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Use of infrared microscopy in the detection of particles of animal origin in bone ashes

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Bovine spongiform encephalopathy is a bovine mortal disease linked to contaminated animal feed with infected protein. In Argentina, it is banned to feed bovine with different components of animal origin, except fishmeal and bone ash among others. The specific infrared microscopy method presented in this work delivered qualitative results in terms of the presence or absence of animal particles by applying specific decision rules. The object of this work was to assess the methodology of near infrared microscopy (NIR) for the qualitative determination of the presence of particles of animal origin in matrices of bone ashes. The spectra were collected by an image microscope coupled to a Fourier-transform infrared (FTIR) spectrometer in the reflection mode. Four mappings were done per sample, obtaining 1000 spectra per mapping from 1000 particles on the slide. To find the fragments of animal origin in the samples, a specific software program was developed. It analyzed the spectra and evaluated the presence of bone fragments. From the validation results it could be inferred that 4000 particles should be observed in order to achieve a detection limit of 0.05 g bone fragments/100 g bone ash. Selectivity, intermediate precision and repeatability were also analyzed with satisfactory results. Therefore, the validated method can be easily applied in routine analysis of bone ashes. The potential users of this research product are those control laboratories working in the prevention of bovine spongiform encephalopathy, located in countries where the use of bone ashes in the mineral supplementation of grazing ruminants is permitted.

Biography

Mercedes Bertotto is Food Science and Technology Licentiate and an advanced PhD Student at the University of Buenos Aires. She has worked five years in NIR-chemometrics at Senasa, which is a decentralized body of the national government that reports to the Secretariat of Agriculture, Livestock, Fisheries and Food of the National Ministry of Production of Argentina. She has carried out several developments related to food safety. She has received the John Shenk Travel Award to attend the International Congress of Near Infrared Spectroscopy which was held on June 11th-15th, 2017 in Copenhagen, Denmark.

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