

Models of research and implementation for sustainability in animal nutrition

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Switzerland, like many other countries around the world, has a great diversity of livestock farming systems (LFS). This is mainly due to pedo-climatic and environmental conditions, linked to the territory but also to social and historical elements. Regardless of the LFS, the challenges faced by the livestock sectors are comparable. These can be summarized in six main areas: maximizing the resource use efficiency, improving animal health and welfare, reducing the food/feed competition, minimizing emissions and losses, promoting circularity of agro-ecosystems and enhancing positive externalities.

The Swiss model envisages a site-adapted arable and livestock production system, in which arable land is used primarily for food production, while non-arable land is used for forage production. The forages are then be converted into food of high nutritional value by the ruminants, which under these conditions contribute to the provision of ecosystem services and to the livelihoods of farmers in rural areas.

However, it would be a mistake not to integrate grass/legume leys in crop rotations, on arable land, since in addition to being a source of very high-quality forage, they provide essential benefits maintaining soil structure, preventing soil erosion, controlling weeds, reducing nutrient losses and storing carbon.

While grass-based production adequately supports ruminants, although not entirely, it will be insufficient for monogastrics like swine and poultry. To meet their dietary requirements while reducing feed-food competition, a paradigm shift is necessary whereby their energy and nutrient requirements are partly or fully met by alternative feed sources such as by-products, former food products, or algae. Ultimately, this approach would further close the nutrient cycle. A sustainable LFS should integrate regionally adapted arable and livestock production, combining grassland for ruminants with circular feed sources for monogastrics.