

Heifer inventory

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Abstract

The heifer enterprise of a modern dairy operation plays a crucial role in health and productivity performance, cost of production and future potential. The variables that determine heifer inventory are nearly innumerable, but at minimum, reproductive performance in the cow and heifer herd, semen selection, morbidity and mortality in the heifers, and age at first calving have major influence. Recently, a lot of dairy management publication, analysis and marketing strategy have included recommendations for increased cow longevity, genetically superior replacements, and “right-sized” heifer inventories. However, it would be wise to remain open to the value that an adequate or even plentiful supply of dairy replacements brings to an operation, and evidence for this consideration is at least as sound and plentiful as evidence in support of the opposite approach. Analyzing costs and benefits of the heifer enterprise needs to be considered carefully, and economic concepts such as fixed and variable costs, sunk costs and opportunity costs need to be applied appropriately.

Key words: dairy heifers, management, inventory, economics

Introduction

Reproduction and health performance are better than ever on most dairy herds. Among those that raise their own replacements, internal growth, marketing animals for dairy, the incorporation of aggressive genetic selection, and beef-dairy cross breeding have become common. These dairy management strategies all have merit and can be successfully incorporated into profitable dairy systems. The economics of herd turnover and replacement rearing decisions seem straight forward, but we need to be careful not to over-simplify our thinking on this important topic. If low heifer inventories, slow herd turnover and extreme cow longevity were optimal for dairy production, then every successful dairy that you know would have reduced herd turnover rate to 25% and heifer inventory to 60% years ago. Why does the efficiency of dairy production continue to climb while average herd turnover rates remain in the upper 30s to low 40s and heifer inventories supporting those turnover rates continue to be maintained? The answer lies in our imperfect predictions of the future, and the opportunity cost of keeping suboptimal producers in the herd.

Who replaces the milking herd and when?

One of the first concepts to grasp is the imperfection of all of our tools. Our preventive health management is improving all the time and plenty of resources in this conference and elsewhere will help us continue to strive for excellent health, fertility and welfare. Still, variations in performance, as well as all-out failures, occur, and culls and euthanasia will be indicated at times. We would be wise to help our clients with timely culling, and appropriate euthanasia as indicated to improve upon welfare,⁵ not to mention performance. Having a replacement available to fill an empty slot is a no-brainer.

Whether using genomics or pedigrees for genetic selection, or using historical or modeled numbers for future replacement needs, our predictions are estimates based on a lot of information, but not perfect information. The distribution of milk production phenotype, AFTER selectively culling some bottom fraction of heifer calves based on genetic merit, illustrates this concept well. The performance of the animals that start lactation is not a bell curve with the bottom chopped off, it is a new bell curve, one with outliers of its own. Leaving zero wiggle room in a “raise only the best” strategy will still result in underperforming young cows entering the herd.

Other similarly unpredictable future events influencing the need for replacements might include disease outbreaks, marketing opportunities (or lack thereof) and regulatory interventions. Our imperfect ability to know exactly what will happen with exactly which animals makes a modest surplus or cushion of heifers advisable.

Who pays the cost of rearing?

The lactating cows in a herd pay the bills for the whole dairy enterprise. The all-too-common notion that a lactating cow should “pay for herself” is flawed economic thinking. If she is making milk, the expenses the dairy incurred to rear her are the definition of sunk costs – they are in the past and they have already been accounted for. Failing to allow the most productive animal available to occupy a slot today and help pay today’s and future expenses can be an opportunity cost for a dairy.

Lower herd turnover rates and smaller replacement heifer inventories do tend to lower replacement costs,¹ and we should constantly pursue the kinds of health and fertility outcomes that allow the best cows to reach 6th, 7th, 8th lactations successfully. However, if production efficiency, superior animal welfare and profitability are our goals, it is a mistake to ignore replacement opportunities. Managing for lower herd turnover rates without appropriately improving health across the herd can easily lead to poor decisions for cows and dairy business. Herd turnover should be an outcome of countless upstream events, not a benchmark to target.⁴

Fixed vs. variable costs

It is very common to think that raising heifers costs far too much to make selling extras at a loss worthwhile, but this thought process is again somewhat over-simplified and flawed. The last heifer raised does not cost the same as the average heifer raised. If your client raises 2% fewer heifers this year in an attempt to save \$2,000 per heifer, only their variable costs go away. They will in fact only save feed costs and maybe some breeding and health costs – roughly \$1,000 per animal not raised. The total average cost of raising a heifer is not disputed here, only the marginal costs of the last few heifers or the next few.

Opportunity cost revisited

Some will ask, “What if we are using a custom heifer raiser and it costs exactly \$2.65 per head per day?” Then raising just one extra heifer incurs the same cost as the average heifer. This is true. In this case, should we save money by only raising the bare minimum and leaving no wiggle room? No, a little buffer is advisable. A model developed by Dr. Mike Overton based on real dairy inputs and realistic probabilities explains this recommendation. A 1,000-cow dairy raising 10% excess heifers compared to historical turnover needs, can actually incur a cost of \$2,000 for every one of those heifers, sell the underperforming 5% of lactation=1 (Lact=1) animals when they reach 2nd test day (60-90 DIM) for a beef revenue of just \$700, and the dairy is still ahead about \$19,000 because they allow the most productive animals to occupy slots.⁷ Comparing income over feed cost per day or per year, and recognizing that the average productivity is higher for all ~400 Lact=1 animals remaining in the herd after culling poor performers reveals this advantage. The opportunity cost of calving in exactly what is needed and culling zero under-performing heifers is actually greater than the cost of raising a modest excess.

Finally, today’s heifers are increasingly superior to the cows they replace.³ If higher quality Lact=1 heifers are entering the herd, the opportunity cost of keeping less-productive animals goes up – whether they are older cows or inferior Lact=1 animals. This means that the very act of raising only the most genetically elite youngstock (assuming good health management) should incentivize more aggressive culling down the road; raising only the exact number historically needed turns out to be a mistake yet again.

Conclusions

I am a huge proponent of excellent health and reproduction; I understand the power of genomics to predict future potential performance. I love watching good mature cows remain healthy and productive for many lactations; I think dairy-beef cross calves will bring tremendous value to the food system; and I know that heifer raising is expensive. However, I would encourage a thoughtful evaluation of all the information we have available to us about heifer-raising decisions and culling decisions. Economics, welfare and public perception should all be evaluated when making replacement decisions. With this information, and an understanding that we cannot perfectly predict the future, I urge caution around the simplest recommendations to “right size” heifer inventories, and encourage careful consideration of the opportunity costs of raising too few.

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