

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.<sup>1,2</sup> The prognosis of chronically affected bulls for resolution of this condition using antimicrobial therapy, sclerosing agents or surgical removal is guarded at best.<sup>1,2,5</sup> 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.<sup>3,4</sup> 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

monitor the bulls for any complications. On day 60, the seminal vesicles and surrounding soft tissue structures (ampulla and colliculus seminalis) of each bull were examined post mortem. Histologic sections were evaluated for alveolar density, the degree of infiltration of inflammatory cells and accumulation of hyperchromatic debris (parenchymal necrosis). The severity of each category was numerically ranked (1=normal, 2= mild, 3=moderate, 4=severe).

The reduction in alveolar density of infused vesicles was evaluated by comparing the number of alveoli present per 400X field in infused and control vesicles. Less than 25% reduction in alveolar density was considered mild, 25 to 50% reduction was considered moderate, and severe reduction in alveolar density was characterized as greater than 50% loss of alveolar density. No inflammatory cells present per 400X field was considered to be characteristic of normal vesicular alveolar tissue. Accumulation of one to five inflammatory cells (predominately lymphocytes and plasma cells) per 400X field was considered to be mild infiltration of the inter-alveolar connective tissue. Accumulation of five to ten inflammatory cells per 400X field was considered to be moderate infiltration, and accumulation of greater than 10 inflammatory cells per 400X field was considered to be severe infiltration. Sparsely scattered, hyperchromatic, necrotic debris within the alveolar lumen was considered to be evidence of mild necrosis, and focal, dense accumulation of necrotic debris was considered to be evidence of moderate necrosis. Dense, diffuse, homogenous accumulation of hyperchromatic debris was characterized as severe necrosis. Statistical analysis was performed using an analysis of variance and Fischer's PLSD with a  $P < 0.05$  being significant.

## Results

All bulls were successfully injected and no abnormalities were noted on physical examination during the

follow-up period. At necropsy, the ampulla, colliculus seminalis and pelvic urethra of all bulls appeared grossly and histologically normal. The loss of alveolar density, degree of infiltration of inflammatory cells and accumulation of hyperchromatic debris identified in the seminal vesicles of the treated bulls were moderate to severe. The histologic findings were statistically significant ( $P < 0.05$ ) between treated and control bulls.

## Significance

Based on the results of this study, we believe that the infusion of 4% formaldehyde solution into a seminal vesicle performed percutaneously is feasible and may result in destruction of the gland. This study provides a basis for further investigation of the efficacy of formaldehyde solution in ablating an infected seminal vesicle of bulls with naturally occurring or experimentally induced septic seminal vesiculitis.

## References

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