
Use of the dairy records database to establish benchmarks and estimates for potential economic improvements of individual herds

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Use in herd management is the primary reason dairy producers acquire milk recording services. The value of production data for grouping, culling, mating and other decisions has long been the traditional application of the information. Secondary uses of the dairy records database in genetic selection and measurements have also resulted in considerable value to the producer as well as the dairy industry. Publication of high herds and cows for production, as well as average levels for various management attributes has allowed some comparative analysis by individual herds. However, relative position to the high or the average has been more difficult to ascertain, and extension of economic values to those differences have, when available, frequently been outside services provided by milk recording organizations.

The Profit Opportunity AnalyzerSM™ (POA) has been developed to estimate the major areas of potential economic improvement in dairy herd management. The POA takes seven major herd management areas and, when applying user-defined economic values, establishes percentile rankings for individual herds in each of these categories. Relative performance levels are established from use of over 5 000 herds in the AgSource/CRI dairy records database. POA is size neutral and economic potential is measured against the 80th percentile for cohort herds in each individual management category. Level of potential is graphically summarized to illustrate areas of most and least significance allowing the producer to focus on the broadest opportunities to enhance overall herd profitability.

Key words: *Herd management, Economic improvement, Performance recording, Reproduction, Udder health, Genetics, Production.*

Applying dairy records' databases to benchmark herd performance has been achieved to varying degrees. Traditional lists of high herds and cows set standards of performance allow producers to recognize what is possible with excellent

Summary

Introduction

management. Publishing averages for various management measures allows a herd manager to assess performance against the mean. However, these mechanisms are limiting in failing to allow the herd to more precisely, other than above or below average, measure their position against others. Additionally, there have been few attempts to place a financial value on milk recording data to allow for an economic assessment of performance. Some highly sophisticated systems have been developed to establish benchmarks and quantify economic potential. While these systems have been very flexible they have resulted in less standardization, had limited use of graphics, and consequently made education and training to support interpretation and application of results more challenging.

AgSource has attempted to address this need in development of the Profit Opportunity Analyzer™. POA allows users to input basic parameters specific to their situation then reports are presented in standard formats using several graphs and tables. It identifies opportunity for potential economic gain against the 80th percentile of contemporary herds by breed and size in the AgSource records database in each of seven major areas of dairy herd management. Top performance is measured in each of the seven areas rather than overall. This allows the herd manager or consultant to quickly identify what area should receive primary management attention. Results are summarized in graphic form on the first page of the report (Figure 1). Although additional profit may be available from improvement beyond the 80th percentile, this report assumes that at extremely high levels of performance net returns begin to diminish relative to what could be achieved if resources were applied to an area where performance is not as comparatively outstanding.

The POA is designed to be a very broad and standardized evaluation of economic potential. While “Profit” is used in the name, the economic gain from a given management area may come from increased revenue, reduced expense, or a combination of both. The product is not intended to delve into the specific issues that may or may not affect individual herd performance. Rather, it serves as an unbiased analytical tool for identifying operational areas with the most economic opportunity from improvement. Currently, POA benchmarks are being produced only for Holstein herds, although Jersey products are near release and other breed comparisons will be developed.

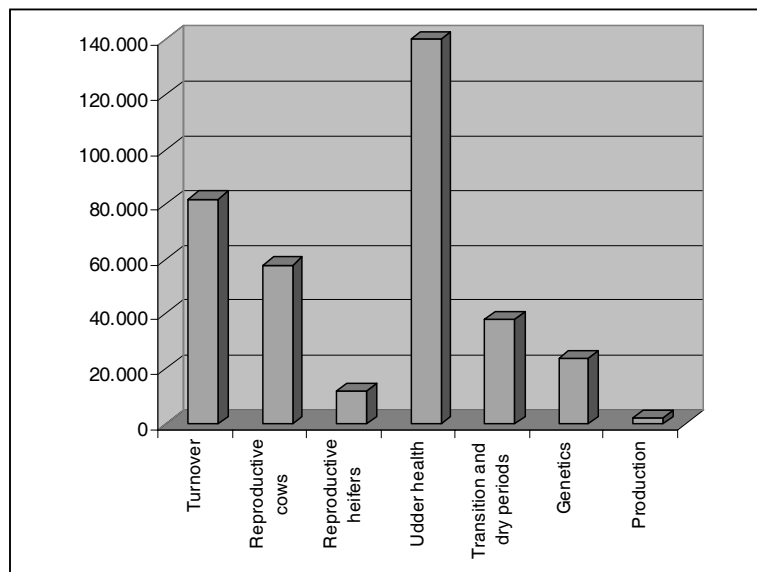


Figure 1. Sample graph profit opportunity summary.

