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Recycling of livestock manure in a whole-farm perspective

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Abstract

Intensification increases the environmental impact of livestock production systems. Efforts to recycle nutrients in livestock manure for crop production will effectively reduce several pollution problems, although general solutions are difficult to devise in view of the diversity in production systems, management strategies and legislation between countries and regions. This paper argues that a whole-farm perspective taking side-effects and on-farm interactions into account is needed to determine the cost-effectiveness of strategies to mitigate pollution from livestock manure management. Animal feeding plays a key role in the control of nutrient flows on livestock farms, since the diet affects the composition of excreta. There is a great potential for manipulating manure composition by diet manipulations. Manure is a significant source of heavy metals in soil, and in Europe the permitted levels of Cu and Zn in livestock diets have been lowered to reduce their environmental impact. A variety of environmental technologies are being developed for treatment of manure, many of which have a significant potential for reducing nutrient losses. Internationally agreed and enforced

significant potential for reducing nutrient losses. Internationally agreed and enforced regulations that link pollution control with the adoption of best available technologies could provide the demand that is needed to drive research and development. In the past, policy-makers have typically focused on individual environmental problems. It is essential, however, that the efforts to close nutrient cycles on the farm are accompanied by a corresponding reduction in total inputs, otherwise losses after field application will increase. Integrated assessment tools are needed which can evaluate all internal flows of nutrients, imports and exports, energy use, hygienic risks and contaminants, as well as costs, at the farm-scale and beyond. It is important to consider pollution control strategies for a farm in the framework of local and regional pollution control planning.



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Keywords

Intensification; Feeding strategies; Emissions; Contaminants; Pathogen control; Manure treatment; Legislation

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