

Sexed Semen Beef Cattle Breeding System Economics Decision Aids

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 to natural service. This can be compared to conventional artificial insemination (Conventional AI) using other beef cattle decision aids. Doing “**what if**” analysis is facilitated by decision aids.

Sexed semen can be a part of anyone’s program who is using AI breeding, as all breeding programs do have the most valued gender in mind. The first semen providers adopting this technology as part of semen sales will benefit from the capture of market share for the higher-valued gender. Likewise, producers utilizing sexed semen will gain from the **Gender value difference**. Whether bull or heifer, it is what makes sexed semen a profitable alternative to conventional artificial insemination and natural service.

The economic advantage of the sexed semen breeding system is the result of the revenue difference associated with producing more heifers (or bulls), compared to the added cost of using sexed semen versus conventional AI. Specifically, the added revenue captured by taking advantage of the higher valued gender, less the added breeding system cost, results in a significant return on the investment (ROI).

The other costs in a synchronized AI breeding system do not change, so the semen cost and reproduction rate are the only differences. Currently, sexed semen is expected to produce a conception rate of about 90-95% of conventional semen. The sexed semen is about 90% accurate for the selected gender.

Pregnancy, calving and weaning rates are a result of the entire breeding system including nutrition, management, herd health, synchronized breeding, etc. Semen is one component of the breeding costs, and it is not significant. In order to put semen cost into perspective the decision aids calculate semen cost as a percent of total cost of production.

The potential is being realized in the seedstock sector and has opportunity when considering the difference in gender value of F1 replacement females. Current calf price difference between steers and heifers in the commercial cattle market provides profitable opportunity for using sexed semen to increase revenue.

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

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

- Sexed semen pregnancy rate is assumed to be 92% 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 reported.
- Pregnancy loss and calving to weaning losses can be varied by the user's date input across breeding systems. This is often a data limitation as one would expect the AI system 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.
- 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 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 using the same genetics, 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 total breeding cost. This will help keep breeding cost into proper total 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 total cost per head.
- **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 ranchers producing replacement heifers. Heat detection, although costlier as it requires more labor and management than 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 system and total production cost.

For the AI breeding system economic evaluation decision aids see:

Sexed Semen Based Breeding Systems - Economics of Alternative Uses

1. Sexed Semen AI Advantage Steers Vs. Heifers
2. Replacement Heifer Sexed AI Vs. Natural Service
3. Replacement Heifer Sexed Semen Vs. Conventional AI
4. Seedstock Sexed Vs. Conventional AI Bulls Vs. Heifers
5. Sexed Semen AI Replacement Heifer Budget*
6. Replacement Heifer Reproduction Standardized Performance Analysis (SPA)

*Allows comparison of AI to Natural Service.

The Market:

The market for quality bred heifers should be good give herd size in Texas!

Size of Herds Head	Number of Operations	% by Herd Size	Head of Beef Cows	% by Herd Size	Average Sized Hd.
1 to 9	50,282	37.5%	236,773	5.2%	5
10 to 19	30,075	22.4%	405,812	8.9%	13
20 to 49	33,070	24.6%	976,043	21.3%	30
Less than 50		84.5%		35.4%	
50 to 99	12,142	9.0%	804,074	17.6%	66
Less than 100	125,569	93.5%	2,422,702	53.0%	19
100 to 199	5,567	4.1%	727,048	15.9%	131
200 to 499	2,351	1.8%	671,652	14.7%	286
500 or more	763	0.6%	751,340	16.4%	985
200 or more	3,114	2.3%	1,422,992	31.1%	457
Total	134,250		4,572,742		34
Texas - % of Total U.S.	18.4%		14.4%		

Sexed Semen Beef Cattle Economics Decision Aids - Set of Slides

Choosing Breeding System Requires Defining Objectives and Goals

- Size of cow-calf operation is a key driver for earnings expectations.
- Producing cattle that meets the **market demand**.
- Having a controlled breeding season.
- Seedstock – again meeting market demands.
- Change the cow herd genetics currently used.
- Specialized markets – replacement heifers.
- Retained ownership and or “program cattle”.
- Commit to a high level of labor and management.
- Necessity for making a living in the cattle business.

