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TECHNICAL INFORMATION FOR TODAY'S FEED PROFESSIONAL

Strategies to Reduce the Cost of Milk Replacer

Current market conditions have once again led to a steep increase in the cost of milk replacer powder over the past 3-4 months. Whey protein and lard prices are the primary drivers of the increased cost, but the uptrend of milk replacer prices has rightfully coincided with significant increases in fluid milk price as well.

Benefits of Milk Replacer

When looking at ways to reduce calf feed costs, do not forget that the use of milk replacer is still a sound management practice for anyone raising calves. The benefits of feeding milk replacer include:

- Biosecurity – Prevent feeding pathogenic organisms that may be present in saleable or waste milk.
- Consistency – High-quality milk replacer is the same from bag-to-bag and batch-to-batch.
- Nutritionally balanced – Protein, fat, and vitamins/minerals are balanced for optimal growth.
- Simple – No extra equipment and expense is needed to support the simple process of mixing and feeding milk replacer.

Controlling Liquid Feed Costs in Periods of High Milk Replacer Prices

During high milk replacer prices, it is common for calf raisers to consider ways to reduce milk replacer costs. Good growth and health is still the goal no matter what, so be sure to consider what impact the change in your milk replacer feeding program will have on calf performance and health. Considering the mounting evidence that shows greater preweaning growth rates result in greater 1st lactation milk yield, it is imperative that any adjustment to the feeding program maintains calf growth. *A short-term cost saving measure can have long-term negative effects on profitability if calf growth or health is negatively affected.*

The cost of any milk replacer program is a function of 1) cost per bag of milk replacer, 2) milk replacer feeding rate per calf per day, and 3) weaning age (days on milk replacer diet).

1. ***Cost of the bag of milk replacer*** – cost is dependent on several things:

- **Source of Protein:**
  - *Milk Protein:* Whey protein and whey protein concentrate have had the sharpest increase in cost but they still provide the best calf performance compared with other options. Quality (and price) can differ significantly among all-milk protein milk replacers – always buy from a trusted supplier and stick with what has delivered good performance and health in the past.
  - *Plasma Protein:* These support similar performance to milk protein, and in cases of health challenges (e.g., environmental stress, co-mingling) may support greater growth and health due to functional proteins (similar to antibodies found in colostrum) being continuously delivered to the calf's intestine.
  - *Alternative Proteins:* Soy protein concentrate and soluble wheat gluten are two of the most common alternative proteins available. These ingredients usually contribute about 50% of the protein in the bag (remainder from milk sources). Alternative proteins can deliver considerable cost savings compared with an all-milk (as much as $10/bag or more), but calf performance will most certainly be lower during the 1st three weeks compared with all-milk milk replacers. Proven alternative protein milk replacers can provide at least 90% of the gain of an all-milk protein milk replacer with no negative health effects (Table 1).

Table 1. Effect of milk replacer protein source on average daily gain (ADG) of Holstein heifer calves[1].

Item	All-Milk MR	50% Soy Protein Concentrate MR	50% Wheat Gluten MR
ADG, d 1-56, lbs/d	1.72	1.57	1.54
ADG, % of all-milk	100%	91.3%	89.5%

[1]Hayes et al., 2007. J. Dairy Sci. 90(Suppl. 1):M348. Abstract.

  - *Two Phase Program:* One idea to consider is to feed an all-milk or plasma protein milk replacer to calves in their first 3 weeks of life and then switch them to a soy- or wheat-based alternative protein milk replacer until weaning. This will reduce some cost and should have minimal (if any) impact on growth performance. Slowly transition calves to a new milk replacer to avoid potential digestive upsets.

2. ***Feeding rate per calf per day*** – An adequate feeding rate is critical for achieving desired growth rates and supporting the calf's immune system. To accomplish this, it is likely necessary to feed at least 1.25 lbs of powder per day to the young calf. The preweaning period has distinct time spans that are critical for calf growth and health but offer opportunities for cost control.

