

Dairy Breeding Economics Decision Aids

These dairy herd decision aids calculate economic advantage of sexed semen over conventional artificial insemination (AI) on difference in pregnancy rate, pregnancy and calving losses and in the day-old calf value by gender. In other words, it's the net calving rate based on females exposed and the value of the day-old calves by gender that makes the economic difference. Sexed semen produces a higher portion of higher valued gender calves with added semen cost.

All decision aids are based on the same calculations and have similar data requirements. Sexed semen is compared to conventional in each alternative. The purpose of decision aids is to assist producers and educators organize data to evaluate breeding alternatives. Data in these examples must be modified to fit the producer's actual data and experience. Alternative spreadsheets decision aids and examples include the following:

- a. Dairy Virgin Heifer Breeding Economics
- b. Dairy Milking Cow Breeding Economics
- c. Beef-on-dairy Cross Sexed Versus Conventional AI
- d. Beef-on-dairy Breeding Economics

The day-old calf value is established in the market or the value to the dairy operation when the breeding system provides an advancement in the herd genetic progress. This is why it's a common practice to use sexed semen AI on replacement heifers that have best genetics in the herd. These heifers also have a higher pregnancy percentage than lactating cows. Calculated advantage **does not capture** the potential for speeding up genetic advancement by using sexed semen to improve herd production performance.

These decision aids **do not capture** the potential increase in net income if retained ownership is followed with the day-old crossbred calf value versus the dairy calf. Calf market price difference by sex should reflect this reality. Beef-on-dairy crossbred calves are more valuable because of superior feed efficiency and carcass value for the crossbred versus dairy finished cattle. Angus-On-Holstein crossbred qualify for the Certified Angus Beef (CAB) premium market. This is a value-added opportunity. Retained ownership performance results can support this economic reality. Separate decision aids are provided for this retained ownership analysis.

The calf income from the day-old calf sale covers all or part of the breeding and semen costs. The percent that calf value covers breeding costs is calculated. These values must be kept in proper perspective as **breeding costs are a small portion of a dairy operation's total cost of production**. Dairy bull calves have been treated as a necessary dairy by-product. Using sexed semen produces higher valued beef-on-dairy crossbred calves that cover more breeding costs.

Prepared by Jim McGrann, Ranch Economist Management, Professor Emeritus, Department of Agricultural Economics, Texas A&M, College Station, Texas, 2-9-2021.

The breeding systems are based on three inseminations. The accuracy of gender selected for sexed semen is an input variable and the overall gender percent reflects this.

Actual results will of course vary but this gives a quick approximation that facilitates "what if "analysis by the user.

The pregnancy rate and gender accuracy of sexed semen versus conventional are input variable.

Reproduction performance and calf prices are dairy operations specific. It is important dairy producers **use their own data and pricing reality** in decision aids.

In summary, the costs and revenue of sexed semen versus conventional AI are calculated and the difference in added revenue compared to added cost of sexed semen is the advantage of using sexed semen over conventional AI. The revenue difference is the calf value margin over the breeding costs that include semen and the technician services cost. The value of retained ownership for beef-on-dairy calves and production impact with improved genetic is not accounted for in these decision aids. Separate decision aids to measure the economics of retained ownership of beef-on-dairy calves are available from the same source as these decision aids.

Observations from an economic perspective:

- Anything that can be done to **increase live calving rate** is economically important. That is increase pregnancy rate and reduce pregnancy and calving loss.
- Increasing the live calving rate reduces the number of females exposed to produce replacement heifers. More females can be bred to produce beef-on-dairy crossbred calves.
- Using sexed semen to produce the gender desired is economically positive.
- Improvement in sexed semen accuracy and pregnancy means in time conventional semen will have limited use for dairy breeding. Producers can choose the calf genders desired.
- Increased market price of beef crossbred steers relative to heifers favors sexed semen use.
- Selection of beef sires with the correct genetics including calving ease for sexed semen will improve the beef-on-dairy crossbred feed efficiency and carcass quality and profitability of beef-on-dairy retained ownership. Increased calving ease will raise the live calving rate.
- Use of sexed semen for beef-on-dairy crossbred production will improve the quality of beef produced by the dairy industry. The Angus-On-Holstein crossbred finished cattle qualification for the CAB premium market demonstrates this advantage.
- Measuring breeding system production and financial performance identifies important opportunities. What gets measured gets managed!