



Minnesota Dairy Team

*Educating the dairy industry on
today's and tomorrow's dairy technologies.*

Post-Weaning

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This power point presentation concentrates on the post-weaning period in a dairy heifer calf's life.

Post-Weaning



- 65 ft x 150 ft grower barn -- 9 to 25 weeks of age
- 120 head in 20 pens

At 8 weeks of age, 2 weeks after weaning, calves are moved to the grower barn and placed in group pens.



A view of the Grower Barn at SROC where 120 post-weaned calves are grouped 6/pen in 20 pens.



Weight scales in the grower barn makes it convenient for monitoring growth of the heifer calf.



A older shed at SROC is also used as a grower barn for post-weaned calves.

Benchmarks at SROC (7 studies)

Calf Starter Intake DM basis

- **Pre-weaning – 1 to 42 days**
- **Post-weaning – 43 to 56 days**

➤ Days 1-14	1.7 lbs (range 0.8-2.6 lbs)
➤ Days 15-28	12.0 lbs (range 8.8-15.8 lbs)
➤ Days 29-42	29.7 lbs (range 24.6-34.2 lbs)
➤ Days 1-42	43.5 lbs (range 34.6-51.6 lbs)
➤ Days 43-56	62.2 lbs (range 55.9-67.2 lbs)

Based on seven studies at SROC, listed are the calf starter intake levels on a dry matter basis for various age periods. Shown are the average intake and ranges for each period.

Post Weaning Studies at SROC

On-going SROC research is looking at various management and feeding strategies in the nursery prior to moving calves from individual to group housing to improve performance during this adjustment period, a challenge on many dairies.



It is a stressful the time for the calf as she moves from an individual pen to a group housing and a change in the ration. On-going SROC research is looking at various management and feeding strategies to improve performance during this adjustment period.

Standard Protocol for Transition at SROC

- Wean at 6 weeks of age
- 2 additional weeks in nursery barn on same starter, no hay
- Move to grower barn (6/pen) with 1 more week on starter
- Then, to limit fed grain and free-choice hay using different treatments of grain mixes

This is the standard protocol used for all calves that arrive at SROC and stay for a 6 month period.

Estimated Feed Costs using Standard Protocol at SROC

2-4 days to weaning at 6 weeks

- ~ 50 lb of a 20:20 MR @ \$0.80/lb = \$40.00
- ~ 50 lb min of CS to 6 wks (weaning) @\$0.24/lb = \$ 12.00

Total = \$52.00/calf

Weaning to 9 weeks

- 60 lb of starter, age 6-8 wks (still in nursery) = \$14.40
- 49 lb of starter, age 8-9 wks (grower barn) = \$11.76

Total = \$26.16/calf

9 to 25 weeks of age

- Ave about 5.3 lb of grain (limit-fed)
- 5.2 lb hay/day (free choice)
- Grain and hay = \$0.07/lb
- about \$0.74 /day feed costs at current prices

Total = \$82.88/calf

Total (2-4 days to 6 months) = about \$161.04/calf

Estimated feed cost based on price assumptions for milk replacer, calf starter, grain and hay. Total feed cost to 6 months of age, of course, will vary based on market prices, calf performance and other factors.

Transition Pen Management

General Recommendations

1 week before and after moving to group pens:

- Minimize stress
- Nutrition
 - Eating at least 5 # grain before moving
 - Do not change feeds
 - No hay for 1st week in group pens
- Minimize size of group
- Adequate space for lying down and eating
- Ready access to water

Hayes, DCHA, 2008

These are the general recommendations for transitioning a dairy calf to a group pen after weaning.

Post-Weaned Studies

Research study profiles:

Post-weaned –

- 112 day studies mostly initiated once heifers transition to group pens from 63 days of age.
- 16 studies; 15 completed, 1550 post weaned calves

Bottom Line –

Studies to date have established that DMI by heifers will be close to 3% of BW from 9 to 25 weeks of age.

A number of post-weaning research studies have been conducted at SROC since 2004. More will continue to take place in the future. One rule of thumb that has been established as a result of these studies is that dry matter intake by heifers from 9 to 25 weeks of age will be close to 3% of body weight.

