TERMS OF REFERENCE FOR THE R&D PROJECT

Food and Agriculture Department
Spices, Culinary Herbs and Condiments Sectional Committee, FAD 9

1 Title of the Project

Study of Asafoetida for determining its quality and safety parameters.

2 Background

Asafoetida is the dried latex (gum oleoresin) exuded from living underground rhizome or tap root of several species of Ferula. It is a native species of Iran and Afghanistan. It is also grown in many parts of India. Ferula gum-resins are imported to India, mainly from Iran and Afghanistan. A part of the imported gum resin is re-exported to various countries after some processing and value addition.

It carries a strong, tenacious and sulfurous odor. It is also used as a spice or as a condiment in various cookeries as a flavor like in curries, fresh vegetables, meat, pickles and pulses. It is also claimed to possess various therapeutic and medicinal properties. The main active constituents present in the *Ferula asafetida* plant are resins, gums and essential oils. It is extensively used as a spice for flavouring curries, sauces and pickles etc. and is traded worldwide. There are different types or forms of asafoetida available in market like pure resin and compounded asafoetida, where the resin is ground and mixed with other ingredients and additives to add body to the spice. The gum-resin is also steam distilled to obtain the essential oil known as oil of Asafoetida.

Currently, there are no standards and national or international level to specify the safety and quality parameters for Asafoetida, therefore a need was felt to initiate a study to collect information and data on this as no regulation or standard is published in this field till now. In this backdrop, this project is envisaged to study the different types or grades of Asafoetida available and determine their safety and quality in terms of composition, functional compounds and their benefits.

3 Objective

To collect technical data and scientific evidence with respect to Asafoetida market, types/grades, quality and safety parameters, raw material quality, good packaging and storage practices.

4 Scope

4.1 Thorough review of the available literature on Asafoetida, including but not restricted to the following and provide comparative analysis:

a) International and National guidelines;
b) Regulatory stipulations;

c) Research publications;
d) National import export data;
e) Manufacturing and testing infrastructure in India; and
f) Any other sources.

4.2 Identification of manufacturing base of Asafoetida in India along with categorization of large, medium, small and micro units. Collection of information on its physico-chemical properties, test methods and packaging.

4.3 Determination of testing infrastructure available in India for Asafoetida, characteristics being tested and test methods being followed.

4.4 Undertake industry visits covering both small scale and large scale units (preferable both) to collect information on manufacturing processes, critical control points, raw material checks and parameters, other ingredients and additives, if used, GHP/GMP, in process controls, end product specifications, packaging and storage requirements, waste disposable etc. Further, study the sustainability aspects of the processes followed by industry such as energy conservation, waste management, 4Rs (Reduce, Reuse, Recycle, Recover), carbon footprint etc. Prepare a questionnaire for this purpose.

4.5 Identification of organized user base of Asafoetida and collection of feedback on intended applications, product quality, and performance satisfaction.

4.6 On the basis of literature review and industry visits establish the sampling plan covering a minimum of 30 samples from different manufacturers.

4.7 Testing of collected samples from NABL accredited labs/ labs of ICAR or CSIR Institutes, Labs of MoU partner Institutes, on parameters including but not restricted to physico-chemical characteristics, mycotoxins, contaminants etc.

4.8 Recommend suitable and sustainable packaging materials and storage conditions for Asafoetida.

5. Research Methodology

5.1 Undertake thorough literature review as per **4.1** and prepare summary report including comparative analysis.

5.2 Identify manufacturing base categorized into large, medium, small, and micro. Contact the manufacturers and collect information using a structured questionnaire. Inform them about requirement of industry visit and collection of samples of Asafoetida.

5.3 Identify exporters and importers of Asafoetida. Contact them and collect information using a structured questionnaire as per **4.2, 4.3** and **4.4**. Inform them about requirement of collection of samples.

5.4 Undertake visit to identified manufacturing units (preferably 2 large and 2 small scale), considering criteria set in 4.4 and the following activities shall be carried out and report prepared:

i) Observation on:
   a) Raw material and its properties, other ingredients and additives, if any;
   b) Manufacturing process being utilized;
   c) Additives used, if any
   d) Types or grades of the product being manufactured;
   e) In-process quality control;
   f) Characteristics being tested for the final product and test methods being used;
   g) Marking and labelling; and
   h) Packaging practices.

ii) Discussion with relevant persons of industry regarding:
   a) Quality and safety specifications of raw material and finished product along with the process control parameters;
   b) Sustainability practices being implemented;
   c) Buyers/users of the Asafoetida manufactured at their unit; and
   d) Collection of samples for all types/grades of Asafoetida manufactured in the unit.

5.5 Identify users of Asafoetida. Contact the users and collect information using a structured questionnaire.

5.6 Identify laboratories for testing of Asafoetida. Conduct visits to the laboratories, observe characteristics being tested and test methods being followed. Preferably one government laboratory and one NABL accredited private laboratory/ labs of ICAR or CSIR Institutes, Labs of MoU partner Institutes should be covered in the visits.

5.7 Undertake testing of the collected samples for the characteristics identified using recommended test methods. If the manufacturer has claimed any additional properties, the same should also be tested as per the test method declared by the manufacturer. Test report for each sample shall have complete information on source of the sample (manufacturer/importer), physicochemical parameters, manufacturing process, reported values, and test method used.

5.8 Based on the test reports and information collected through questionnaires, visits and discussion, analyze and establish correlation amongst safety and quality parameters of Asafoetida and its manufacturing process. A project report shall be submitted.

6 Expected Deliverables

6.1 Project report, in hard copy and digital formats, covering all aspects mentioned in scope.

6.2 Questionnaires, discussion and visit reports, test reports, to be appended with the project report

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 for Review:

7.2.1 Stage I: At the end of 1st month, project allottee shall prepare a comprehensive plan identifying the following:

a) Details of literature review carried out and summarized report;
b) Identified manufacturers, exporters, importers, laboratories, and users;
c) Information obtained through questionnaires from the above-mentioned stakeholders and visits to be carried out;
d) Laboratory where testing is to be carried out; and
e) Proposed characteristics and relevant test methods to be used as per clause 4 and associated sample volume and sampling plan.

7.2.2 Stage II – At the end of 5th month, project allottee to submit draft report covering all aspects mentioned in scope including the following information:

a) Details of visits carried out to manufacturing units and laboratories;
b) Details of physico-chemical characteristics of Asafoetida and manufacturing processes being used;
c) Number of samples collected with information related to source of the sample (manufacturer/importer);
d) Test reports and analysis of data collected/generated;

Sectional Committee will evaluate the draft report and provide feedback/recommend changes, if required. 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, wherever required for support in research project.

9 Nodal Officer

Ms. Navita Yadav, Sc. D, FAD, BIS, may be contacted at fad9@bis.gov.in for any queries on the research project.