



Starter/Grower Research Feeding hay or roughage

The current recommendation of most advisors is to not feed any hay until the calf is weaned. Calves have very small rumens, thus one might expect their ability to utilize hay or roughage could be limited by their capacity to consume a bulky feed and even their ability to digest it. Monogastrics (i.e. pigs, humans, chickens), especially neonatal monogastrics, cannot digest feeds that are high in fiber like hay or other roughages.

We have fed graded amounts of high quality, chopped grass hay (14% CP, 44% NDF, as-fed basis) to calves mixed into the starter feed. As we increased the hay from 0 to 2.5 to 5% of the starter, daily gain, starter intake, efficiency, and hip width change declined ($P < 0.05$) in a linear manner (Table 1). In this trial, calves had been fed Pinnacle milk replacer (26% CP, 17% fat) at 1.5 lb daily and weaned at 28 d. They also had free-choice textured starter (18% CP) and water. **Thus, hay should not be fed with the starter.**

Additionally, we have introduced hay at 14 days post-weaning (or 42 days of age) to calves that had been fed Pinnacle milk replacer at 1.5 lb daily and weaned at 28 d. They also had free-choice starter (18% CP) and water. Two starter forms were fed. One was textured and the other was a complete pellet. Calf gain and efficiency was greater ($P < 0.05$) from 42 to 56 days for calves fed the textured compared to the pelleted starter (Table 2). However, other measures as related to form of starter did not differ. Daily gain, starter intake, and hip width change were greater ($P < 0.05$) for calves fed no hay vs. calves fed hay from 42 to 56 days. Efficiency tended to be greater ($P < 0.05$) for calves fed no hay vs. calves fed hay from 42 to 56 days. Starter intake tended to be greater ($P < 0.10$) for calves fed no hay vs. calves fed hay from 56 to 84 days. **The take home message is that hay should not be fed until at least 28 days post-weaning in calves weaned at 28 days.**

In 56-day old calves in group pens, we have investigated feeding either 5 or 15% chopped hay fed along with an 18% CP textured feed. Calves had previously been fed Pinnacle milk replacer at 1.5 lb daily and weaned at 28 d. Gain and total intake were approximately 14% greater for calves fed the diet with 5 vs. 15% hay, while efficiency was not different between treatments (Table 3). This indicates that the bulky hay was likely limiting consumption of the diet with 15% hay by these small calves with small rumen capacity. Calves fed the 5% hay diet consumed approximately 98% (or rejected only 2%) of their hay, while calves fed the 15% hay diet consumed approximately 88% (or rejected 12%) of their hay. **To summarize this trial, 15% hay is too much because it limited intake and gain.**

The overall summary points to these 3 trials are:

- Do not feed hay until at least 2 months of age (1 month post-weaning in calves weaned at 1 month of age).
- Limit the amount of hay fed to calves 2 to 3 months of age to 5% of the diet (less than 0.33 lb per head daily).
- Never was excessive fattening an issue. Feeding excess hay did result in reduced hip width change (reduced structural growth) and body weight gain. So, the risk is in feeding too much hay, not too little.

Table 1. Effect of the amount of hay included in a starter from birth to 56 days.

Item	0% Hay	2.5% Hay	5% Hay	SEM	Linear P value
Gain, lb/day					
0 to 28 days	0.93	0.90	0.93	0.06	NS
28 to 56 days	1.89	1.74	1.42	0.07	0.05
0 to 56 days	1.41	1.32	1.17	0.05	0.05
Intake, lb/day					
0 to 28 days	0.37	0.33	0.35	0.04	NS
28 to 56 days	4.49	4.19	3.74	0.15	0.05
0 to 56 days	2.44	2.27	2.05	0.09	0.05
Efficiency					
0 to 28 days	0.52	0.51	0.52	0.03	NS
28 to 56 days	0.42	0.42	0.38	0.01	0.05
0 to 56 days	0.45	0.44	0.43	0.01	0.05

Table 2. Effect of starter form and hay fed from 14 days post-weaning (42 days) to 84 days.

Item	Form		Hay fed		SEM	P value	
	Pellet	Textured	0% Hay	5% Hay		Form	Hay
Gain, lb/day							
42 to 56 days	1.98	2.21	2.25	1.94	0.10	0.05	0.05
56 to 84 days	3.36	3.36	3.36	3.35	0.16	NS	NS
Intake, lb/day							
42 to 56 days	5.92	5.94	6.19	6.36	0.13	NS	0.05
56 to 84 days	7.99	7.85	8.08	7.76	0.16	NS	0.1
Efficiency							
42 to 56 days	0.33	0.37	0.36	0.33	0.01	0.05	0.1
56 to 84 days	0.42	0.43	0.42	0.43	0.02	NS	NS

Table 3. Effect of hay in a grower diet fed from 56 to 84 days.

Item	5% hay	15% hay	SEM	P value
Gain, lb/day	2.27	1.98	0.05	0.05
Intake, lb/day	5.92	5.19	0.14	0.05
Efficiency	0.39	0.39	0.01	NS