Management Considerations For Replacement Dairy Heifers

By Edward A. Fiez, Extension Dairy Specialist,
Department of Animal & Veterinary Sciences
University of Idaho Caldwell Research & Extension Center
16952 S. Tenth Avenue, Caldwell, Idaho 83605
208-459-6365

Management Considerations For Replacement Dairy Heifers

Management of the dairy replacement enterprise can minimize cost to first calving, reduce competition for resources with the milking herd, and result in first lactation cows that meet herd production requirements for profitability. Key factors include replacement expense in producing milk, measurements of first lactation performance, rearing expense, feeding and growth management and contract considerations.

Replacement Expense In Producing 100 Lbs. Milk

A number of factors influence the cost per 100 lbs. of milk for replacements. To illustrate these factors I would like to use examples based on a 20,000 pound Holstein herd with a 25% herd replacement rate, springer price at $1,200, and 1,400 pound dairy culls at 50¢ per pound. These values were entered into a dairy enterprise budget computer program to generate the data in Table 1. The market price for springer heifers in our example ranges from $1,000 to $1,400, and price for cull cows varies from 30 to 70¢ per pound.

These data clearly illustrate the impact of springer heifer and cull cow prices on the cost of producing 100 lbs. of milk. The present cost of 63¢ per 100 lbs. milk for replacements in our example is located under the current value for springers ($1,200) and cull cows (50¢ per pound). Each $100 increase in heifer market price increases milk production cost by 13¢ per 100 lbs., or $26 per cow annually. Each 5 cent change in cull cow price impacts 100 lbs. milk cost by 9¢, or $18 per cow annually. The best to worse scenario in prices for culls and springers makes differences in excess of $1 per 100 lbs. of milk.

Table 1: Replacement Cost Based On Springer And Cull Cow Price.

	(cost per head for replacements)				
	$1,000	$1,100	$1,200	$1,300	$1,400
cull cow price/lb.	replacement cost per cwt. of milk				
$0.30	0.73	0.85	0.98	1.10	1.23
$0.35	0.64	0.76	0.89	1.01	1.14
$0.40	0.55	0.67	0.80	0.92	1.05
$0.45	0.46	0.59	0.71	0.84	0.96
$0.50	0.38	0.50	0.63	0.75	0.88
$0.55	0.29	0.41	0.54	0.66	0.79
$0.60	0.20	0.33	0.45	0.58	0.70
$0.65	0.11	0.24	0.36	0.49	0.61
$0.70	0.02	0.15	0.27	0.40	0.52

Replacement costs per 100 lbs. of milk decrease with increased production. Production and culling rate are plotted in Table 2. The current cost of 63¢ is found under the 25% replacement range and 20,000 pound milk level. In our example, each 1,000 pound change in milk production impacts cost by about 3¢ per 100 lbs., or $6 per cow. Each 5% change in culling moves the cost per 100 lbs. of milk by 16¢, or $32 per cow.

Market price for springer heifers, cull cow price, replacement rate range, and herd annual milk production greatly impact the cost of replacements in dairy herds. Producers who raise heifer calves for herd replacements may have an advantage in that cash outlays are less if their costs are below market value. However, the true cost to the enterprise is fair market value for the replacement at time of calving.

First Lactation Cows: What To Expect

First lactation cows contribute significantly to herd production and profits. Currently in the Western United States, approximately 36% of all DHI Holstein cows are milking in their first lactation. Genetics, age and weight at calving, growth management and early lactation management all contribute to the replacement's level of milk production. Peak daily milk yield during the first 90 days of lactation is an excellent indicator of lactation production, and a measure of the success of heifer growing programs. To evaluate peak yield differences, DHI herds were summarized into peak milk yield categories (Table 3). Currently 19% of the DHI Holstein herds in the Western United States exceed 80 lbs. peak yields on first lactation cows. There is little question that these 240 dairies have quality replacements entering the milking herd. Key decisions related to rate of growth and age and weight at calving, along with sound genetics, account for much of the differences in peak yields in these herds. These first lactation cows are also very persistent in production with a calculated 30-day change in fat-corrected-milk production less than 2.0 lbs.

