project

To study the requirements, standardization, validation and operational aspects of Farm-to-Fork Traceability System in Meat Sector in order to develop a code of practice for guidance of meat industry.

4 Scope

4.1 Study of existing literature related to published research conducted, international/ regional guidelines & standards related to Farm-to-Fork Traceability System in meat sector and any other relevant national/ international documents to understand the traceability protocols practiced globally and nationally.

4.2 Primary survey among stakeholders involved in different points of Farm-to-Fork value chain to understand the best practices of traceability, existing issues and potential solutions.

4.3 Baseline study of the present livestock and meat production practices in representative locations with special emphasis on practices related to traceability (On-site visits and structured interview)

4.4 Primary survey with research and academic institutions working on Farm-to-Fork Traceability System in meat sector for collecting science-based evidence for understanding the principles, processes and methodology adopted in the development and operationalization of the livestock and meat traceability system in India, including practical challenges and gaps.

4.5 Pilot implementation and validation of the available livestock and meat traceability systems to understand the challenges in implementation of the traceability protocols

4.6 Comparative analysis of existing traditional/modern Farm-to-Fork Traceability System in Meat Sector with the proposed traceability model.

4.7 Collection of information on sustainability and circular economy aspect of Farm-to-Fork Traceability System, if any, through life cycle approach analysis.

4.8 Preparation of a comprehensive report based on research for the development of code of practice on Farm-to-Fork Traceability System in meat sector considering best practices and technological advancements.

5 Research Methodology

5.1 Conduct study of existing literature related to published research conducted, regulatory stipulations international/ regional guidelines & standards related to Farm-to-Fork Traceability System in meat sector and any other relevant national/ international documents

to get broad sense of the livestock and meat model followed in developed countries especially European Union countries.

5.2 Conduct primary survey among stakeholders involved in different points of Farm-to-Fork value chain through focus group discussions (FGD) with at least a total of 10 stakeholders (at least 2 stakeholders representing each point of the value chain) to understand the best practices of traceability in meat sector, existing issues and potential solutions.

5.3 Conduct on-site visits to at least one facility practicing Farm-to-Fork Traceability System in meat sector in each of the six metro cities for the study of effectiveness of the existing traceability system and interact with the stakeholders of sector to get an insight into expectations and practical issues in implementation of the traceability system.

5.4 Conduct on-site visits for primary survey with research and academic institutions working on Farm-to-Fork Traceability System in meat sector for collecting science-based evidence for understanding the principles, processes and methodology adopted in the development and operationalization of the traceability system, including practical challenges and gaps.

5.5 Validate traceability system recommended through Pilot implementation to establish the effectiveness and understand the challenges in implementation of the traceability protocols.

5.6 Conduct comparative analysis of existing traditional/modern Farm-to-Fork Traceability System in Meat Sector with the proposed traceability model through SWOT analysis. (PESTLE analysis may also be done for a more comprehensive analysis)

5.7 Prepare a report comprised of research findings and data collected as per the deliverables of this project.

5.8 The primary survey should focus on the following aspects:

i. *Definition of livestock and meat traceability*
ii. *Review of documents on best practices on livestock and meat traceability around the world*
iii. *Understanding the effectiveness of the animal identification system followed in India*
iv. *Processes and methodology necessary for implementation of the meat traceability in India with special reference to different meat animal species*
v. *Pilot implementation of the available livestock and meat traceability system*
vi. *Infrastructure and the facilities required for implementation of the livestock and meat traceability system*
vii. *Draft standards for livestock and meat traceability suitable for India*
viii. *Performance/Review (Criteria for the evaluation of meat traceability system including (but not limited to) : Assessment of improvements/ advancement over the existing practices, extent of compliance to the existing and relevant regulatory guidelines, authenticity of the information in the traceability system, facilities available and ease of retrieval of information by the consumer, data handling capacity of the information technology platform, number of species to which the system can support)*
ix. *Review during the Site visit of developed small scale slaughterhouses [Platform available for achieving meat traceability, Robustness of the traceability platform and user-friendly features in the system, Ease of use of the traceability system by different stakeholders including farmers and abattoir personnel, Capacity (number of*

animals) the platform can handle, Number of species the platform can handle (large animals, small animals, pig and poultry)]

x. *Compliance to International guidelines - Extent to which the traceability platform complies to relevant Indian and global standards*

xi. *Effectiveness of the meat traceability system (Animal identification system followed, Hardware required for using the traceability system, Issues related to falling of the ear tags, Ease with which the animals can be registered, Ease with which the information can be collected in the slaughterhouse, Ease with which the information can be retrieved by the consumer)*

xii. *Availability of validated meat traceability system available for stakeholders*

xiii. *Enhanced image of the Indian livestock sector in view of the availability of the comprehensive traceability system*

xiv. *Improvement in the quality of meat produced as compared to present meat production system*

xv. *Sustainability aspects addressed through traceability system in meat industry*

xvi. *Challenges faced: All the challenges faced including the implementation of the system in the rural areas, lower educational level of the farmers and challenges in getting accurate information along the value chain need to be recorded*

xvii. *Any other important issue to be shared by the proposer.*

NOTE: The proposer should collect and rely on the primary data to the extent possible and may also use peer reviewed publication data to support the finding, wherever necessary.

6 Deliverables

Detailed project report of the work done, in hard copy and digital formats, as per the scope specified under 4, with the following as appendices:

a) Research findings and data collected through the secondary as well as primary study including focus group discussions.
b) Primary research findings from research and academic institutions working on small scale slaughterhouses as per criteria mentioned under Item 5.8.
c) Sustainability report of the recommended Farm-to-Fork Traceability System in meat sector after life cycle approach analysis.
d) Validation report of recommended Farm-to-Fork Traceability System in meat sector after pilot study.
e) Engineering drawings/layout for various structures/ designs related to recommended Farm-to-Fork Traceability System in meat sector
f) Comparative analysis report of existing traditional/modern Farm-to-Fork Traceability System in Meat Sector with the proposed traceability model.

7 Timeline and Method of Progress Review

7.1 Timeline for the project is 6 months from the date of award of the project.

7.2 Stages of review :

Stage	Timeline
Stage I : Review of the literatures and existing stipulations, identification of key stakeholders in different parts of India, conduct of FGD, visit to metro cities for baseline study	Second Month
Stage II : Primary research findings on rrequirements of Farm-to-Fork Traceability System in meat sector, sustainability analysis, pilot validation of traceability system Submission of interim report to Sectional Committee at the end of third month for review.	Third Month to Fifth Month
Stage III : Draft report submission – Sectional Committee will evaluate the draft report and provide feedback/recommend changes, if required.	End of Fifth Month

At the end of 6th month, project allottee to submit final project report incorporating recommendations/feedback of Committee.

***Note**: The timelines given above are indicative and calculation of time will start from the date of award of sanction letter for the project to the Project leader.*

8 Support from BIS

8.1 Access to Indian and International Standards

8.2 Letters from BIS to concerned stakeholders for support in research project.

9 Nodal Officer

Shri Debasish Mahalik, Scientist-B/ Assistant Director, FAD, BIS may be contacted at fad18@bis.gov.in for any queries on the research project