



# Dairy Keeper's Barn Report

June 26, 2009 Report #13

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**Reference Source:** David B. Fischer, Illini Dairy Net

**Barn Report Topic:** Managing Replacement Heifers

## TAKE HOME MESSAGES

Quantity, Quality and Timing of colostrums intake is critical to improving calf survival and proper heifer growth.

Monitoring heifer growth rates is essential for making important management decisions.

Milk producing ability of 1st lactation cows can be influenced by the accelerated calf nutrition program.

Heifer replacement rearing costs have increased 31 percent in the past 9 years.

Replacement herd management is receiving increased interest due to higher costs of raising heifers, an increased demand for higher milk production in younger cows, and the importance of dairy cow longevity resulting in greater total productive life. When describing a productive and profitable dairy replacement enterprise one suggests the following goals:

95 percent or greater survival rate (birth to calving)

healthy and disease-free heifers with permanent identification

bred by 14-15 months (58 to 62 percent of mature weight)

offspring of genetically superior sires

calve at 23-24 months, body condition score of 3.5

(Lg. breed) weigh 1250 pounds after calving, withers height of 54 - 55inches

(Sm. breed) weighing 825 pounds after calving and 51- 52 inches at withers  
high milk production in young cows  
raised economically

Sound management decisions based on proper nutrition, herd health, and animal comfort will provide increased dairy profit potential for the replacement herd. The health and productivity of the replacement as a dairy cow should be significantly credited to the growth and health conditions of dairy heifers in their first 22 to 24 months of life.

Replacement heifers that have been stressed via disease problems, overcrowded conditions and/or inadequate nutrition will have detrimental affects on their production and reproduction ability as a cow, resulting in lower production, reduced reproduction efficiency and thus, decreased profitability to the dairy enterprise.

### **BIRTH TO WEANING**

The first 6 to 8 weeks of life is the most critical in keeping calves alive. It is a recommended practice to remove the calf from its dam within the first hour of birth and before nursing. The 2007 National Animal Health Monitoring System (NAHMS) survey reports that 65% of all heifers are removed from their dam immediately and before nursing (table 1). The U.S. average mortality rate in 2006 for calves stillborn (born dead or died within 48 hours) was 6.5 percent. Average mortality rate for preweaned calves is 10.5 percent.

Diarrhea and respiratory problems remain the leading causes of heifer mortality. It is well documented by research and on-farm trials that providing the correct amount (Quantity) of high quality colostrum (Quality) immediately after birth (Timing) is crucial in reducing heifer mortality (table 2). Getting the needed immunoglobulins, also called antibodies, into the new born calf as soon as possible is the single most important management practice in calf nutrition and should not be taken lightly. These antibodies must be absorbed through the small intestine within the first 24 hours of life. This process is called passive transfer. When the immunoglobulin are not absorbed in adequate amounts to provide the needed immunity it is called failure of passive transfer (FPT). This FPT can be caused by delay in first feeding, inadequate amount of colostrums intake, low levels of antibodies in the colostrums, and environmental stress. Maximum passive transfer begins at birth and declines to less than 5 percent absorption at 20

hours following birth. Some calves will experience quicker gut closure and may be unable to absorb immunoglobulin past 10 to 12 hours after birth.

After the colostrum feeding period, calf raisers must follow with a proper nutrient balanced liquid feeding and dry grain starter program. Liquid feed options include waste milk, whole milk, or milk replacer. Waste milk can be the most economical liquid feed. Research has shown the use of on-farm pasteurization of waste milk is effective in eliminating pathogenic strains of bacteria and also lowers the incidence of scours and pneumonia. Saleable whole milk does not require pasteurization but it is rarely recommended to use saleable milk for calf feed because it is more costly compared to other liquid feed options. Milk replacers provide a convenient and economical way to raise calves. The use of milk replacers with medicated products and feed additives provide an added benefit to promote calf health and growth. Typical nutrient concentrations of milk replacers should range from 18% to 20% crude protein and 15% to 20% fat. However, accelerated milk replacer feeding programs, with 28% to 30% crude protein, has been proven to stimulate calf growth and increases feed efficiency without excessive fattening. This translates to decreased days to breeding and first calving as well as improved immune system and increased future milk production. Along with the use of an accelerated milk replacer, it is recommended to have water available at all times and increase the crude protein percent of the calf starter to 22% to 24% in order to match the nutritional needs for the dry matter feed intake and calf growth. Following these sound management practices from birth to weaning and vigilant monitoring of calf health can help minimize calf mortality and improve growth:

- provide clean, dry draft-free maternity pen and calf housing

- remove calf from dam and hand feed colostrum ASAP, certainly within one to three hours

- provide 3 to 4 quarts of high quality colostrum soon after birth and another 2 quarts 12 hours later. Avoid feeding colostrum from Johne's infected cows

- dip navel with 7 percent tincture of iodine at birth and again 12 hours later

- feed whole waste milk or milk replacer, calf starter, and water based on desired ADG

wean when daily intake of calf starter reaches 1.5 lbs.-Jersey and 2.5 lbs.-  
Holstein

avoid other stressors at weaning, i.e. dehorning, removing extra teats, etc.