Knowing the genetics in replacement heifers is a must for high milk production. In Table 3, herds with highest 1st lactation peak yields also have the highest average value for the sire's predicted transmitting ability (PTA) for milk production. In addition, high peak yield herds have a higher percent of 1st lactation cows with sire IDs. The number of herds with sire information decreased, along with the sire PTA milk pound, with lower peak yields.

A Breakdown Of Costs In Growing Dairy Heifers

Costs in this discussion are based upon a 1,284-lb. Holstein replacement calving at 24.4 months of age. Total weight gain is 1,194 lbs., with an average gain of 1.61 lbs. per day for 742 days. Average cost is 96¢ per pound gain, $1.54 per day, and $1,145 over the entire period.

Feed amounts to $719, or 63% of the total cost. Rations are based on alfalfa hay, corn silage and concentrates to achieve the required daily gain to reach calving weight by 24 months of age.

Fixed and several variable costs are lumped into a yardage category. Yardage was set at 75¢ per day during the liquid feeding period and 25¢ per day from weaning to first calving. Labor, drugs, repairs and ownership cost for facilities are included in yardage, which represents $215, or 19% of the total cost. Labor would account for about 40% of yardage. Also, roughly half the labor required from birth to calving is associated with a 60-day liquid feeding period.

Interest charges of $142, or 12% of the total cost, are the combined total for operating capital and the capital investment in the growing heifer. These substantial costs are often overlooked as expenses in producing the ready-to-calve replacement.

Death loss was set at 10%, with the highest mortality occurring in the early growing periods. In this example, 10% of the heifers were culled throughout the growing periods. Death loss and culling accounted for 4% of the total expenses in our example herd. Usually unthrifty heifers are sold prior to breeding or calving and then represent a loss. These losses, similar to death losses, are spread over the remaining heifers as an expense.

Breeding cost represents semen cost plus any additional breeding fees. The $27 breeding expense is based on 1.8 services per conception and represents 2% of the total cost.

This distribution of costs is based on the total time from birth to first calving, and is a reasonable method of expressing costs if heifers are started as calves and held until calving. However, in many dairy heifer growing operations, heifers are bought, grown and sold at many different weights and ages. Purchase weight and price and sale weight and price become major factors in determining both cost and possible profits. In these type of operations, costs incurred in selected growing periods can be used to further break down the costs and evaluate growing expense.

In Table 4, the number of days represent the time the animals remain in each growing period. These days can be set (such as the liquid feeding period) or variable, depending on gain and target weights at the end of the period. Average daily gain is a key factor in determining how long a heifer remains in the time periods, i.e. weaning to 400 lbs. and 400 lbs. to breeding weight. Low rates of gain extend the number of days in both of these periods. Likewise, increasing target breeding weight requires more days on feed.

Average daily gains range from a low of one pound during the liquid feeding period to 1.8 lbs. from 400 lbs. to breeding. Average gain over all periods is 1.61 lbs. per day. Total weight gains are based on these averages and the days in each period.

Accumulated values in the table include all costs plus $130 for the initial value of the calf. Accumulated values per pound represent sell break-evens at the end of each period. Market values are rough estimates for

Table 2: Replacement Cost Based On Replacement Rate And Herd Annual Milk Production.

	(replacement rate)				
	15%	20%	25%	30%	35%
herd average	replacement cost per cwt. of milk				
16,000	0.47	0.63	0.78	0.94	1.09
17,000	0.44	0.59	0.74	0.88	1.03
18,000	0.42	0.56	0.69	0.83	0.97
19,000	0.39	0.53	0.66	0.79	0.92
20,000	0.38	0.50	0.63	0.75	0.88
21,000	0.36	0.48	0.60	0.71	0.83
22,000	0.34	0.45	0.57	0.68	0.80
23,000	0.33	0.43	0.54	0.65	0.76
24,000	0.31	0.42	0.52	0.63	0.73

