

Dairy Cows Sort Their TMR

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It is important that dairy cow diets contain physically effective fibre that stimulates chewing and saliva secretion to prevent ruminal acidosis. To develop guidelines for sufficient physically effective fiber, it is necessary to determine the extent that dairy cows sort long particles from small particles when fed a TMR.

Two studies were conducted to determine whether particle size of forage affects sorting of feed by dairy cows. Corn silage and barley silage, chopped fine, medium and coarse were each used in a separate study designed as a double 3 × 3 Latin square. The fine, medium and coarse silages were combined with a barley-based concentrate to provide three levels of physically effective fibre (forage:concentrate ratio of 45:55). Particle distribution of the diets was determined using the Penn State Particle Separator with a top sieve (19-mm), middle sieve (8-mm) and pan. The sum of particles retained on the top and middle sieves, or the physically effectiveness factor (pef), were 0.35, 0.32 and 0.30 of dry matter for the corn silage-based diets, and 0.41, 0.37 and 0.33 for the barley silage-based diets, for coarse, medium and fine silages, respectively.

For cows fed corn silage diets, the proportion of long particles (i.e., those retained on the 19-mm sieve) left in the orts 24 h after feeding (6.3, 1.7 and 0.2%, for coarse, medium and fine, respectively) was smaller than the proportion in the original diets (8.9, 7.9 and 7.0%, for coarse, medium and fine, respectively). This difference in proportion of long particles between the diet and the orts means that cows selected long forage over small particles. In addition, the pef of the diets were greater than the pef of the orts (0.23, 0.20 and 0.16, for coarse, medium and fine, respectively). The reduction in pef from diet to orts was more pronounced for fine (47%) than for coarse (34%) diets. For cows fed barley silage diets, proportion of particles retained on the 19-mm sieve and pef in the orts (0.33, 0.31 and 0.28, for coarse, medium and fine, respectively) were also smaller than in the original diets.

Take Home Messages: For barley-based diets that are highly fermentable in the rumen, dairy cows intentionally select long particles to meet their need for physically effective fibre, especially when ruminal pH is low. The selection of coarse particles was greater for corn silage- than for barley silage-based diets, because the corn silage used in this study was slightly finer than the barley silage.