



Heifer Management Blueprints

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Building a Better Breeding Criteria for Dairy Heifers

[Introduction](#)

The use of artificial insemination (AI) in dairy cattle has brought about changes to the dairy industry in a variety of areas, including the criteria for first breeding of heifers. Historically, before the introduction of AI, the timing of first breeding was primarily determined by the age of the heifer, possibly to ensure that the heifer was mature enough to withstand the weight of a dairy bull. As AI started to become a common practice, the idea of breeding by body weight (BW) surfaced in the 1960-70s, with the ideal BW being considered 875 lbs. for Holstein heifers. Breeding dairy heifers by body weight was considered superior to breeding by age as it was designed to avoid late breeding of heifers, which has been linked to excessive rearing cost. Today with well-managed heifer operations, however, the use of BW as sole breeding criteria for individual dairy heifers has some limitations. This article will discuss issues associated with breeding modern, well-managed dairy heifers by BW and propose an alternative method of deciding when to breed a heifer for the first time.

[Some disadvantages of breeding dairy heifers by body weight alone](#)

When breeding heifers, there are actual disadvantages of using body weight as sole breeding criteria. One concern involves normal genetic variance of body weight within a breed. Large framed, well-fed heifers will reach breeding weight at an accelerated rate as compared to smaller framed or less well-fed heifers. To help to counteract this issue, it has been suggested to breed heifers at 60% of their mature body weight although this solution is post-facto and challenging to employ at a practical level.

Another issue with breeding dairy heifers by body weight alone is the simple issue of getting an accurate body weight. Both the use of scales and heart girth tape has some error associated with their estimates depending on gut fill as well as human error. The inaccuracy and labor intensity of obtaining heifer body weights makes it somewhat arbitrary that heifers are actually bred at their "ideal" body weight.

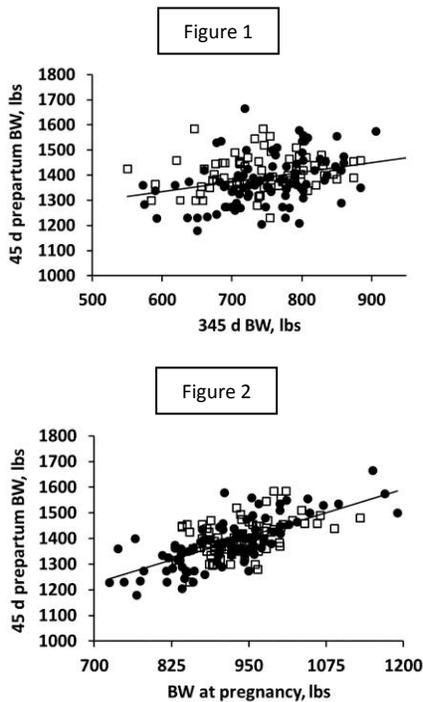
There is also concern associated with determining heifer body weight on dairy heifers on an individual basis. Weighing dairy heifers individually, repeatedly until they reach the appropriate weight requires an immense amount of time and labor and is mostly impractical.

[Building better dairy heifer breeding criteria](#)

Information from recent experiments at the University of Wisconsin have demonstrated the potential for building better, more practical breeding criteria for dairy heifers. Some simple key concepts are required. First, when dairy producers and or consulting staff are evaluating the body size of dairy heifers it is important to understand these (12-13 month) body weights are not absolutely related to calving body weight. This effect can be observed in Figure 1.

The reasons 12-13 month body weights are not perfectly related to calving body weight (Figure 1) have been previously discussed, but include genetic variation of body weight, compensatory growth patterns, and, most importantly when breeding dairy heifers AI, uncertainty when the heifers will actually become pregnant. While challenging, dairy producers and their consulting staffs have to become accustomed to this variance. In short, looking at the size of a dairy heifer at 12-13 months of age is not that informative of "how big she'll be" at calving.

What is important in regard to body weight at first calving is AI reproductive efficiency. The body weight of a heifer at conception is more influential on body weight at calving and is represented in Figure 2.



Adding age back to dairy heifer breeding criteria

Because body weight of dairy heifers at 12-13 months of age is not a perfect predictor of body weight at calving, screening dairy heifers for adequate body weight pre-breeding and breeding dairy heifers by age thereafter is an alternative heifer breeding criteria. This breeding criterion was explored in a recent experiment at the University of Wisconsin-Madison. In this experiment Holstein heifers were assigned to be bred individually by body weight or screened for general body size at 12 months of age and bred by age thereafter. Heifers assigned to be bred by age were eligible to be bred on the first observed heat after 13 months of age. Heifers assigned to be bred by body weight were weighed and bred at 850 lbs. All heifers were bred using visual heat detection and artificial insemination. Breeding heifers by age as compared to body weight had no effect on services per conception, conception body weight, or gestation length. Heifers bred by age tended to conceive at a younger (11 d) age as compared to heifers bred by body weight. Likewise, breeding heifers by age had no effect on body weight at 45 d pre-calving with age bred heifers averaging 1380 lbs as compared to 1400 lbs for heifers bred by body weight. Breeding heifers by age resulted in slight younger ages at first calving (23.7 vs. 24.1 mo.) as compared to heifers bred

by body weight. No differences milk, fat or protein yield and milk fat or protein concentrations were observed between first lactation cows bred by age or body weight as heifers. The conclusions of the study revealed as long as pre-breeding heifer growth was adequate it made little difference if heifers were bred by body weight or age thereafter.

Reasons for using dual criteria to breed dairy heifers

Breeding dairy heifers by body weight is a sound management practice but in terms of practicality for producers especially of large herds it is challenging to truly implement. Body weight is still an important consideration to ensure the optimum future milk production and to minimize dystocia. However, a simple combination of pre-screening (12 mo) Holstein heifers for adequate body weight (850-900 lbs) and breeding by age criteria can also be implemented with success. At about 12 months of age, a group of heifers should be evaluated as a pre-screening for being bred in a month. If the heifers in the group are generally about 850 lbs. at the time of the pre-screening, the heifers can then be bred as a group at their first observed estrus following 13 months. If most heifers are lighter than this, heifer management should be evaluated and corrected so that subsequent groups of heifers are averaging in the desirable weight range at pre-screening.

Conclusion

Although BW is an important consideration for breeding heifers, truly implementing the practice is challenging. In well-managed dairy heifers, using body weight as the sole criteria for breeding heifers appears to be no more effective than a simple age breeding criteria. Using a dual body and age breeding criteria removes the impetus of weighing heifers on a regular basis. A combination of both BW and age criteria can be utilized to determine the time of first breeding. This method combines the safety net of assuring adequate body size prior to the breeding period with the ease and precision of an age criteria.