Incorporating

Artificial Insemination

Into Your Breeding Program

Samantha Lowman

Instructor, Animal Science Department of Agriculture Southeast Missouri State University slowman@semo.edu 573.651.2228



The Decision

Artificial Insemination or



Natural Service

Percentage of Operations by Reproductive Technology used and by Herd Size

USDA APHIS, 2011

Percent Operations

Herd Size (number of beef cows)

	1–49		50-99		100–199		200 or More		Operations	
Reproductive Technology	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error	Pct.	Std. Error
Estrus synchroniza- tion	5.7	(0.9)	10.5	(1.8)	14.9	(2.1)	19.3	(1.9)	7.9	(0.7)
Artificial insemination	5.6	(0.8)	8.4	(1.6)	16.3	(2.1)	19.8	(2.0)	7.6	(0.7)
Palpation for pregnancy	10.8	(1.2)	25.8	(2.6)	41.2	(2.8)	58.3	(2.6)	18.0	(1.0)
Body condition scoring	10.5	(1.1)	19.1	(2.3)	26.8	(2.5)	34.4	(2.5)	14.3	(0.9)
Semen evaluation	10.9	(1 .1)	33.2	(2.7)	45.9	(2.8)	56.8	(2.5)	19.5	(1.0)

- Frozen semen is always available
- Utilize genetically superior sires

 Breed more females at one time to a given sire
 Value-added product due to niche market
- Selection of gender (sexed semen)
- Reduce investment in sires
- Increase bio-security
 - Control disease transmission

- Increase herd productivity
 - In addition to a greater weaning weight due to age and genetics of the calf crop, herd production could improve in other ways:
 - 1. Improve "quality" of retained replacement heifers
 - 2. Early identification of reproductive problems and concerns
 - Freemartins, non-cycling cows, cystic ovaries, etc.

3. "Mating" of specific cows with specific bulls through the use of Expected Progeny Differences (EPDs)

- Enabling genetic inferior cows for a trait (*e.g., weaning weight*) to be mated to an A.I. sire superior for that trait

4. Easier compilation of performance data on cows (& their calves)

 Could help to improve future breeding/culling decisions in your herd if they are individually identified when inseminated



Don't have to worry about moving bulls...

... from pasture to pasture!



Disadvantages of Using Artificial Insemination

• Cost of semen

- \$5.00 to \$500.00/dose

- Extra facilities and labor to handle cattle
- Does not totally replace the use of bulls
- Requires increase in record management for estrus detection and insemination times
- Females must be cycling and in good body condition

Major Areas In Which Management Expertise for AI Must Be Exerted

- 1. Semen Tank Management
- 2. Semen Handling
- 3. Insemination Technique
- 4. Estrus Detection

Nitrogen Tank – Double walled container with vacuum between the Inner and Outer walls. Insulation between walls slows evaporation of the liquid nitrogen for 4-16 weeks.





- Place the tank where it can be observed daily Watch for condensation or frost on the tank.
- Check the amount of nitrogen in the tank once a week. Never allow level to go below 3 in.
- 3. Lock the lid on the tank to keep semen from being tampered with.
- 4. Inventory record of number and location of each bull in tank.
- 5. Do not keep semen in the neck of the tank for more than 5 sec. as this will damage semen over time.

Handling of Semen



Figure 24.1 – Cross-section diagram of liquid nitrogen tank used to store semen. Adapted from American Breeders Service. OSU Beef Cattle Manual, 5th Edition, page 208

Proper Thaw Bath Temperature





<u>Always</u> use a thermometer to monitor water bath temperature

Universal Thawing: 90° – 95° F

For a minimum of 40 sec. (30-60 sec.)

Make sure you do not thaw more straws of semen than you can deposit in the cows within 10 - 15 minutes

Insemination Technique

Completely Dry the Straw of Semen

- Water is toxic!
- Load the straw into the AI gun
 - Make sure the AI gun is not cold needs to be the same temperature as water bath!
- Prevent Cold Shock
 - Results in permanent sperm damage
- Deposit semen in the *uterine body* of the cow
- Record AI Breeding Date and Double Check Bull and Reg.# on Straw of Semen when finished with the insemination process



Estrus Detection

- The success of any estrus-based artificial insemination program requires detecting animals in standing estrus and inseminating them at the correct time relative to detection of estrus

	Effect of Estrus Detection Rate on Pregnancy Rate									
Estrus Detection										
Rate	95%	90%	85%	80%	75%	70%	65%	60%	55%	
Conception Rate	70%	70%	70%	70%	70%	70%	70%	70%	70%	
Pregnancy Rate	67%	63%	60%	56%	53%	49%	46%	42%	39%	

G.A. Perry, J.C. Dalton and T.W. Geary, 2011



Pregnancy Rate = Estrus Detection Rate x Conception Rate

Estrus Synchronization

When administered properly:

- Effective management tool that can be utilized to facilitate artificial insemination or natural service
- Several protocols exist for synchronization of estrus and ovulation
 - Selection based on: body condition score, days postpartum, and producer resources

Key Points to Consider!

Before you start an estrus synchronization and Al program, ask yourself:

- What has the pregnancy rate in your cows been over the past few years?
- What is the length of your breeding season?
- What was the body condition score of your cows at calving?
- What is the current body condition score of your cows?
- How many days postpartum will your cows be when estrus synchronization is initiated?
- What portion of your cows will be cycling by the start of the breeding season?

Please feel free to contact me if you have any questions.

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