Strategies for a successful heifer reproduction program

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Today's outstanding dairy reproduction programs have created a new environment for producers. The traditional mentality was to raise every heifer as a replacement. Now dairy producers are changing their strategies because of more opportunity to raise the best replacements – with outstanding reproduction more heifers are produced than are needed to maintain herd size.

Raising healthy replacements is still a high priority, but now dairy producers can choose which calves will be the most productive on their farm. This article summarises the strategies commonly used to raise high quality heifers in an economical fashion.

Healthy calves

A cow's or heifer's transition affects the health and reproductive status of the resulting calf. The dam not only needs to be able to deliver a healthy calf, but also produce quality colostrum to build calf immunity. Newborns need clean high quality colostrum equal to 10% of their body weight within eight hours of birth. With adequate colostrum, healthy newborn calves have fewer illnesses, higher growth rates, increased fertility and improved production over their lifetime.

Disease prevention

Preventing disease is essential for successful and profitable reproduction programs as many diseases have a high impact on reproduction. For example, calves with respiratory disease are twice as likely to leave the herd, and first calving will be delayed approximately six months when compared to calves that did not experience respiratory infections. Additionally, calves with scours will calve at 30 months of age or greater.

Many of the key areas of disease prevention management include: parasite control; coccidiosis; infectious diseases like infectious bovine rhinotracheitis (IBR), bovine viral diarrhoea (BVD), Parainfluenza-3 virus (PI-3) and bovine respiratory syncytial virus (BRSV); and others such as pinkeye, foot rot and mastitis.

The Virginia Cooperative Extension website provides good background, explanations and suggestions for vaccination protocols. It is important to note the prevalence of some diseases may vary by region. Seek advice from a local veterinarian or animal health consultant to set up a proper vaccination and treatment protocol.

Growth and nutrition

Ideal growth rates for dairy calves are 1.7-2.0lb per day. As calves grow and mature, they also need different protein ratios in their feed. Work with a nutritionist and veterinarian on rations that best fit each age group.

Table 1 is from a 3,200 cow herd that tracks daily gain on all heifers from birth to post freshening. The data shows replacements with average daily gain greater than 1.71 calved earlier and produced more milk. As the average daily gain from birth to post freshening increased, so did milk production in the first lactation.

By 13-15 months of age Holstein heifers should weigh 850-900lb and possess a hip height of greater than 50 inches and a whither height of 48 inches. According to the American Jersey Association the target weight for breeding age Jersey heifers should be 55% of mature weight. Therefore, if mature cows are 1,000lb, the target breeding weight is 550lb.

Breeding

A good goal is to breed all heifers within 21 days of the set artificial insemination (AI) date. If the herd's set breeding age is 365 days, then all heifers should be inseminated by 386 days of age. During this 21 day period, several methods can be used to detect oestrus (tail paint, visual observation,

Continued on page 35

Table 1. Heifer average daily gain in relation to production and age at freshening.

Average daily gain	No. of cows	Actual 305-day production	Average age at freshening
<1.51	75	29,561	26.3
1.51-1.71	322	31,548	23.8
1.72-1.81	336	31,823	22.5
1.82-1.92	486	31,975	21.7
1.93-2.13	230	32,763	21.8
>2.13	30	32,705	21.9

Continued from page 33
activity monitors or a combination of methods).

A common heifer breeding protocol is to give prostaglandin and utilise a heat detection method the day heifers are moved to the AI pen. Observe and breed heifers displaying oestrus activity. Give a second prostaglandin injection 10-12 days later to heifers not yet inseminated. Heifers not inseminated during the period of giving prostaglandin injections may not be cycling; these heifers could be enrolled into a five-day Eazi-Breed CIDR synchronisation program or be checked by a veterinarian for issues such as freemartins.

Re-enrolling in program

Pregnancy check bred heifers 29-42 days since last heat through rectal palpation or blood pregnancy testing. Heifers that are not pregnant should be given prostaglandin or enrolled into a five-day CIDR program.

Virgin heifer abortion rates average 3%, so it is necessary to follow up with a pregnancy check at 60-90 days since last heat to confirm heifers are still carrying a calf.

This step is more important for heifers first confirmed pregnant less than 32 days since last heat, because they are at a higher risk for early embryonic loss.

Finally, perform another pregnancy check at 180-200 days carried calf. In a high feed cost environment, it is cost effective for heifers to calve around 23 months of age.

Heifers that calve at greater than 25 months consume feed longer versus returning a profit through milk production. Also, as mentioned previously, they are more likely to have calving issues and leave the herd earlier.

Culling strategies

In recent years, the bar has been raised for reproduction management. It is not uncommon for herds to have a pregnancy rate for cows greater than 25%. According to the CRI Dairy Performance Navigator program, the USA benchmark for the average Holstein herd was 16.6% in 2008; in 2015, it has increased to 19.8%. Jersey herds went from 20.1% to 21.5% respectively.

For 2015, the program shows a benchmark average 40% sexed semen use in Jersey cows and 65% in Jersey heifers. The average Holstein herd uses 4% sexed semen in cows and 33% in heifers. The point is dairy herds have improved reproduction performance and implemented sexed semen use, resulting in more replacements than ever before.

Knowing this, the question becomes: does a herd need to raise every replacement? The simple answer is no.

So, how does one determine a breeding strategy that will result in the highest dairy profits?

Here are some basic steps to follow when developing an appropriate breeding strategy.

- **Know the herd goals.**

Is there a goal to expand the herd? By how much? Is there opportunity to sell bred heifers? Would the herd benefit from culling calves early? Is there a market for beef crosses? What is the ideal cull rate?

- **Determine how many replacements are needed each year.**

Calf Math is a simple calculator with individual herd inputs that can help producers determine the number of replacements needed annually. The calculator also offers options for breeding strategies involving sexed semen or beef semen. For instance, a producer may determine that increasing sexed semen usage in heifers by 10% would produce enough replacements and allow the bottom 10% of the herd to be bred to beef semen to take advantage of strong beef prices.

- **Decide how animals are to be sorted.**

Animals can be sorted through data from herd software programs, dairy herd improvement record processing centers and CRI's Precise genomic testing.

- **Decide what to do with the information.**

The strategies can be as simple as culling calves with more than three health events or culling heifers not pregnant after four inseminations. Strategies can also be as complicated as genomic testing all animals, selecting the elite for flushing and transferring embryos into lower genetic merit cows.

- **Make a plan.**

Write down the plan; indicate how it will be implemented and who will be responsible for each step along the way. Ensure everyone involved knows their role and monitor the results.

In summary, the priorities in developing replacement strategies are good dam health and transition, quality and quantity of colostrum, disease prevention, growth rates greater than 1.7lb per day, and a structured and well planned breeding program. Once these essential priorities are in place, a dairy has more options to raise the highest quality replacements in both health and genetics. ■

References are available on request from the author