

ENVIRONMENTAL FOOTPRINTING

PRIMARY PRODUCTION FOOTPRINTING INITIATIVES



The market is changing and today more and more people are looking for eco-friendly products. The agri-food industry is a major sector where this shift is occurring, with consumers becoming more selective about how their food is produced. Retailers are therefore requiring more information from their suppliers regarding their production practices. Although some primary producers are taking it upon themselves to analyze their own production processes and make changes to reduce negative environmental impact, other organizations such as government, NGOs and producer associations are also assisting in conducting this research.

For example, Alberta Agriculture and Rural Development (ARD) is conducting a project to determine the Environmental Footprint (EF) of four major Alberta agri-food commodities (canola, chicken, egg and potato) using a Life Cycle Assessment (LCA) approach. For more information on this project, see ARD's "Agri-Food Footprinting in Alberta" information bulletin. In addition, a few examples of North American research initiated by primary producer associations are described below. These groups are helping farmers implement footprinting tools in order to better understand their production processes and implement changes that increase both efficiency and sustainability.

Dairy Farmers of Canada (DFC)

In response to changing consumer expectations and with a vision for sustainable agriculture, Dairy Farmers of Canadaⁱ (DFC) has undertaken a project to determine the environmental and socio-economic impact of Canadian milk production. The study, commissioned in 2010 and funded by Agriculture and Agri-Food Canada (AAFC) and the Canadian Dairy Commission under the Dairy Research Cluster Initiative, makes use of LCA, a comprehensive tool that accounts for all of the inputs (energy, raw materials, etc.) and emissions (greenhouse gases, etc.) used in the production, use and disposal of a product. This methodology is being used to determine the production impact from one kilogram of milk on indicators such as greenhouse gas (GHG) emissions, water stress and cultural heritage. DFC is following the guidelines of the International Dairy Federation for its study and has adapted them to include a Social Life Cycle Assessment as well. This Canadian approach is the first in the world to incorporate both environmental and socio-economic analyses into a milk production LCA.

DFC's objectives are to decrease GHG emissions from Canadian dairy farms, to advocate sustainable natural resource management and to develop a baseline for the socio-economic performance of dairy farms in Canada. With the LCA results, DFC's short term strategy is to communicate the snapshot perspective of environmental impact and production opportunities to milk producers and consumers across the country. The production opportunities will be determined by the identification of "hotspots" (areas of production that have the most negative impact) and will allow for future policy development. On-farm management will be addressed by using the LCA results to determine cost-effective production decisions that also allow for impact mitigation. In the long-term, DFC plans to use the LCA results to develop an on-farm calculator/benchmarking tool so that individual farms may determine specific problem areas and implement Beneficial Management Practices (BMPs). DFC also hopes that the results of this research will contribute to improving LCA methodology and accuracy.



The Innovation Center for US Dairy

The United States dairy industry has undergone a LCA to determine the carbon footprint associated with the production of one gallon of fluid milk. This study, which followed the life cycle of a gallon of milk from cradle-to-grave, was initiated by the Innovation Center for U.S. Dairyⁱⁱ, which commissioned the Applied Sustainability Center at the University of Arkansas to conduct the LCA.

In 2009, the Innovation Center for U.S. Dairy voluntarily supported a goal of 25 per cent reduction in GHG emissions from fluid milk production by 2020. Part of the motivation to undertake the carbon footprint study was to have a benchmark to compare to when determining the industry's progress towards meeting this goal. Another factor that influenced the adoption of the study was the ever changing marketplace. Consumer behavior is demonstrating a shift towards environmentally sustainable goods and services, and the agri-food industry is no exception. The U.S. dairy industry is responding to these market signals and, through this LCA, is hoping to increase the sustainability of milk production by measuring and improving its EF.

The results of this study concluded that the aggregated total of fluid milk consumed in the United States leads to approximately 17.6 pounds of carbon dioxide equivalent (CO₂e) emissions per gallon. This study helped confirm that the total U.S. dairy GHG emissions represent about two per cent of total U.S. GHG emissions, an amount much lower than what has previously been reported. The results also determined that farm management practices are a significant driver of the carbon footprint associated with farms, plants and transportation fleets, as opposed to other factors such as farm size. Specific areas of farm management are highlighted in the final report and will allow primary producers to implement BMPs in order to better serve both the environment and their customers.

The U.S. dairy industry LCA, which follows International Standard Organization (ISO) protocol, only addresses GHG emissions. Full scale ISO LCAs must include a variety of environmental indicators; therefore, the Innovation Center for U.S. Dairy plans to expand this study and conduct a broader EF study in the future. Additionally, the results of the LCA is allowing for the development of the Dairy Plant Smart tool, a web-based decision support tool that allows producers to measure and thereby improve their GHG emissions, as well as compare their farm to others regionally or nationally.

Pulse Canada

In association with the Cool Farm Institute and Heinz UK, Pulse Canadaⁱⁱⁱ has undergone a pilot carbon footprinting study of navy bean production in Canada. To perform the carbon footprint, this study made use

of the Cool Farm Tool (CFT), a GHG measurement tool developed by the Cool Farm Institute. Documentation regarding environmental impact of production is becoming required more often and so suppliers are looking at different tools to determine these impact. The motivation behind this project stems from increasing retailer expectations for carbon footprint labels on their goods. However, Pulse Canada wants to do more than simply generate an aggregate number; the goal for this project is to analyze the process of navy bean production and understand more about the science behind GHG measurement in agriculture.

Pulse Canada is sharing the information from this study with the bean industry to encourage further GHG reduction. It also wants to share its carbon footprinting experience with other Canadian crop groups to improve the methodology in Canada. A major aspect to this pilot study includes a comparison between GHG measurement tools. The results of this research using the CFT will be compared to those using software known as HOLOS Farm GHG Calculator, a carbon footprint tool developed by AAFC. The data was also compared to similar Canadian carbon footprint studies to help verify the results.

The project studied 34 navy bean producers from Ontario and Manitoba with varying size and yield. The resulting dataset of this study must comply with Publically Assured Standards (PAS) 2050 guidelines put forth by the British Standards Institution (BSI). These guidelines are the major standard in the UK for life cycle GHG emissions of products.

A baseline scenario was created from the project's data and compared to seven reduction scenarios involving different farm management practices such as reduced tillage and intensive pest management. The results highlighted which scenarios were most effective at reducing GHG emissions. Each farmer will be provided with an individual report comparing their farm to the others in the study and indicating which BMPs would be most effective for them. The results will allow for Canadian GHG measurement tools to improve and become more commonly used by primary producers who want to reduce their carbon footprint.

The initiatives taken by these producer associations indicate the significance of sustainability in primary production. The desire for sustainable production is being driven by both the demand from retailers wanting more eco-friendly products, as well as demand from producers wanting to increase production efficiency. With organizations conducting projects like those described above, producers will gain useful information on how to better manage their production systems. What's more is that these projects will benefit producers on a larger scale than if they were to undertake the

initiative themselves. With primary producers working together on decreasing the negative environmental impact of food production, the agri-food industry will continue to increase the amount of sustainable products in the marketplace.

ⁱwww.dairyfarmers.ca/

ⁱⁱwww.usdairy.com/Pages/Home.aspx

ⁱⁱⁱwww.pulsecanada.com/

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