



## Placing a Value on the Quality of Calf Feeds

Buying decisions are based on many factors and quality should be an important factor. However, the value of quality is frequently not considered by producers. Quality in calf feeds is especially confusing because the calf and heifer is typically not a profit center but a cost center. Two areas related to quality feeds should be considered. One is future production and the other is cost per unit body weight gain.

### Value of Future Production

Consider the impact of calf nutrition on the future dairy cow. A quality feeding program should enhance the growth rate of calves and reduce the incidence of health challenges. At the Southwest Nutrition Conference in 2008<sup>1</sup>, Dr. Van Amburgh from Cornell University summarized 7 different studies from different institutions where calves were fed conventional milk or milk replacer programs or fed at least 50% more nutrients than is conventional. Calves fed at higher planes of nutrition produced from 998 to 3,092 lb more milk during their first lactation than calves fed conventionally. From these data, Dr. Van Amburgh suggested a goal to double calf birth weight by 56 days of age to reap the benefits of more milk in first lactation. To make this simple to evaluate, if one assumes 1,000 lb more milk at \$0.12/lb, the future return is \$120 per calf. A calf program (i.e. Akey Pinnacle milk replacer) providing 50% more nutrients costs \$25 to \$30 more per calf than conventional programs. (To be fair, there is a trial from the University of MN<sup>2</sup> that reported no significant increases or decreases in first lactation milk from feeding 50+% more milk replacer.) More information on costs of feeding programs is discussed below.

### Cost per Unit Body Weight Gain

To help assess costs of gain, an example conventional feeding program and its costs are outlined in Table 1. The assumptions are for the first 84 days of a calf's life. During that time, it is assumed that the calf will gain 140 lb of body weight, 80 lb during days 0 to 56 and 60 lb from day 56 to 84. Additionally, it is assumed that the calf will receive 40 lb of milk replacer powder, 100 lb of starter feed, and 200 lb of grower feed, totaling \$75 per calf. The cost per unit gain for the 84-day period is \$0.536 per lb (\$75 divided by 140 lb gain).

Table 2 shows examples of calves fed a conventional calf feeding program and lower quality programs. Scenario 1 is the control program using the assumptions in Table 1. Scenario 2 assumes the same feed consumption and costs, but with 10% less body weight gain. Feed cost per lb body weight gain was 11% higher. Scenario 3 assumes the same feed consumption but 10% less body weight gain. Starter and grower feed costs had to be reduced \$0.025/lb (\$50/ton) to achieve the same cost per lb body weight gain as Scenario 1. Scenario 3 assumes the same feed consumption but 10% less body weight gain during the first 56 days. Milk replacer powder costs had to be reduced \$0.10/lb (\$5/50 lb bag) to achieve the same cost per lb body weight gain as Scenario 1. A simplified interpretation is that each 1% change in gain over the 84-day period is worth \$0.50/ton of starter/grower feed or each 1% change in gain over the 0 to 56 day period is worth \$0.50/50 lb bag of milk replacer powder.

<sup>1</sup>Proceedings of 2008 Southwest Nutrition Conference

<sup>2</sup>Journal of Dairy Science 92:799 (2009)

## Examples of quality

In 2007, Akey published<sup>3</sup> a trial where a milk replacer was formulated with Dairy NRC 2001 guidelines or Akey guidelines (White Gold) and observed a difference in body weight gain is approximately 20%. Using the assumptions in Table 1 and 2, the 20% difference in gain meant that NRC-based milk replacer powder in the 2007 publication was worth \$10 less than White Gold

In 2008, Akey published<sup>4</sup> several trials comparing corn-based starters with starters with significant amounts of soyhulls replacing corn. The differences in body weight gain exceeded 10% favoring the no soyhulls starter/growers meaning a difference in value of over \$50/ton between the feeds.

| <b>Table 1. Assumed Body Weight Gain, Feed Consumption, and Feed Costs in Conventional Growth Program</b> |  |
|---|--|
| 0 to 56 days: 80 lb of body weight gain   |  |
| 40 lb milk replacer powder consumed at \$0.80/lb  |  |
| 100 lb starter feed consumed at \$0.15/lb   |  |
| 56 to 84 days: 60 lb body weight gain   |  |
| 200 lb grower feed consumed at \$0.14/lb  |  |

| <b>Table 2. Milk Replacer, Starter Feed, and Grower Feed Costs Relative to Body Weight (BW) Gain</b> |                 |                |                  |                |                  |                |                  |                |  |
|--|-----------------|----------------|------------------|----------------|------------------|----------------|------------------|----------------|--|
|  | Scenario 1      |                | Scenario 2       |                | Scenario 3       |                | Scenario 4       |                |  |
|  | Control BW Gain |                | 10% Less BW Gain |                | 10% Less BW Gain |                | 10% Less BW Gain |                |  |
|  | Control costs   |                | Same feed costs  |                | Less feed costs  |                | Less feed cost   |                |  |
|  | lb or \$/lb     | \$/calf        | lb or \$/lb      | \$/calf        | lb or \$/lb      | \$/calf        | lb or \$/lb      | \$/calf        |  |
| Milk replacer, lb  | 40              |                | 40               |                | 40               |                | 40               |                |  |
| Milk replacer, \$/lb   | \$0.80          | \$32.00        | \$0.80           | \$32.00        | \$0.80           | \$32.00        | <b>\$0.693</b>   | \$27.70        |  |
| Starter feed, lb   | 100             |                | 100              |                | 100              |                | 100              |                |  |
| Starter feed, \$/lb  | \$0.15          | \$15.00        | \$0.15           | \$15.00        | <b>\$0.125</b>   | \$12.50        | \$0.15           | \$15.00        |  |
| Grower feed, lb  | 200             |                | 200              |                | 200              |                | 200              |                |  |
| Grower feed, \$/lb   | \$0.14          | <u>\$28.00</u> | \$0.14           | <u>\$28.00</u> | <b>\$0.115</b>   | <u>\$23.00</u> | \$0.14           | <u>\$28.00</u> |  |
|  |                 | \$75.00        |                  | \$75.00        |                  | \$67.50        |                  | \$70.70        |  |
|  | Gain            | Cost           | Gain             | Cost           | Gain             | Cost           | Gain             | Cost           |  |
|  | lb              | \$/lb          | lb               | \$/lb          | lb               | \$/lb          | lb               | \$/lb          |  |
| 0 to 56 days   | 80              | \$0.588        | <b>72</b>        | \$0.653        | <b>72</b>        | \$0.618        | <b>72</b>        | \$0.593        |  |
| 56 to 84 days  | 60              | \$0.467        | <b>54</b>        | \$0.519        | <b>54</b>        | \$0.426        | 60               | \$0.467        |  |
| 0 to 84 days   | 140             | \$0.536        | <b>126</b>       | \$0.595        | <b>126</b>       | \$0.536        | <b>132</b>       | \$0.536        |  |
| Relative to Control , 0 to 84 d:   |                 |                |                  |                |                  |                |                  |                |  |
| Difference in BW gain, lb  |                 |                |                  | (-14.0)        |                  | (-14.0)        |                  | (-8.0)         |  |
| Cost/lb BW gain as percent of control  |                 |                |                  | 111%           |                  | 100%           |                  | 100%           |  |
| Difference in total feed costs, \$   |                 |                |                  | \$0.00         |                  | (-\$7.50)      |                  | (-\$4.30)      |  |

<sup>3</sup>Professional Animal Scientist Journal 23:401 (2007)

<sup>4</sup>Journal of Dairy Science 91:3128 (2008)