

Assessing the lifetime profitability of a cow combining production and health data

Duration: 2011 – 2014

Highlights

- Cow longevity is a known problem which results in too many expensive herd replacements, and a sub-optimal proportion of mature cows in the herd. This results in lower productivity and, consequently, profitability. Producers have separate access to milk-recording information (Valacta) and to veterinary health event data (e.g., DSA); however, they lack an integration which could provide a lifetime view of a cow's profitability and her herd mates (i.e., benchmarks).
- This project combined production (Valacta) and health event (DSA) data to model and demonstrate the value of an integrated cumulative lifetime profit perspective, and to examine the factors affecting culling rates and longevity.
- A prototype visualisation tool was developed to show the lifetime profit of a cow or group of cows in a herd compared to a suitable contemporary average. The prototype tool also allows for a comparison of a herd versus a benchmark average of comparable herds.
- Profitability (calculated to the end of the fourth lactation) can be reduced by as much as 20% due to health events (e.g., mastitis, ketosis, displaced abomasum, feet and leg problems, repeat breedings and long dry periods); hence these are important factors to consider when deciding which cows to keep and which to cull.
- The visualisation tool also demonstrates – in a very visual manner – the impact of delayed age at first calving on lifetime profitability, as well as the time required to pay off the rearing costs of a heifer.
- The prototype software and model consider revenues and costs at the individual cow level and can, therefore, use accumulated information to provide a profile for the herd.

Objectives

General objective: To combine Valacta and DSA data to produce lifetime profit records for each cow and hence demonstrate the impact of health events on overall individual cow profitability and longevity.

Hypotheses:

- a failure to integrate production and health-event information results in under-estimating the overall impact of health events;
- the integration of production and health event information, on a lifetime basis, can provide useful comparative and benchmark statistics, and allow a producer to better evaluate the profitability of the cows in his/her herd;
- the presentation of the results in a visual and graphical form can aid in understanding what particular factors or time points in a cow's life are impacting overall productivity, and hence should be focussed on in an effort to improve profitability.

Results and potential benefits

Results obtained :

1. Development of a methodology and software program to combine production information from Valacta (e.g., milk production, feed information and breeding information) with DSA health event information (e.g., mastitis, reproductive problems, feet and leg problems etc.);
2. Development of a profitability model based on production and health events; and
3. Development of a prototype software to visualise the lifetime profit of a cow and a benchmark comparison, indicating the various events (e.g., calvings, breedings, health events, dry periods, etc.).

The results of this research and development project can aid dairy producers and their advisors to reduce veterinary-health costs by showing them the overall impact of each cow in a particular herd, thus motivating the producer to prevent problems. It is expected that sensitising producers to the cost and impact of health events will allow them to reduce

milk loses and costs associated with somatic cell count penalties (or at least enable producers to benefit from the premiums for low cell counts). Being able to show the overall impact of events during the lifetime of a cow can assist a producer in working to improve productivity as well as to improve overall animal welfare and health. Having a tool to show the impact of health events, specific to a particular farm, can help the producer respond to concerns and preoccupations of the general public concerning animal welfare and wellbeing. These results should allow the dairy industry to see the increased benefits of combining all available data (e.g. production, veterinary health events, hoof trimming and cow comfort, etc.) to provide better profiles of cows and herds, thus improving on-farm management. The results of this research can be applied in the short to medium term, and are primarily applicable for an on-farm management tool for producers and their advisors.

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Professionals trained

Two doctoral students (**Hector Delgado** and **Denis Haines**) were trained as part of this project. They acquired expertise and training in the analyses of large data sets, epidemiological methods, interpretation of field-level data, and presentation of scientific results had scientific conferences.

For further information

Several scientific presentations were given at conferences (e.g., American Dairy Science Association, Bovine Veterinary Practitioners) as well as poster presentations at the Symposium sur les bovins laitiers and at the forum Technologique of Novalait. In addition to a poster presentation at the Symposium sur les bovins laitiers (2015) the prototype software visualisation tool was also available for demonstration purposes. Scientific articles from both doctoral students are in preparation for high-quality journals, and an extension article has appeared in the Producteur de Lait (in addition to an informative short video on the Novalait web site.

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- Novalait

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