

## **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 requirements and operational aspects of small-scale slaughterhouses for hygienic meat production.

### **2 Background**

**2.1** India produced about 9.29 million tonnes of meat in the year 2021-22, which was about 5.6% more than the previous year's production. This total meat production was produced by the slaughter of 2.73 million cattle, 12.94 million buffaloes, 69.56 million sheep, 111.32 million goats, 8.88 million pigs, and 3.06 billion poultry. Per capita meat availability is about 6.82 kg per year, against the ICMR recommendation of 11 kg per year. While the demand for meat and meat products is rapidly rising, and production is also rising correspondingly, there are serious concerns about the quality of meat produced in the country. Generally, local bodies in many towns have established service abattoirs for the slaughter of cattle, buffalo, sheep, and goats. However, there are no service slaughterhouses available for the slaughter of poultry, and very few are available for pigs. Generally, such service abattoirs established by the local bodies are not used to their full potential due to various reasons, such as small-scale slaughter practices followed by the stakeholders and the cost involved in transporting animals to the facility and bringing back the slaughtered meat.

**2.2** It has also been felt that the overhead rail-based system, which requires multiple operators in the line, is good for private abattoirs producing large quantities of meat and owned by a single entity. While in the service abattoirs, multiple meat retailers slaughter about 4 to 8 animals and take back their meat. There will be around 100 to 200 such producers who wish to have the meat and byproducts produced from the animals brought by them. Due to this, even where the animals are slaughtered, they are done outside the overhead rail facility established by the local bodies. This calls for finding innovative solutions to address this problem, and it was felt that the small-scale slaughterhouses, which can support the slaughter of 10 to 50 animals per day and have all the facilities for hygienic meat production and safe disposal of the waste produced, can address this problem. Attempts are being made to develop such small-scale slaughterhouses by different research and academic institutions. There is a need to study such facilities, validate their utility, and develop standards for the benefit of the meat industry.

**2.3** Considering the importance of the subject and no National/International Standards are available for small scale slaughterhouses, it has been decided by the Sectional Committee to conduct a detailed study on small scale slaughterhouses based on the established facts and information including principles, legal requirements, methodologies, procedures, best practices, documentation and evaluation during small scale slaughterhouse development and formulate an indigenous standard based on the findings of the research project.

### **3 Objective of the Project**

To study the requirements and operational aspects of small-scale slaughterhouses for hygienic meat production in order to develop a code of practice for guidance of meat industry.

## **4 Scope**

- 4.1** Study of existing literatures related to published research conducted, international/ regional guidelines & standards related to small scale slaughterhouses and any other relevant national/ international documents.
- 4.2** Primary survey among small scale stakeholders involved in meat production
- 4.3** Baselines study of the meat production practices in the service abattoirs in six metro cities through primary survey (visits and structured interview)
- 4.4** Primary survey with research and academic institutions working on small scale slaughterhouses for collecting science-based evidence for understanding the principles, processes and methodology adopted in the development and operationalization of the small-scale slaughterhouses, including practical challenges and gaps.
- 4.5** Validation and demonstration of the effectiveness of the small-scale slaughterhouses in hygienic meat production
- 4.6** Comparative analysis of existing traditional/modern slaughterhouses with the proposed small-scale slaughterhouse through SWOT analysis.
- 4.7** Collection of information on sustainability and circular economy aspect of small-scale slaughterhouse through life cycle approach.
- 4.8** Preparation of a comprehensive report based on research for the development of code of practice on small scale slaughterhouses considering best practices and technological advancements.

## **5 Research Methodology**

- 5.1** Study the existing literatures related to published research conducted, regulatory stipulations international/ regional guidelines & standards related to small-scale slaughterhouses and any other relevant national/ international documents.
- 5.2** Conduct primary survey among small scale stakeholders involved in meat production through focus group discussions (FGD) with at least 5 stakeholders to understand the issues pertaining to hygienic meat production, feasibility of implementation of small-scale slaughterhouse, the probable issues and potential solutions.
- 5.3** Conduct on-site visits to at least six municipal abattoirs established by six metro cities for the study of effectiveness of the service abattoirs in hygienic meat production and disposal of the waste, through survey-based research including standards and practices being used, infrastructure requirements etc.
- 5.4** Conduct on-site visits for primary survey with research and academic institutions working on small scale slaughterhouses for collecting science-based evidence for understanding the principles, processes and methodology adopted in the development and operationalization of

the small-scale slaughterhouses, including practical challenges and gaps. The primary survey should focus on the following aspects:

