

ASA Presentation Notes Lesson 6.2

Unit Name: Unit 6 - Animal Reproduction

Lesson Topic: Lesson 6.2 Generating Generations

Presentation on: Livestock Breeding Systems

Breeding Systems.

- Straight breeding.
 - Mating animals of the same breed.
 - Purebreds, inbreeding, out crossing, and grading up.
- Crossbreeding.
 - Mating animals of different breeds.
 - Two-breed crosses, three-breed crosses, and rotational breeding.

Straight Breeding.

- