Economic Impact of Nutritional Grouping in Dairy Herds

A. S. Kalantari L. E. Armentano, R. D. Shaver and V. E. Cabrera
Department of Dairy Science, University of Wisconsin Madison

Introduction

Grouping cows is a common practice among farmers to manage herds more efficiently. They use different grouping strategies to separate cows to address cow-specific needs. However, grouping lactating cows for nutritional purposes is not a widely adopted strategy in the dairy industry. Feeding one TMR to all lactating cows with diets formulated for the high producing cows is the norm. This results in: 1) more over-conditioned cows; 2) greater nutrient excretion; 3) increased cost of nutrient usage; and 4) likely less than potential productivity.

Objectives

- Evaluate and quantify the economic value of nutritional grouping

Materials & Methods

Simulation Framework

A dynamic, stochastic, Monte Carlo simulation was developed to represent each individual cow in a herd. This simulation takes into account several factors:

- Reproductive (calving, ovulation, estrus detection, service, conception, abortion, dry-off, parturition)
- Non-reproductive (involuntary and voluntary culling and mortality)

Stochastic Events

- Based on scheduled events, cows’ attributes and their nutritional requirements were updated on a daily basis. In addition, changes in BW and BCS of the cows were dynamically tracked by estimating their body energy and updating it based on the consumed energy in the diet.

Economic Value of Nutritional Grouping

- Average Milk Revenue
- Average NEL Cost
- Average RDP Cost
- IOFC from 1,000 replications for all the herds when fed average NE\textsubscript{L} and average MP+1SD

Results

- Grouping Dynamics
- Grouping Criteria
- Scenario Analysis
- Formulated Diet (5 Herds Average)
- Economic Impact of Nutritional Grouping

Scenario Analysis

- Average 5 herds IOFC ($/cow per year)
- Formulated Diet (5 Herds Average)
- Economic Value of Nutritional Grouping

Economic Impact of Nutritional Grouping

- IOFC from 1,000 replications for all the herds when fed average NE\textsubscript{L} and average MP+1SD

Conclusion

- Nutritional Grouping increased IOFC
- No matter the herd size the majority of IOFC was obtained by having 2 groups
- The IOFC gain was due to higher milk sales and lower RUP costs
- In tough economic conditions the IOFC gain was even greater

Acknowledgement

This project was supported by Agriculture and Food Research Initiative Competitive Grant no. 2011-68004-30340 from the USDA National Institute of Food and Agriculture.