100 Improving nutritional accuracy and economics through multiple ration-grouping strategy. J. A. Barrientos Blanco*, V. Cabrera, and R. D. Shaver, *University of Wisconsin Madison, Madison, WI.*

Study objective was to evaluate implementation of nutritional grouping strategy (NGS) to improve nutritional accuracy and reduce feed costs for lactating cows 148 ± 65 DIM. A 2,500-cow Wisconsin commercial dairy farm was used in the study. Three months (June–August 2017) of data, including individual cow reproductive and productive performances, were used to simulate NGS. Three pens (450 cows total) of multiparous cows currently grouped in 3 pens indiscriminantly, were regrouped using k-mean algorithm based on their net energy (NE) and metabolizable protein (MP) requirements. An equation was developed to calculate a diet accuracy index (DAI = |[Diet nutrient/PENs DMI] – [nutrient requirement/required DMI]|), utilized to assess and compare nutritional accuracy of feeding cows clustered by NGS to the farm grouping strategy (FGS). The lower the DAI value, the more accurate the diet. Minimum least squares algorithm (L2 - norm) was used to calculate the most representative NE and MP requirements per pen from NGS. These NE and MP requirement values where utilized to formulate diets using the same recipe and equal or lower cost than the current farm diet. Supplied NE, MP by the diets, DAI and cost per pen at the farm, were compared with the simulated pens using NGS. Results from the simulation suggest that NGS increases diet accuracy for supply of NE and MP per pen (see Table 1). DAI values were lower for NGS in both NE and MP. Total cost of 3 mo of feeding lactating cows using FGS was $51,894, whereas it was $43,041 for NGS; $8,943 diet cost savings. Implementing NGS in groups of lactating cows has potential to increase nutritional accuracy of diets and savings through decreased diet costs.

Key Words: feeding costs, diet accuracy, nutritional grouping

Table 1 (Abstr. 100). Diet accuracy index (DAI) of diet NE and MP supply for FGS vs. NGS

	PGS			NGS			FGS-NGS
Nutrient	Pen 1	Pen 2	Pen 3	Pen 1	Pen 2	Pen 3	All pens
DAI NE (Mcal/kg)	0.246±0.424	0.086±0.667	0.081±0.602	0.031±0.043	0.028±0.020	0.032±0.026	0.107
DAI MP (g/kg)	9.693±7.238	8.846±6.270	9.058±5.827	3.299±4.272	2.934±2.541	3.812±3.040	5.861