

## Heifer Rearing: Do you know your costs ... per kilogram?

Dr. Charlotte Winder  
November 2016

The cost of raising heifers is commonly referred to as a single price tag – the total of feeding, housing, labor, medical, and breeding costs associated with a heifer calf from birth until first calving. Sometimes this is broken down further into a cost per day during different growth stages (i.e. pre-weaning, post-weaning, pre-breeding, etc.). While knowing inputs costs is key to being able to evaluate the efficiency of your replacement program, knowing what you are getting for those dollars also needs to be measured and tracked.

A successful replacement program results in a healthy animal entering her first lactation, beginning to generate income to pay for her rearing costs, and ultimately contributing to the profitability of the dairy. Getting animals to this point for the least cost, while still generating an equally productive animal, will be the most economically efficient. However, least total costs do not always equate to least total costs per day. Instead of judging our costs over a time period, which is somewhat arbitrary, it can be more helpful to divide costs by what they are actually contributing towards getting our animals across the finish line of first calving.

*How do we do this?* A common target is for heifers to be 75 – 85 % of mature body weight after first calving. To achieve this, we can begin breeding when heifers are approximately 55 % of mature weight and 85 % of mature height (Overton, 2015). While the gestation period is fixed by mother nature, the time it takes to get a heifer to breeding size is far more flexible. Feed efficiency is best when calves are young, and tapers slowly as they age (measured as dry matter intake in kg required per one kg of gain). Feed efficiency is also driven in part by feed quality. While costs per day during the pre-weaning period can vary substantially between different management systems (eg. ‘accelerated’ vs. ‘traditional’ feeding programs), the outputs of these systems should be standardized to more accurately compare costs. Measuring growth during the milk-feeding stage allows you to track your pre-weaning costs on a per kilogram basis. Many dairies are easily doubling birth-weight by eight weeks when calves are fed well; some are approaching tripling this, and it is no coincidence these farms also typically have optimal air quality, bedding, and colostrum feeding. We know that calves without any recorded disease events have higher rates of gain – this inherently makes sense, but is also backed up from the most recent NAHMS findings in the US. Making efficient use of this pre-weaning growth period is associated with increased milk yield; in a study of two large New York herds, for every 500 g of average daily gain pre-weaning, first lactation milk yield increased by 425 – 550 kg (Soberon et al., 2012). The most recent meta-analysis on average daily gain and milk production saw a fairly linear relationship between milk yield and gains over 500 g per day (Gelsinger et al., 2016).

*Avoiding post-weaning slumps.* Unfortunately, sometimes the benefits of an accelerated milk feeding program are lost when the post-weaning phase is neglected. When calves stall

out, or even lose weight post-weaning, they can accumulate substantial additional costs by requiring more total days of labor, housing and maintenance, and total feed, to reach breeding size. Keeping animals gaining well post-weaning, and avoiding stall outs, will ensure the dollars spent to get to weaning size are not lost thereafter. Step down weaning programs, avoiding coupling multiple stressors together (dehorning, pen moves, diet changes, etc.), considering air quality and bedding, and having an appropriately formulated diet for this stage, all help to keep these animals efficiently growing during the post-weaning period.

*Added benefits to reducing age at first calving.* Beyond the benefits of increasing pre-weaning gains on milk production, improving efficiency of gains on most farms typically results in allowing heifers to be bred at an earlier age, but at the same frame size than previous. Uniformity within age groups also usually improves when positive changes are made to heifer programs, partially as a result of reduced illness and set backs as young calves. Breeding at an earlier age, and subsequently having an earlier age at first calving, can provide additional benefits to a dairy's profitability. Decreasing age at first calving by three months (eg. moving from 26 to 23 months) not only results in a quicker positive cash flow, and decreased days on feed, but also decreases the required number of replacements needed per year by 12 – 15 % (Overton, 2015). Whether this benefit is captured in an increased culling rate of lactating cows, or sales of fresh, bred, or young heifers depends on the goals and challenges of the individual dairy – regardless, this can be an additional source of revenue from improved replacement rearing.

*The bottom line.* Incorporate weigh taping calves and/or measuring heights into key parts of your heifer management, and keep track of this information over time. Taking the time to collect this data can help better inform your decisions on where to target your efforts to optimize the efficiency of your heifer rearing. Do your calves gain well in the first three weeks of life? How big are they at weaning, and how uniform are they? Do they grow well post-weaning? Knowing your outputs – how efficiently your heifer calves turn into healthy, productive first-lactation animals, is as valuable as knowing your inputs when considering making changes to your replacement program.

### Resources

PennState Extension: Tools to monitoring heifer growth, feeding, management, and economics.

<http://extension.psu.edu/animals/dairy/nutrition/heifers>

### References

Gelsinger, S.L. A.J. Heinrichs, and C.M. Jones. 2016. A meta-analysis of the effects of preweaned calf nutrition and growth on first lactation performance. *J. Dairy Sci.* 99:1-9.

Overton, M. 2015. Opportunities and challenges in dairy replacement heifer reproduction and monitoring. Proceedings of the American Association of Bovine Practitioners annual pre-conference seminar: The replacement heifer.

Soberon, F., E. Raffrenato, R.W. Everett, and M.E. VanAmburgh. 2012. Preweaning milk replacer intake and effects of long-term productivity of dairy calves. *J. Dairy Sci.* 95:783-793.