

The Relationship Between Disease Occurrence, Feeding Management and Return Over Feed in Ontario Dairy Herds

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Introduction

On a worldwide basis, dairy industries of most countries are becoming increasingly concerned with factors that impact return on investment. Historically, research has focused on the relationship between management, production-limiting disease and milk production. However, few studies have quantified their association with herd economics.

The objectives of this research are to examine the relationship between profitability as measured by the Ontario Dairy Herd Improvement (DHI) Corporation's Return over Feed (ROF) index, and herd characteristics such as milk production, somatic cell count linear score and health management practices. The ROF index will also be used to assess on-farm health and disease information that includes lameness, clinical ketosis, clinical mastitis, retained placenta (RP), displaced abomasum (DA), milk fever, monensin use and ration particle size. Herd level incidence risks for subclinical ketosis and subclinical mastitis will be evaluated by using the California Mastitis Test and the KetoTest[®] ketone test in early postpartum cows. Subsequently, the associations between the risk of disease, management factors and ROF will be determined.

Materials and Methods

Producers were identified through the Ontario DHI Corporation ROF and management club groups. The study period was from January 01, 2002 to January 31, 2003. The ROF index was calculated from the difference between milk revenue and feed cost each month. Percent dry matters were taken from provincial averages and individual cow dry matter intakes were calculated. These intakes were multiplied by fixed market prices to generate feed costs per cow per day. Revenue was calculated based on the Dairy Farmers of Ontario multiple component pricing formula for milk.

Standard milk production (energy corrected and standardized for a second lactation animal at 150 days in milk), component percentages and somatic cell count linear score were gathered from the Ontario DHI Corporation. Management information was determined through a telephone survey of all participants that included health, management, housing and nutrition in-

formation. Study participants recorded clinical disease incidences for DA, ketosis, RP, lameness, milk fever and mastitis. Incidence risk, expressed as the number of lactations affected per 100 lactations at risk was created. Subclinical mastitis and subclinical ketosis incidence information was determined through the use of the California Mastitis Test (greater than zero) and the KetoTest[®] milk ketone test (greater than or equal to 100umol/l).

Linear regression modeling was used for the determination of the production, management and disease incidence risk associations with ROF.

Results

There were 157 producers that submitted ROF information for the study period. These producers represented nearly 50% (157/356) of all the ROF participants for the same time period. Only producers with adequate compliance and participation for the submission of ROF and postpartum monitoring information were included in the study. Of the original 157 producers, a final group of 48 herds were identified as having complete information for analysis.

A 2.2 lb (1 kg) increase in herd standard milk production and a 0.1% increase in herd milk protein percent were associated with approximately \$0.30/cow/day increase in ROF. Conversely, herd milk fat percent (0.1%) was found to be associated with a decrease of \$0.11/cow/day in ROF. Increased herd milk fat percent were negatively associated with herd standard milk production and may partially explain the negative association of fat percent with ROF.

Herd size and facility type were not associated with the ROF index in this group of producers. However, *Escherichia coli* mastitis vaccine use was associated with an increase of \$0.60/cow/day of ROF. Three times daily milking was observed to have \$1.25/cow/day increase in the ROF index. Furthermore, monensin use both as a lactating cow and controlled release capsule were associated with \$0.39 and \$0.54/cow/day increase in ROF, respectively.

A one percent increase in both clinical ketosis and DA herd incidence risk in the study was associated with approximately \$0.08/cow/day increase in ROF index. Both of these conditions were associated with increased

herd milk production and may partially explain the increased ROF with these conditions. The median cumulative incidence was determined to be 62.8 and 28.0% for subclinical ketosis and subclinical mastitis, respectively. It was determined that there was no significant association ($p>0.05$) of subclinical mastitis incidence and ROF. However, there was a significant reduction ($-\$0.013/\text{cow}/\text{day}$, $p<0.05$) in the ROF index with each percent increase in the incidence of subclinical ketosis.

Significance

This research project demonstrated the need to maximize milk production and milk components for increased return over feed. A 2.2 lb (1 kg) increase in standard milk production would result in approximately \$110/cow increase in return over feed for one year. In

addition, the need to implement management such as monensin use that reduces subclinical ketosis in the postpartum period would increase the ROF. A reduction of herd incidence of 1% for subclinical ketosis would result in approximately \$4.75/cow increased ROF for the year. The positive association of both clinical ketosis and DA with ROF may be a function of increased management and monitoring for these diseases on some farms. The interaction of this increased management, elevated herd milk production and subsequently economic return may have impacted the observed association.

The use of the ROF index to assess the economic consequence of dairy farm factors is a promising finding. However, there is a requirement for further research in this area to guide the development of management that will improve the profitability of dairy farms around the world.

Preliminary Study to Evaluate the Feasibility of Chemical Ablation of the Seminal Vesicles in the Bull

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Introduction

Bulls affected with septic seminal vesiculitis are often classified as unsatisfactory potential breeders due to leukocyte contamination, poor sperm motility and other abnormalities noted during the breeding soundness examination.^{1,2} The prognosis of chronically affected bulls for resolution of this condition using antimicrobial therapy, sclerosing agents or surgical removal is guarded at best.^{1,2,5} Because of this poor response to present treatment options, we performed a preliminary study investigating a method of chemically ablating the entire seminal vesicle with a 4% formaldehyde solution. In horses, ablation of ethmoidal hematomas and salivary glands using a 4% formaldehyde solution is successfully documented.^{3,4} The goal of this study was to determine the feasibility of injecting the seminal vesicles of healthy bulls, percutaneously, with a 4% solution of formaldehyde, and the efficacy of this procedure in ablating the parenchyma of the seminal vesicles as a potential treatment of chronic septic seminal vesiculitis.

Materials and Methods

Eight, two-year old bulls, determined to be satisfactory potential breeders, were equally and randomly divided into treatment and control groups. The breeding soundness was evaluated according to the standards of the Society for Theriogenology and consisted of physical examination, rectal examination, determination of scrotal circumference, and evaluation of sperm motility and morphology. The seminal vesicles were injected using a 16-gauge 30 cm hypodermic needle inserted 2-3 cm dorsal to the tuber ischii and angled toward the ipsilateral seminal vesicle. Using a hand in the rectum to guide the needle and stabilize the gland, the needle was directed into the body of the seminal vesicle. Placement of the needle within the gland was confirmed by palpation per rectum and by distention of the gland after infusion of physiologic saline. The seminal vesicles were injected with 15 to 40 mL of 4% formaldehyde solution, depending on the vesicle size. A daily physical examination was performed for the following seven days to