Alberta’s over 150 registered egg producers care for nearly 2 million hens that produce nearly 49 million dozen eggs each year. Alberta layers produce well over 25,000 eggs per hundred hens in a year and over 48 million dozen eggs that are sold for retail, restaurant and processing use.

Recognizing the importance of the egg industry and the increasing need for sustainability reporting, Alberta Agriculture and Rural Development (ARD) initiated the egg environmental footprint project (2012-2014).

Objectives

This project aimed to set out a scientifically robust and transparent environmental assessment of current egg production in Alberta through life cycle assessment (LCA) following the ISO 14040/14044 standards. Specifically, the objectives were to:

• Establish a credible and transparent industry benchmark
• Establish mechanisms for data gathering and storage
• Provide quantitative results to support industry needs

Scope of the project

The cradle-to-gate life cycle assessment starts at the hatchery and ends at the washing and grading facility, including extraction and processing of inputs as well as the energy used at the various life cycle stages.

Feed production
Field inputs, field operations and other activities needed to produce layer feed.

Hatchery
Inputs, energy and operations at the hatchery.

Transportation
Includes feed, chick and egg transport.

Farm operations
Egg farm infrastructure, manure management and energy consumption.

Functional unit
Production of 1 dozen (approx. 705 grams) graded and washed Alberta-produced eggs.

Washing and grading
Inputs, energy and operations at the washing and grading facility.

Indicators

Life cycle assessment is a holistic and systematic tool to measure a variety of impact category indicators that are used to measure environmental sustainability of products.
Feed is the main contributor to the carbon footprint which mostly comes from fertilizer production, subsequent nitrous oxide emissions after field application and field-related activities.

Farm operations is second in importance. Its contribution comes from energy consumed at the farm and methane emissions from manure management.

Hatchery, transportation and washing and grading account for a small proportion of overall impacts.

**Key findings**

The project identified and modelled different practice changes in feed production, feed conversion ratio, energy consumption on farm and manure handling.

- Energy efficiency measures studied would result in a 5.5% decrease in carbon footprint.
- The other practice change measures offered a potential decrease in carbon footprint ranging from 0.5% to 13%.

**Other key results**

**Water use**

- Feed: 5.41L
- Farm: 51L
- Other: 2.8L

**Resource use**

- Feed: 1.58kg CO₂e
- Soybean meal: 0.05kg CO₂e
- Wheat: 0.15kg CO₂e

**Land use**

- 5.4m²

* Greenhouse gas emissions expressed in CO₂ equivalents

We thank the Egg Farmers of Alberta and their producer members for their cooperation and participation in this project.

Acknowledgments: