

More Is Not Always Better

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Many businesses operate on the assumption that more is better. When looking at dairy farm profitability more milk is good, more milk per cow is even better. The dairy industry has been working toward this goal with sustained effort in understanding the cow's needs with respect to behaviour, housing and nutrition.

One area where we have lapsed on defining our goals and understanding our needs is raising replacement animals. Many dairies have fallen victim to their success through improved reproductive performance, the use of sexed semen and reducing calf morbidity and mortality. Although, surplus heifer sales have historically represented a significant opportunity to improve farm income, this is no longer a reality. Evaluating your heifer management strategies and goals represents a significant opportunity to improve your farms performance.

Before estimating how many heifers you need, it is a good idea to calculate how many heifers you have room to house. There are very good recommendations for space per replacement heifer available from the Dairyland Initiative at the University of Wisconsin and OMAFRA. For weaned calves there should be 12 inches of linear bunk space, 3 inches of linear water space, not more than 10 calves per group and less than a 100lbs weight difference from largest to smallest calf. As we move through different age groups maintaining a tight age group to limit the risk of calves failing to compete, bunk space increases to 26 inches per calf in the pregnant heifer group and water access increases to 3.5 inches per calf. Take the time to measure your feed bunks, count the available heifer pens and determine what your maximum number of replacement animals could be.

Aiming to raise the required number of replacement heifers to meet your demand is largely an argument for improved calf performance, health and ultimately more milk in your fresh heifers. This is a quality over quantity argument. Reducing the number of heifers will immediately reduce your feed cost. An Iowa State University study that used 2019 forage values estimated feed cost at \$1167 per calf assuming that they calve at 24 months of age. Combined with Veterinary and Breeding cost this is already more than half of the heifer raising cost. Many producers will reduce feed cost by using pasture or feeding less grain or a less expensive supplement. This will work, but it accomplishing our goal to produce more milk per cow? Finally, and perhaps of most importance is that total labour commitment was estimated at 22 hours per calf. Raising less heifers will give you time to do something else.

When discussing change, considering reasons to maintain the status quo must be evaluated. On most dairies the top two reasons for maintaining the status quo are: 1. fear

of not having enough animals to meet milk demand and 2. A desire to maintain a closed herd. It is difficult to discount these concerns. Done right, replacement heifers raised with proper nutrition, proper stocking density will grow faster, reach breeding size (65% of mature weight) earlier and will milk more as first lactation. An achievable outcome of this management decision is an improvement in average milk per heifer and a reduction in the number of heifers that fail to make it to the milking string. You can maintain a closed herd and make more milk per stall with the proper number of heifers.

To estimate the number of heifers you require to meet future milk production you need to understand your current herd performance. First and foremost, how many lactating and dry cows do you have? When you are looking at this number you should start to estimate how many you will be milking in the future. A heifer calf conceived today will reach the milking herd in 35 months. Considering your quota purchasing plans for the next 3 years will help to ensure that you have a buffer of heifers to meet herd growth. The predicted number of heifers required from any formula will be a ballpark number not the actual number.

To estimate the number of heifers you need, your current age at first calving is needed. The most profitable age for a Holstein to calve for the first time is between 22 and 24. This requires that heifers receive controlled nutrition, attention to getting them bred at 65% of mature body weight (roughly 900 lbs) and that you maintain adequate average daily gain so that heifers calve at 85% of mature body weight. For now use your actual age at first calving number measured in months.

Next calculate your cull rate in the past year. Cull Rate is simply the number of cattle removed (voluntary, involuntary or dead) divided by the number of milking and dry cows in the herd. On many dairy farms the cull rate is a function of the number of replacement heifers available and not a representation of an optimal cull rate. Again, there is an opportunity to decide personal goals for longevity. How many mature cows leave because there is no room to stay vs. how many mature cows fail to fit into your dairy system? Based on the stated goal of more milk per cow, aiming to have an older herd is justifiable. With improved selection on which cows will have heifers we could actually increase the milk per heifer and reduce the herd's risk of older cow diseases. Setting an optimal cull rate target for your farm is a management decision. For the current calculation use both your actual number and your theoretical optimal cull rate number.

Finally, how many heifers fail to survive past the first 60 days in milk? This has been referred to as the heifer non-completion rate. This includes heifers born alive that leave the herd before they contribute milk to the system. Heifers that are sold for dairy purposes can be included in this calculation if you decide to continue with this avenue.

To calculate the heifers required to maintain herd size the equation would be:

Heifers required = Herd Size X (Age @ first calving/24) X Cull Rate X (1 + heifer non completion rate)

Assuming a 30% cull rate, a heifer non-completion rate of 10% and average age at first calving of 25 months in a 100 cow (milking + dry cows) dairy requires 28 heifers born per year to maintain current herd size.

Heifers required = $100 \times (25/24) \times (0.3) \times (1+0.1) = 34$

The next step is to count the number of heifers you actually have. Are you in a surplus situation with the number of heifers you have relative to the predicted number you need?

The next opportunity is to improve genetic progress by selecting the cows and heifers that will carry replacements. Remember your worst heifer is not better than every cow, so using sexed semen on your heifers may not be the best strategy. There are tools available to select which females should be bred to produce replacements for the herd. Genomic testing, mature equivalent milk or udder conformation, feet and legs or other herdsman choices can be used to select which cows will be bred to make herd replacements.

The limiting resources on all dairy farms are time and physical space. There is satisfaction in looking at a barn full of heifers. When we take a step back and consider overall farm goals we can save time, money and produce a more productive heifer in less physical space. Make time to understand your system and set targets to ensure your farms success.

The consequences of exceeding your heifer raising capacity will at the best of times increased costs by increased the time required for bedding and veterinary care and will reduce ADG and delayed age at first calving. Ultimately you will compromise our initial goal of more milk per stall.

Overcrowded heifers will be at in increased risk for diarrhea, pneumonia and poor performance. This will reduce your milk per heifer in the milk barn. Producers attempt to reduce cost by reducing the amount of feed purchased for heifers and

Calculating how many heifers you actually need requires and understanding of your current performance, your stated goal and finally the estimated future quota holdings on your farm. To start, what is the lactation distribution of your current herd?

Age at first calving.

Heifer non completion rate represents the number of heifers that are culled or die prior to 60 days in milk.

If we get to an estimate of required heifers that is significantly less than your current inventory then we have significant opportunity to improve your herd. Remember by choosing to the top half of your herd to sexed semen offers the potential for significant increase in milk production.

Finally, we can begin to estimate how many heifers you will need to meet future milk demand. This calculation requires some data analysis and some estimates of where you think your opportunity for milk sales will be in the future. First we need to understand your culling goals.

Your future milk production capacity

Stillborn, dead before 1 year of age and culled prior to 60 dim will also factor into the estimate.

Raising heifers can be costing you time.