Very little information not already included on the milk recording database is needed to produce a POA. When requesting the product, a simple input form is provided by the herd operator or consultant with the following herd-specific values:

- Net milk price per hundredweight.
- Replacement value per animal.
- Cull cow value per animal.
- Calf value (estimated value per calf at 3 weeks of age).
- Annual Interest Rate (current rate of borrowed capital).

Additional information necessary to evaluate and benchmark herd performance is available from the AgSource records database.

Single page reports are produced for each of the seven major management fields. In each, they are headed by a summary of the herd's position relative to the 80th percentile for their cohort group, and the economic value of the difference between the two positions. Most areas are accompanied by a graph showing trends the previous year or two. These graphs are valuable because, in some cases, the management changes needed to generate improvement may already have been made during the course of the year. But, because the estimate uses a full year of performance in the benchmark, the benefit may not fully show in the analysis. Likewise, deterioration during the past year may suggest even greater opportunity than expressed in the summary. However, the trend line should give an indication of what lag time exists in the data.

The value of improved management of herd turnover is expressed through calculation of turnover the previous year, excluding sales for dairy purposes, and incidence of death loss. This data is coupled with the cow values submitted by the herd, and benchmarked against the top performers of the cohort group. It is accompanied by a bar graph showing early lactation turnover by period across the previous year. Turnover in the first 60 days in milk is an indicator of future annual turnover. Total profit opportunity is reported from the total of the two areas.

The profit opportunity for milking herd reproduction uses herd Pregnancy Rate (percent pregnancies vs. cows eligible to be bred after a 55 day voluntary wait period) as the primary output to assess performance. In applying the economic opportunity against the targeted standard all five of the variable inputs are used as the model calculates impact on milk production as well as the value of surplus (or purchased) replacements, calves, etc. Assuming the herd manager replaces open cows at 318 days in milk with a fresh cow, lower Pregnancy Rates affect the value of replacement costs far more than milk volume. If all breeding dates and pregnancy confirmations are not available on the database, Average Days in Milk can be used as the primary benchmark of reproduction. This is less accurate but can still be used for a broad assessment.

Age at first calving is used as the primary management attribute associated with heifer reproductive management. For Holsteins, the optimum calving age is between 23 and 25 months. Average rearing costs are considered as is the impact on first

Input required

Management fields

Turnover

Reproduction - milking herd

Reproduction-heifers

lactation milk production from a younger or older calving age. The difference between feed savings (reduced rearing costs) of the heifer and production loss during the subsequent lactation is the value of reducing the number of heifers calving at less than 23 months. Loss from heifers freshening older than 25 months is entirely extra rearing costs for the heifer. An accompanying bar graph shows distribution of first calving ages in months during the previous year.

Udder health

Udder health management profit opportunities are measured in terms of milk production losses as well as the value of premiums paid for higher milk quality. Milk losses are calculated for two groups – first lactation and second and greater lactations – by valuing the difference in milk production impact between the herd level and 80th percentile lactation linear somatic cell score (LSCR). The value of somatic cell count (SCC) premiums is estimated using typical adjustments in regional milk markets. The analyzed herd's premium or deduction is made against the premium obtained by herds at the 80th percentile. An associated graph shows the herd level weighted SCC average for the previous two years in addition to the average LSCR for the two lactation groups during the same period.

Transition and dry period

Transition management looks at performance with the herd's Transition Cow Index® and management of the length of dry period. TCI™ is a unique measure of transition cow performance developed at the University of Wisconsin-Madison and licensed to AgSource. Each pound of TCI between herd performance and the 80th percentile equates to 1.27 pounds of additional milk in the subsequent lactation, which is then applied to milk price to establish economic value. Additionally, each pound increase in TCI would be expected to contribute to a decrease in herd turnover. For dry period length, adjustments are made based on the estimated economic impact of excessively short (less than 30 days) or long (over 70 days). A herd TCI graph for the past year is provided which shows the trend in transition cow management.

