



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

Towards Ecological Sustainability in (sub)tropical Animal Nutrition - Life Cycle Assessment as a Tool to Identify Environmentally Sound Feeding Options

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Abstract

The increasing demand for animal products in developing countries presents opportunities, but also challenges to the socio-economic and environmental sustainability of animal production. Research concerning (sub)tropical animal nutrition has focused mainly on the optimisation of the nutritional properties of animal diets. However, especially in (sub)tropical regions, sustainability issues, such as soil conservation and biodiversity, should be considered thoroughly in order to maintain the alimentary basis of the local population in the long run. Life Cycle Assessment (LCA) is the internationally most accepted method to assess potential impacts to human health and the environment associated with a product, process or activity by evaluating resource consumption and emissions. In temperate zones, LCA has been applied to assess the environmental impact of different animal production systems, e.g. comparison of conventional and organic dairy systems or different animal diets. In (sub)tropical countries, there does not exist any LCA study concerning animal production. LCA studies in temperate regions and related LCA studies in (sub)tropical areas, however, provide a good basis for the application of LCA in (sub)tropical livestock nutrition, e.g. LCA studies on soy production in Brasil, which are available because soy bean meal is a European animal feed ingredient. In addition, LCA studies on bioethanol production in Mediterranean and tropical regions can provide useful data concerning the environmental burdens of crop cultivation, e.g. wheat and corn. These crops or their by-products are important supplements for livestock in (sub)tropical areas. Furthermore, LCA studies concerning irrigation-based fruit production can provide important basic information on the application of LCA in (sub)tropical environments. In order to be able to account for ecosystem services of agricultural and grazing land and to differentiate between extensive and intensive land use, consensus on how to include biodiversity in LCA is essential. To be able to identify environmentally sound animal diets in (sub)tropical regions, we therefore have to i) give an overview on existing publications concerning the use of LCA in (sub)tropical countries, ii) point out which factors have to be taken into account specifically when applying LCA in (sub)tropical animal nutrition, and iii) highlight the importance of including biodiversity in LCA studies.

Keywords: Food chain, integrated production, nature conservation, sustainable land use, water use efficiency

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