

# Meetings focus on calf, heifer

## Bottom Line

with  
**AL KERTZ\***



**I**t was unusual, but the first three months of 2005 had four conferences focused on calves and heifers, with key papers in two other conferences as well.

Thus, this and the September columns will address some key and more unique aspects covered in these conferences.

The first conference was Dairy Calves & Heifers: Integrating Biology & Management, and it was billed for dairy producers and their advisers. It was held in Syracuse, N.Y., by the Natural Resource, Agriculture & Engineering Service and Cooperative Extension in Ithaca, N.Y.

Proceedings can be purchased at [www.nraes.org](http://www.nraes.org). (Interestingly, at the previous program of this type held in 1996 in Harrisburg, Pa., the concept evolved from a side discussion of some participants that led to the founding of the Professional Dairy Heifer Growers Assn.)

Brief comments will be developed that relate to presentations that were more unique to this conference.

**Mike Lormore** of Monsanto Dairy Business addressed "The Case for a Quality Dairy Replacement Program" using a data set of more than 2.5 million first-lactation cows from 937 herds in California and the Northeast accumulated between 1985 and 2002 by Meyer et al. (2004). Several analyses were done, but one most related to economic return is shown in Table 1.

The most significant economic advantage to early age at first calving (AFC) occurred during the first lactation for the earliest AFC group, and this advantage was not ever recovered by other AFC groups in later lactations as shown in the total income over feed cost (IOFC).

**Jason Karszes** of Cornell University assessed "Dairy Replacement Programs: Costs & Analyses" based on a cost study done with eight farms in New York in 2003. These farms were above average in herd size and were considered to have high-quality dairy replacement programs. Average initial value of animals was \$151.

The inter-quartile range represented a middle range of values reported and did not include high and low extremes. The largest expense categories were: feed at 49%, labor at

## 1. Average IOFC (\$) discounted to a year 2 (24 months) AFC across five AFC treatment groups within six age opportunity groups

Age, years	23.3	24.3	25.6	27.2	30.3
AFC, months	23.3	24.3	25.6	27.2	30.3
3	1,349	1,237	1,138	1,003	578
4	1,241	1,260	1,247	1,227	1,273
5	856	869	867	870	899
6	532	542	547	552	567
7	316	306	313	325	329
8	175	168	165	173	179
Total	4,467	4,382	4,277	4,150	3,823

## 2. Total costs to raise heifers on eight New York farms in 2003

Item	Average	Inter-quartile	Range
Number of heifers	975		
Age, months	22.5	22	23
Calving weight, lb.	1,302	1,280	1,348
Average daily gain, lb.	1.78	1.69	1.82
All heifers per labor hour	41	25.1	67.0
Preweaned heifers per labor hour	9	6.5	11.4
Postweaned heifers per labor hour	66	29.9	90.0
Total investment in animal, \$	1,580	1,364	1,797
Non-completion rate, %	7.9	4.5	11.9
Cost per worker, \$	34,482	24,915	40,487

17%, interest on investment at 7% and building ownership at 5%. Other parameters are shown in Table 2.

Average raising cost per heifer per day was \$2.10, with half of the farms within a range of \$1.77-2.74. Average costs per day were: more than \$4.00 before weaning, \$1.75 from weaning to breeding, \$2.02 from breeding to close-up and \$2.81 right before calving.

Average raising cost per pound of gain was \$1.18, with an inter-quartile range of 98 cents to \$1.48. By stage of growth: birth to 200 lb. represented 8% of weight gain with 14% of total cost, weaning to puberty was 38% of growth with 28% of total cost, breeding stage added 12% of growth and 11% of cost and after breeding represented 35% of growth and 46% of cost.

**Brad Johnson and Erin Sissom** of Kansas State University discussed "Bovine Growth & Development: Composition of Growth & Mechanisms Regulating Growth." Most of this concentrated on studies with beef cattle, since there are more data in that arena.

Using the classic 1920 data of Haecker at the University of Minnesota, the inverse relationship between body water and fat was shown with 72% water:45% fat at birth to 43.5% water:37.6% fat at 1,500 lb.; protein percentage went from 20% at birth to 15.7% at 1,500 lb.

Ash (mineral) changed little from 4.3% at birth to 3.2% at 1,500 lb.

Daily gain in a review of beef data showed that as growth rate increased, protein and lipid accretion increased — but lipid at an accelerating rate and protein at a decelerating rate. This is a major concern for dairy heifers, with increased growth rates in excess of 2.0-2.2 lb. after two months of age being potentially problematic (Kertz, 2002a).

