

A cluster analysis to describe profitability on Wisconsin dairy farms.

*M Dutreuil*¹, V.E Cabrera¹, R Gildersleeve², C.A Hardie¹, M Wattiaux¹; UW Madison, Madison, WI, USA¹, UW Extension, Dodgeville, WI, USA²*

A survey was implemented on Wisconsin dairy farms to understand the impact of farm management on profitability. Farms were selected across 3 systems: conventional (C), grazing (G) and organic (O). The objective was to characterize main factors associated with profitability. A cluster analysis using complete linkage was conducted on 20 farms as preliminary analysis: 4 O, 4 G and 12 C. The analysis yielded 3 clusters. Cluster 1 included 1 O, 2 G and 6 C farms; cluster 2 included 4 C and 1 G farms; and cluster 3 included 3 O, 1 G and 2 C farms. Clusters 1 and 3 had the same income over feed cost (IOFC, \$5.97 and \$5.22/d per cow, respectively) whereas cluster 2 had an IOFC of \$8.09/d per cow. Farms in cluster 2 had 71 cows and 95 ha and were managed by the youngest farmers (44 years old). They used a ration with 35% grass silage (GS), 1% hay, 18% corn silage (CS) and 46% concentrate (C). They had the greatest milk production (10,764 kg/cow per year) and the lowest percentage of milk withheld from sale (0.49%). They produced milk with 3.55% fat, 3.03% protein and 203,000 somatic cells (SCC), but received the lowest milk price (0.348\$/kg). Farms in cluster 1 had 72 cows and 115 ha and were managed by 49 years old farmers. They used 20% GS, 32% hay, 12% CS and 36% C in the ration. They had a lower milk production (7,068 kg/cow per year) and more milk withheld (1.65%) than farms in cluster 2. Their milk had 3.78% fat and 2.99% protein with a price of 0.368\$/kg. Farms in cluster 3 were the smallest farms with 48 cows and 54 ha and were managed by 49 years old farmers. They used 17% GS, 54% hay, 5% CS and 24% C in the ration. They produced the least amount of milk (4,146kg/cow per year) and withheld 3.08% of production. They had the greatest milk fat and protein content (4.36% and 3.25%, respectively), the greatest SCC (317,167) and the greatest milk price (0.480\$/kg). The 3 clusters contained farms from different systems indicating that management system was not a major descriptor of IOFC. However, this study suggested that IOFC was associated with quantity and quality of milk, percentage of milk withheld, feeding strategy and age of the farmer.

Key words: Cluster analysis, farm profitability, farm management.