- **First 3 weeks:** The first 3 weeks are critical for the calf. This is a time when the calf is most prone to diseases such as scours, and it is also when the calf relies almost entirely on liquid feeds for its nutrient supply. Dramatic cost cutting is not advised for calves of this age because health and growth are likely to suffer. Do not reduce feeding rates below those noted above or feed an alternative protein milk replacer during this time to avoid negative performance and health issues.
- **After 3 weeks of age:** This is a time period in the calf's life when they begin eating starter and actually consume enough starter feed to provide significant nutrition. Once the calf is consuming at least 1 lb/day of starter, a calf raiser may consider reducing milk replacer feeding rates (e.g., go from feeding 1.25 lbs/day to 1.0 lbs/day) or switch to a lower cost milk replacer. Some things to consider:
    - Avoid dramatic reductions in milk replacer feeding rate (reduce by a maximum of 0.25 lbs/day each week) to allow calf starter intake to increase and minimize the chance for growth stalls.
    - Feeding less of the same milk replacer will avoid any potential refusal or digestive upset issues associated with switching milk replacers.

3. ***Weaning age:*** The national average for weaning age is around 8 weeks. Research has shown that once a calf is eating ~2 pounds of starter every day, milk replacer feeding rates can be cut in half by feeding once instead of twice daily. Calf starter intake should approximately double during the week of once a day milk replacer feeding, and continue to increase during the week after completely weaning the calves from milk replacer. If the calves are consuming enough calf starter, try reducing the age at which calves are weaned by 1-2 weeks in order to reduce feed costs without impacting calf growth. Table 2 below clearly shows the impact of weaning age on milk replacer costs – at a cost of $65/bag, reducing weaning age by 1 week can save over $10/calf in milk replacer costs!

Table 2. Effect of weaning age on milk replacer usage and total milk replacer costs.

Weaning Age, Days[1]	MR Fed, lbs/calf	Cost of Milk Replacer, $/50 lb bag				
		$50	$55	$60	$65	$70
35	**39**	$39.41	$43.35	$47.29	$51.23	$55.17
42	**48**	$48.16	$52.98	$57.79	$62.61	$67.42
49	**57**	$56.91	$62.60	$68.29	$73.98	$79.67
56	**66**	$65.66	$72.23	$78.79	$85.36	$91.92

[1]Assumed that calves were fed 1.25 lbs/day until one week prior to weaning, then fed 0.63 lbs/day for 7 days.

Other Considerations

- **Services Offered –** Information is key to calf success. Seek out a good feed service professional when buying your milk replacer. Have them help you examine your feeding program and find the plan that works best for you and the goals of the operation. Now is NOT the time to reduce performance to save a few dollars as the replacement heifer will be a valuable addition to the dairy herd in two short years. Now IS the time to maximize your return on dollars invested in a milk replacer by using proven products and programs as outlined above.

- **Should I Feed Saleable Milk? –** Milk replacer was developed as an alternative to using saleable milk as calf feed. During periods of high milk replacer prices it is tempting to consider pulling milk from the bulk tank, but typically if milk replacer price is increasing then the milk price is trending upward as well. A general thumb rule for comparing the cost of saleable milk and milk replacer is to multiply the price of milk by 4, as 400 lbs of milk – at 12.5% solids – results in 50 lbs of milk solids.
    - If the milk price is $18, then multiply $18 × 4 = $72
    - If a bag of conventional all-milk milk replacer (20-22% protein) is less than $72, then it is economical to purchase milk replacer versus feeding milk out of the bulk tank.
    - Also consider the cost of the additives that may be present in milk replacer (medications, MOS, direct-fed microbials, etc.) that may have to be purchased and added separately to whole milk

Resources:

Milk Replacer vs. Whole Milk Calculator: http://www.milkproductsinc.com/html/basicEconomics.php