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Book of Abstracts

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Objectives of the Meeting

Agriculture and the food sector are responsible for a large share of the environmental impacts and resource use caused by human activity. For certain environmental issues such as the conservation of biodiversity, agriculture is the key driver. For about 15 years now, the Life Cycle Assessment (LCA) method has successfully been used to analyse agricultural production systems and food chains. A variety of inventories, tools and methodical approaches for analysing different food chains have also been developed over this period.

The objectives of the meeting are:

- to show recent developments in terms of methodology, approaches, databases and tools;
- to present applications of the LCA methodology in new case studies or case studies showing new aspects in various food chains;
- to present successful examples of communication of LCA results to stakeholders and their use in decision making.

We are pleased to welcome you to the conference "LCA in the Agri-Food Sector 2008", the sixth conference in a series that started in 1996.

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Life-cycle energy and greenhouse gas analysis of a large-scale vertically integrated organic dairy in the U.S.

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Agriculture is responsible for nearly seven percent of the total U.S. greenhouse gas emissions; over half of this is from livestock (USDA, 2004). The U.S. organic food sector has consistently grown between 15-20% annually over the past decade. Organic dairy in particular has grown by upwards of 25% in recent years (OTA, 2007). While such growth is in general lauded as an environmental success, there is a great need for systemic benchmarking of the environmental impact of organic agriculture in the U.S. in order to provide guidance for continual improvements in the sustainability of this rapidly growing sector.

This study is the first life cycle assessment (LCA) of a large-scale, vertically integrated organic dairy in the U.S. Aurora Organic Dairy (AOD) is a leading U.S. provider of private-label organic milk and butter, managing over 12,000 milking cows and processing over 84 million liters (22 million gallons) of milk annually. Data collected at AOD farms and processing facilities were used to build a LCA model for benchmarking the greenhouse gas (GHG) emissions and energy consumption across the entire milk production system, from organic feed production to transport of packaged milk. The analysis covers all aspects of milk production (see figure), from growing organic feed, to delivering packaged milk to customers (retail outlets). Overall GHG emissions were 1.7 kg CO_2 eq. per liter of packaged liquid milk. The major GHG contributors include enteric fermentation (28% of total) and feed production (23% of total). The energy consumption for the entire system was 17.3 MJ per liter of packaged liquid milk. Potential strategies for reducing the system GHG emissions are discussed. This energy and greenhouse gas analysis is phase one of a two phase project, to be followed by a thorough sustainability assessment including additional ecological indicators, as well as social and economic indicators.

References

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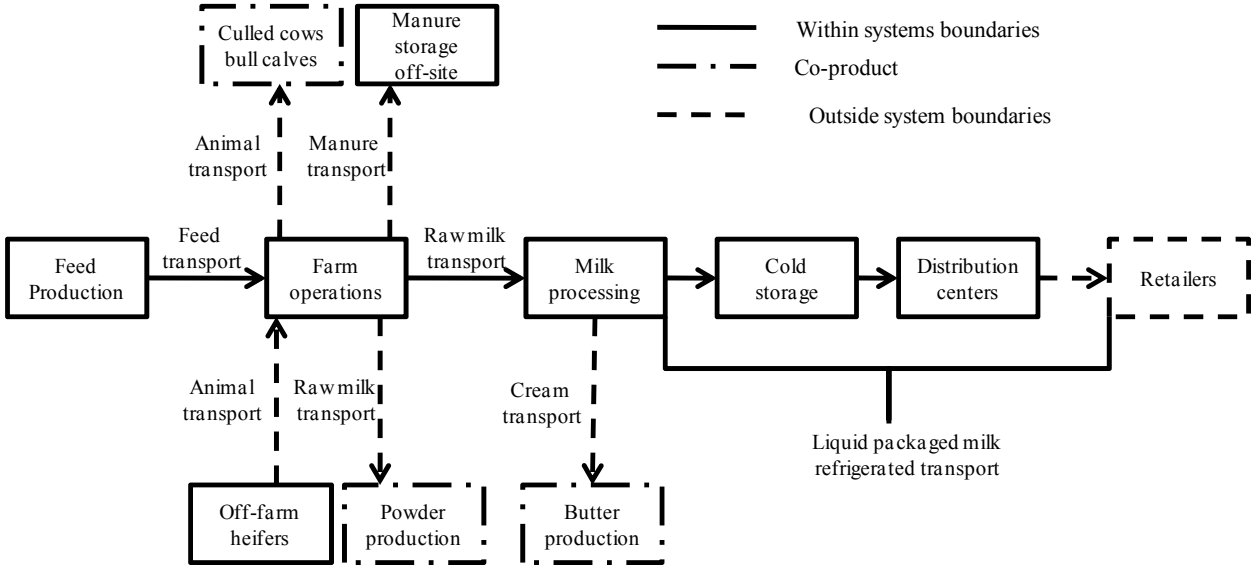

Figure 1: Process flow for organic milk production. Arrows represent physical movement of materials and boxes represent different phases of milk production. Processes accounted for in this study are shown in solid lines while processes not accounted for are shown in dashed lines. Processes (co-products) with upstream burdens allocated away from the liquid milk system are shown in dashed-dot lines.