Case Report—Integrating Dairy Nutrition, Production, and Financial Records

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Abstract

An important role of the dairy consultant is to increase the profitability of their clients. Current and comprehensive production, nutrition, and financial records that can be analyzed daily are essential to track the effect of management changes on production and profitability.

This paper uses a case study to describe the effect of changes in ration formulation and feed particle size on feed intake, feed costs, milk production, and profitability.

Introduction

The primary role of a dairy consultant is to increase the profitability of their clients. Additional profits can result from increasing revenues, decreasing costs, or both. On many dairies, management and labor are unable to further increase output. As a result, they must pursue improved profitability through improved business practices.

Most businesses measure efficiency and manage profit by maintaining records of the material utilized in a production process to create a unit of product. Unfortunately, the dairy industry typically prepares these records at most every quarter, and often only annually. There are several disadvantages to using historical data as a monitoring tool. First, historical data is not particularly useful to detect recent changes in performance or cost of production, which makes timely decisions more difficult. Second, it averages numerous management changes and production subgroups over a prolonged period. As a result, recent changes within a single production subgroup may go undetected. In addition, changes may be detected but cannot be linked to a specific management decision because of the long time span between management changes and detection. For accurate and timely evaluations and management decisions, we now monitor production information on a daily basis for each subgroup of production. This paper discusses an approach to production monitoring being employed on large commercial dairies by one of the authors (KB).

An integral part of the management service provided to these dairies is an information management system. Several types of integrated feed/production software packages are coming onto the market this year. The computer software[a] discussed in this paper is described in the reference paper[1] and is being used to design new software for release later this year. Any software system chosen should link units of production, such as a hundred-weight (cwt) of milk, with feed costs and other fixed costs on a daily basis. The information from the system should show the impact of feed ingredient changes, feed handling and delivery changes, cow density levels, and other housing or health management changes on profitability. The data should be reported on both a whole herd and subgroup (pen, string, or corral) basis. The end result should be pertinent, accurate, and timely information, presented in a format easy to interpret.

Basics of the Information System

The following are key factors in the information system:

- Feed inventory control on an accrual basis.
- Daily data storage of milk production, feed used, and cow numbers in each production unit.
- Minimizing the time and effort to store and process information.
- Presentation of accurate, timely, and pertinent information in an easily interpreted, graphical format.

How is this accomplished?

- Information on incoming individual feed ingre-

[a]Feedwatch Software, Valley Agricultural Software, Tulare, CA 93274 (559) 686-9496

dients is entered upon delivery, including vendor, amount delivered, and cost.

- Ration formulations for each group of animals are stored in the computer.
- Daily animal numbers for each group are entered into the computer, along with ration mixes and the amount of the ration to be fed. From this load sheets are generated and used to mix and feed each group of cows.
- A flowmeter is installed in the milk line to measure milk production for each group of animals on a per-milking basis.
- The program then produces a daily report which combines both feeding and production data.
- Fixed costs are defined as {(all non-feed costs, i.e. supplies, labor, semen, medicine, interest, etc.) minus (all non-milk revenue, i.e. calf and cull sales, colostrum sales, etc.)}; depending on the manager's goals, cost can be evaluated on a cash flow basis or a profit basis.

Most management programs fail to be implemented because of a lack of time, the amount of effort required, or the absence of motivation. A well-designed software program can overcome the time and effort barrier; low profit margins have provided the necessary motivation. After initial training on a prototype program, only 5-10 minutes per day are required for data entry. The first dairy to use the prototype program (2,250 cow unit) saved 2 employee-days/month for feed inventory control and bank reports.

Presentation of Information

When and how information is presented has a major impact on the value of the information. This data system is designed to have all information available after the last production shift is finished for the day. This allows detection of changes in feed efficiency, production, and profitability as they occur. These changes can be used to evaluate current management conditions on the dairy and to assist in the decision-making process.

Total herd and subgroup information is displayed in both graphic and tabular format. The graphical presentation allows for rapid evaluation of the data. Graphic information is presented with four graphs per screen so that each graph's information can be evaluated relative to other graphical data presented in the same view.

