Replacement Report

*Starter/Grower Research*

# Fiber for starters and growers

Previously, we have shared rather convincing data from trials where hay was fed with a starter feed. The conclusion was, **do not feed hay with starters**. In trials where the calves were weaned at 28 days, a second conclusion was **not to feed hay until at least 28 days post-weaning** or 56 days of age. Feeding hay reduced starter intake, reduced average daily gain, and efficiency of gain.

Cottonseed hulls are a fibrous feed that is palatable to cattle. The NRC, 1989 lists a zero net energy for gain in growing beef cattle. Nonetheless, cottonseed hulls are recommended by many advisors for calf feeds. Below are results from two of our trials.

We fed four starters. One was a control with no hay or cottonseed hulls. Others contained 5% cottonseed hulls, 10% cottonseed hulls, or 5% chopped grass hay. Calves were fed a 26% CP, 17% fat milk replacer fed at 1.5 lb daily and weaned at 28 days. All starters were formulated to contain 18% CP (as-fed) and were textured starters based on rolled corn, whole oats, and soybean meal. Starter and water were fed free-choice. Calves were maintained in individual pens. Daily gain, starter intake, and efficiency declined linearly ($P < 0.05$) from 0 to 56 days of the trial as cottonseed hulls increased in the diets with 0, 5, and 10% cottonseed hulls (Table 1). There were no differences ($P > 0.10$) in calf performance between calves fed diets with either 5% cottonseed hulls or 5% hay. **The conclusion from this trial is to not feed cottonseed hulls via the starter in calves less than 56 days of age.**

These same four diets were fed to the same calves from 56 to 84 days in group pens of six calves per grower pen. The grower diet and water were fed free-choice. Daily gain declined quadratically ($P < 0.05$) as cottonseed hulls increased in the diets with 0, 5, and 10% cottonseed hulls (Table 2). Intake declined linearly ($P < 0.05$) as cottonseed hulls increased in the diets with 0, 5, and 10% cottonseed hulls (Table 2). Efficiency did not differ ($P > 0.10$) among diets compared. There were no differences ($P > 0.10$) in calf performance between calves fed diets with either 5% cottonseed hulls or 5% hay. Calves fed the grower with 10% cottonseed hulls grew the slowest, while daily gain did not differ among the other three treatments. **The conclusion from this trial is that no more than 5% cottonseed hulls should be included in a grower diet.** This is much less cottonseed hulls than typically included in starters and growers.

Previously, we have reported that feeding small amounts of beet pulp, and whole fuzzy cottonseed hulls in starters reduced efficiency of gain. Feeding large amounts of soyhulls in starters reduced gain, intake, and efficiency. Recently, we have evaluated graded concentrations of soyhulls (0, 14, 28, and 42% soyhulls) in calf growers. Body weight gain declined quadratically ($P < 0.06$) and efficiency declined linearly ($P < 0.09$) as soyhulls increased in the diet (Table 3). **Less than 14% soyhulls should be included in grower diets.**

**The overall summary points to these trials are:**

- **Fibrous feeds should not be included in calf starters.**
- **Approximately 5% of fibrous feeds should be included in calf growers.**

Table 1. Effect of the concentration of cottonseed hulls (0, 5, or 10%) or 5% hay in a calf starter fed from birth to 56 days.

| Item | 0% CSH or Hay | 5 % CSH | 10% CSH | 5% Hay | SEM | Linear 0, 5, 10% CSH [a] | 5% CSH vs. 5% Hay [a] |
|---|---|---|---|---|---|---|---|
| Gain, lb/day | | | | | | | |
| 0 to 28 days | 1.11 | 0.97 | 0.92 | 1.07 | 0.08 | P < 0.10 | NS |
| 28 to 56 days | 1.74 | 1.69 | 1.58 | 1.59 | 0.07 | P < 0.05 | NS |
| 0 to 56 days | 1.42 | 1.33 | 1.25 | 1.33 | 0.08 | P < 0.05 | NS |
| Intake, lb/day | | | | | | | |
| 0 to 28 days | 0.59 | 0.50 | 0.42 | 0.62 | 0.08 | P < 0.10 | NS |
| 28 to 56 days | 4.59 | 4.34 | 4.31 | 4.14 | 0.10 | P < 0.05 | NS |
| 0 to 56 days | 2.59 | 2.42 | 2.37 | 2.38 | 0.11 | P < 0.05 | NS |
| Efficiency | | | | | | | |
| 0 to 28 days | 0.551 | 0.497 | 0.494 | 0.518 | 0.029 | P = 0.17 | NS |
| 28 to 56 days | 0.382 | 0.392 | 0.370 | 0.382 | 0.013 | NS | NS |
| 0 to 56 days | 0.433 | 0.425 | 0.407 | 0.427 | 0.010 | 0.042 | NS |

[a] Probability of linear relationship. NS = not significant (P > 0.20).

Table 2. Effect of the concentration of cottonseed hulls (0, 5, or 10%) or 5% hay in a calf grower fed for 28 days.

| Item | 0% CSH or Hay | 5 % CSH | 10% CSH | 5% Hay | SEM | Relationship 0, 5, 10% CSH [a] | 5% CSH vs. 5% Hay [a] |
|---|---|---|---|---|---|---|---|
| Body weight gain, lb/d | 2.67 | 2.69 | 2.42 | 2.68 | 0.04 | Q, P < 0.05 | NS |
| As-fed intake, lb/d | 7.73 | 7.49 | 7.13 | 7.07 | 0.22 | L, P < 0.05 | P = 0.13 |
| Efficiency | 0.346 | 0.359 | 0.339 | 0.380 | 0.016 | NS | NS |

[a] Probability of linear (L) or quadratic (Q) relationship. NS = not significant (P > 0.20).

Table 3. Effect of the concentration of soyhulls (0, 14, 28, or 42%) in a calf grower fed for 28 days.

| Item | 0% | 14% | 28% | 42% | SEM | Relationship [a] |
|---|---|---|---|---|---|---|
| Body weight gain, lb/d | 2.92 | 2.86 | 2.73 | 2.51 | 0.05 | Quadratic, P < 0.06 |
| As-fed intake, lb/d | 6.36 | 6.42 | 6.34 | 6.34 | 0.52 | NS |
| Efficiency | 0.459 | 0.446 | 0.430 | 0.400 | 0.029 | Linear, P < 0.09 |

[a] Probability of a linear or quadratic relationship. NS = not significant (P > 0.20).