Figure 1: Cost Breakdown

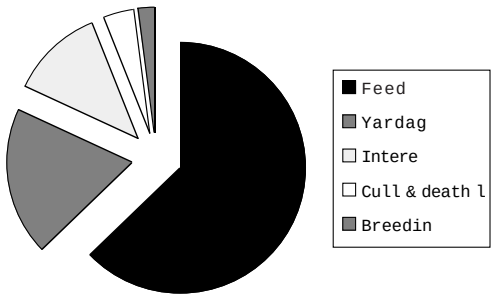

Table 3: Distribution Of DHI Holstein Herds In The Western U.S. By 1st Lactation Average Lbs. Peaked.

lbs. peak	avg. age (months	% of herds	peak lbs. milk	30-day milk change (lbs.)	days to peak	extended 305d milk	sire PTA milk (lbs.)	% herds w/sire ID
80 and over	26.2	19	85.5	1.6	92	21,049	1,002	88
75 to 79	26.5	18	77.3	1.6	88	19,054	933	88
70 to 74	26.5	24	72.4	1.6	84	17,780	881	86
65 to 69	26.9	18	67.7	1.4	83	16,594	828	75
60 to 64	27.0	12	62.6	1.4	78	15,301	781	75
55 to 59	26.4	9	55.0	1.3	77	13,130	745	58
averages	**26.6**	**100**	**72.1**	**1.5**	**85**	**17,684**	**887**	**81**

Based on 1,386 Holstein herds in the Western U.S. with at least 25 first lactation cows, with records processed at DHI Computing Service. Data generated October 1996.

Holstein dairy heifers at the end of each period. Profit or loss is the difference in each period between accumulated values and these value estimates.

Table 4: Summary Of Birth To First Calving By Growing Period.

	(——— growing periods ———)				
	liquid feeding 60 days	weaning to 400 lbs.	400 lbs to breeding wt. of 790 lbs.	breeding wt. to 90 days pregnant	90 days pregnant to calving
number of days	60	156	217	115	194
gain per day, lbs.	1.0	1.6	1.8	1.6	1.6
total gain, lbs.	60	250	390	183	310
ending wt., lbs.	150	400	790	973	1,284
ending age, mos.	2.0	7.1	14.2	18.3	24.3
feed cost	$54	$123	$190	$120	$232
feed cost/lb. of gain	89¢	49¢	49¢	65¢	75¢
non-feed cost	$57	$62	$96	$100	$111
non-feed cost/lb. of gain	95¢	25¢	25¢	54¢	36¢
accumulated cost[1]					
per head	$111	$296	$582	$802	$1,145
per lb. of body wt.	74¢	74¢	74¢	82¢	89¢
accumulated value[2]					
per head	$241	$426	$712	$932	$1,275
per lb. of body wt.	$1.60	$1.06	90¢	96¢	99¢
market value[3]	$200	$400	$700	$800	$1,200
profit (or loss)[4]	**($41)**	**($26)**	**($12)**	**($132)**	**($75)**

1: Cost from beginning of period 1 to end of each period.
2: Total accumulated cost plus the beginning value of the heifer
3: Expected and/or current market value at the end of each period
4: Profit or loss is the difference between market value and accumulated value.

Age At First Calving

Age at first calving directly impacts cost to first calving. The number of days from birth to first calving impact time-related expenses like yardage and interest. Personal preference by the dairy operator will often influence decisions regarding age at first calving. However, 1,200 to 1,300 pound heifers are usually considered adequate, with this weight achieved by 23-25 months of age with reasonable growth rates. Production tends to increase with age, however, it is highly unlikely that additional milk income from heifers beyond 25 months will cover additional cost. Evaluations by the University of Idaho suggest no economic advantage of calving heifers prior to 22 months of age. Currently only a small percentage of the DHI Holstein herds in the Western U.S. have averages for age at first calving in categories below 25 months (Table 5). Over 50% of these herds fall into the range from 25-28 months on average age of first calving. Production data is included for each of the age categories. Little differences are apparent in peak yield, peak days, persistency and 305-day milk in categories greater than 24 months at calving. These data suggest opportunities exist in many herds to reduce age at first calving.