Example Information

Figures 1-4 show two sets of information for a dairy; Figures 1-2 show information for the dairy as a whole, while Figures 3-4 show information for 3 subgroups. This data is available for each month and for all 12 pens on the dairy. With real-time information, data is avail-

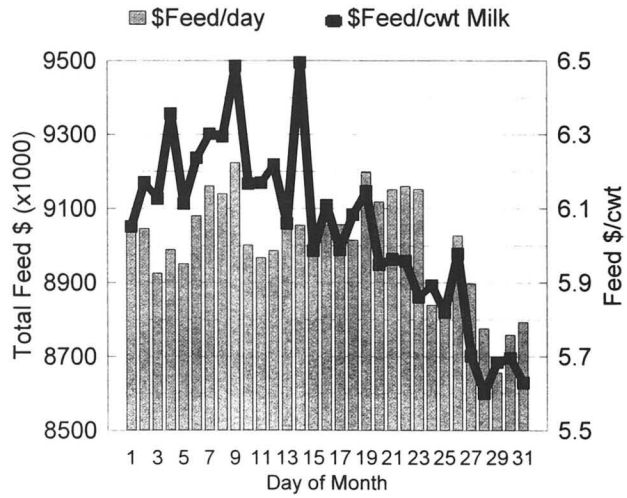

Figure 1a. The total feed cost for the herd and the herd's average feed cost per hundred weight of milk produced on a daily basis.

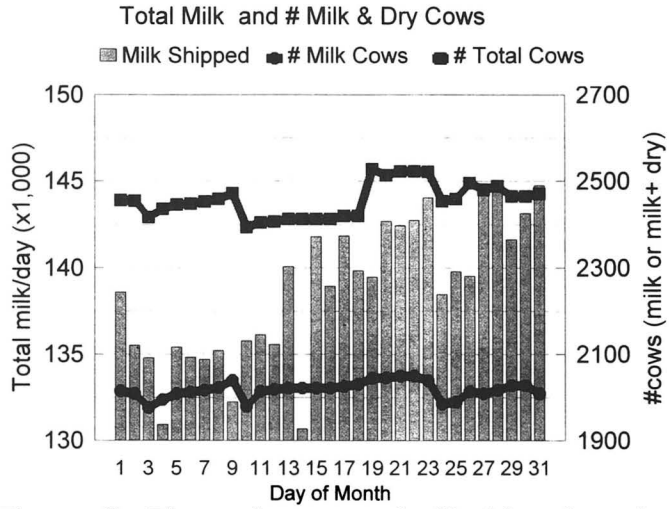

Figure 1b. The total amount of milk shipped per day, number of milking cows, and the number of cows milking and dry on the dairy.

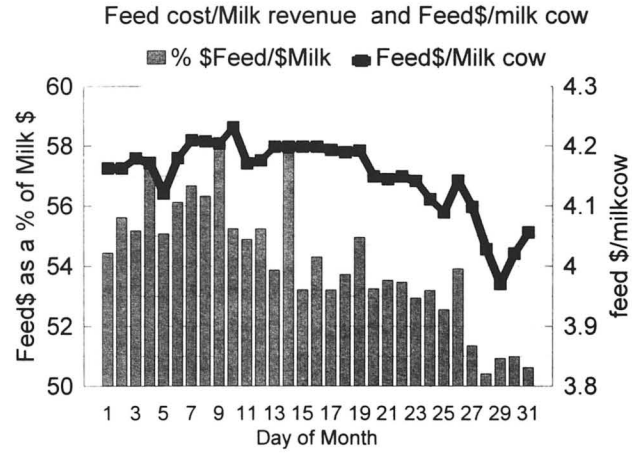

Figure 1c. The total dairy feed costs as a percent of milk revenue and the milking herd's average feed cost per cow on a daily basis.

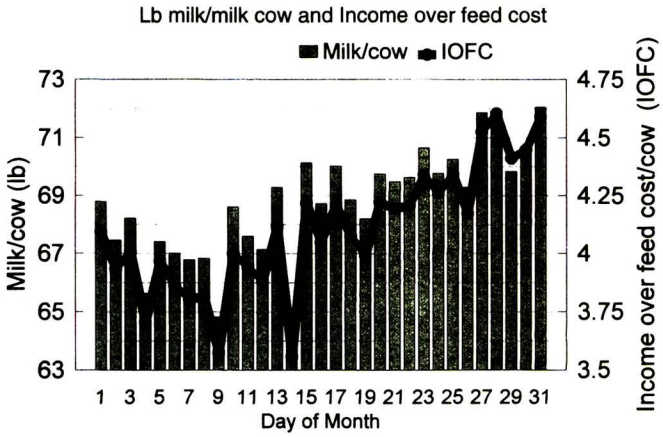

Figure 1d. The herd's average daily milk production per cow and the herd's average income after feed cost per cow on a daily basis.

