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A preliminary study on tracing origin of DDGS by near infrared reflectance spectroscopy (NIRS)

X.F. Zhou^{1,2}, Z.L. Yang^{1,2}, S. A. Haughey³, L.J. Han^{1,2}, C. T. Elliott³

¹ College of Engineering, China Agricultural University, Beijing 100083, China

² State Key Laboratory of Animal Nutrition, Beijing 100091, China

³ Institute of Agri-food and Land Use, Queen's University Belfast, Northern Ireland

E-mail: hanlj@cau.edu.cn

Abstract Distillers Dried Grains with Solubles (DDGS) have high nutritional content and many studies have shown that using it as protein feed ingredient not only increases animal productivity but also saves cost. As a byproduct of fermentation industry, the safety and quality of DDGS was a low priority. This study investigated the feasibility of tracing the geographical origin of DDGS. Forty DDGS samples were collected; 39 from corn origin and 1 from wheat-corn origin were collected. The corn DDGS samples included 31 from bio fuel production, collected from two provinces of China, and 8 DDGS from alcoholic beverage production collected from the USA. Samples were analyzed on a PerkinElmer Spectrum400 instrument by China Agricultural University and on a Thermo Antaris II NIR instrument by Queen's University Belfast. Near infrared reflectance spectroscopy combined with different chemometric methods (PCA-X, OPLS/O2PLS-DA, SIMCA and PLS-DA) were used to study the geographic traceability of DDGS samples in two laboratories (China Agricultural University and Queen's University Belfast). Results showed that discrimination of DDGS samples from different geographic origin were possible, even though the DDGS were produced by different process route (bio fuel production vs. alcoholic beverage production) or different botanical origin (corn origin vs. corn-wheat-origin). Results from two laboratories achieved similar results with different instruments and chemometric packages. Although preliminary results are exciting, the representative of samples is limited. Further research is needed to validate the effectiveness of the method using many more samples.



Keywords feed;DDGS;NIRS;traceability

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