Weight At Breeding

Larger and/or older heifers cost more to produce. To produce a larger heifer, breeding is usually delayed. This increases the growing cost prior to breeding. In addition to this cost, it requires more feed to carry the larger heifer from breeding to first calving. Cost estimates for delaying breeding are presented in Table 6. These estimates are based on least-cost rations formulated for the time periods between 750 and 950 lbs. and from breeding to calving. These are based on breeding weights of 750 lbs., 850 lbs. and 950 lbs. The average daily gains after breeding were considered to be the same. A 100 pound increase in breeding weight from 750 to 850 lbs. and from 850 to 950 lbs. adds a cost of $87 and $91, respectively. These costs can be related to first lactation milk yields. For example, to pay for the increased cost of $87, another 725 lbs. of milk (at $12) from the heifer is required during her first lactation. First lactation breakeven milk increases generated for this example and others are summarized in Table 7.

Larger heifers at calving do produce more milk. The relationship between weight at first calving and lactation yield has been investigated in several extensive field studies and research trials. A study including 618,366 Holstein heifers demonstrates the relationship between

Table 5: Average Age At First Calving For DHI Holstein Heifers In The Western U.S.

months at calving	avg. age	% of herds	peak lbs. milk	30-day milk change (lbs.)	days to peak	extended 305d milk
<24	22.7	2	74	1.2	92	18,113
24	24.6	14	73	1.4	88	17,982
25	25.4	21	74	1.5	87	18,178
26	26.4	20	72	1.8	84	17,616
27	27.4	15	72	1.6	84	17,368
28	28.4	10	70	1.6	82	17,036
29	29.4	7	70	1.6	80	16,932
>30	31.6	11	69	1.5	78	16,563
total	**27.0**	**100**	**72**	**1.5**	**84**	**17,590**

Based on 1,386 Holstein herds in the Western U.S. with at least 25 first lactation cows, with records processed at DHI Computing Service. Data generated October 1996.

weight after calving (first DHI test date after calving) and first lactation. Records were adjusted for age and month of calving. These data show that the weight at freshening has more influence on milk produced than month and age at calving. Production increases substantially until the 1,250 pound point, with smaller increases with each 50 pound change in calving weight above this level.

Herd owners in colder climates often time the breeding of replacement heifers to prevent winter calvings. This non-calving period may range from two to four months. To offset extra costs associated with the delayed breeding, adequate growth rates are essential during this period to ensure higher production from larger size at calving in addition to older heifers at calving. The additional milk from these heifers will help to recapture costs. Producing an older but not larger heifer in this situation reduces the likelihood that extra milk will cover the extra cost. An alternative to delayed breeding is to early breed a portion of the heifers to calve prior to the winter non-calving period. This could be especially effective if the heifers selected for early breeding could be fed for slightly higher gains after puberty. Producers might elect to calve some heifers two months earlier and the remainder two months older than the standard for their management program.

Most would agree that dairy heifers are important to the milking herd. I think we could also agree that adequate growth rates are critical to the production of a quality, low cost springer for herd replacement. We may not be able to reach an agreement on the size and age of this heifer. Economics based on current information still must be the deciding factor. In all heifer rearing programs, there is a point at which the added cost for larger, older heifers is not recaptured in milk sales once the heifer enters the herd. I have tried to demonstrate this relationship by expressing added cost to break-even milk increases in the first lactation. Few herd owners take the time or have the data to determine when this point is reached. Furthermore, most heifer programs lack any type of growth measurement to monitor performance through the critical periods prior to breeding. I am convinced the lack of significant improvement in the lowering of the average age at first calving is the lack of performance indicators from birth to first calving. If daily growth rates were reported along with the milk in the bulk tank, heifer performance would improve.

Figure 2: Action Plan For Feeding And Growth Management

1. *Establish a target age, weight or stature at breeding and calving for heifers.*
2. *Follow growing period breakdowns: liquid feeding; weaning to 400 lbs.; 400 lbs. to breeding; breeding to 90 days pregnant; and breeding to calving.*
3. *Based on selected target age, weight or stature at calving, set intermediate growth goals for the time periods. Consider age, weight, average daily gain, body condition and stature growth.*
4. *Determine roughage quality available to each of the growing periods. Allocate higher quality roughages to the younger age groups.*
5. *Supplement roughages as required with protein and energy to reach target growth requirements. Using least-cost ration computer programs to determine grain supplementation allows for least-cost formulation based upon individual feeds.*
6. *Monitor progress of each group using criteria outlined in step 3 above.*
7. *Track first lactation performance.*

Feeding And Growth Management

Feeding is the main factor in producing an economical, adequate sized heifer at the time of calving. Replacement heifer growth rate directly impacts time related expense. Only two situations can exist in herds with heifers calving at ages above 25 months: growth rates are adequate and heifers are bred at weights well above recommended levels, or low rates of gain delay breeding until the breeding weight is reached.