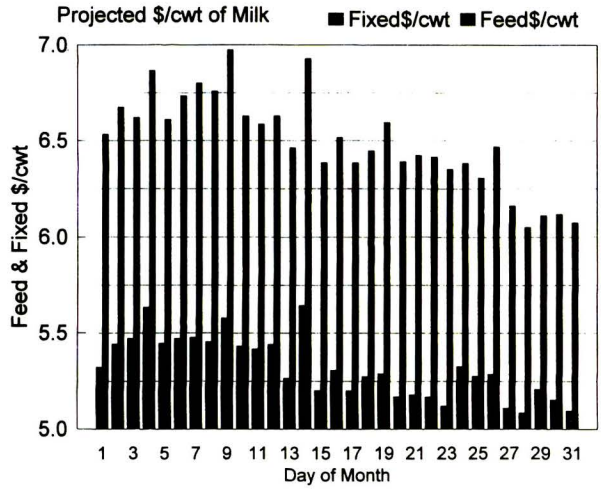

Figure 2a. Projected fixed cost and feed cost per hundred-weight of milk produced for the whole herd.

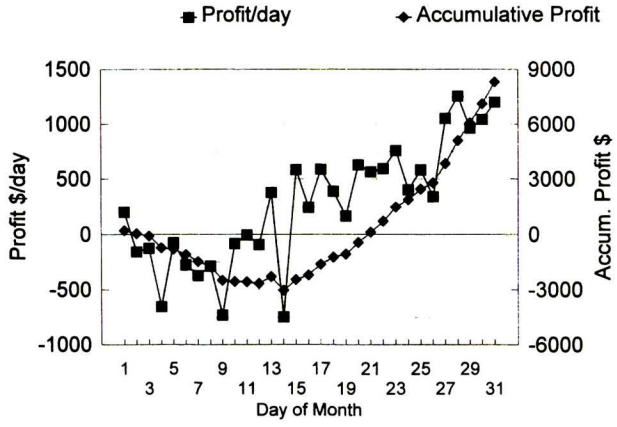

Figure 2b. Projected daily profit and accumulative profit at each day of the month for the whole herd.

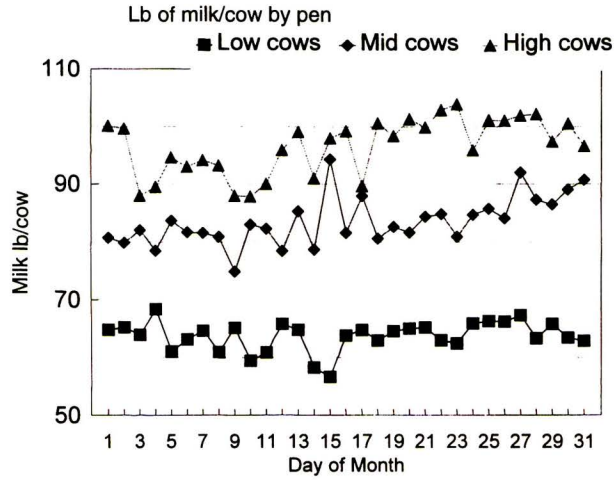

Figure 3a. Each pen's (subgroup) average milk production on a daily basis.

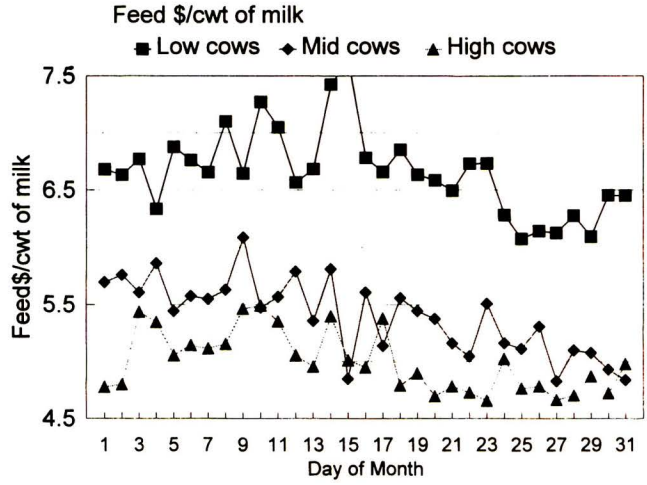

Figure 3b. Each pen's (subgroup) average feed cost per hundred-weight of milk per day.

