

Introduction & Objectives

- Dairy cows rely heavily on their nutrient intake to support the demands of pregnancy and lactation
- When cows cannot consume sufficient dry matter to meet their energy requirements in the first weeks of lactation:
 - They enter a state of negative energy balance (NEB)
 - Cows in NEB mobilize body fat as a source of energy, increasing the risk for ketosis and other health disorders

The objectives were to determine:

- How feeding behavior, feed intake, and milk production are altered in response to being fed a diet that does not meet nutrient requirements for production
- If cows will alter their behavior to maximize nutrient consumption, particularly when fed a more easily sorted diet

Methods

- Diets were diluted with straw and formulated for a 25% reduction in energy available for milk. 30 Holstein lactating dairy cows (DIM = 51±20; parity = 3±0.2) were enrolled.



← 2-wk Baseline Standard lactation diet (NE_L=1.66 Mcal/kg; 68%forage) | 3-wk reduced energy Treatment diets Long (10.16 cm) or Short (2.54 cm) straw diet (NE_L=1.56 Mcal/kg; 73%forage) | 2-wk Return to Baseline Standard lactation diet (NE_L=1.66 Mcal/kg; 68%forage) →

- Feeding behavior
 - Automated feed bins recorded feed intake and time at each visit for each cow
 - Fresh feed and ort samples from each cow to determine particle size distribution: long (>19mm), medium (<19, >8mm), short (<8, >4mm), and fine (<4mm)
 - Feed sorting was calculated as actual intake of each particle fraction expressed as a % of its predicted intake
- Milk yield was measured at each milking (2x/d)

Results

In the first week after treatment exposure, all cows consumed less feed ($P<0.01$; Fig. 1a); one week later, they all produced less milk ($P<0.01$; Fig. 1d). Cows fed the Long straw diet spent more time feeding and ate more slowly ($P<0.01$; Fig. 1b,c). Cows on the Long treatment sorted more for the short and fine particles ($P<0.01$) and increased their sorting against the longest particles ($P<0.01$) (Fig. 1e).

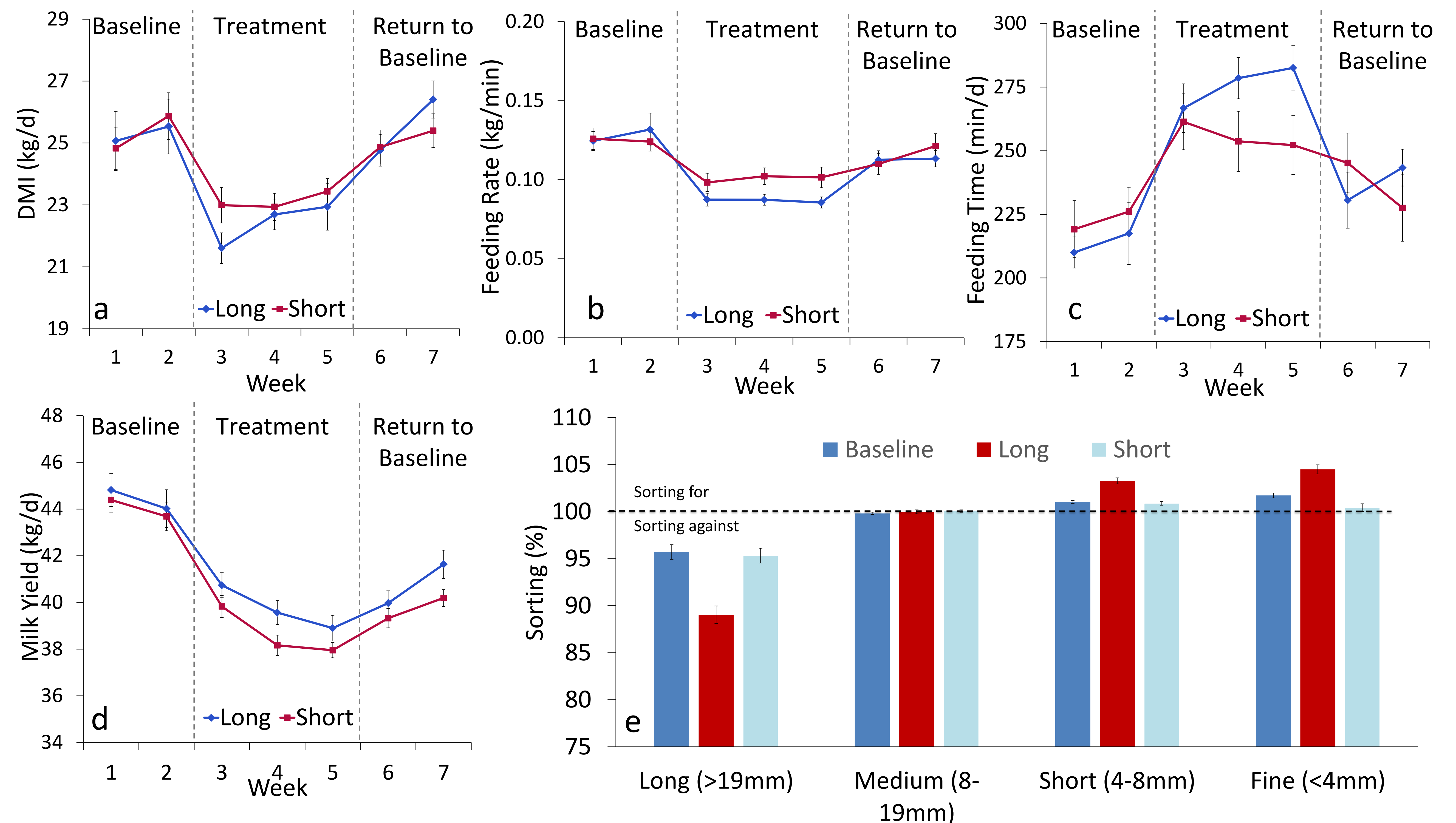


Figure 1. Weekly means of (a) dry matter intake (DMI), (b) feeding rate, (c) feeding time, and (d) milk yield, and (e) feed sorting

Conclusions

- Cows on the long straw diet sorted more for the energy dense portions of the diet and against the less energy dense portions when exposed to a diet that was limited in the total energy available for milk production
- Despite differences in DMI, milk yield remained similar between treatments, possibly due to sorting
- This suggests that cows exposed to a diet that does not meet their nutrient requirements will sort that diet, when possible, to maximize nutrient consumption

