

Composition of partial mixed rations are more important than the type of pellet fed to dairy cows in mid-lactation

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Previous research evaluating nutritional strategies for automated milking systems (AMS) has focused on type and allowance of pellet fed in the AMS with a common partial mixed ration (PMR). The objective of this study was to determine the effects of feeding a high-fibre (7.7% starch, 41.2% neutral detergent fibre [NDF]; F) or high-starch (59.5% starch, 14.7% NDF; S) pellet at 3 kg (H) or 1 kg (L) twice per day. Four types of PMR were formulated for each pellet treatment such that the overall diet (PMR + pellet) fed was the same among all treatments. Eight mid-lactation (136 ± 21 days in milk) ruminally-cannulated cows were used in a 4 x 4 Latin square design study with 14-d periods and treatments of FH, FL, SH and SL. Cows were fed PMR once daily at 1200 h, and pellet twice daily at 0600 and 1800 h, and cows consumed all pellets within 10 min at each feeding. Pellet type or quantity fed did not affect milk yield (42.7 kg/d), milk fat content (3.75%), or total dry matter intake (27.7 kg/d); however, PMR intake was reduced when more pellet was fed (22.9 vs. 25.3 kg/d; $P < 0.01$). Contrary to our hypothesis, feeding the high fibre pellet tended to increase duration of rumen acidosis (210 vs. 103 min/d; $P = 0.08$), and feeding a low amount of pellet, regardless of type, tended to increase the duration and severity of acidosis. These findings are likely attributed to type and intake of PMR, rather than pellet, as cows fed the high-starch pellet tended to consume less immediately after PMR delivery (28.5 vs. 33.5% of daily PMR intake; $P = 0.04$), with intake spread out more evenly over the day.

Implications: The data suggest that cows modify their feeding behavior in response to the type and amount of pellet they are fed, and that composition and intake of PMR have greater effects on rumen fermentation than the pellet, and this should be considered in nutritional management decisions for AMS.