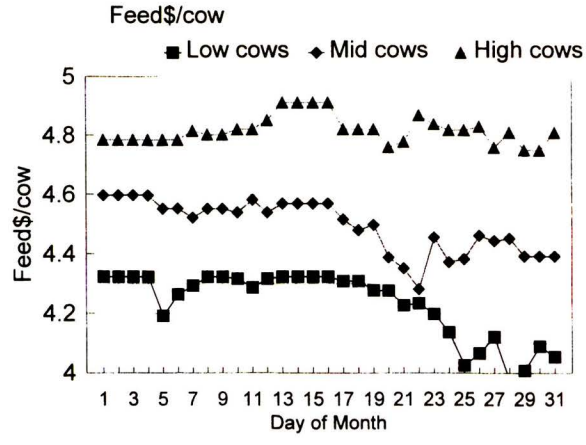

Figure 3c. Each pen's (subgroup) average feed cost per cow on a daily basis.

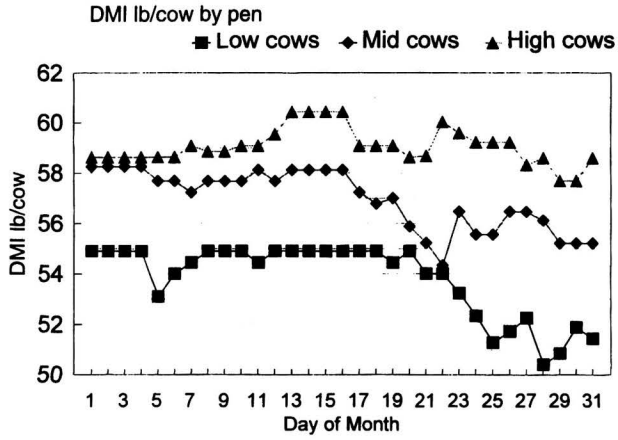

Figure 3d. Each pen's (subgroup) average dry matter intake on a daily basis.

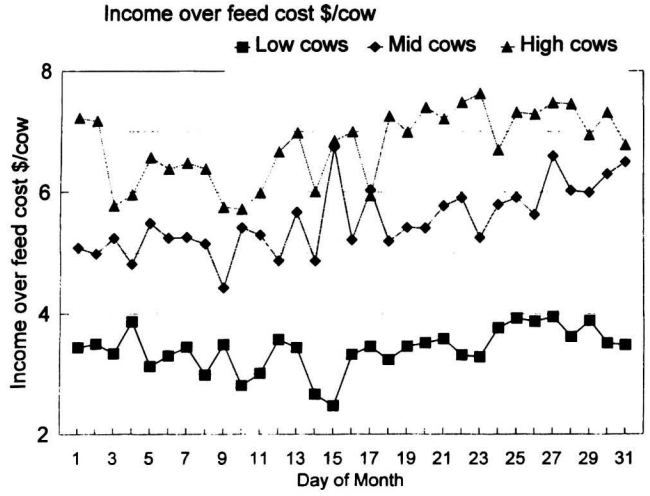

Figure 4a. The daily average income after feed cost on a per cow basis for individual pens (subgroups).

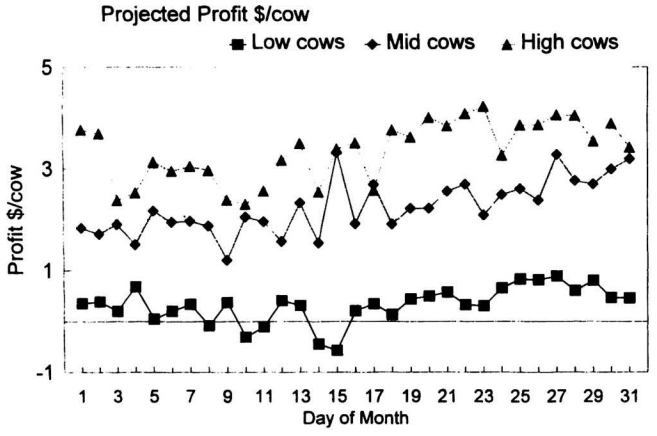

Figure 4b. Projected daily average profit per cow for individual pens (subgroups).

able to determine and motivate the need for change in a timely manner. Trends are easier to detect and monitor. When management changes are made, the impact on profit can be evaluated as early as the day after the change is made. Often, the changes may not be made to all pens, which allows for some pens to act as controls for pens in which changes are made.

Discussion of Example

This dairy called on the 9th of the month to inform us they were losing money (Figure 2b) and were willing to try some ration changes discussed during an earlier visit. A decision was made to replace meat and bone meal with a high-fat bypass soy protein in the high and middle-producing cow rations (Figures 3a-d, 4a-b). This was implemented on the 12th. On the 17th, a site visit was made. During the site visit it was determined that the particle size of the ration was too fine due to excessive mixing of the forages in the mixing wagon. The decision was made to place the forage in the mixer as the last feed rather than the first. This was implemented on the 18th.

