

Upcoming Events

June 22

EFA Research Committee Meeting
(Calgary)

June 29

EFA Board Meeting (Calgary)

July 4-5

EFA Board Training (Calgary)

July 6

Growing Forward 3 Funding
Priorities Meeting (Airdrie)

July 7

Avian Influenza Town Hall Call

July 9-13

EFC Summer Conference
(Mont Tremblant, QC)

July 12

Farm Safety Workshop (Balzac)

July 13

Farm Safety Workshop (Lethbridge)

July 19

Farm Safety Workshop (Leduc)

July 20

Farm Safety Workshop (Grande
Prairie)

July 21

EFA Production Management
Committee Meeting (Calgary)

July 25

Net-Zero Barn Grand Opening
(Brant)

July 25

EFA New Entrant Meeting (Calgary)

July 26

EFA Board Meeting (Calgary)

August 11

EFA Grader Advisory Com Meeting
(Calgary)

Feed Efficiency

What it Means and What it Tells you About Your Operation (Part 1)

By Matt Oryschak, Research Associate – Alberta Agriculture and Forestry

What is feed efficiency?

Feed efficiency is the amount of product produced per unit of feed, and it is always less than 1 (no biological process is 100% efficient). It should not be confused with feed conversion, which is the reverse (amount of feed required per unit of production)! Feed efficiency is generally an easier concept to use when talking to most people. When feed efficiency increases it is generally a good thing, whereas when it decreases it is generally regarded as a negative. In the context of egg production, another way of defining feed efficiency is egg mass-to-feed ratio.

How do you calculate feed efficiency for your farm?

Most farms have a reasonably good idea of daily feed consumption, as feed allocation per hen can be controlled via automated feeding systems.

Daily egg mass production per hen housed is the average egg weight multiplied by the number of eggs laid each day. To estimate daily egg mass production per hen on your farm, there are 3 pieces of information you need:

1. Average 30-dozen case weight (in lbs)
2. Number of 30-dozen cases produced per day
3. Number of hens housed

First, calculate daily egg mass production as follows:

$$\text{Daily egg mass production (g/hen/d)} = \frac{\# \text{ cases produced per day} \times \text{case weight (lbs)} \times 454}{\# \text{ of hens housed}}$$

Note: The 454 factor (360 x 1.26) in the above equation converts the number of cases into number of eggs (30 x 12 = 360) and the case weight in lbs into average egg weight in g (454 g/lb ÷ 360 eggs/case = 1.26)

Step 2. Feed efficiency (egg mass:feed ratio) is calculated as:

$$\text{Feed efficiency (egg mass:feed ratio)} = \frac{\text{Daily egg mass production (g/hen/d)}}{\text{Feed allocation (g/hen/d)}}$$

Example: A farm with approximately 12,000 hens allocates 105 g of feed per hen per day. The flock generates 32 cases of eggs per day with an average case weight of just under 48 lbs.

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Daily egg mass production for this farm would be:

$$32 \text{ cases} \times 48 \text{ lbs/case} \times 454 \div 12,000 \text{ hens} = 58.1 \text{ g/hen/day}$$

Feed efficiency for this farm would therefore be:

$$58.1 \text{ g egg mass/hen/d} \div 105 \text{ g feed/hen/d} = 0.553$$

What does feed efficiency tell you about your feeding program?

In most situations, feed allocation is controlled by the producer. It therefore serves to reason that changes in feed efficiency result either from a reduction in average egg weight or the number of eggs produced.

The two main drivers of egg production are available energy content of your feed and the ratio of other essential nutrients (e.g., amino acids, minerals, etc.) to energy in the diet. A suggested feed formulation strategy is to set all other requirements (Ca, P, digestible amino acids) in a ratio to energy in the diet. This way feed allocations can be changed without worrying that nutrients are over or under-supplied in the ration. Generally, feed allotments should be adjusted according to the energy density in the diet to ensure that all birds receive their target daily energy (caloric) intake, as per recommendations in the production guide for the specific strain.

The most likely reasons for changes in feed efficiency under commercial conditions are:

- Differences in digestible nutrient content between feed formulas, if formulas change frequently during the production cycle;
- Differences in digestible nutrient content between batches of feedstuffs, if feed formulas don't change dramatically during the production cycle; and/or,
- Changes in the health status of your flock - health challenges increase the amount of energy needed for maintenance functions (e.g., immune system to fight off disease), leaving less energy available to support egg production or reducing feed consumption.

To avoid the first two situations, it is recommended that diets for hens be formulated on a digestible nutrient basis and that individual batches of feedstuffs and mixed feeds be sampled. If you are purchasing ingredients from off farm on a regular basis, you should make sure there is a guaranteed minimum nutrient specification (e.g., oil content in expeller pressed canola meal). If flock performance does not meet expectations, feed allocations may need to be adjusted and samples analysed to identify the cause and to adjust feed formulas accordingly.

The third bullet underscores the importance of good on-farm hygiene and following biosecurity protocols and following best practices under the Start Clean – Stay Clean program. In situations where feed consumption decreases but there is no apparent infectious disease present, testing the feed for mycotoxin levels (e.g., DON) may be warranted.

In part one of this article we discussed:

1. What feed efficiency is in the context of an egg operation (egg mass-to-feed ratio);
2. How to calculate feed efficiency for a farm, using average 30-dozen case weight, egg production (# of cases/d), # of hens housed and daily feed allocation; and,
3. How tracking feed efficiency for your operation can tell you about adverse changes in the digestible nutrient content in the feed, health status of the flock and some basic principles to help manage these risks.

In the next issue of *EggNotes*, we will take a critical look at the relationship between feed efficiency and profitability. If you'd like to read it now, please visit the best production practices page of the producer website: www.albertaeggproducers.ca/best-production-practices/egg-production/.