

Economic Benefits of Rightsizing the Farm

Dairy Replacements Numbers

Determine how many heifers you need on your farm for a healthy economics on the farm.



During the last few years, dairy producers have been facing not only low milk prices but also low prices on the heifer market. Producers can't rely on raising replacements and later sell them to generate cash. To raise a heifer to the age of 24 months for \$1,700 to \$2,200 and then sell her for a half of what she is worth is not a sustainable thing to do. In some cases, even the feed cost alone is approaching to the sale price.

So, what can dairy operators do? It depends on what the manager's intentions are. If he/she plans on a herd expansion or aggressive culling sick, low production, and cows with high SCC, it is perhaps a good reason to keep heifers you raise. However, if expansion is not in the future, then selling them as soon possible would save you a bundle.

Things managers need to know to take an action:

1. How many heifers you need to replace annually (herd replacement rate)
2. How many heifers the herd produces annually
3. The farm costs of raising a heifer
4. Current heifer market price
5. Which heifer to sell, and which heifer to keep

The number of replacements a manager needs every year for the herd and how many heifers the herd produces annually. The difference between these two numbers is the number of heifers that can be sold.

Determining how many cows in the herd need to be replaced annually is not difficult. DHIA Herd Summary record provides all the numbers needed to calculate it. The basic formula is:

$(\text{herd size [milking and dry cows]} \times (\text{cull rate}) \times (\text{age at first calving} \div 24) \times (1 + \text{noncompletion rate for heifers}^*)^{1*})$ The heifer noncompletion rate, or heifer culling rate, accounts for heifers that are born alive but are sold or die before they calve. Cull rate here includes animals that die.

The number of heifers produced on a farm is more complex:

$(\text{herd size}) \times (12 \div \text{calving interval}) \times (\text{percent female calves}) \times (1 - \text{calf mortality rate}^*) \times (24 \div \text{age at first calving})^{1*}$ Calf mortality counts deaths in the first 48 hours after birth.

How Does an Average Farm Measure Up?

For example, a producer manages a herd size of 238 cows, annual cull rate is 30 percent, age at first calving is 23 months, and non-completion rate for the heifers is 10 percent. Using these formulas, this producer would need 75 heifers annually, 150 heifers on the farm for two years. Producers can object that many things happen during the two year's period and after the heifers join the milking herd. Having a few more heifers on hand is beneficial. Add an additional six percent (12 heifers) which totals 162 heifers in the farm at a time. Any more heifers above this count can be marketed.

Meanwhile, this dairy herd produces 111 heifers annually, or 222 heifers biannually. There are 60 heifers on the farm that can potentially be sold.

The expenses associated with raising the heifers are not so easy to get. Penn State researchers documented the costs of raising heifers for different stages of life quite well a few years ago (Table 1).

Table 1. Dairy heifer replacement costs².

Heifer Age	Heifer Market Value (\$)	Operating Daily Costs* (\$/day)	Operating Costs (\$/period)	Costs of Raising Heifer (\$)
Birth to weaning	70	3.90	218	13,000
Weaning to 6 mos.	400	1.95	248	14,800
6 to breeding	600	2.32	606	36,300
Breeding to fresh	800	2.33	735	44,100
Total costs			1,807	108,000

*Costs of feed, labor, bedding, reproduction, health

The daily operating costs in the above table represent averages across several farms.

The heifer raising costs vary widely among farms as some farms are more, and some are less efficient. Penn State data² suggests that the difference between efficient and inefficient farms can be over \$300 per heifer for feed and labor combined. Each dairy manager is encouraged to calculate his/her own costs of raising heifers. Heifers are the second largest expense on a dairy farm. This can be one of the most important steps managers can take to save money now and in the future.

The average operating costs associated with raising one heifer are \$1,807. These costs do not include costs of facilities, equipment, and livestock costs. These costs indicate that the sooner the heifers are sold, the more savings it is. This manager could potentially save over \$108,000 in operating costs. Additionally, he/she would receive \$4,200 in sales if these heifers are sold right after being born. The longer the manager waits, the more dollars are invested, and the saving are smaller.

Saving feed and labor on these heifers can be attractive to producers who are facing shortage of feed due to either bad crop years or loss of crop land.

What Heifers to Sell?

If a manager sells heifer calves out of the hutches and they don't have any health history, the only choice producers have is to take a closer look at the sire's and dam's PTA data. DHIA records provide the necessary information to find out the genetic makeup of the heifer and how much she is going to contribute to the herd in the future.

Health records are useful tool to evaluate heifers that are sold at older ages. Any diseased heifer, stunted in growth, difficult to breed, leg/hoof problem heifers can be

culled. Respiratory issues, in particular, should be of a concern for future as they affect the cow for the rest of her life. Research indicates that calves with multiple pneumonia cases will produce about 743 lbs and 1,870 lbs less milk in the first and second lactation, respectively³.

Body condition, weight and size, are reason to sell. If a Holstein heifer weighs less than 750 lbs and measures less than 47 inches in the wither (565 lbs and 44 inches for Jersey heifer) at breeding age of 15 months, she should be re-evaluated. The [Penn State growth charts](#) provides weight and sizes for heifers of different dairy breeds. Evaluate breeding. Repeated breeders will have troubles to get bred later in life.

Fewer heifer in the farm also helps with nutrient management. Fewer heifer also means less manure and phosphorus and less time spent with manure management.

Alternative to Consider

Another good reason to calculate the operation's heifer raising costs is to consider the heifer custom raised. Raising heifers from birth to weaning is the most expensive period (\$3.90/day). After that, the average operating costs per day for Pennsylvania farms are \$2.26. A custom raising operation can typically charge \$2.35 - \$3.20 per head per day. If your operating costs are higher than the rate a custom operator charges, it would be worthwhile to investigate this option. It would not only save you some cash, free feed, barn space, but also free time to focus on the milking herd.

References

¹A. J. Heinrichs, C. Jones, R. Goodling: How many heifers do we need? Hoard's Dairyman, July 2019

²A. J. Heinrichs et al.: Identifying efficient dairy heifer producers using production costs and data envelopment analysis; J. Dairy Sci. 96 :7355–7362

³Morrison, S., G. Scoley, and J. Barley. 2013. The impact of calf health on future performance. Veterinary Ireland Journal. Vol. 3. Number 5.