

Pornpamol Pattamanont 2011: Losses, Resource Utilization and Carbon Footprint of Pasteurized Fresh Milk Produced at Kasetsart University Dairy Center. Master of Science (Agriculture), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Pravee Vijchulata, Ph.D. 100 pages.

The objective of this study was to study losses, resource utilization and evaluate carbon footprint of pasteurized fresh milk 200 milliliters in plastic pouch produced by Kasetsart University Dairy Center, which is a medium size processing factory in central Thailand. System boundary of carbon footprint evaluation pattern is cradle (raw material production) to gate (final manufacturing at factory) as a Business-to-Business (B2B). The study was separated in 3 parts. Part 1: Evaluation of pasteurized fresh milk mass balance and productive efficiency, the data was randomly collected for 30 production days. It was found that there are 5 traits of milk losses; however, only 4 traits are responsible for greenhouse gas emission these include losses during pre-pasteurization, pasteurization, after pasteurization and during packaging and leakage of milk pouches after packaging. The percentage of losses are 0.11, 0.23, 0.45 and 0.36, respectively. Part 2: The study of resources used for pasteurized fresh milk production consisted of raw milk, electricity, diesel, tap water, film packaging, cleaning agent and sanitary agent. The data was collected for 238 production days. These resources used was for the calculation of greenhouse gas emission. Part 3: Evaluation of greenhouse gas emission from cradle to gate of pasteurized fresh milk product. The evaluation of greenhouse gas emission from pasteurized fresh milk process was based on primary data from part 1 and 2. The evaluation of greenhouse gas emission from production and transportation of raw materials was based on secondary data from Food and Agriculture Organization of the United Nations (FAO), Technical Committee of Product Carbon Footprint and Intergovernmental Panel on Climate Change (IPCC). The results showed that total carbon footprint, from cradle to gate, of 200 milliliters pasteurized fresh milk was 0.32 kilogram carbon dioxide equivalent (kg CO₂e). Greenhouse gas emission of raw material production, raw material transportation and pasteurized fresh milk process were 0.25, 0.01 and 0.07 kg CO₂e, respectively. It is evident that most important contributing factor to greenhouse gas emission in pasteurized fresh milk processing from this factory is electricity which is responsible for 61.92 percent of the total emission. On the other hand, milk losses represented only 1.20 percent. As far as milk losses are concerned, leakage of milk pouches after packaging is the most important factor contributing to greenhouse gas emission.

Student's signature

Thesis Advisor's signature