

Impact of calving difficulty and age at first calving on subsequent lactation

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There are two areas which I do not think dairy operations pay enough attention to: calving difficulty (CD) and age at first calving (AFC). They may not even record such data. And if they do, how do they know if any negative effects may result from what these parameters are? In both cases, since there are so many variables and much variation, massive data are needed to sort out these effects.

For this reason, I initiated a major project about 5 years ago. That involved Albert de Vries at the University of Florida who referred me to Marcos Marcondes then at Washington State University and now at the Miner Institute. The project also involved Jeffrey Bewley of the Holstein Association USA who provide access to lactation records through T. Allen of Agritech Analytics, Visalia, CA. The database for CD had 794,870 records of mainly Holstein with some Jerseys and crosses located primarily in CA. Only about 90,000 records were available for AFC evaluations (Marcondes et al, 2025). Prior AFC studies were addressed in Kertz (2019), CD (Kertz 2007), and possible interrelations with stillbirths (Kertz 2018).

Calving difficulty is scored as 1 = quick, easy birth with no assistance; 2 = over 2 hours in labor, but no assistance; 3 = minimum assistance, but no calving difficulty; 4 = used obstetrical chains; and 5 = extremely difficult birth that required a mechanical puller. However, these data may not be consistently recorded on dairy operations--especially when calvings are overnight or on weekends when employees may be minimal.

The importance of this area was made evident to me when I was asked once by a calf operation to visit two dairy farms from which he received calves to contract raise. These dairies were in a similar area and managed by two brothers but in separate operations. The problem was that calves from one dairy did well at the calf operation, but calves from the other dairy did not. I was only able to visit the good dairy operation. When I completed that dairy's review, I asked the calf manager if she had any idea why calves from the other dairy had problems. Yes, she said because they pull every calf! Such stress is not good for the dam, but it also negatively affects the calf since, for instance, that lowers antibody absorption from colostrum.

Marcondes et al., (2025) found in other studies that dystocia (calving difficulty) negatively affected milk yield, reproduction, stillbirths, dam death, retained placenta, uterine infection, and greater involuntary culling, veterinary fees, and extra labor. In the Marcondes et al., (2025) study:

“Calving difficulty affected differently primiparous and multiparous cows. In primiparous cows, there was a linear decrease in milk yield with higher CD, while in multiparous cows, there was an increase in milk yield from CD 1 to 2 and then a linear decrease after that. We suspect there is a correlation between CD and milk yield, where more productive cows tend to have more calving problems; however, when CD is 1 or 2, that does not affect their current milk yield but when that CD is ≥ 3 , there is a negative consequence for that current

lactation.”

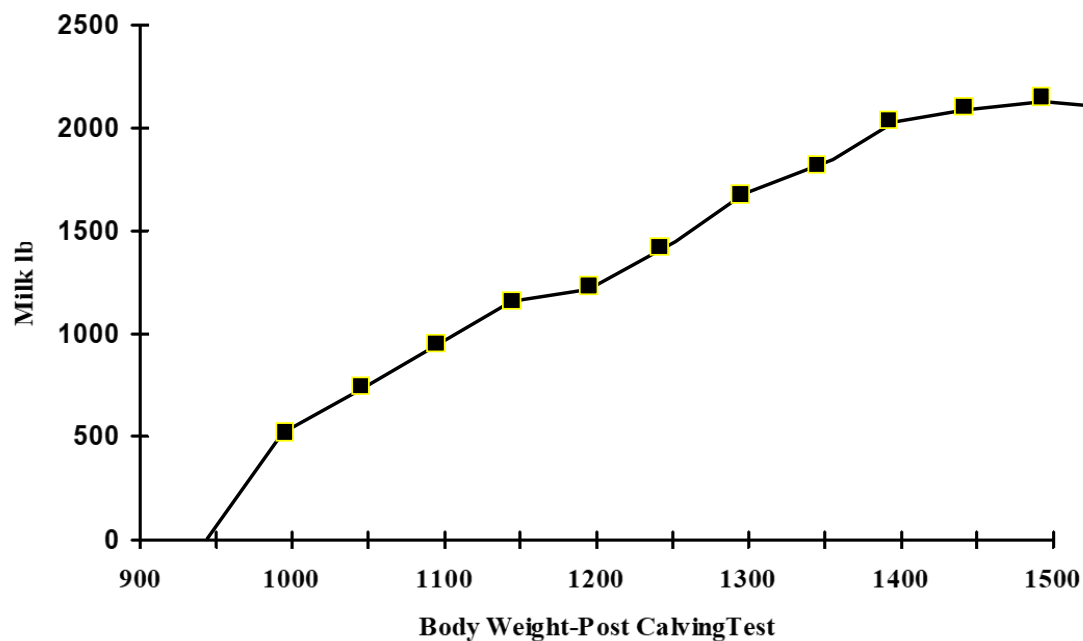
There was a decrease in milk yield:

