**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\textsubscript{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\textsubscript{L} = 1.56 Mcal/kg; 73% forage).
- **2-wk Return to Baseline**
  - Standard lactation diet (NE\textsubscript{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).

**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.

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

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