

Every day open has a price

by Karmella Dolecheck and Jeffrey Bewley

HOW much does one day open cost you?

The truth is it depends on many herd and cow-specific factors. That's why we decided to build an online dashboard tool that uses herd-specific information to estimate the cost.

The tool was built using a retention payoff approach to calculating the cost of days open. The retention payoff value of a cow in your herd is the difference between the potential future profits of that cow and the potential future profits of its replacement if it started in the herd today.

For an example, we calculated the cost of days open using herd assumptions representative of Holstein herds using Dairy Records Management System, or DRMS (323 milking cows and 23,700 rolling herd average milk production). The herd was assumed to have a 60-day voluntary waiting period, 37 percent conception rate, 50 percent heat detection rate, and 175 average days open.

Differences between lactations

Looking at the figure, you can see the total cost per day open for cows in Lactations 1 through 5. Each point on the line represents the sum of the cost of each day open between the end of the voluntary waiting period (60 days in milk) and that point. For example, at 300 days in milk (DIM), a cow in its fourth lactation has a total cost of days open around \$110, which is the equivalent of 37 cents per day open.

You may notice that our estimates

Dolecheck completed a Ph.D. focused on the cost of lameness at the University of Kentucky. Bewley is a dairy housing and analytics specialist with Alltech.

for the cost of days open are lower than the typical value that comes to mind — between \$3 and \$5. This can be attributed to both the method we used (retention payoff, which considers daily changes in cow value) and the market prices we assumed. For market prices, we used the averages from 2006 to 2015, and there were multiple years of high cull prices and low replacement heifer prices. As a result, the cost of days open was less than it has traditionally been.

The total cost of days open for all cows climbs as cows get further into lactation. However, the lines are not straight, indicating that not every day open contributes equally to the total cost. Up until around 250 DIM, the cost per day open moves at an increasing rate (the next day open costs more than the one before it).

After 250 DIM, all of the lines except that of the Lactation 1 cows begin to flatten out. The flattening of the line indicates that the total cost of days open is actually moving at a declining rate (the next day open costs less than the one before it).

The reason the cost per day open falls in late lactation is because we assumed that when the cow became unprofitable, we would cull it and replace it with a more profitable animal. Therefore, the cost per day open drops because we have reached the point where we should be planning to replace that cow, and its replacement will make up for some of its lost production. Regardless of this assumption, the total cost of days open continues to rise beyond 300 DIM even if the incremental

costs per day open is falling.

Cows in Lactation 1 are a little different. The figure shows no costs associated with days open until these cows reach 100 DIM. In other words, we are not losing money by waiting to breed them. Why?

Compared to older cows, the lactation curve of first-lactation cows peaks later and does not drop off as fast — it is more persistent. This means the first-lactation cow can be maintained at a profitable level for longer, and the fact that it is not pregnant yet at 100 DIM is less concerning than for older animals.

On the other end of the line, up to 300 DIM we never see the Lactation 1 cows' curve start to turn downward like in the other lactations. Although there is likely some point that Lactation 1 cows would start to see diminishing costs per day open, this occurs at a much later point in lactation than older cows. This indicates that we should not consider culling non-pregnant first-lactation cows as early as nonpregnant older cows.

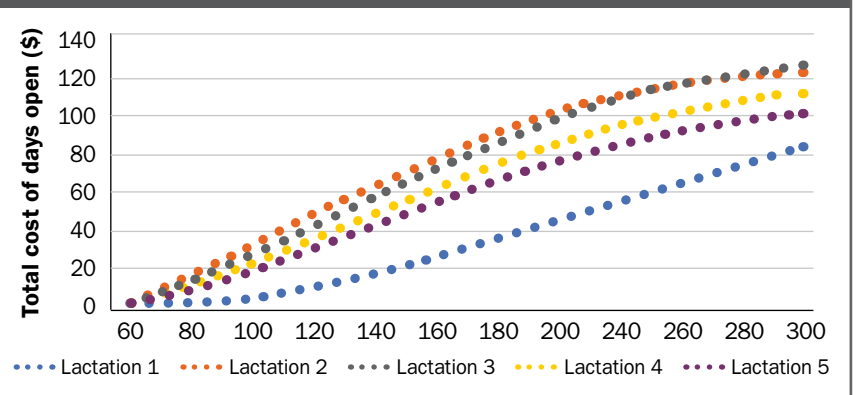
Although the overall trend of our "average herd" example is interesting to look at, the real message you should get out of this is that the cost per day open is not only herd specific but also cow specific. Ultimately, the cost per day open in a herd depends on not only reproductive performance but also the overall productivity of your cows and their potential replacements.

Every cow is unique

The crucial question to ask is if it would be more economical to keep breeding a cow for one more day or to replace it with a freshening heifer? Some of the herd-specific factors that will determine this include average milk production, milk price, feed prices, replacement prices, genetic potential of replacements, and cull price.

If you are interested in evaluating costs per day open using your own herd-specific values, consider trying the interactive tool we created located on hoards.com/ukdaysopen. 🐄

Figure 1: Total cost of days open per cow across days in milk



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