- when CD went from 1 to 2 in Holsteins and Jerseys, but no further decrease with higher CD levels.
- With cross-breeds, there was a slight reduction in milk yield from CD 1 to 3, but a greater drop from CD 3 to 4. This may be because calving difficulty might be more intense in crossbred cattle than in purebred cattle due to several factors: heterosis (hybrid vigor) which generally leads to improved overall performance, but if that results in larger birth weights and increased gestation length, both are closely associated with greater dystocia rates. This explanation is likely more valid when cross-breeding if that results in calves which have greater body weight and conformation changes.
- Lastly, greater calf size increased milk yield in that cows pregnant with males produced more than cows carrying female calves. Other research has found the opposite. This may be due to hormonal differences, but could also be whether male calves had or not had greater CD. If not, their greater body weight than female calves (Kertz et al, 1998) could enhance milk yield as found in other species.

The impetus to decrease AFC is largely driven by reducing feed and other costs for each month below the traditional goal of 24 months AFC.

- While that is the goal, there will always be calves below that average, or any average, and above it as well.
- Other reasons for decreasing AFC are decreasing inventory of heifers, and furthering when heifers initiate milk production earlier.
- However, that raises the question as to what negative effects may ensue for each month decreasing AFC below 24 months? I have seen some of these heifers bred to calve at 20 to 21 months of age, and cringe as they appear not well grown.
- In typical first lactation, when AFC averages 24 months (Kertz et al., 1997), those heifers grew another ~12%. If heifers are grown from weaning to calve at 20-21 months of age, instead of 1.8 to 2.0 lb daily gain, they would have to average about 2.1 to 2.2 daily gain which approaches fattening.

