Grouping strategies to improve feed efficiency

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Feeding lactating cows more than one ration improves production efficiency because it provides closer-to-requirement nutritional density diets avoiding unnecessary nutrient wastes without decreasing productivity. Multiple nutritional grouping alleviates over conditioned animals and nutrient excretion while enhances income over feed cost (IOFC) by decreasing feed nutrient expenditures. Savings on additives and nutrients should largely compensate additional investments of nutritional grouping such as management, labor, equipment, or facilities; or milk depression losses that could be attributed to social interactions when cows are moved to different groups. Beyond the economics, nutritional grouping promotes environmental stewardship by improving nutrient use efficiency. To test the above principles, we developed a Monte Carlo model that stochastically simulates every cow of a herd and the herd dynamics over time. In brief, the model loads a herd dataset and then projects its performance based on estimates of energy and protein requirements, and diet formulation under different nutritional grouping scenarios. We confirmed all the above premises after applying the model to 5 commercial, high producing herds in Wisconsin. Economically, the IOFC increased about $20, $45, $55, $63, and $70 when the nutritional grouping increased from 1 to 6, respectively. These estimates included the negative value of milk depression that varied between $16 for 2 groups to $23 for 6 groups. Energy efficiency (Mcal in milk/Mcal consumed) improved from 62% to 62.18, 62.59, 62.85, 62.86, and 62.88% and N efficiency (Milk N produced/Feed N consumed) improved from 25.43% to 25.79, 26.11, 26.27, 26.34, and 26.40% when nutritional grouping increased from1 to 6, respectively. We did not find an association between either culling risk nor pregnancy rate on the effects of grouping strategies. Further analysis is suggested on establishing better diet formulation protocols at the group level for one and multiple groups and studying the interactions between herd size and number of nutritional groups.