**Dan Weary** of the University of British Columbia addressed "Alternative Management & Housing to Improve the Well-being of Dairy Calves." Dehorning is often done too late, at two months of age, to reduce its trauma and impact. In this report (subsequently published in detail in Vickers et al., 2005), physical restraint was found to be a source of distress in itself. Caustic paste combined with a sedative was found to be a way of reducing pain due to dehorning and was less painful than hot-iron dehorning with both a sedative and a local block.

From a practical viewpoint, it seems that a bigger factor may be that many wait too long to dehorn, making the process more traumatic for all involved. Dehorning between two and four weeks of age is more advisable.

## Milk-fed animals

A second conference, Milk-fed Farm & Companion Animals: Basic Aspects — Practice for the Future, was held Feb. 10-12 at the University of Berne, Switzerland. This program was organized by Professor Jurg Blum, who has done extensive work related to unique aspects of colostrum, transition milk and calf metabolism (Kertz, 2002b).

Some data and ideas imparted were:

- A multitude of bioactive compounds have been identified in colostrum that extends its benefit beyond just antibody absorption for the newborn calf. Blum and Baumrucker (2002) have collaborated in this area and have a publication addressing some of these components.

The researchers reported, "Significant intestinal absorption and appearance in the general circulation of (immunoglobulin G) IgG and other proteins and peptides (such as lactoferrin and enzymes) are only possible for one to two days after birth. However, significant intestinal absorption does not occur in the case of many of the colostral hormones and growth factors, as shown for (insulin-like growth factor-1) IGF-1, insulin and prolactin, i.e., absorption is to some extent selective.

"The status of glucose, plasma amino acids and the glutamine/glutamate ratio, non-esterified fatty acids, triglycerides, phospholipids, essential fatty acids, beta-carotene, retinol and alpha-tocopherol depends on whether

colostrum is fed early postnatally or if calves receive only milk replacers or formula," they reported.

- A French INRA study showed some benefits in feeding pigs with supplemental cow's colostrum.
- Foals grow to more than 80% of their adult height and 50% of their weight by six months of age in contrast to calves at about 60% of adult height and about 25% of adult weight by six months of age (Kertz et al., 1997).
- German work at the School of Veterinary Medicine in Hannover showed the effect of quantity of colostrum administration over time in calves up to 14 days of age. This is a picture to know in buying or transferring calves up to 14 days of age. This is also a subject for a future column.
- Ruminant drinking (emptying of liquid diet into the rumen) was profiled by a student of Blum's. During discussion, it was evident that while this is prevalent, although no one knows for sure the rate of incidence, no one understands how to prevent or cure it.
- Proceedings will be published that should provide a unique and helpful reference.

## The Bottom Line

More detailed data on the economic value and costs of heifer growing programs are becoming available. Further understanding of the growth processes and early nutrition and metabolism of calves is still unfolding.

## References

- Blum, J.W., and C.R. Baumrucker. 2002. Colostral and milk insulin-like growth factors and related substances: Mammary gland and neonatal (intestinal and systemic) targets. *Dom. Anim. Endo.* 23:101-110.
- Kertz, A.F. 2002a. Heifer growth rate requirements should be closely defined, evaluated. *Feedstuffs*, March 11. p. 10.
- Kertz, A.F. 2002b. Feeding colostrum beyond first day may have growth benefits. *Feedstuffs*, Sept. 9. p. 10-11.
- Kertz, A.F., B.A. Barton and L.F. Reutzel. 1998. Relative efficiencies of wither height and bodyweight increase from birth until first calving in Holstein cattle. *J. Dairy Sci.* 81:1479-1482.
- Meyer, M.J., R.W. Everett and M.E. Van Amburgh. 2004. Reduced age at first calving: Effects on lifetime production, longevity and profitability. *Proc. 3rd Annual Arizona Dairy Producers Conf.* Tempe, Ariz. p. 41-55.
- Vickers, K.J., L. Niel, L.M. Kiehlbauch and D.M. Weary. 2005. Calf response to caustic paste and hot-iron dehorning using sedation with and without local anesthetic. *J. Dairy Sci.* 88:1545-1459.

\* Dr. Al Kertz is a board-certified, independent dairy nutrition consultant based out of St. Louis, Mo. His area of specialty is dairy calf and heifer nutrition and management. To expedite answers to questions concerning this article, please direct inquiries to *Feedstuffs*, Bottom Line of Nutrition, 12400 Whitewater Dr., Suite 160, Minnetonka, Minn. 55343, or e-mail [comments@feedstuffs.com](mailto:comments@feedstuffs.com).