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Classification of dried distillers grains (DDGS) for animal feed by geographical origin using proton transfer reaction mass spectrometry (PTR-MS)

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Abstract Emerging low cost animal feed stock, originating from the bioprocessing and food production is increasing on a global scale. In particular, distillers dried grains with solubles (DDGS) obtained from alcoholic distillation by drying solid residues of fermented cereal grains with the addition of pot ale syrup or evaporated spent wash have been utilised as animal feed. Despite the original source, from alcoholic distillation, DDGs are now readily available from the emerging global bioethanol and fuel industry. Subsequently, the authentication and traceability of alternative animal feed sources is of high priority for ensuring animal welfare, safety and quality.

From this perspective considerable attention has focused on verification of feed authenticity using analytical finger-printing techniques to distinguish geographical and botanical origin, method of production (processing, organic). Nevertheless a rapid non-destructive technique capable of distinguishing the geographical origin of DDGS is limited.

In this study and as part of the EU research project "Quality and Safety of Feeds and Food for Europe an attempt was made to classify the geographical origin of DDGS obtained from Germany, China, and the USA using volatile finger-prints assessed by proton transfer reaction mass spectrometry (PTR-MS). Chemometric analysis of volatile finger-prints allowed for promising classifications of DDGS by country of origin and enabled visual representation of the data. This rapid non-destructive technique could be adapted for routine verification of DDGS geographical origin.