

Should you Feed Concentrate in the Partial Mixed Ration (PMR) or Automated Milking System (AMS)?

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In an AMS, concentrate is used attract cows to voluntarily enter the AMS. Currently, the amount of concentrate fed in the AMS ranges between 1.8 and 7.7 kg/d (Rodenburg, 2011). However, providing additional concentrate in the AMS without altering the PMR does not improve milking frequency (MF) or milk yield (Halachmi et al., 2005; Bach et al., 2007). It is not clear if motivation to enter the AMS is affected by the amount of concentrate fed when the total dietary energy density (PMR + concentrate in AMS) is balanced. The objective of this study was to determine the effect of high and low concentrate allocation, under iso-nitrogenous and iso-caloric dietary conditions, in the AMS on milking performance, feeding behavior, and activity budgets of Holstein cows. This study was conducted at the Rayner Dairy Research and Teaching Facility (University of Saskatchewan, Saskatoon), using 5 primiparous and 3 multiparous cows (DIM = 139 ± 77) in a randomized, cross-over design (26-d periods). Treatments consisted of either a high concentrate allowance (5.2 kg DM; HIGH-AMS) or low allowance (500 g/d; LOW-AMS) in the AMS with HIGH-AMS cows receiving a PMR containing a lower energy density relative to LOW-AMS cows. Predicted total energy density of the diet (PMR + concentrate) was equivalent. Voluntary visits to the AMS, milk yield and feeding behavior (Insentec, Markness, Netherlands) were measured from d 19 to 26. Milk samples were collected over the last 3-d of each period and daily composites were analyzed for composition.

Cows fed LOW-AMS consumed 6.0 kg more ($P < 0.001$) PMR and 4.4 kg less ($P < 0.001$) concentrate in the AMS than HIGH-AMS. There was a tendency ($P = 0.078$) for DMI to be greater for LOW-AMS than HIGH-AMS cows. Milk yield (+ 2.7 kg; $P = 0.093$) and MF (+ 0.45 visits/d; 0.085) tended to be greater for LOW-AMS. Milk composition was not affected.

Implications: This study indicates that provision of concentrate within the PMR rather than the AMS could increase DMI, voluntary visits to the AMS, and milk yield.