TECH OFFER

Rapid Screening of Heavy Metals in Food/Feed Powders

KEY INFORMATION

TECHNOLOGY CATEGORY:
Foods - Processes
Foods - Quality & Safety
Infocomm - Big Data, Data Analytics, Data Mining & Data Visualisation
Infocomm - Video/Image Analysis & Computer Vision

TECHNOLOGY READINESS LEVEL (TRL): **TRL4**
COUNTRY: **SINGAPORE**
ID NUMBER: **TO174556**

OVERVIEW

The presence of heavy metals in food or feed powders involves contamination of the food chain and potential harm to public health, as such, rapid detection is a time-critical issue. The uncertainty about food safety caused by the possible presence of heavy metals is of concern to consumers and regulatory authorities and this is typically addressed by increasing the testing frequency of food or feed samples. However, existing testing methods are often time-consuming and require highly skilled laboratory personnel to perform the testing.

This technology employs spectroscopic imaging methods and machine learning techiniques to rapidly detect heavy metals in food or feed samples. The machine learning model can perform a multi-class differentiation of the various heavy metals based on spectroscopic measurements. It is also able to predict the concentration of heavy metals present in food or feed powders using

spectroscopic measurements. Minimal sample preparation is required for this method, allowing for the rapid screening of food or feed powder samples.

The technology owner is interested in collaboration with companies working with food powders, with an interest in heavy metal content within food powders.

TECHNOLOGY FEATURES & SPECIFICATIONS

The features and specifications of this rapid screening technology include:

- Spectroscopic methods to collect unique spectral measurements from samples based on their chemical compositions
- Heavy metal classification between cadmium and lead
- Generation of datasets from spectral measurements to create predictive model to identify heavy metal presence and predict concentration levels
- Predictive model is trained on spectral measurements for increased accuracy
- 95% accuracy in heavy metal detection, with trace concentration detection of as low as 4ppm

This technology is further customisable to include other classes of heavy metals e.g. mercury, and to include other food types e.g. seafood, meats etc.

POTENTIAL APPLICATIONS

Detection and measurement of heavy metal species in food/feed powder products such as:

- Insect powders
- Animal feeds
- Milk powders
- Protein supplement powders
- Plant-based nutritional supplements

UNIQUE VALUE PROPOSITION

- Rapid detection of heavy metal species with minimal sample preparation
- Screening of large amounts of food or feed powder samples within a short period of time
- Model performance and prediction results are comparable to industry accepted method to measure heavy metal content