

replicative ability of these viruses. The role and significance of NO \cdot production by bovine alveolar macrophages in infectious pneumonia remains speculative.

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Association Between Ration Protein and Economic Efficiency of Milk Production on Ontario Dairy Farms

Lissemore, K., Kelton, D., Martin, S.W., Godden, S., Vonk Noordegraaf, A., Edge, V.L.

Department of Population Medicine, University of Guelph, Guelph, Ontario, Canada.

Introduction

An investigation of the association between the protein content of the ration and the economic efficiency of milk production indicates that increasing forage protein on Ontario dairy farms increases the daily milk income minus feed costs (IMFC).

Materials and Methods

Milk production data were collected monthly on 59 Ontario dairy farms, from August 1995 to December 1996. Total amounts of forage (corn silage, haylage, hay and pasture) and concentrate (grains, mineral and protein supplements) fed to lactating cows, and forage analyses, were recorded. Milk production and daily milk income minus feed costs (IMFC) were initially analyzed by herd-month, and then at the herd level by averaging variables across months within herd.

Mean herd size was 58 (± 35) milking cows. On average, each cow was fed 4 kgs of protein daily, with 60% coming from protein supplements. Monthly ration composition remained fairly constant, with a slight decrease in the dry matter intake (DMI) and protein intake during the months of June through September.

Results, Discussion and Conclusion

In analyzing the herd-month data, a repeated measures approach was used to adjust for the correlation

within herd, with milk production (MILKPROD) and IMFC as outcomes. In the final model, protein from haylage, grain and supplements all had a significant curvilinear relationship with IMFC. An increase in haylage protein, however, would have to be accompanied by a decrease in the supplemental protein to achieve a higher IMFC. Herd effect accounted for 60% of variation in the model. If total protein intake was held constant at the optimal average of 4 kgs, the maximum for IMFC was achieved with a lower level of forage protein than was required to maximize MILKPROD.

Because of the large herd effect, a herd-level model was created. Protein from haylage and corn silage were the two significant (linear) factors in modeling both IMFC and MILKPROD. An increase in haylage and/or corn silage served to increase both IMFC and MILKPROD, with subsequent decreases in feed costs per cow.

Since there are obvious herd-level as well as within herd associations between protein source and economic efficiency, the results from both levels of analyses must be considered when making recommendations to dairy producers.