The two time periods (weaning to 400 lbs. and 400 lbs. to breeding) are extremely important. Low growth rates (less than 1.5 lbs. average daily gain) during these periods delay age at breeding and age at first calving. Excessive rates of gain during these time periods may reduce future milk production and increase growing costs. In general, total growing costs increase with delays in breeding and advancing age at first calving.

Table 7: Milk Increase Required During First Lactation To Offset Higher Cost Of Replacement Heifers.

	increased breeding weight from:		
	750-850 lbs.	850-950 lbs.	750-950 lbs.
est. added cost (refer to Table 6)	**$87**	**$91**	**$179**
at $13.00/cwt.	669	700	1,377
at $12.50/cwt.	725	758	1,492
at $11.50/cwt.	757	791	1,556
at $10.50/cwt.	829	867	1,705

Table 6: Added Cost Estimates For Dairy Heifer Breeding Weight Comparisons.

added cost	750-850 lbs.	850-950 lbs.	750-950 lbs.
feed for extra growth	$54	$57	$111
feed during gestation	$11	$11	$23
yardage for extra days	$10	$10	$20
interest for extra days	$12	$13	$25
total added cost	**$87**	**$91**	**$179**

The time interval from breeding to calving is fixed by the length of the gestation period. Gains during this period (usually around 1.5-1.7 lbs.) usually depend on body condition at breeding and personal preference for body condition at calving.

It has been well established that the growing period prior to puberty is related to lactation performance. High rates of gain tend to reduce the amount of milk-producing mammary cells (parenchyma cells). Consequently, these heifers produce less milk in their first lactation and lifetime compared to herdmates with lower rates of gain. Researchers might argue on the upper level of average gain that contributes to reduced mammary growth. However, most agree it is an important consideration in growing replacement heifers. In monitoring performance prior to and near puberty, stature measurements in addition to daily weight gain should be considered. This is especially critical when gain exceeds 1.8 lbs. per day.

The use of body condition scoring might be the best alternative to tracking stature growth in each of the growing periods. Heifer body condition scoring has been used very successfully in California heifer growing operations, where heifers are targeted at a 2.5 body condition score through one year of age.

I strongly believe that many heifers are overfed and become too fat prior to first breeding. High quality roughages, especially corn silages, combined with high concentrate feed will often produce gains above two lbs. per day. These higher gains have not contributed to increased stature growth in trials at the University of Idaho. Heifers on these diets may be 50 lbs. heavier at breeding time, but not taller than same age heifers fed for lower average daily gains. In our dairy heifer feeding trials, differences in stature growth between treatments have not been apparent above 1.5 lbs. average daily gain. If feeding programs are designed to provide adequate nutrition during the feeding periods we discussed earlier, extremely high gain during any period should not be necessary. Our studies indicate that reaching calving weight (1,250 lbs.) in less than 23-25 months of age offers little, if any, economic advantage. Maximizing high quality forages with grain supplements fed sparingly will produce ready-to-calve replacements at the least possible cost. Ionophores can also be used to improve feed efficiency and reduce growing cost.

Contract Considerations For Dairy Replacements

Increasing herd production through improved genetics is the main reason to retain ownership in calves from the dairy herd. Contract rearing of dairy heifers can allow the dairy operator to focus resources on the milking herd while still maintaining a supply of quality replacements of known genetics. Effective agreements must be mutually beneficial to the herd owner and replacement grower. These agreements must also consider the basic fundamentals in producing well grown, low cost, correct body condition ready-to-calve replacements. Contract agreements must be competitive with home grown cost. Agreements and/or conditions of the contract should optimize future production potential of a quality ready-to-calve replacement.