- i. *Definition of small-scale slaughterhouse*
- ii. *Applicable Regulatory and Statutory requirements*
- iii. *Processes and methodology adopted for production of hygienic meat in India.*
- iv. *Infrastructure required for small scale slaughterhouses.*
- v. *Any other stipulation w.r.t. the small-scale slaughterhouse development*
- vi. *Performance criteria for the evaluation of small-scale slaughterhouses including (but not limited to):*
  - a. *assessment of improvements/ advancement over the existing meat production practices,*
  - b. *Extent of compliance to the existing regulatory guidelines*
  - c. *Ergonomic facilities*
  - d. *Quality of the treated slaughterhouse effluent in the facility*
  - e. *Facilities available for hygienic meat production (including List of facilities provided along with their scope for hygienic meat production; Microbial and physico chemical quality of the meat produced in the small-scale facility;*
  - f. *Number of animals the facility can handle*
  - g. *Number of species the facility can handle (large animals, small animals, pig and poultry)*
- vii. *Review during the Site visit of developed small scale slaughterhouses (Observe the complete operation of small-scale slaughterhouse covering waste management)*
- viii. *Effectiveness of the slaughterhouse waste disposal system*
  - a. *Extent to which the waste is released to the surroundings/ drainage (The pollutant load and Emission characteristics)*
  - b. *Effectiveness of disposal of the solid waste (Time taken for treating the solid waste and Quality and utility of the solid waste produced*
- ix. *Compliance to animal welfare guidelines - Extent to which the facility ensures animal welfare*
- x. *Observed benefits of small scale slaughter house over traditional slaughter houses*
  - a. *Reduction in the extent of pollution caused by the meat production activities*
  - b. *Improvement in the quality of meat produced as compared to present meat production in municipal abattoirs*
  - c. *Sustainability aspects addressed through small scale slaughterhouse in comparison with traditional slaughtering practices*
- xi. *A model for hygienic meat production under small scale system*
- xii. *Challenges faced.*
- xiii. *Any other important issue to be shared by the proposer.*

**5.5** Validate the small-scale slaughter houses designed and developed by different Institutions and identification of the extent to which it can overcome the problems in the hygienic meat production identified during primary and secondary survey.

- 5.6** Conduct comparative analysis of existing traditional/modern slaughterhouses with the proposed small-scale slaughterhouse through SWOT analysis. (PESTLE analysis may also be done for a more comprehensive analysis)
- 5.7** Prepare report comprised of research findings and data collected as per the deliverables of this project.

## 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 **5.4**.
- c) Sustainability report of the small-scale slaughterhouse after life cycle approach analysis.
- d) Validation report of small-scale slaughter houses designed and developed by different Institutions
- e) Engineering drawings/layout for various structures/ designs of small-scale slaughterhouse in the report.
- f) Comparative analysis report of existing traditional/modern slaughterhouses with the proposed small-scale slaughterhouse.

## 7 Timeline and Method of Progress Review

- a) Timeline for the project is 6 months from the date of award of the project.
- b) The different stages of review along with its timeline is given as follows:

Stage	Timeline
<b>Stage I :</b> Review of the literatures and existing stipulations, identification of key stakeholders in different parts of India, conduct of Focused Group Discussions, visit to metro cities for baseline study	Third Month
<b>Stage II :</b> Primary research findings from research and academic institutions working on small scale slaughterhouses, sustainability analysis, validation of existing small scale slaughterhouse model Submission of interim report to Sectional Committee at the end of fourth month for review.	Third Month to Fifth Month
<b>Stage III :</b>	End of Fifth Month

Draft report submission – Sectional Committee will evaluate the draft report and provide feedback/recommend changes, if required.	
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At the end of 6<sup>th</sup> 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](mailto:fad18@bis.gov.in) for any queries on the research project