Post-Weaning Studies

Control:

- limit-fed 16% CP grain mix with whole corn and pellet fed 6 lbs/head for 28 days
- and 5 lbs/head from 29 to 112 days with free choice hay
- some variations on these rates

For the post-weaning studies at SROC, the control group were fed the amounts shown.

Post-Weaning Studies

Studies have evaluated:

- protein levels
- sources
- fiber levels
- limit vs. full feeding the grain mix with or without access to hay for period.
- grain mix with varying hay quality has been assessed.

The post-weaning studies at SROC have evaluated various protein and fiber levels and sources, limit and full feeding of a grain mix with and without hay, and varying hay quality.

Post-Weaning Studies

Calf Starter programs –

- Levels of molasses in complete texturized starters.
- Different physical form of starters with/without intake enhancing supplements.
- Corn sources for calf starters – (steam flaked, whole, roasted).

Management programs

- Use of calf blankets in the winter of 2004-2005.
- Group vs Individual transitional management in the nursery.

Studies on calf starters have evaluated levels of molasses, physical forms, enhancing supplements and corn sources. Management programs were evaluated using calf blankets in the winter and group vs individual transitional management in the nursery.

14-day Transition Study - 2008

Purpose of this study:

Management strategies for the transition from nursery to group pens in the grower units.

- 108 Holstein Heifers
- Study took place at end of 8 week nursery study -- from 56 to 70 days of age. Three groups.
 1. Calves stayed in individual pens in nursery, move to grower barn on day 16
 2. Calves moved to grower barn (6/pen)
 3. Moved to group pens in nursery, move to grower barn on day 16
 - First 7 days starter fed to all groups
 - Day 8-14, all groups fed whole corn and pellet free choice
 - Day 15-112, all groups fed whole corn, pellet @ 6 lb from day 15-28 and @ 5 lb from day 29-112. Free choice hay.

A 14-day study took place in 2008 looking at management strategies for transitioning from the nursery to group pens in the grower barn.

14-day Transition Study - 2008

Results:

- **Calf performance similar during the 14-day period**
- **For group housing days 15 to 112:**
 - Calves moved immediately to grower barn and calves that stayed in individual pens for 14 more days before moving to grower barn performed similarly.
 - However, both groups had 3.9% higher ADG than the group that moved to group pens in nursery and then moved to grower barn on day 16.
 - Calves left in individual pens in nursery for 14 days utilized their feed more efficiently.

Bottom Line:

- Stress of moving twice reduced performance compared to moving once.

Results of the study indicated calf performance was similar during the 14-day period. However, over 112 days, those calves that were moved twice during a 14-day period had reduced performance compared to the calves that were moved once.

Post-Weaning Study – Hay Quality

Diets differing in forage quality and use of a low moisture block

- 112- day study with 96 post weaned heifers (203.1 lb, 37 inches hip height)
- All fed 6 lbs of a 16% CP grain mix (66.25% cracked corn; 32.5% of a 34% CP pellet; 1.25% molasses) from days 1 to 14 and 4 lbs from day 15 to 112 plus free choice hay

Treatments:

1. 100 RFV hay (value @ \$90/ton – based on April 7th markets);
2. 100 RFV plus a 30% CP low moisture Crystalux block in the pen;
3. 130 RFV hay (value @ \$110/ton);
4. 154 RFV hay (value @ \$130/ton);

A study was conducted on hay quality and its affect on calf performance during the post-weaning period.

