



## **Feeding and Managing Youngstock on Commercial Heifer Rearing Operations**

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Heifers account for 15 to 20 percent of the cost of milk production on most dairy farms (Heinrichs, 1993; Mourits et al., 1997). Only feed costs represent a higher percentage of the cost of milk production. Estimates of heifer rearing costs range from \$550 to \$1,325 per head (Bethard, 1997; Bolton, 1992; Ely and Brown, 1984; Heinrichs and Schwartz, 1990; Hoffman, 1992b; Karszes, 1994; Miller and Amos, 1986; Randle et al., 1998; Smith, 1992; Virginia Cooperative Extension, 1997; Webb, 1992; Willet et al., 1992). These costs represent a significant investment in the future of the dairy herd. The goal of the heifer rearing program is to economically raise heifers to be of adequate size and body condition to calve at a reasonable age and to produce high levels of milk during the first lactation. For Holsteins, heifers would ideally calve for the first time at 24 to 26 months of age, weigh at least 1,250 pounds after calving, and peak at 75 pounds of milk per day or greater.

Numerous trends have influenced heifer management on US dairy farms over the past 25 years. The use of artificial insemination on virgin heifers increased the number of replacement animals by one-third in herds that were previously using beef bulls as service sires to prevent dystocia. Improvements in calf care reduced calf mortality. Emphasis was placed on calving heifers at a younger age, thus reducing the number of animals needed in the replacement herd. A trend toward fewer, but larger herds continues. Specialization in milk production, heifer rearing, or crop production has become more commonplace. Environmental concerns and price fluctuations in grain, milk, and cattle prices have forced producers to do business differently.

The trends listed above have caused dairy farmers to look at different options for bringing replacement animals into their herds. Producers have four basic heifer rearing options:

1. Raise all heifers born on the farm.
2. Cull some heifers and raise only those needed to maintain a constant herd size.
3. Sell all calves and purchase all replacements as springers.
4. Contract heifers out to a professional dairy heifer grower.

The first option is the most common practice in Virginia dairy herds. While the second option may offer an economic advantage, most producers have not been willing to risk culling baby calves with imperfect information or have not been interested in marketing heifers as springers. The third option offers an opportunity for quick genetic progress, but also creates the potential for the introduction of new diseases into the herd. The fourth option of having a professional dairy heifer grower raise heifers is increasing in popularity. Custom heifer rearing is one of the best opportunities for specialization in Virginia. The National Dairy Heifer Evaluation Project (1992) reported that 1.6 % of dairy operations in the US used contract heifer raising. Prevalence in the Southeast was 2.1 % at that time. These numbers would be expected to be much higher if a similar survey was conducted today.

Before a dairy producer considers contracting with a professional dairy heifer grower, the following questions should be addressed. Are heifers calving at a reasonable size and age under

current conditions? Are heifers producing well during the first lactation? What is the cost of rearing from birth to calving? Are there adequate resources on the farm to raise heifers? The biggest barrier for most producers is the question of cost. Custom rearing charges may seem high to a producer who has never calculated his/her own costs of rearing. Reasons to consider a custom grower include lower cost, better quality, limited space, time or feed supplies, and environmental concerns.

The service provided by heifer growers adds value to heifers they raise. The added-value concept may be defined as taking raw or semi-processed material and doing something that makes it worth more than the original raw materials or ingredients. Roger Cady, a dairy technical specialist at Monsanto, outlined several ways that heifer growers add value to replacement animals. The first or basic level includes such items as reduced age at first calving, adequate size, and reasonable cost. Improvements in health/mortality, identification, record keeping, genetic improvement, and use of artificial insemination would be components of the second value-added level. The third level might encompass environmental protection and biosecurity through sanitation procedures, closed systems, and quarantines. Improvements in cattle longevity and conditioning behavior through housing, human interaction, and use of headlocks comprise the upper level of service. (Cady, 1999)

Entering into a contractual arrangement presents opportunities and challenges for the dairy producer and heifer grower. Potential advantages for the dairy producer are: decreased labor requirements; increased attention to milking herd management; increased facility capacity for milking cows; possibility of herd expansion without capital investment; increased feed inventory for milking cows; and the possibility of better rearing of replacement heifers. The heifer grower may enjoy the following advantages: a profitable business opportunity; increased use of otherwise obsolete facilities; and use and marketing of forage and grain crops. Potential disadvantages for the dairy producer include: losing an outlet for low quality forages that would normally be fed to older heifers; losing management control over heifer rearing; possible conflicts with the grower; the possibility of poorer replacement heifers; and fixed costs associated with replacement facilities that are idle. Likewise, the grower might face several potential disadvantages such as increased repairs on facilities, potential conflicts with the dairy producer, and increased farm presence requirements to care for animals. (Hoffman, 1992)

