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Traceability of feed materials-classification of DDGS by near infrared microscopy

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Abstract In recent years, the production of ethanol as a fuel additive has increased in consequence the amount of grains used for ethanol production has dramatically increased. Dry-grind is the major process, resulting in distillers dried grains with solubles (DDGS) as a major co-product. Like fuel ethanol, DDGS has quickly become a global commodity. DDGS are the products of alcoholic distilling obtained by drying solid residues of fermented grains to which pot ale syrup or evaporated spent wash was added. There are two main sources of distillers grains, the traditional source from brewers, where beverage ethanol is produced; and the growing source from fuel-ethanol plants. DDGS are characterised by their high nutrient content (proteins, fat), since grain constituents other than starch are concentrated in the distillation residues. However, high compositional variation has been the main problem hindering its use as a feed ingredient. One of the factors that can affect the nutritional composition of the DDGS is the geographical origin of the grains. The influence of climate and seeds type are also crucial for the nutritional content of DDGS, thus the geographical origin of DDGS is an important quality factor and has become more attractive for authentication in recent years. In Europe the official regulations for agricultural production are different from those in China or USA. These differences could also affect the nutrient content of the DDGS in the last step. In this study, corn DDGS samples, from fuel-ethanol plant, from different countries in Europe, and two different provinces in China, have been analysed by Near Infrared Microscopy using NIR mapping, obtained 600 spectra per sample. Near infrared microscopy is a simple and fast technique to authenticate the geographical origin of the DDGS. In this study a model to discriminate samples from Europe and China has been developed.

Keywords DGS;nutritional composition;near infrared microscopy;geographical origin.

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