

## Sexed Semen Beef Cattle Breeding System Decision Aids User Guide

The purpose of these decision aids is to facilitate the organization of reproduction, calf price and breeding system cost data to calculate the economic advantage of using **sexed semen** for beef cattle production. Information will facilitate calculation of profitability of the sexing semen technology compared natural service. This can be compared to conventional artificial insemination (Conventional AI) with the other decision aid in this set beef cattle decision aids. For sexed semen to be successful for beef cattle producers it must be the more cost effective than natural service or conventional AI breeding.

It's the **gender difference of calves' value and reproduction success** that makes sexed semen a profitable alternative to natural service or conventional AI.

These are the things to keep in mind when using this decision aids to evaluate the alternative breeding systems:

- Reproduction rates for pregnancy and calf losses in the are only examples. The capability to easily do “what if” analysis with these decision aids facilitates changing the reproduction values to check their impact on the alternative breeding systems economics.
- Sexed semen pregnancy rate is assumed to be 90% -95% of conventional AI but this is a variable controlled by the user. Accuracy of 90% in gender selection is also controlled by user input. Again, these are examples.
- A synchronization breeding system is used for conventional AI and sexed semen. The protocols are described and costs reflect the cost sheets.
- Pregnancy loss and calving to weaning losses can be varied by the user varied across breeding systems. This is a data limitation as one would expect the AI systems to have lower losses because of selecting use of lower birth weight sires.
- Prices of weaned calves should be adjusted for weights and sex using market data and price slides.

### Methodology and Considerations

- The advantage of sexed semen is determined by calculating the **income margin over breeding cost** generated by each system. That is the value of the weaned calves minus the breeding cost. This margin above breeding cost is a measure of the economic performance of the sexed semen system.

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- When calculating the advantage of sexed semen is determined by the difference in the gender value of the weaned calves and reproduction rate (weaning percentage) and the breeding cost differences between breeding systems. **Weaned calf values by gender** are very important in determining sexed semen competitiveness.
- Calculating the advantage of the sexed semen when the same genetics is used it's a question of the **added revenue being greater than the added cost** of the sexed semen breeding system compared to conventional AI or natural service.
- Breeding costs are reported on the basis of females exposed. Semen cost is reported as percent of breeding cost. This will help keep breeding cost into proper cost perspective. Semen cost is a minor cost for replacement heifer production. The overall pregnancy rate is always the most important factor in determining bred replacement cost.
- **Synchronization** is a big part of making the use of sexed semen profitable. Fixed time AI with heat detection and followed by clean up bulls is especially cost effective and managerially feasible for most produces producing replacement heifers. Heat detection although costlier as it requires more labor and management then timed AI is normally more cost effective as pregnancies are higher. Timed AI is an alternative that can be evaluated with this decision aid.
- In economic terms, **sexed semen** is a small part of the total breeding and production cost.

For more on the AI breeding system economic evaluation see “Replacement Heifers Costs and Return Calculation Decision Aids” **B. Replacement Heifer Budgets.**  
<http://agecoext.tamu.edu/resources/decisionaids/beef/>

### **Decision Aids Operation**

The data convention is items in **blue** are **user input** data all the cell black numbers are calculated numbers and are protected cells. This is a very comprehensive tool to evaluate the sexed semen breeding alternative. This decision aid has 10 sheets that are linked together. Titles are as follows:

1. Data and Description – Breeding and Delivery Dates
2. Weaned Calf to Sell Bred Heifers
3. Summary Report – Production and Financial information
4. Sexed Semen Breeding Costs
5. Sexed Semen AI Summary
6. Bull Cost – Natural Service or Cleanup
7. Natural Service Cost
8. Bull Investment Costs
9. Breeding System Costs
10. Weaned Calf Margin – by Alternative

The calculation helps compare Heat Detected to Timed-AI. The spreadsheet also provides the calculation associated with the use of sexed semen for gender selection. These costs are then compared to the revenue from sales differences.

In calculating costs these are full costs including cash operating costs, depreciation of facilities and equipment, purchased clean up bulls, management and labor and general and administrative costs. Breeding costs, although important they are less than 10% of total the value of a bred replacement or production cost. This should not be an area to try to reduce costs. The focus must be on pregnancy - getting the heifers or cows bred and produce live calves that are market acceptable and for the females to rebreed. Using low EPD birth weight bull semen and clean up bulls is of course a good management practice for replacement heifers. Gender selection adds another value-added dimension to AI breeding.

The actual costs of the breeding system can be variable between systems used. If experience is lacking it would be good to speak with the technician involved. Get as many details as possible on the protocol followed and record the information in the description sheet. Then modify the data in sheets.

Once all is set up its good to print the third sheet and check data. Unusual results are normally a product of data entry so check all input data carefully.

### **Doing “What If” Analysis**

The main reason all is set up in a spreadsheet is to facilitate “what if analysis”. Key numbers to “play around” are gender prices and reproduction. Sexed semen has advantage where gender value is difference. So, it’s very logical when sexed semen will pay. The summary sheets have these variables to easily facilitate the impact of these changes on the final return to producer’s increase in Breeding Cost on return in investment (ROI) on added cost. Because semen is a small part of total breeding cost, the ROI is very sensitive to changes in gender difference and all reproduction rates. The best way to observe this is to change parameters in the summary sheet and watch the change in ROI.

As noted **sex semen is a small component** of the breeding cost and breeding system. All other management, marketing, nutrition and implementation issues must be taken care of before this is a cost-effective breeding system. Failure in any aspect of implementation will result in poor reproduction and economic performance.

## Date Components of the Sex Semen Evaluation

There is a need for be more documented performance data on the use of sexed semen breeding systems for beef cattle. Here are some suggestions on data that needs to be recorded and analyzed.

Description of females exposed for the sexed semen and conventional AI

- Age and body condition score at the beginning of the breeding season and nutritional program followed.

Program of Operation

- Sires chosen- registration number
- Description of the **Synchronization** breeding system protocol – drugs, timing, etc.
- Description of pregnancy testing, calving and weaning system.
- Clean up bulls used, age, breeding soundness exam and number of females per bulls

-Desired data to measure performance for each group – recorded by individual animal

- Date of breeding (s)
- Description of sexed semen used
- Date of pregnancy diagnosis and method used and results
- Date of calving, calving difficulty and sex of calves
- Pregnancy loss
- Calving loss by sex and why
- Loss between calving and weaning by sex
- Sales or transfer date when weaned.
- Weight and gender difference in value
- Written assessment of the experience

This data will be used to calculate the following for the sexed semen and conventional group of females

- Pregnancy rate
- Calving rate
- Weaning rate and weight and production per exposed female and gender value.
- Losses at each stage of production

All this production data can be used to identify reproductive performance and use in economic evaluation of the breeding systems.

A suggested web site for information on sexed semen technology is [WWW.STGEN.com](http://WWW.STGEN.com)  
Many questions are addressed in the sire directory for Sexing Technology Company