Genetics

USDA-ARS Animal Improvement Program Laboratory values for Lifetime Net Merit (NM\$) are used to calculate the profit opportunity associated with improved genetics. The milking herd average NM\$ is compared to those in the 80th percentile. As NM\$ is a lifetime estimate, the value is divided by the annual herd turnover percentage to convert it to an annual impact. The herd input milk price is divided by current milk price used for NM\$ to adjust for real value of genetic opportunities. USDA average NM\$ is used if sire is not identified. Clearly, there will be a time lag associated with mating decisions reflected by sires of the milking herd and current service sire selection. A graph associated with this section shows the trend in NM\$ for second and greater lactations cows, first lactation cows, and service sires used for the previous two years. This gives additional information on potential genetic progress from more recent sire selection decisions.

Production

Impact from increased production is simply the difference between rolling herd average (RHA) for milk and that of 80th percentile contemporary herds multiplied times the herd inputted milk price and the number of cows in the herd. An associated graph shows the two year trend in RHA for the herd and 305 day age standardized milk production for two separate lactation groups.

One additional graph related to increased milk production is included in the POA. This pie chart shows the total opportunity for increasing per cow milk production from the individual herd management areas. Opportunities to increase milk production as a result of improvements in the individual management areas will total the herd-level potential shown in the Production area. Turnover is not included because, in the economic model, reducing high turnover more frequently lowered production while increasing overall profitability. Production increases not specifically attributable to the other individual areas are categorized as “nutrition and management.” If a herd already exceeds the 80th percentile in a given area, the production increase potential is shown as zero. A sample chart is shown as figure 2.

POA is produced either as printed copy or a Portable Document Format (PDF) to allow for electronic distribution to the end user for printing and review. Detail on methodology and calculations are included in every report to allow individual users (producers or consultants) to understand and adjust for herd-specific differences that may be affected by the broad assumptions used in the report.

In test and trial, and since product release, hundreds of POAs have been produced and no herd has yet been identified to be so well managed that it has no opportunity for improved performance in multiple areas of herd management. The greatest value seems to be immediately identified for herds universally regarded as extremely well managed but, at high levels of production and/or profitability, may have failed to recognize their relative opportunity in one or more key areas to make further improvement. One tactic used to illustrate the diversity of management opportunities across herds has been to produce summary graphs for multiple herds included in training groups, without individual identification. In that way, the herd owner is able to recognize their herd but can contrast their opportunities with the unidentified peers. This clearly illustrates operational diversity and the variability of opportunities across herds.

Marketing of POA was initiated in early 2008 and is primarily targeted at organizations and consultants providing services to members of the cooperative. AgSource provides comprehensive training to these organizations and individuals

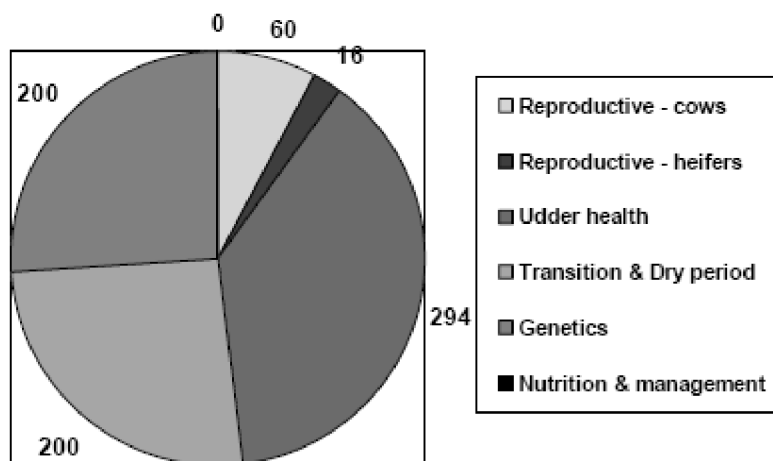


Figure 2. Sample graph opportunities for raising per cow production.