The cost summaries in Figure 1 and Table 4 (section on growing costs) reflect typical costs from birth to first calving and respective costs for the five growing periods. Agreements may be made to only transfer replacements to second parties for segments of the total growing period. These might include birth to weaning or more typically from around 400 lbs. to calving. The average cost per day and/or pound average daily gain differs greatly during the five growing periods summarized in Table 4. The liquid feeding period and breeding to calving period have the highest cost per day or per pound gain. Typically, the growing periods after weaning to breeding have low feed cost with efficient rates of gain.

Dairy calves. Labor expense increases with longer liquid feeding periods. Non-feed expense exceeds feed expense in the example cost summary in Table 4. Labor requirements during the liquid feeding period account for the majority of non-feed expense. This is directly related to the length of the liquid feeding period. Our example is based on 60 days. Substantial increases occur with liquid feeding periods of 90 and 120 days. Death loss is a main consideration in working out contract agreements for growing dairy calves.

Growing heifers. Starting weight and breeding weight are key considerations for growing heifer contracting. Heifers are often started on the dairy followed by contract growing. Usually these heifers are in the 400 pound range at the time of transfer. Feed intake increases and efficiency of gain decreases with body weight gains. Consequently, cost per day and cost per pound gain increase with size. The starting weight of contract heifers directly impacts the average cost to return of the ready-to-calve replacement. This calculated cost advantage with lighter starting weight has been documented in research feeding trials conducted by the University of Idaho. In these trials a steady increase in average cost occurred with increases in Holstein heifer starting weights.

Increasing the weight at breeding results in a corresponding increase in the weight of the ready-to-calve replacement. Replacement heifers that exceed 1,350-1,400 lbs. prior to calving are usually past 900 lbs. at breeding. Based on heat detection efficiency and service per conception, most heifers conceive about 25 days or 45 lbs. after going into breeding groups. This management decision results in only small increases in daily- and gain-based ration costs. However, total feed cost due to an increased number of days on feed (56 additional days on feed prior to breeding) results in much higher growing cost to the owner of the replacement. Total non-feed costs also increase with increased weight at breeding. These added costs for larger replacements were discussed in

the section on breeding weight (Tables 6 and 7).

An unlimited number of contract arrangements are being used to compensate the grower for rearing dairy heifers. Feeds, feeding, and facilities are usually provided by the grower for a set fee. Death losses, breeding fees, drugs, veterinary services, and transportation are often negotiated within general agreements based on gain, daily head charge or feed plus yardage. The bottom line to the replacement owner is "what is it going to cost?". The cost to the dairy owner is highly variable and will depend on the share of economic responsibility that is transferred to the grower. The following is a brief discussion of possible methods of establishing cost for replacement contracts.

Gain-based contracts. Many contracts for rearing dairy heifers are based on weight gain. A specified price is established for the total gain from receiving weight to the return weight prior to calving. Fees for breeding are often charged directly to the owner. The grower is usually expected to provide lockup breeding pens. Heat detection may be the responsibility of the grower or the AI technician provided by the replacement owner.

Advantages for contracting on a gain basis include a fixed cost over the feeding period and ease of calculations. Changes in feed price over the feeding period will not impact the cost to the replacement owner but will impact the grower. Gain-based agreements must take into account differences in the receiving weights of incoming replacements and breeding weight considerations. Some stepwise pricing schemes are being used to compensate for receiving weights; for example, a 2 cent increase in contract price for each 50 pound increment over 450 lbs. Since the cost per unit gain decreases with higher average daily gains, some conflicts can develop over the degree of body conditioning on replacements under gain-based contracts.

Daily charges per head. Contracts are also being based on a daily charge per head. Daily charge is determined for the feeding period. Receiving and breeding weights require consideration in this arrangement as with gain-based contracts. This provides easy monthly billing to the replacement owner and aids in cash flow planning. Rate of gain becomes less important to the grower. The replacement owner in this arrangement will usually specify expected rates of growth or performance. Feed costs per day increase with larger heifers. Likewise, starting weight of incoming replacements will impact average daily ration cost to calving to the grower. As with gain-based contracts, other expense items are negotiated. Contracts based on a daily charge per head are more common for starting dairy calves.