You Need to Consider Using Sexed Semen If

- Currently using conventional AI.
- In seedstock business.
- Producing replacement heifers.
- Changing cow herd genetics.
- Using a crossbred breeding system.

Economic Reality of Breeding Systems

- Breeding cost is irrelevant as % of total production cost or calf value.
- Semen cost is a small percent of costs.
- Pregnancy and value of calves is the key.
- Improved market for cattle and gender produced.

Other Positive Economic Factors With AI

- Fewer herd bulls required.
- Improved genetics with AI.
- More calves born early in breeding season.

Why are Breeding Costs Economically Irrelevant

- The difference in cost is small between breeding alternatives.
- Change in net revenue can be significant.
- You don't save by having a poor or cheap breeding system.

Comparing Breeding System Alternatives

- It all comes down to **added revenue versus added cost**.

Don't Tell the Semen or Breeding Service Provider

- They mostly compete on semen price and service costs.
- Seldom measure or know the benefits to producer.
- All bull owners think **their bull is the best!**
- You can blame providers if anything goes wrong!

Key Variables When Comparing Breeding System

- Gender Value Difference.
- Cattle market difference.
- Pregnancy and weaning percentages.
- Some difference in breeding system protocol cost.

Alternative Breeding System to Compare

1. Sexed Semen AI
2. Natural Service – with same bull genetics
3. Conventional AI

Key Economic Variables – Gender Difference

- Bull or steer price
- Heifer price
- Replacement heifer price
- Weight of weaned calves

Pregnancy and Weaning Percent by Breeding System

- By breeding system – overall % won't differ much.
- Timed AI – 55% to 60% pregnancy
- All systems use cleanup bulls.
- Overall - 88% to 90 % pregnancy – is a goal!
- Calving ease can be improved when using AI.

Replacement Heifers Comparisons

- AI versus natural service.
- Compare breeding system alternatives with the same genetics.
- Same **initial heifer cost** and production costs.
- You **buy a profit** when purchasing heifers to breed.
- Synchronized breeding easier to employ with heifers.

Females Must be Managed Correct

- Breeding system can't solve poor female management.
- All starts with proper female management.
- BSE for cleanup bulls.
- Breeding protocols must be implemented.

Rely on a Top Professionals Team to Assist

- Breeding service and semen (genetics) provider.
- Your veterinarian.
- Your auction barn owner for the market information.

Breeding Systems Do Differ

- Protocol and semen costs differ. Not much as % of total cost.
- Cleanup bulls' (genetics) costs are the same for fair comparison to AI.
- Management requirement of system.
- Need to get the professional team to be involved.

TAMU-Ag. Econ. Spreadsheet Decision Aids

- Organization of date and assist in doing the calculations.
- Facilitate "What if" analysis.
- Make an effort to get your data.
- Measure results – start with this last breeding season.

Steps for Implementation

- Get information and choose breeding system **with team**.
- Team can assist in choice of genetics to use.
- Do the economic budget or projection of expected results.
- Get your plan down on paper.
- Get the job done correctly. Timing is critical.
- Document your performance.

Buyers of Replacement Heifers

- Heifers produced under AI requires a superior production system.
- Early calving can be a productive life attribute.
- These AI produced replacements are worth more!

Get Your Management Information System (MIS) in Place

- Quick Books™ for accounting.
- CattleMax™ for production record.
- SPA reproduction – use TAMU spreadsheet.
- Use spreadsheet-based decision aids.

Recall you manage what you measure!

See Sexing Technologies information

WWW.STgen.com – Under Beef

Very complete beef cattle information website.

WWW.Jordancattle.com