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New approaches for safe use of food by-products and biowaste in the feed production chain

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Reuse or recycling are some of the essential retention options recognised in circular economy approaches. An attempt to embed the linear feed and food production chain in the general concepts of circular economy revealed common elements as well as principle different issues between feed/food and non-food strategies. Regrading of former food products as feed ingredients is an important, if not essential, development in reducing large volumes of biowaste, and to achieve a footprint as small as possible for animal husbandry. An analysis of legal requirements provides opportunities as well as legal restrictions for reusing former food as feed. The specific issues include feed and food safety, possible adverse effects of strict loop closing, the frame of the biological background and legal requirements. Dedicated concepts are developed for reaching solutions.

Feed and food safety covers four domains, including biology (e.g. prions, viruses), chemical compounds (e.g. pesticides, antibiotics, heavy metals, dioxins), microbiology (pathogenic bacteria and viruses, zoonoses), and physics, (e.g. microparticles, packaging material). Physical hazards should receive extensive attention for the identification and characterisation of physical hazards.

Legislation should allow and encourage innovations and technologies for regrading of by-products of the feed and food production chain. The WISE principle (Witfull, Indicative, Societal supportive, Enforceable) for legal developments should be used as framework for optimising the relationship between the legal framework, assurance of feed safety, and support of necessary innovations.

Examples with different backgrounds will be presented and discussed. Technological innovations for upgrading biowaste and former food products will result in suitable feed ingredients. The evolutionary distance between animals and their biological needs should be part of the design of strategies and of the legislative process. The requirement of circularity for production and usage loops should be applied diversely. The approach of food webs as found in nature should be explored for feed and food production. Genetic distance among species in loops or webs can be used as guidance for route diversification.

Keywords: circular agronomy, feed, animal husbandry, evolution, food webs