

Abstract 5:

Producing resilient pellets in circular agriculture

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The physical quality of feed pellets is essential for the handling properties and efficient use of feeds. To produce high quality pellets, modern pellet manufacturing processes rely heavily on the physicochemical properties of starch-rich materials such as cereals. Through addition of moisture and heat, the deformability of these materials is increased, which enhances inter-particle contacts during compaction and consequently yields stronger pellets. It is expected, however that cereals in livestock feed are to be increasingly substituted by co-products from food- and biofuel processes, as part of the transition towards a more circular agriculture. These co-products are more fibrous in nature, with low- or negligible levels of starch and, therefore, expected to be less deformable. Ergo, the substitution of cereals with co-products is expected to result in a reduced pellet quality. This project aims to develop knowledge on the inclusion of fibre-rich co-products in pelleted animal feed without compromising physical quality. Rheological-, phase transition- and viscoelastic-properties of fibrous co-products are determined under processing conditions. In addition, fibrous co-products are included in feed mashes and pelleted on pilot and industrial scale, to determine the relation between material characteristics, pellet quality and process conditions. Particle size and addition of fat impacts inter-particle binding and are therefore investigated in subsequent studies. Obtained insights are integrated into an overarching framework that is actively disseminated to the sector via the development of new teaching material. Thus, the results allow for the increased incorporation of fibrous co-products in resilient livestock feed pellets, contributing a more circular agriculture.