BEEF CATTLE RESEARCH UPDATE

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Adaptation Programs for Starting Cattle on Feed

Traditionally, feedlot cattle have been adapted to high-grain finishing diets by ad libitum feeding of three to five sequential diets with increasing grain concentration (decreasing roughage concentration) over 2 to 4 weeks. This allows ruminal microorganisms to gradually adapt to a ruminal environment with a lower pH in an attempt to minimize subacute acidosis and intake variation that can occur with overeating of grain. The starting diet will commonly contain 40 to 50% roughage while the final diet will contain 5 to 10% roughage. A 2007 survey of consulting feedlot nutritionists showed that most nutritionists recommend an average adaptation period of 21 days for starting cattle on feed.[1] Two recent studies have evaluated alternative methods of adapting cattle to high-grain diets.

Effects of Monensin Concentration and Accelerated Step-up Regimen on Feedlot Performance

Accelerating the traditional step-up regimen when starting cattle on feed would reduce overall roughage intake potentially improving feed efficiency. However, this would also increase the risk of digestive upset or subacute acidosis. Indeed, a review of research evaluating the influence of grain adaptation procedures on performance of feedlot cattle indicated that adapting feedlot cattle with incremental increases in dietary concentrate from approximately 55 to 90% of diet dry matter, in 14 days or less, generally results in decreased performance during adaptation or over the entire feeding period compared with adapting cattle over longer periods of time.[2] Feeding a high level of monensin might modulate feed intake helping to prevent digestive upsets.

Kansas State University research used 720 yearling crossbred steers (804 lb initial weight) in a 2 x 2 factorial experiment to evaluate the effects of monensin concentration and step-up regimen on feedlot performance and carcass characteristics.[3] Factor 1 was 33 or 44 g/ton monensin (dry matter basis) fed for the entire 153 day trial and factor 2 was length of the step-up period (10 or 21 days). In both the traditional (21 day) and accelerated (10 day) step-up regimens, a series of three diets were used (60, 77, and 93% concentrate). The step-up regimens are graphically illustrated in Figure 1.

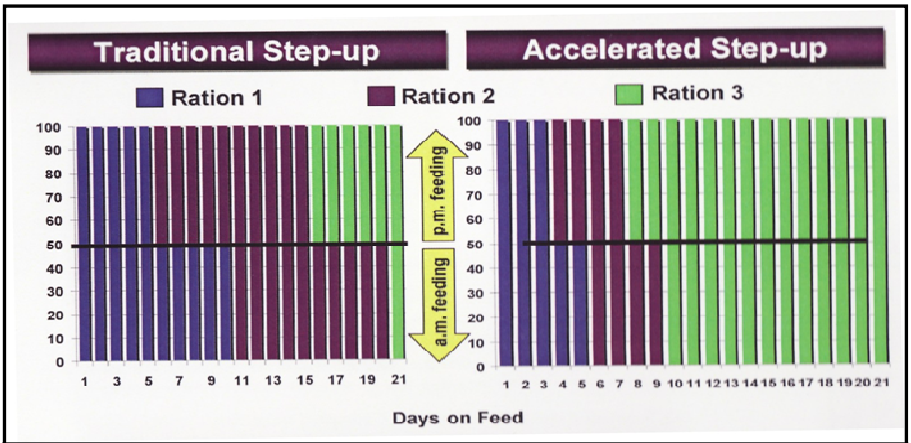

Figure 1. Step-up feeding regimens.
Source: Parsons et al., 2010

These researchers reported that were no interactions between monensin concentration and step-up regimen. The step-up regimen did not influence performance or carcass characteristics. However, steers on the accelerated regimen consumed 63 lb less roughage over the entire 153-day feeding period ($P < 0.05$) than steers on the traditional regimen. The incidence of liver abscesses tended to be greater for cattle started on the accelerated regimen compared to the traditional regimen (5.95 vs. 3.10%, $P = 0.09$). Feeding increased concentrations of monensin reduced dry mater intake by 3.5% (22.72 vs. 23.55 lb/day, $P = 0.004$) and improved feed efficiency by 2.3% (6.01 vs. 6.15, $P = 0.03$) over the entire trial. It was noted that feeding increased monensin levels was most beneficial during the first 56 days on feed (7.8% improvement). The increased monensin level also reduced USDA yield grade (2.29 vs. 2.49, $P = 0.05$). Monensin concentration did not affect other carcass traits.

These data suggest that yearling steers can be transitioned to high-concentrate diets in 10 days without compromising performance. Since less roughage is fed in this regimen, cost of gain might be reduced. These data also suggest that feeding 44 g/ton of monensin will improve feed efficiency.