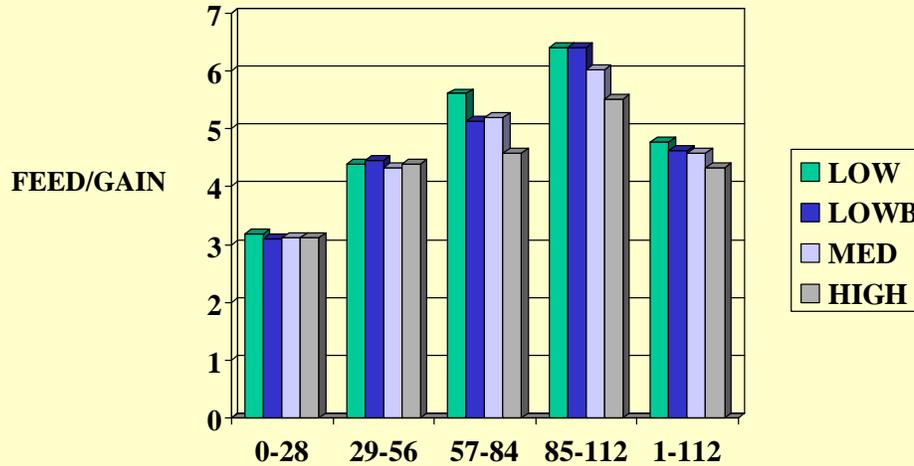
Post-Weaning Study – Hay Quality

Heifer performance with different forage quality during the 112-day study

	100 RFV	100 RFV+BL	130 RFV	154 RFV
Final BW, lb	416.5	425.9	438.5	441.4
Daily gain	1.91	1.99	2.10	2.13
Final HH, in	44.3	44.1	45.3	44.7
Grain DM/day	3.7	3.7	3.8	3.7
Hay DM/day	5.3	5.2	5.9	5.5
BL DM/day	-----	0.30	-----	-----
Total DM/day	9.0	9.2	9.6	9.2
Feed/gain, lb	4.76	4.62	4.59	4.33

Results of post-weaning heifer performance using varying levels of quality hay over a 112 day period. Hay quality was measured by relative feed value (RFV).

Post-Weaning Studies Hay Quality



The 100 RFV hay – green; 100 RFV hay plus a 30% CP low moisture Crystalyx block -- dark blue; 130 RFV hay – light blue; 154 RFV hay -- gray. Graph shows the feed per lb of gain for each group over various periods in days of the trial.

Post-Weaning Studies Hay Quality

Results:

- Hay Quality study at SROC showed some increased daily gain and feed efficiency as the RFV increased.
- Heifer performances were acceptable and an economic comparison should be the criteria to select the hay of choice when limit feeding concentrates.

Results of the hay quality study at SROC. It is important to compare hay price vs quality and what type of performance is acceptable when determining which hay to select for post-weaned calves.



When calves arrive at SROC twice per week, data is collected for height, weight and a serum protein test is conducted. When calves leave at 6 months of age, heights and weights are collected. All data is entered onto spreadsheets. These calves are then followed through the end of their first lactation. The completed first lactation data is entered onto the spreadsheets as well.

Tracking Calves thru 1st Lactation

Calves at SROC

Animal L.D. #	Birth Date	Arrive @SROC			Final data leaving SROC					
		HW	Prot.	Trial 1 Code	Trial 2 Code	Date Left	HW	III	Total ADG	Notes
2430	04/03/04	98	5.0	4201-2	4202-2	11/03/04	556	46.75	2.14	
2431	04/04/04	88	6.5	4201-1	4202-2	11/03/04	518	46.50	2.02	
2432	04/06/04	72	5.9	4201-3	4202-2	11/03/04	537	46.00	2.20	

Heifers at Custom Raiser

Heifer Growth Data

Date	HW	III	After SROC		Birth to Date		Notes
			def-1	ADG-1	def-2	ADG-2	
02/18/06	1358	57	462	1.74	676	1.86	
06/05/06	1568	56	518	1.64	731	1.75	
04/05/06	1228	56	518	1.33	728	1.59	

Heifers Back to Owner

Date	Problem	First Lactation Data									
		1st test	Milk Total	Fat %	Prot %	SCC 1st	2nd test	ME	Dry off BCS	End Ref Index	Sire
5/21/2006	7 (7-6)	29560				410					105518
5/6/2006		29150				50					105702
5/10/2006		29460				20					105635

This is a sample of just three calves showing data collected and entered onto spreadsheets they arrive and leave SROC. On the bottom is shown the data entered from a completed first lactation.

Summary:

- SROC applied research programs have investigated options to support an improvement in the consistency of nutritional management for commercial dairy heifers from 2-4 days up to 6 months of age.
- Following the heifers back to their respective dairies to monitor first lactation performance allows a complete systems approach to establish a relationship between calf health and performance up to 6 months of age to first lactation milk production parameters.

Dairy calf research at SROC has investigated nutritional management options since 2004 for calves up to six months of age. Following the calves through their first lactation provides the opportunity to analyze relationships between calf health, performance and first lactation milk production parameters.



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Thank You