The manager made the decision to call us because of negative profits (Figure 2b); -$3,000 as of the 9th of the month. The losses were also the reason to request the site visit so that other changes to improve profitability could be investigated. Without the availability of the daily information, the manager may not have detected the financial losses for several months.

Results

An increase in profitability started occurring between the 13th and 16th, with a second jump in profitability occurring near the 27th and 28th of the month. The accumulated profit was $8,500 for the month or an increase of $11,500 from the 14th to the 31st. Factors associated with the increase in profit included a $0.30 reduction in fixed costs per cwt of milk and a $0.60 reduction in feed cost per cwt (Figure 2a). Concurrently, the break-even price per cwt of milk dropped from $12.10 to $11.20.

The subgroup (pen) information in Figures 3a-d and 4a-b can help explain how, why, and where increases in profitability occurred.

Milk production increased in the high-producing cows near the 12th-15th and continued the remainder of the month (Figure 3a). An increase in milk production occurred during the last 5 days of the month for the middle-producing cows. There was no change in milk production by the low-producing cows. This was expected because the low-producing cows had no ration ingredient changes during this period of time. The implication is that production increased in those pens with

ration changes. This interpretation is bolstered by the correlation of ration ingredient changes with production increases.

Dry matter intake (DMI) declined (2-3.5 lb) in the middle and low-producing pens between the 18th and 21st of the month (Figure 3d), resulting in decreased feed costs of $0.15-0.25/cow/day (Figure 3c). At the same time, production was increasing in the middle-producing pens and remained constant in the low-producing pens (Figure 3a). The increased particle size resulting from changing the mixing order of the feed ingredients likely resulted in reduced rate of passage, reducing dry matter intake and increasing the efficiency of digestion. This interpretation is bolstered by the correlation of time and changes in mixing, DMI, and milk production.

These changes markedly affected profitability (Figures 4a-b). The increase in milk production resulted in a $1.00/cow/day increase in profit for the high-producing cows. The increase in milk production and concurrent decrease in DMI resulted in a $0.80-$0.90/cow/day increase in profit for the middle-producing cows. The decrease in DMI resulted in a $0.25/cow/day increase in profit for the low-producing cows.

Summary

At first glance, the end result of the changes in ration ingredients and particle size was an increase in profitability. While this was very important, the greatest benefit was the education that the dairy manager, feeder, and consultants received. The ability to quickly observe and quantify the profitability of changes as they occurred made a permanent impression in their minds. Particle size has now become an important part of the daily observations on this dairy.

Real-time production-accounting systems are becoming essential tools for dairies and other production-based agricultural businesses to be profitable. Commercial dairies can use this approach to monitor new types of dry-cow programs, minimize feed cost relative to production, modify bovine somatotropin (BST) usage programs, experiment with new by-product feeds, new feeding strategies, and monitor milking shift production. Management changes that affect profitability can be quickly evaluated and the decision to keep or abandon the management changes can be made in a timely fashion.

Reference

1. Buelow KL et al.: Daily feed cost and production accounting for dairies. The Comp Cont Ed Pract Vet 19: s56-s64, 1997.

Abstract

Epidemiological characteristics and financial costs of the 1997 foot-and-mouth disease epidemic in Taiwan

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Between March and July 1997, a devastating outbreak of foot-and-mouth disease (FMD), serotype O, occurred in pigs in Taiwan. A total of 6147 pig farms with more than 4 million pigs were infected, and 37.7 percent of the pigs in Taiwan either died (0.18 million pigs) or were killed (3.85 million pigs). The epidemic reached its peak during the fifth week after it was first recognised. During the eighth and ninth weeks, a two-dose blanket vaccination programme was instituted which led to a large reduction in new outbreaks. Except for two cities, the whole of Taiwan was declared an FMD-infected zone. During the four months in which new farm outbreaks occurred, 21.7 percent of the pigs on infected farms showed clinical signs, and there was an overall mortality of 3.95 percent. During the early stages of the epidemic, the incubation period was as short as 24 hours and the case fatality rates for suckling piglets reached 100 percent. The financial cost of the epidemic was estimated at US$ 378.6 million, including indemnities, vaccines, carcase disposal plus environmental protection, miscellaneous expenses, and loss of market value. Owing to the ban on exports of pork to Japan, it is estimated that the total economic cost to Taiwan's pig industry will be about US$ 1.6 billion.