apply vaccination and health programs as prescribed by veterinarian

## **WEANING TO CALVING**

Heifers should be grouped according to their nutritional and management needs. Usually growers will group heifers in five categories. These include:

calves birth to 2 months

post-weaning 2 to 4 months

pre-puberty 4 to 10 months

breeding 10 to 16 months

post breeding 16 to 24 months

Since feed is the largest single cost of raising dairy heifers, it is important to provide a balanced diet and position forages based on the nutrient analysis. Daily feed costs from grower to grower can vary by 50 percent depending on the feeding option selected. The use of intensive grazing, corn stalks with wet distillers grains, or limit feeding are feeding options that can generate savings in the feeding program without jeopardizing the health and growth of the heifer. Over feeding or under feeding protein and energy will result in any number of problems, such as, increased feed costs, higher or lower body condition score, delayed puberty or poor reproductive performance. Replacement dairy heifer nutritional goals include:

match quality of feedstuffs to meet the animal needs

include ionophores to improve feed efficiency (table 3)

consider feeding strategies with by-products, limit feeding, intensive grazing

adjust rations for environmental challenges (cold and heat stress)

achieve 1.8 pounds average daily gain (ADG) for lg. breeds and 1.4 pounds for sm. breeds

avoid over conditioning and monitor body condition score

### **BRED AT 14 TO 15 MONTHS OF AGE**

Perhaps more correctly stated, bred by size rather than age (table 4). With current documented research and knowledge of heifer growth nutritional needs and feeding technologies, it is easily attainable to have heifers reach adequate size to breed at 14 months of age. In order to make breeding decisions based on size and monitoring how well heifers are growing, it is imperative that producers take the time to weigh and measure heifers at different stages of growth. Heifer growth rates and body condition scores should be collected at a minimum of twice per year. Realizing that this requires additional labor, producers should consider incorporating this task when working cattle for other reasons.

### **CALVING AT 23 TO 24 MONTHS OF AGE**

As discussed on how to achieve proper size at breeding, it is also achievable to reach optimum heifer size to calve at 23 to 24 months. While it is true that historically, older heifers (25 to 26 months) have produced more milk, it also is true that the loss of milk production in early life and the increased cost to raise the replacement more than offsets the benefits for the extra milk produced. Reports from leading researchers indicate that the milk production in the first lactation is more a factor of size than age. Heifers that are not properly grown due to factors, such as inadequate nutrition, overcrowding, unhealthy housing, etc., will need to reach an older age before achieving adequate size to withstand the demands of high milk output. Any delay past 24 months will add to the cost of raising replacements as well as require more heifers to meet the herd replacement needs. Based on the 2007 Wisconsin survey, the current costs for raising heifers during the last 2 months, prior to calving, average \$2.60 per day. The Illinois DHI average age for 1st lactation cows is 26 months. This delay in bringing replacements into the milking herd represents an added rearing cost of \$160 per animal or \$80 per month.

### **ECONOMIC COSTS ASSOCIATED WITH RAISING REPLACEMENTS**

The costs associated with raising replacement heifers from birth to calving will vary from farm to farm. It is very important to monitor costs of production and be able to allocate the costs to a heifer enterprise analysis. The University of Wisconsin Extension produced a 2007 survey of heifer costs from both producers and custom growers. The average rearing costs for the calf, from birth to post weaning, was \$5.42 per calf per day. The cost per day was broken down as follows: labor/management - \$2.51; feed - \$1.88;

variable costs - \$0.83; and fixed costs - \$0.20. The average cost for raising the heifer, from post weaning to calving, was \$2.04 per day. This includes: feed - \$1.06; labor/management - \$0.38; variable costs - \$0.36; and fixed costs - \$0.24.

The total cost from birth to calving was \$1,647.00 (\$326 calf costs and \$1,321.00 heifer costs). The total cost does not include the value of the calf. The 2007 Wisconsin survey shows a 31 percent increase in herd replacement costs from the 1998 survey. The biggest increase was in labor/management and feed costs.

Table 1. Time with dam increases mortality

Time with Dam After Birth (hours)	Herds Evaluated	Percent Mortality
2 to 6	13	5.2
7 to 12	35	9.3
13 to 24	32	10.7
25 to 48	24	20.5

Source: by H. Chester-Jones, Univer. of Minnesota, 2003

Table 2. More colostrum lowers mortality

Amount of Colostrum Fed (quarts)	Herds Evaluated	Percent Mortality
1 to 2	18	15.3
3 to 4	16	9.9
4 to 5	26	6.5

Source: by Chester-Jones, Univer. of Minnesota, 2003

Table 3. Ionophore feeding rates

Heifer Weight (pounds)	Milligrams/head/day	
	Lasalocid	Monensin
Birth-200	0.45 mg/lbBW/day	50-100 mg/day
200	60-90	100
300	90-140	125

400	140-180	150
500-Calving	200	200

Source: Based on product label information, 2003. Raising Dairy Replacements

Table 4. Desired body weights (pounds) at first calving

Breed	Time of Measurement		
	Prior	Post	Lactation
Holstein	1400	1260	1200
Brown Swiss	1375	1240	1180
Ayrshire	1240	1120	1070
Guernsey	1175	1050	1010
Jersey	900	810	775
M. Shorthorn	1300	1170	1120

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