Any individual interested in starting a custom dairy heifer growing operation needs to carefully plan the business. Several important issues should be addressed. The grower needs to decide the age(s) of heifers to be raised. Some will be more comfortable with pre-weaned calves, whereas others will want heifers several weeks post-weaning. Another key decision is whether to purchase heifers, raise them and resell them or to contract with one or more dairy producers. Those who opt to purchase, raise, and resell must be willing to develop a timely market for their heifers. If working in a contract situation, the grower must decide how to charge the client (per head, per day, or per pound of gain) and how frequently billing will occur (monthly, quarterly, or lump sum when the heifer returns to the producer). Once a potential client is located, it is extremely important to negotiate a contract that is a win-win situation for both grower and dairy producer. Decide who will be responsible for what and put it in writing.

A budget must be prepared to determine projected breakeven costs in order to know how much to charge the client. Smith and Christenson (1999) developed a table to project the amount of net income needed per head per day to generate a desired projected family living draw or salary based upon the number of animals in the operation.

**Table 1.** How much can you / do you need to make?

# Head	Projected Family Living Draw / Salary			
	\$30 K	\$50 K	\$70 K	\$90 K
	Net Income Per Head Per Day			
100	\$0.82	\$1.37	\$1.92	\$2.47
200	0.41	0.68	0.96	1.23
300	<b>0.27</b>	0.46	0.64	0.82
400	<b>0.21</b>	<b>0.34</b>	0.48	0.62
500	<b>0.16</b>	<b>0.27</b>	<b>0.38</b>	0.49
600	<b>0.14</b>	<b>0.23</b>	<b>0.32</b>	0.41
800	<b>0.10</b>	<b>0.17</b>	<b>0.24</b>	<b>0.31</b>
1000	<b>0.08</b>	<b>0.14</b>	<b>0.19</b>	<b>0.25</b>
1200	<b>0.07</b>	<b>0.11</b>	<b>0.16</b>	<b>0.21</b>
1400	<b>0.06</b>	<b>0.10</b>	<b>0.14</b>	<b>0.18</b>

Smith and Christenson (1999)

The greatest thing a grower can do to expand his/her business is to do a good job. Heifer rearing is a business of reputation. Those who do a good job have potential clients contacting them on a routine basis.

### Virginia Custom Dairy Heifer Rearing Survey

The commercial dairy heifer rearing industry is relatively young in Virginia. The Virginia Custom Dairy Heifer Rearing Survey was conducted via personal interviews between November 1996 and March 1998 to characterize the industry. Twenty-four custom heifer growers were identified to participate in the survey through dairy producers, dairy industry personnel, extension agents and specialists, and other heifer growers. The survey contained 53 questions covering the following topics: general herd description, heifer inventory, records, labor, pre-weaned calves, replacement herd health, nutrition and feeding, monitoring heifer growth, reproductive management, and replacement herd culling practices.

Of the 24 growers surveyed, seven contracted with dairy producers to raise heifers for them, nine purchased heifers, raised them, and resold them, and eight did both. Raising dairy replacements was the principal occupation for 41.7% of those surveyed. Average herd size was 194 head with a range of 22 to 550. They used written records, computer spreadsheets and databases, and/or DHI records to collect and manage heifer information.

Contract growers raised heifers for business associates (67.7%), neighbors (33.3%), family members (20.0%), and friends (6.7%). They acquired heifers at various ages although the 5 to 9 month old range was most common. Most charged their clients a per diem with a mean of \$1.12 per head per day. In contracts growers were most likely to be identified as the responsible party for breeding services, heat detection aids, pregnancy checking, heat detection, deworming, emergency health care, medications, external parasite control, vaccinations, feed, bedding, and growth monitoring. Dehorning, identification, and insurance were most likely to be owner responsibilities. Both parties shared responsibility for death loss and transportation.

Growers who purchased, raised and resold heifers acquired heifers at similar ages to those for contract growers. Heifers were obtained from local and out-of-state dairy producers, auctions, livestock brokers, livestock markets, and leased cattle. Most cattle were marketed to

out-of-state and local dairy producers although some were exported and some were sold through consignment sales. When heifers were purchased from a dairy producer, two-thirds of growers gave the producer the first option to buy the heifers back.