Feed plus yardage. Feed plus yardage is a common method to feed beef cattle on contract. Feeds at cost are charged to the cattle owner, with a daily yardage charge of 15-30¢ per head assessed to cover feeding, facilities and grower operating cost. Gain is less important to the grower. Total costs for rearing replacements become more variable to the owner. Risk for major changes in feed price are shifted to the replacement owner. Feed plus yardage reduces any possible conflicts between the grower and replacement owner on rate of gain. Discussions are usually necessary to establish the items covered in the yardage charge (heat detection, veterinary and drugs, death loss, etc.).

Ration cost only. Ration cost includes feeds, feeding and other expenses normally considered yardage. Gain is not important to the grower unless minimum levels are set by mutual agreement between the owner and grower. The owner may have input into ration specifications and/or requirements. This method allows for monthly billing, however, exact billing amounts are less predictable. Cost for additional expenses are negotiated.

Option to purchase. Option to purchase contracts are also used to farm out replacements. The owner sells the calf or starter replacement heifer but reserves the right to buy the springer that results at current or a pre-determined price. The owner may retain a small partial interest in each animal that is transferred to the grower. This method transfers all growing cost to the grower (owner) of the replacement. Often major decisions, such as age and weight at breeding, are also made by the grower.

Summary. Contract rearing of replacement heifers can be good for both parties. It is an excellent way to market high quality roughage by the grower. For dairy calves, days on liquid feed and early calf mortality are key considerations. In growing cattle, receiving and breeding weights impact the average cost per day and per pound gain for the time on feed. Conflicts in rate of gain and body condition can occur on gain-based contracts. Contracts based on daily head charges and feeds plus yardage prevent this possible conflict.

Conclusion

Replacements represent a major expense in the cost of producing milk. The milk production performance of these replacements is critical since first lactation cows account for over 30% of all milking cows. Management decisions related to rate of growth, age and weight at breeding and calving, along with genetics, account for much of the first lactation milk production differences among herds. The bottom line for replacement programs is to produce a well-grown, ready-to-calve heifer at the lowest possible cost. In many operations, replacement management is an opportunity area to reduce costs and improve herd productivity and profits.

References:

1. Bath, D.L., H.A. Johnson, S.J. Strasser. PC DAIRY: A rations program for dairy cattle. University of California, Davis.

2. Crowley, J., N. Jorgensen, T. Howard, P. Hoffman, R. Shaver. March 1991. Raising dairy replacements. North Central Regional Extension Publication No. 205.

3. Fiez, E.A., R.L. Smathers, D.E. Falk, C.W. Gary, N.R. Rimbey. December 1992. Holstein heifer enterprise budget. University of Idaho MS 110-4.

4. Fiez, E.A., N.R. Rimbey. May 1993. Optimum age at first calving. University of Idaho Current Information Series 688.

5. Fiez, E.A. January 1989. Sizing up heifer age. Dairy.

6. Hoffman, P.C. December 1992. What it's worth to have heifers raised. Hoard's Dairyman.

7. Keown, J.F., R.W. Everett. Effects of days carried calf, days dry and weight of first calf heifers on yield. J. Dairy Science, Vol 69:1891.

8. Rimbey, N.R., E.A. Fiez. 1988. HCOST: A micro computer enterprise worksheet for estimating heifer dairy cost. J. Dairy Science. Volume 71, Supplement 1.

9. Rimbey, N.R., E.A. Fiez. 1989. HCOST: A micro computer enterprise worksheet. University of Idaho Micro Computer User Guide 37.

10. Shultz, T. Ionophores for replacement heifers. June 1993. Pacific Northwest Agribusiness Dairyman.

11. VanAmburgh, M., D. Galton, D. Fox, D. Bauman. April 1992. Opportunities exist to optimize dairy heifer growth. Feedstuffs.

12. Waldo, D.R., A.V. Capuco, C.E. Rexhold Jr. February 1988. Growing dairy heifers for optimum milk production. Proceeding Southwest Nutrition and Management Conference, Tempe, AZ.

Notes