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### Determination of the geographical origin of DDGS with FT-IR spectroscopy

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Distillers Dried Grains and Solubles (DDGS) are a novel feed material mainly used in feeding of ruminants, poultry, swine and fish in aquaculture. They are a by-product of the alcohol distilling process obtained by drying solid residues of fermented grains (e.g. corn, wheat, barley), to which pot ale syrup or evaporated spent wash was added [1]. Besides the traditional source from breweries, DDGS are nowadays also produced from the fuel-ethanol industry. As a result of the upgrowth of the fuel-ethanol industry, DDGS became a global commodity and play an even more important role in the feed market due to their low price and their high nutrient content (proteins, fat) [2]. DDGS are investigated in the framework of Work Package 2 of the EU research project Quality and Safety of Feeds and Food for Europe (QSAFFE). Particularly DDGS were chosen to be analyzed, because of potential risks associated with the fact that DDGS are only by-products



of ethanol production and the main focus in the production lies on the yield of ethanol. Furthermore, in a crisis situation associated with DDGS, it appears reasonable that DDGS from particular countries are banned for importation into the EU for example. In such a crisis situation the determination of the geographical origin of DDGS could be of interest. The analytical proof of the origin of DDGS – exemplary for feed ingredients – is therefore one of the aims in the QSAFFE project.

In this context DDGS from different countries and derived from different botanical raw materials have been analyzed by ATR(attenuated total reflection)/FT-IR spectroscopy in their solid state. As ATR/FT-IR spectroscopy of solids is dependent on contact of the sample to the internal reflection element (diamond), the DDGS have been homogeneously milled to fine powders prior to spectroscopy. Applying chemometrics to the spectral data in a second step, clear discrimination of samples with regard to their geographical origin could be shown. PCA (Principal component analysis) has been performed to FT-IR spectra of over 40 DDGS samples derived from corn and revealed separation of samples from USA and China. In this work we present our first results which were achieved by this approach.

[1] Commission Regulation (EU) No 575/2011 of 16 June 2011 on the catalogue of feed materials, Official Journal of the European Union L159/65, 2011.

[2] Liu K. Chemical Composition of Distillers Grains, a Review. J Agric. Food Chem. 2011, 59, 1508-1526.

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