Two Ration Blending vs. Traditional Step-Up Adaptation to Finishing Diets

Theoretically, the use of a two-ration blending starting regimen (feeding varying proportions of a high- and a lower-roughage diet) as compared to a traditional step-up regimen could improve operational efficiency of feeding cattle by reducing the number of rations needing to be milled. The 2007 survey of consulting feedlot nutritionists reported that only 4 of the 29 surveyed nutritionists used a two-ration blending starting regimen. This survey also reported that two nutritionists used both multiples step-up diets and two-ration blending.

Recent Oklahoma State University research used 144 feedlot heifers (756 lb initial weight) to compare the performance, carcass characteristics, and final value of heifers adapted over a 28-day period to a 94% concentrate, dry-rolled corn based diet using a traditional adaptation program or a two-ration blending program.[4] Heifers on the traditional adaptation program were fed a series of 70, 76, 82, and 88% concentrate diets 7 days each. Heifers on the two-ration blending program were fed the 70% concentrate diet for the first 7 days. Then, during the remainder of the 28 day adaptation program, the heifers were fed the daily feed call based on a predetermined program that decreased the proportion of the 70% diet in the AM feeding and increased the proportion of the feed call as a 94% concentrate diet in the PM feeding. The two-ration blending adaptation program is graphically illustrated in Figure 2.

This research reported that dry matter intake was 5.4% greater during the 28 day adaptation period for two-ration blending heifers compared to traditional step-up heifers (19.23 vs. 18.24 lb/day, $P < 0.05$). However, performance over the entire feeding period (153 to 179 days), carcass characteristics, and final value were not affected by adaptation programs. These researchers concluded that the use of a two-ration blending program should improve feedlot operational efficiency due to a reduction in the number of rations to be milled and delivered without adversely effecting cattle performance. However, the two-ration feeding program may require increased management of feed calls, timing, and distribution compared with a traditional step-up program.

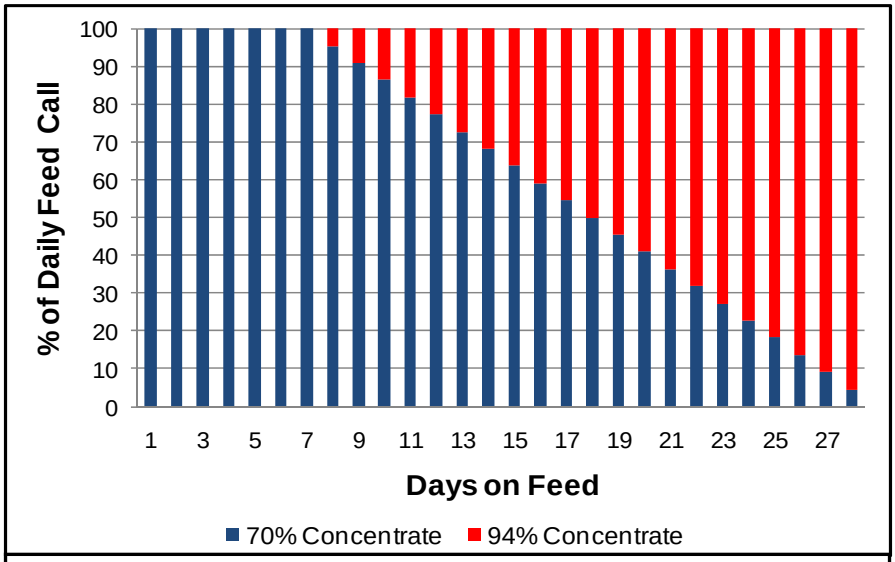

Figure 2. Two-ration blending adaptation program. Adapted from Burken et al., 2010.

[1] Vasconcelos, J. T. and M. L. Galyean. 2007. Nutritional recommendations of feedlot consulting nutritionists: The 2007 Texas Tech University survey. J. Anim. Sci. 85:2772-2781.

[2] Brown, M. S., C. H. Ponce, and R. Pulikanti. 2006. Adaptation of beef cattle to high-concentrate diets: Performance and ruminal metabolism. J. Anim. Sci. 84 (E. Suppl.): E25-E33.

[3] Parsons, G. L., C. E. Walker, K. A. Miller, L. K. Thompson, J. J. Higgins, and J. S. Drouillard. 2010. Effects of monensin concentration and accelerated step-up regimens on performance and carcass traits. Pages 112-113 (Abstr.) in Plains Nutrition Council Spring Conference, San Antonio, TX.

[4] Burken, D. B., J. L. Wahrmund, B. P. Holland, C. R. Krehbiel, and C. J. Richards. 2010. Two ration blending vs. traditional step-up adaptation to finishing diets: Performance and carcass characteristics. Page 99 (Abstr.) in Plains Nutrition Council Spring Conference, San Antonio, TX.

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