The survey distinguished several growers who were doing an excellent job for their clientele overall. However, several opportunities for improving important management practices were identified in the group as a whole. A few of these concerns are bulleted below.

- Only 58.3% of growers were using forage testing to measure forage quality.
- Rations were not routinely balanced on 41.7% of the operations.
- Feed was weighed daily by less than half of the respondents.
- Fifty-eight percent never monitored growth of their heifers using tapes or scales.
- Forty-four percent used natural service exclusively.
- Only 2 out of 15 contract growers had written contracts; none named a third party to settle differences.

Dairy producer expectations of quality service in these areas may necessitate changes by growers to maintain a customer base.

Progressive commercial dairy heifer growers try to distinguish themselves from their competition that includes dairy producers and other growers. They do things differently to improve quality, reduce cost, and increase efficiency. These growers are aggressive in their approach to feeding programs and are not afraid to be innovative. They routinely test forage quality and have their rations balanced. Feed is weighed daily. They know their feed costs and can feed their heifers inexpensively because they shop around for the best buys on feedstuffs. They are equally aggressive in herd health programs. They work with their own veterinarians and those of their clients to develop optimal vaccination strategies to minimize the risk of disease. These growers know that growth is what they are selling, so they monitor average daily gains on a regular basis, not just when it is convenient. They use technology like electronic scales, computer record keeping systems, and the Internet in their businesses.

In many cases, it is the little things and attention to details that make a difference. For example, Robert Lewis, a professional heifer grower in Colorado, videotapes heifers when they are being handled. He sends the videotape to his clients to demonstrate progress. This simple practice is just one step that he takes to maintain his clientele.

Four areas worthy of mentioning for Virginia commercial dairy heifer growers as a follow-up to the survey and the proceeding comments are pasture utilization, ionophores, growth monitoring, and biosecurity.

## **Pasture Utilization**

Pasture is an excellent, economical way of providing forage to dairy heifers. Growers who utilize pasture generally have lower feed costs. Average daily gains can be very acceptable on pasture if the system is properly managed. A system with a diversity of species can ensure that good quality forage is available during a large proportion of the year. Forage and concentrate supplementation needs vary depending on season and weather conditions. Good pasture management includes monitoring forage quality and quantity as well as heifer performance. An aggressive management style is key to achieve desirable average daily gains on a consistent basis. A “back forty” management style is not acceptable if heifers are expected to calve at 24 months of age at an acceptable size.

Heifers reared in a confinement setting and then moved onto pasture generally experience “counterslope withdrawal,” weight loss associated with newfound freedom and exercise. Heifers may lose up to a pound per day for the first 30 days on pasture. In order to limit this weight loss, it is recommended to have small paddock sizes when heifers are initially turned out and to have feed available in the paddock. Once adjusted heifers can be placed in larger paddocks.

## **Ionophores**

Ionophores like lasalocid and monensin provide benefits to heifers when included in rations. They are helpful in the control of coccidiosis, improve rumen fermentation, and increase feed efficiency. An increase of 0.1-0.2 pounds per day in average daily gain is possible with ionophores. It is important to monitor gains of confinement reared heifers when feeding lasalocid or monensin. It may be necessary to adjust grain intake if gains exceed desired levels, particularly in pre-pubertal heifers.

## **Growth Monitoring**

Monitoring heifer performance has been mentioned several times. Growth in the heifer herd is equivalent to milk production in the milking herd. Its importance cannot be overemphasized. Traditional tools for monitoring growth in heifers include weight tapes, scales, and wither or hip height measuring sticks. Progressive growers have constructed facilities that include electronic scales in the design. They weigh heifers routinely not only for billing purposes, but to evaluate their production efficiency through average daily gains. Routine weighing lets the grower know when ration changes are needed for gains outside of the desired range. Growth data on individuals can be used to more easily identify heifers that are poor doers. Standards for height and weight are available for benchmark comparisons. Growers are more likely to collect this data when heifer handling facilities are safe and user-friendly for both heifers and workers.

