

# Feeding Strategies to Raise Healthy Calves to 60 Days of Age

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Two to 4 day old dairy heifer calves from three commercial dairy farms have been custom raised in the SROC calf and heifer facility up to 6 months of age since April 2004. Calves are picked up twice weekly from the dairy farms and housed in individual 4 ft x 8 ft pens for 56 days in a naturally ventilated curtain side-wall frame-steel building. During the winter months, calf blankets are placed on all calves at pick-up. Blankets may remain on calves for 2 to 4 weeks until they adjust to their new environment, feeding programs, and appear healthy. Upon arrival, blood samples are taken from all calves to check for total serum protein levels as indicators of colostrum passive immunity transfer within 24 hours after birth. Calves have been assigned to a number of nutritional management projects evaluating milk replacer (MR) and calf starter (CS) programs. Milk replacer programs have evaluated varying protein and energy sources and levels. Medicated vs. non-medicated MR have been compared with or without supplements to impact intestinal health. Calf starter programs have looked at levels of molasses in complete texturized starters, different physical form of calf starters with or without intake enhancing supplements. Examples of varying feeding programs are:

## Milk replacers

**a)** The effect of varying liquid and dry feeding programs on calf performance and health. Calves were fed 1.25 lb of a conventional 20:20 MR/day with or without acidification with an 18% CP texturized calf starter vs. modified intensive program of 1.5 lb/day of a 28:16 MR fed at two dilution rates (12.5 vs. 16.67% solids) and an intensive program of 2.25 lb/day MR at 16.67% dilution – all with a 22% CP calf starter. Intensive fed calves were weaned at 49 days and all other groups weaned after 42 days. Health treatment costs/calf averaged \$2.52 for conventional 20:20 programs, \$2.44 for the high solids, \$2.82 for the low solids modified intensive program, and \$1.48 for the intensive program. Health costs reflected differences in calf performance. Calf starter intake was the lowest for intensive fed calves. In this study, calves fed the conventional 1.25 lb of a 20:20 MR had good starter intake and acceptable growth rate.

**b)** Feeding a 24:20 MR at 1.50 lb/day for 35 days and 0.75 lb/day from day 36 to weaning at 42 days with varying fat sources (animal fat vs. vegetable blend vs. animal fat plus medium chain triglycerides) with a 20% CS did not affect pre-weaning and immediate post-weaning calf performance.

**c)** A control 20:20 medicated all-milk protein MR fed at 1.25 lb/day for 35 days and 0.625 lb/day from day 36 to weaning at 42 days (12.5% solids) fed with a 18% CS resulted in daily gains of 1.72 lb over 56 days, only 3% less than an intensified program during a study in the late fall of 2005. In this study, the milk protein in the 20:20 MR was replaced with 50% wheat gluten (WG), 50% soybean protein concentrate (SPC), 30% WG or a combination of 25% WG:25% SPC. Daily gains for 56 days averaged 11% lower than the control program but still very acceptable.

## Calf starters

Questions on type and composition of CS are always prevalent.

**a)** The amount of liquid molasses to add to texturized CS was compared using 6, 9 or 12% molasses. No feed intake benefits were observed to increasing molasses levels in CS above a 6% inclusion rate.

**b)** Pelleted CS with or without intake enhancing supplements (chocolate, whey, sweet tart) did not improve calf performance vs. a complete texturized CS.

## Summary

Feeding options will depend on individual farm calf performance goals and economic efficiencies. Feeding strategies at the SROC begin with a strong healthy calf. The initial basis is a standard program with a 20:20 medicated all-milk protein MR fed at 1.25 lb/day for 35 days and 0.625 lb/day from day 36 to weaning at 42 days (12.5% solids). A texturized 18% CS offered free choice plus fresh water. Performance from 175 calves on control diets representing seven projects is summarized in Table 1 below. The data indicates that control diets resulted in good calf performance with the exception of using a non-medicated MR in the summer months.

**Table 1. Pre- (1-42 days) and post-weaning (43-56 days) performance of dairy heifer calves fed the control diets across 7 SROC research projects during 2004-2006 by months of the year.**

Parameters <sup>a</sup>	04-06 2004	03-05 2005	06-07 2005	07-09 2005	09-11 2005	Avg '04-'05	12-02 '04-'05	12-02 '05-'06
Calves/group	26	23	20	25	25	<b>119</b>	20	36
MR Prot:Fat %	20:20 med	20:20 med	20:20 med	20:20 non- med	20:20 med	<b>20:20</b>	20:20 med	24:20 med
MR lb/d, 35 d	1.25	1.25	1.25	1.25	1.25	<b>1.25</b>	1.50	1.25
MR lb/d, 36-42 d	0.625	0.625	0.625	0.625	0.625	<b>0.625</b>	0.75	0.625
% solids	12.5	12.5	12.5	12.5	12.5	<b>12.5</b>	15.0	12.5
CS, % CP	18	18	18	18	18	<b>18</b>	20	18
Init. BW, lb	88.00	90.38	87.96	88.29	90.33	<b>88.99</b>	91.84	92.62
Init. HH, in	31.61	31.88	31.28	31.59	31.59	<b>31.59</b>	31.92	31.98
Init SP, g/dl	5.09	5.34	5.48	5.41	5.07	<b>5.28</b>	4.70	5.48
<i>Days 1 to 42</i>				<i>Pre-weaning</i>				
BW, day 42, lb	142.52	148.03	146.89	136.28	155.05	<b>145.75</b>	152.09	152.70
MR DM, lb	46.87	47.31	45.10	47.16	47.05	<b>46.70</b>	47.07	45.91
CS DM, lb	39.09	47.25	49.79	38.36	58.86	<b>46.67</b>	51.82	58.17
ADG, lb	1.30	1.37	1.40	1.14	1.54	<b>1.35</b>	1.44	1.43
G/F, lb	0.63	0.61	0.62	0.56	0.61	<b>0.61</b>	0.61	0.58
<i>Days 43 to 56</i>				<i>Post-weaning</i>				
BW, day 56, lb	173.88	177.47	178.73	162.28	187.42	<b>175.96</b>	183.70	182.07
CS DM, lb	61.79	67.79	68.88	57.83	71.67	<b>65.59</b>	68.31	65.65
ADG, lb	2.24	2.10	2.26	1.86	2.31	<b>2.15</b>	2.26	2.10
G/F, lb	0.51	0.43	0.46	0.45	0.45	<b>0.46</b>	0.46	0.45
<i>Days 1 to 56</i>				<i>Total individual feeding period</i>				
Final HH, in	34.63	35.74	35.98	35.22	36.09	<b>35.53</b>	36.12	36.04
Total DM, lb	153.02	162.23	164.45	143.35	177.58	<b>160.13</b>	167.20	174.85
Gain, lb	85.89	87.09	90.57	73.99	87.25	<b>84.96</b>	91.86	89.35
ADG, lb	1.53	1.56	1.62	1.32	1.72	<b>1.55</b>	1.64	1.60
G/F, lb	0.56	0.54	0.55	0.52	0.49	<b>0.53</b>	0.55	0.51

<sup>a</sup> Parameter MR = milk replacer powder; CS = calf starter; HH = hip height; SP, g/dl = serum protein, grams/100 mil (deciliter). ADG = average daily gain; G/F = Gain/Feed DM (dry matter).