

# BIG Changes Coming

## for an Environmentally Sustainable Food System

My 85-year old mother is astounded by the transformation from immigrant pioneers to the large scale, high-tech farms of today. Even more change is coming with LCA, an environmental impact tool that will have a lot to say about how we farm and how consumers purchase their food.

By *Al Scholz*

**The** truth is, the scope and scale of change by 2050 will make my mother's life experience seem incidental. In addition to the staggering challenge of doubling global food production is the environmental imperative for "sustainable food systems" and to reduce the carbon-based inputs to agriculture. It's a double whammy—how to do more with less.

Farming has to adapt. Regardless of what those involved in agriculture think, consumers are demanding it. The climate is changing—be it from greenhouse gases or long-term climate cycles—it will impact daily life and the way businesses are run.

Farmers, however, do deserve credit for completing environmental farm plans and taking action to reduce their farm's carbon footprint; yet more will be demanded, and soon.

The emergence of "buy local" and "food miles" within the context of a short growing season adds another layer of complexity, particularly in Canada which is amongst the leading nations for agricultural exports. Is our agricultural system "sustainable", and if so, how do we know and how can we measure it?



This is where the change factor comes in. There is a new environmental impact tool showing up across the global food chain. It is called “life cycle assessment” or LCA. It will provide direction on the way we farm, how food is processed and transported and how consumers make their food purchase decisions.

Best of all, this LCA tool can provide opportunities for Canada’s farms to gain measurable premiums in the market place, if the right adjustments and adaptations are followed.

Developed by industrial engineers in the 1960s and 70s, LCA is a method to systematically break down any manufactured item into its components and the processes that went into making it. LCA then measures with precision the total environmental impact—from the beginning of production all the way through to final disposal, a cradle-to-grave product inventory.

Today, LCA can convert every food product into a single number that reflects everything including the carbon footprint of tractors, equipment, production inputs, chemicals, livestock feed, treatment of workers—the works. This will be the new math used in business and farming across the globe.

LCA is rapidly being adopted by agriculture and food production systems. Leading firms are already using LCA. For example, a California research group known as GoodGuide ([www.goodguide.com](http://www.goodguide.com)) has developed software that allows shoppers to point their cell phone camera at the bar code of a consumer product. The picture is sent to the GoodGuide server and within seconds a three-bar rating is sent back of that very item. It reveals in red, yellow or green the relative impact of that product’s life-cycle in terms of environment, health and society.

Walmart took a leadership position in July 2009 when it launched the worldwide “sustainable product index” (see <http://walmartstores.com/download/3879.pdf>). The purpose is to measure the environmental sustainability of all products by making its suppliers subscribe to the system. The sustainable product index is managed independently by the Sustainability Consortium, co-managed

by the Arizona State University and the University of Arkansas.

On March 2, 2010, Safeway was the first major U.S. chain to join the Sustainability Consortium as a founding member—with the goal of applying LCA systems to all food products<sup>1</sup>. In Canada, Galen Weston, the young CEO of Loblaw’s has ads across Canada focusing on buying more from Canadian farmers, but only if the carbon “food print” is lower than alternative suppliers. (Search YouTube for “President’s Choice – Grown Close to Home”).

This level of “environmental transparency” will transform the food production system in favour of products with lower carbon footprints. Why? Because it will be very easy for consumers to see (and to reach for) more environmentally friendly products.

LCA is not always straightforward. Sometimes it gives surprising results. A classic LCA study, published in *Science* in 1991<sup>2</sup>, was an analysis of the merits of paper versus plastic cups. The study showed that a single paper cup consumes 33 grams of wood (four packs of toothpicks) while a Styrofoam cup uses only about four grams of fuel oil or natural gas (the equivalent of half a small lighter). Both require a handful of chemicals but in the end the paper cup consumed 36 times more electricity and produced 580 times more wastewater.

Producing a paper cup had a much higher environmental cost in terms of production and disposal than plastic cups. While this was a surprise to many, it underscores the importance of accurate calculations to determine friendly from damaging when it comes to environmental impact. Watch for Tim Horton’s version of roll-up-the-rim on plastic cups.

As the LCA system of full disclosure becomes more widely used, Canada’s farmers can expect to be penalized in the marketplace if they leave too big a carbon footprint by using too many petroleum-based inputs.

On the other hand, farmers can expect to be rewarded by the market for production systems that are able to cycle and recycle energy and nutrients and reduce their carbon footprint, such as farms with a mix of livestock and crops that serve local markets and local processors.

But what about Canada’s export based agricultural economy? While LCA is clearly not a simple calculation, it is getting easier to use with the recent emergence of several user-friendly software programs. To date there have been only a few applications for agriculture and food.

A recent study by scientists from Lincoln University in Christchurch, New Zealand reported that lamb shipped to Britain from New Zealand has a carbon footprint just 25 per cent that of British lamb<sup>3</sup>. This is, in part, because most of the electricity in New Zealand comes from renewable sources and their climate, with ample rain and sun, means that New Zealand pastures require less fertilizer than in cloudy Britain. Although it requires shipping across the globe, the transportation footprint (the food miles) of containers from New Zealand turned out to be less than the local trucking in UK.

The lesson is that no one should assume that local production is always more environmentally benign or, conversely, that imports always have a high environmental cost. Global trade will continue to be important in the future but the key competitive factors will increasingly move from price and quality to include environmental impact.

What does LCA hold for the family farm business model in the next ten years? Farming will become much more intensive and focus on ways to reduce the use of inputs connected to fossil fuels. As an export-based agriculture, only processed products will likely stand the carbon footprint test of long transportation distances in the future.

This may mean a marked reduction in the environmental viability of exporting raw commodities—not to mention their economic viability. The alternative is a shift to a combination of more domestic consumption (i.e. import substitution), increased livestock production and exporting products with higher value-added.

This livestock trend runs counter to current market signals, which includes criticism of animal production by environmental activists and the consolidation of slaughter facilities. However, the newly established


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national beef traceability system will give Canadian farmers and ranchers a strategic advantage in the future. It's an example of clear leadership and direct action to anticipate future market requirements.

There's still export potential for specialized cereals, oilseeds and pulse varieties, especially in boutique markets for these types of "quality-plus" commodities with specialized features. But they still must meet the "food print" environmental test for consumer acceptance and we won't really know much on this impact until more LCA analysis has been done.

There are opportunities on the horizon for Canadian agriculture and family farms, especially those that can adapt to the sweeping changes that technology allows and consumers now demand. It will be an interesting, fast-paced ride and by the year 2020, our agriculture will look (indeed it will have to look) very different.

My mother intends to live to 100 years and has the genes to do it. She figures that no generation has seen as much change as she has in her lifetime but the reality is that all she has experienced (and more) will easily be condensed into the next ten years. 

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### REFERENCES

1. See <http://newswire.uark.edu/Article.aspx?ID=13649>
2. See <http://www.sciencemag.org/cgi/reprint/251/4993/504.pdf>
3. See [http://www.jborganics.co.nz/saunders\\_report.pdf](http://www.jborganics.co.nz/saunders_report.pdf)

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- Improving the quality of Canada's apples
- Developing a heart healthy alternative to artery-clogging trans fats
- Making a natural product that enhances kidney function and lowers high blood pressure
- Creating a "salty" taste without using much salt
- Monitoring a large group of Canadian consumers to accurately track changes in Canadian eating habits and measure consumer response to issues like food scares.



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