



# Merrick's **TECH BULLETIN**

## **Performance Of Calves On Intensive Milk Replacer Feeding Programs During Cold Stress**

Cold weather places specific demands on calves to generate body heat to stay warm. A calf exposed to decreasing temperatures will use increasing amounts of energy just to maintain its body temperature. This additional energy must come from feed sources; otherwise the calf begins to utilize its own fat reserve. A young calf has very little stored fat and can rapidly become severely stressed at low environmental temperatures as it quickly depletes its body of fat. To provide additional energy, calf raisers often add a fat supplement to conventional milk replacers (20-20 formula) or increase the amount of milk replacer fed.

Research was conducted at Merrick's Research Farm in Union Center, WI to evaluate the performance of calves raised on different intensive feeding programs during cold stress. The primary research concerns were to explore the possible need for nutrient supplementation during cold weather and the potential performance advantage of one program over another. The trial compared the performance of calves fed a 25% protein, 15% fat milk replacer program to calves fed a competitor 28% protein, 20% fat program during cold stress.

### **Protocol:**

<i>Length of trial:</i>	8 weeks. Two trials were conducted between Jan 6 and April 7, 2003.
<i>Number of calves:</i>	80 Holstein bull calves
<i>Treatments:</i>	Treatment 1. Merrick's Super Star Formula 25-15 milk replacer Calves were fed 1.5 lb/day in water, making 4 quarts total Treatment 2. Competitor 28-20 milk replacer Week 1- calves were fed 1.8 lb day in water, making 5 quarts total Week 2 through 6 - calves were fed 2.6 lb/day in water, making 7 quarts total Week 7 – calves were fed 1.3 lb/day in water, making 3.5 quarts total Milk replacers were fed twice daily except Treatment 2, Week 7 being fed once daily.
<i>Housing:</i>	Individual hutches
<i>Starter/Water:</i>	An 18% crude protein starter was offered free choice from Day 1 and water was provided free choice from Day 0.
<i>Weaning:</i>	Calves on Treatment 1 were weaned at a minimum of 42 day. Calves on Treatment 2 were weaned at a minimum of 49 days. To be weaned, calves must eat at least 1 lb of starter for 3 consecutive days.
<i>Other:</i>	Average high temperature was 32.4° F. Average low temperature was 14.1° F.

### **Trial Results:**

Total weight gain of calves on the Super Star 25-15 and the competitor 28-20 feeding programs were the same. Figure 1 shows weight gains for both treatments throughout the trial and Figure 2 shows weight gains at 6 weeks (time of Super Star 25-15 weaning), 7 weeks (time of 28-20 weaning) and at 8 weeks.

**See reverse for more trial results and conclusions**

Figure 1

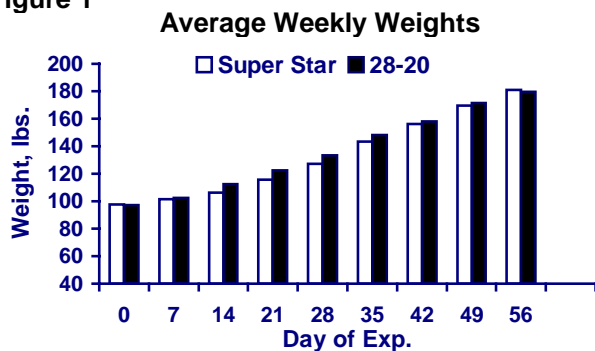


Figure 2

Week of Trial	Merrick's Super Star 25-15	Competitor 28-20
6	59	61
7	72	74
8	83	82

Feed consumption differed significantly between the two treatments. Calves receiving Merrick's Super Star Formula 25-15 consumed a total of 63 lbs of milk replacer powder and ate 127 lb of starter compared to 113 lbs of milk replacer powder and 82 lb of starter for calves receiving the Competitor 28-20 formula. Figure 3.

Figure 3

Feed Intake (lb)  
(cumulative from beginning of trial)

Week Of Trial		Merrick's Super Star 25-15	Competitor 28-20
6	Milk Replacer	63	104
	Starter	55	29
	Total	118	133
7	Milk Replacer	63	113
	Starter	87	49
	Total	150	162
8	Milk Replacer	63	113
	Starter	127	82
	Total	190	195

Average Daily Gains (ADG) for the 8 week trial were the same for both treatments, with Super Star calves growing an average of 1.49 lb/day and Competitor 28-20 calves growing 1.47 lb/day. Figure 4. Super Star calves grew at a faster rate than 28-20 calves during weeks 6-8, with ADG of 1.76 and 1.49 respectively.

Figure 4

Week Of Trial	Merrick's Super Star 25-15	Competitor 28-20
6	1.40	1.45
7	1.47	1.50
8	1.49	1.47
6-8	1.76	1.49

**Conclusions:**

- Super Star calves had the same total weight gain as Competitor 28-20 calves but consumed about ½ the amount of milk replacer and over 50% more starter than 28-20 calves.
- During cold stress, calves receiving a competitor 28-20 milk replacer fed according to intensive feeding instructions of up 2.6 lbs/day do not demonstrate a growth or performance advantage compared to calves fed 1.5 lbs/day of a 25-15 milk replacer.

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