## **Biosecurity**

Biosecurity deals with management practices that protect the herd from the entry of new diseases and minimize the spread and/or adverse effects of diseases in the herd. It is generally a concern on heifer rearing operations where cattle from several herds are co-mingled. Tomsche (1997) identified several methods of managing risk concerning disease control. They were:

- Establish a working relationship with a veterinarian.
- Isolation/quarantine of new animals.
- Vaccination and parasite control programs.
- Metaphylaxis (mass treatment of animals at stressful times).
- Test and cull.
- All in – All out housing.
- Fly, rodent, and bird control programs.
- Sanitation and manure management.
- Veterinarian to veterinarian contact.

Biosecurity is one of the major issues facing professional heifer growers who have multiple clients. A good disease prevention program is critical for continued success. Most producers cannot afford a major train wreck.

Dr. David Tomsche is a veterinarian and a partner in Stearns Custom Calf in Minnesota. He raises calves from two days of age to six weeks pre-calving and is a leader in biosecurity efforts in the dairy heifer rearing industry. Tomsche and his partners at Stearns Custom Calf developed a program called the Quality Assured Replacement Heifer. This program encompasses management procedures that ensure that a heifer is raised to be free of Brucellosis, Persistent BVD, and Johnes Disease when the heifer returns to the home farm. These measures require additional labor and testing, but Tomsche sees the extra effort as a benefit to his clients and consequently to his business.

## **Conclusions**

Commercial dairy heifer rearing can benefit Virginia dairy producers who are facing challenges due to high cost of rearing, poor performance of first lactation animals, limited space, labor shortages, short feed supplies, or environmental concerns. Professional heifer growers who provide quality service at a reasonable cost will attract business. Successful growers will develop a nutrition and health program that supports desirable rates of gain, monitor heifer growth, give attention to biosecurity issues, develop a strong relationships with clients through good communication and trust, have constant knowledge of production costs, and look for innovative ways of marketing the business. The end product should be a well-grown heifer that produces high levels of milk during her first and subsequent lactations, a product in which the grower and dairy farmer will be satisfied.

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Example feeding programs from four commercial dairy heifer rearing operations

## HERD #1

Colorado – 1450 heifers

Ration Ingredients	Group			
	350-500#	500-700#	700-900#	900+#
	-----pounds-----			
Alfalfa hay	5.5	5.0	6.0	6.0
Mineral	.25	.35	.35	.35
Sunflower parts	1.5	2.0	3.0	3.0
Screenings		3.0	3.0	3.0
Wet brewers	9.0	9.0	10.0	8.5
Ear corn	4.0			
Carrots	9.75	14.65	20.0	20.0
Corn silage		12.0	17.65	21.15

Analysis	Group			
	350-500#	500-700#	700-900#	900+#
Dry matter (%)	44.6	37.6	36.6	36.8
Dry matter (lb)	13.4	17.3	21.9	22.8
Crude Protein (%)	16.6	15.1	14.7	14.2
TDN (%)	73.0	72.1	72.0	71.7
\$/head/day	0.64	0.72	0.89	0.92

## HERD #2

Wisconsin – 930 Heifers

Ration Ingredients	Group			
	300-450#	450-650#	650-900#	900-1300#
	-----pounds-----			
Straw			2.25	3.37
Hay	1.5	1.8		
Haylage	7.5	10.2	13.4	13.8
Corn silage	5.8	12.2	18.7	30.4
Corn gluten	3.3	2.7	3.6	3.3
Mineral	0.11	0.15	0.20	0.27
Urea			0.05	0.16
DM Intake (lb)	9.35	12.40	17.04	22.31
Cost/head/day (\$)	0.46	0.61	0.77	0.97

### **HERD #3**

Virginia - 450 Heifers

Ration for 800 to 900# Heifers

<u>Ingredient</u>	<u>Pounds per day</u>
Corn silage	8.5
Alfalfa haylage	4.7
Ground bread	2.0
Brewers condensed solubles	1.5
48% soybean meal	0.2
Custom mineral	0.26
Mixed hay	2.9

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<u>Analysis</u>	
Crude protein (%)	15
TDN (%)	67.15
Cost/head/day (\$)	0.89

### **HERD #4**

Virginia - 275 Heifers

Ration for Heifers Averaging 1175 # BW

- Free-choice stockpiled fescue pasture
- 3.5 # of 50:50 mixture of cured broiler litter and bakery-fryer waste (bread trimmings, french toast fingers, fried batter chunks from fried onion rings and french toast laced with fryer grease and sugar) [16% CP, 0.95 Mcal/lb., 80% DM]

Purchased feed cost/head/day = **\$0.28**