FIND ADDED VALUE FOR YOUR DAIRY THROUGH BEEF IVF PROGRAMS

SimVitro HERDFLEX by Simplot

SELECT SIRES INC.

NEW RESEARCH SHOWS ECONOMIC OPPORTUNITIES FOR DAIRY FARMS

The main source of revenue in dairy herds is from milk sales, however beef output from the sale of cull cows and surplus calves represents 10-20% of the gross income in most production systems. Thus, revenue from the sale of surplus calves can significantly affect dairy farm profitability.

The resulting beef-on-dairy trend has been embraced by the dairy industry with beef semen sales growing exponentially in recent years.

New research published in the *Journal of Dairy Science* supports utilizing full-beef embryos as a breeding strategy for lower-merit cows. This strategy gives producers a chance to reevaluate their breeding program and incorporate a new market of full-beef calves.[1]

Data from Simplot Animal Sciences show this strategy offers dairy producers a greater return on investment compared to cross-bred calves born from dairy cows bred to beef sires.[2]

THREE KEY TAKEAWAYS:

- IVF presents substantial opportunity for dairy economic growth.
- Address dairy herd replacement needs.
- Opportunity to counter dairy bull calf value concerns.

INTEGRATING BEEF INTO DAIRY REPRODUCTION PROGRAMS

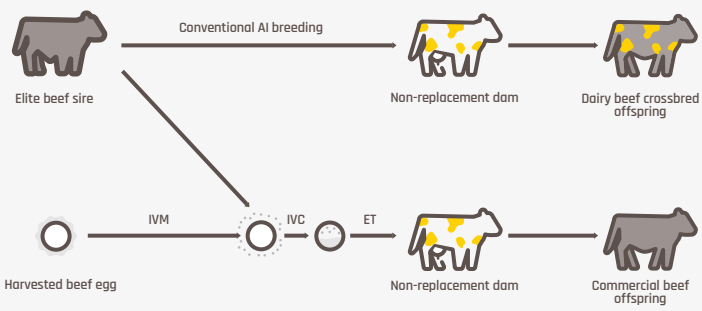
Improvements in dairy herd fertility have combined to reduce the proportion of dairy breed calves required by dairy farms to retain or even grow herd sizes. This presents the opportunity to increase the proportion of beef breed calves born, increasing both the value of calf sales and the marketability of the calves.

As a result, a total of about 40% of the semen used on dairy cattle today is either beef semen or sexed semen. The surge in popularity comes from strategies to right-size replacement inventories, set lower culling rates and add value to calves not needed as replacements.[1] (Figure 1)

There are two methods used to integrate beef into dairy reproduction programs:

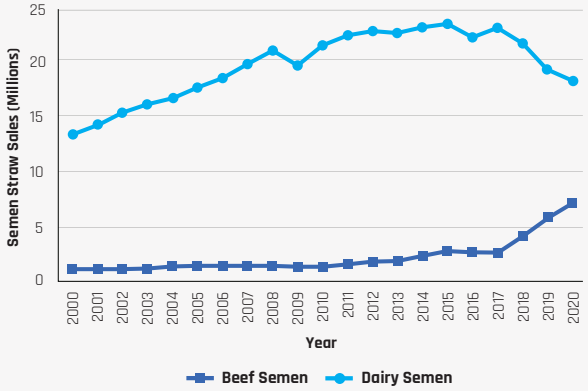
- Breeding lower-merit dairy females to beef sires, resulting in dairy-beef crossed calves (Figure 1).
- Using lower-merit dairy females as recipients of full-beef embryos (Figure 2).

Figure 1. Two ways to integrate beef in to dairy reproduction programs



Source: Crowe et al. Invited review: Maximizing dairy herd offspring value

Figure 2. Total domestic semen unit sales in the United States between 2000 and 2020



Source: National Association of Animal Breeders

[1] Crowe AD, Lonergan P, Butler ST. 2021. Invited review: Use of assisted reproduction techniques to accelerate genetic gain and increase value of beef production in dairy herds. J. Dairy Sci. 104:12189-12206.

[2] Simplot Animal Sciences data on file.

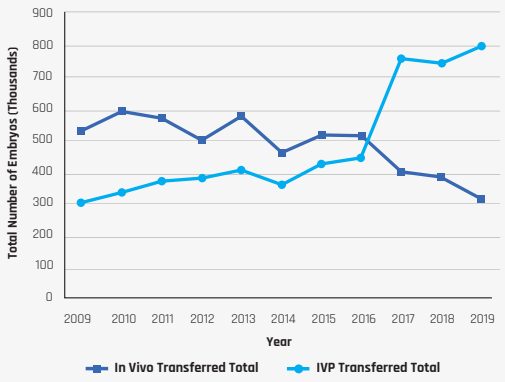
CREATING HIGH-VALUE EMBRYOS TO INCORPORATE INTO DAIRY REPRODUCTION PROGRAMS PRIMARILY OCCUR IN THREE WAYS:

- Elite dairy dams, from which oocytes are recovered from live females using ovum pick-up and fertilized in vitro with semen from elite dairy bulls or replacements
- Elite beef dams, where the oocytes are recovered from live females using ovum pick-up and fertilized with semen from elite beef bulls
- Commercial beef dams (≥50% beef genetics), where ovaries are collected post-slaughter, and oocytes are fertilized with semen from elite beef bulls suitable for use on dairy cows (resulting embryo with ≥75% beef genetics)

Although beef-cross calves have greater economic value than dairy breed calves, further gains can be made by using 100% beef breed genetics through IVF and embryo transfer (Figure 3).[1]

Data indicate these full-blood beef calves command significantly higher prices, even at one-day of age.[2] Dairies often receive a $350-$400 premium for HerdFlex® calves. Keep in mind these rewards are the result of deliberate marketing plans and developing trusted relationships within the marketing chain.

Figure 3. Number of in vivo and in vitro produced bovine embryos transferred from 2009 to 2019



Source: International Embryo Technology Society

THE BULL CALF QUESTION

Because replacement heifer calves are usually more highly valued, dairy bull calves can be a challenge for the dairy industry. According to Larry Corah, Kansas State University professor emeritus, the average day-old Holstein bull calf value is $30-$60; a day-old Jersey bull calf value is drastically lower.[2]

Additionally, the industry will need to address the value and utility of low genetic merit heifers not retained as replacements.

To avoid these concerns, it is important to follow established calf care best practices. And for dairies to consider the opportunity to capitalize and integrate beef embryos into dairy reproduction programs. Doing so reduces the dairy bull calf and lower genomic quality heifer population. It also offers dairy farms increased revenue opportunities with full-blood beef calves that are more highly valued by the beef value chain.

The expected benefits include:

- Accelerated genetic gain for milk and beef production.
- Premium-quality beef calves.
- Increased number of offspring produced from genetically elite dams.

The use of IVF to generate a calf with increased beef merit would contribute to farm profitability, however, these results are herd specific. **To gain the greatest advantage, IVF calves would need to attract greater economic value at two weeks of age vs. cross-bred or straight-bred calves.**

SUMMARY

Breeding the elite dairy cows for herd replacements and breeding lower-merit cows to beef sires or implementing a full-beef embryo transfer program would change the face of the dairy and beef production systems – increasing the value of beef merit coming from individual operations in various regions and helping alleviate dairy bull calf surplus.

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[1] Crowe AD, Lonergan P, Butler ST. 2021. Invited review: Use of assisted reproduction techniques to accelerate genetic gain and increase value of beef production in dairy herds. J. Dairy Sci. 104:12189-12206.

[2] Simplot Animal Sciences data on file.