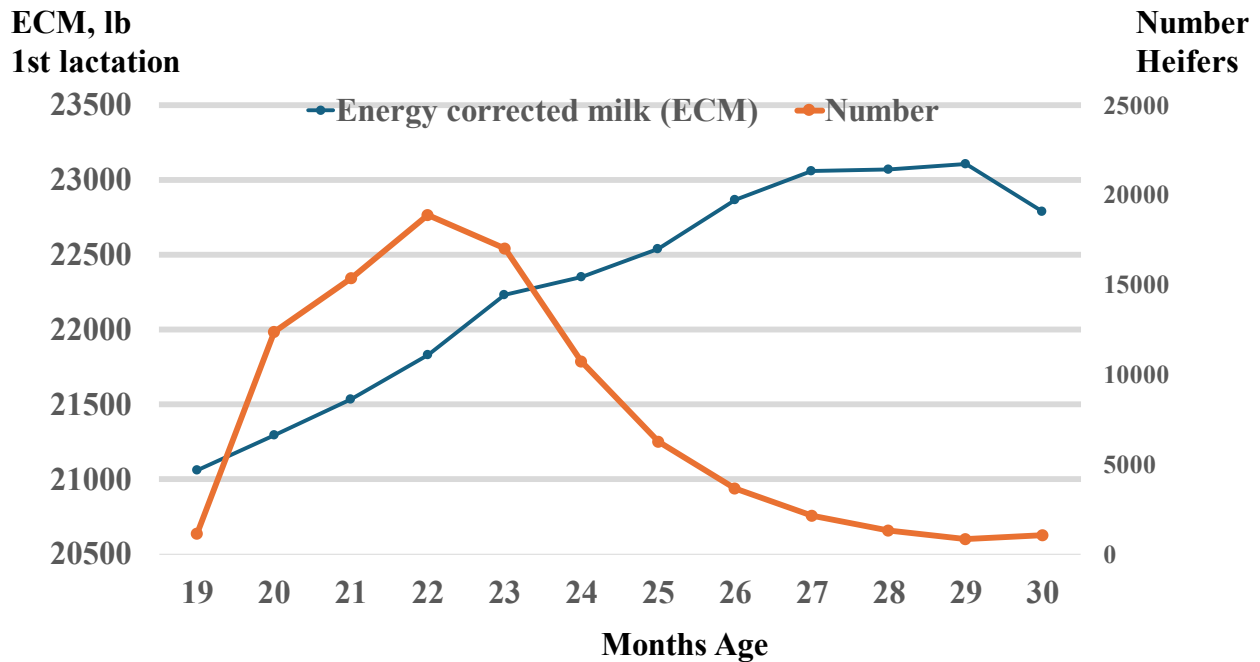
Major prior data (Keown and Everett 1986) somewhat related to AFC and subsequent milk production are seen in **Figure 1** from 305,237 NE U.S.-DHIA records.



Data in this figure are not based on AFC, but are from first post-calving DHI test day and are taped body weights. Peak 305-day milk production among these first lactation cows in this data set was around 1400 lb post calving. With 11% weight loss at calving (Kertz et al., 1997), those heifers would have weighed about 1600 lb before calving. This graph did not provide number of first calf heifers at each body weight—but it is likely that most were around 24 months at first calving. If so, and if they weighed 1200 lb post calving, they would have produced about 1500 lb more milk than 900 lb body weight first calf heifers; but about 600 lb less than peak body weight post calving body weight heifers.

Data from Marcondes et al., (2025) in **Figure 2** indicate:

- Number of heifers in this database (90,718) peaked at 22 months of age (18,901), and then decreased rapidly beyond 23 months of age (17,014).
- Number of heifers below 22 months of age dropped from 15,384 to 12,389 at 21 months of age; then to 12,389 at 20 months of age, and finally to only 1,136 at 19 months of age.
- Annual ECM (energy-corrected milk) increased from a low of 21,039 lb at 19 months of age up to a peak of about 23,000 at 27-29 months of age before decreasing to 22,742 lb at 30 months of age.
- The increase in annual milk yield from 20 months of age to 24 months of age was 1,060 lb. Thus, the cost reduction from raising and breeding heifers to calve at 20 months of age versus 24 months of age in this database would be offset by 1,060 lb less milk in the first lactation. Staley (2022, and personal communication 2025) estimated from his field data that 20-21 month AFC versus 23-24 month AFC resulted in 2-4 lb less milk per day per month AFC difference or 1,000 to 1500 lb less per lactation.
- In addition, younger heifers may use more nutrients to grow in their first lactation, and not grow as much. If so, then less milk may occur in 2nd and later lactations since older cows' performance will reflect their first lactation lower body weight.
- Another factor to consider is whether the younger heifers would have more CD due to less growth or if fattening had occurred.



The Bottom Line

- Calving difficulty needs to be recorded and managed to be minimized in order to avoid negative effects on the dam and calf.
- Younger heifers calving at an average less than 24 months of age, especially at 20-21 months of age, will most likely be less well-grown or fatter if daily gain has been near 2.2 lb.
- Heifers at first calving around 20-21 months versus 24 months of age have been found to produce about 1,000 lb less in the first lactation. This may also carry over into subsequent lactations.
- Thus, these negative effects must be weighed against reduced costs to calve heifers at 20-21 months of age.

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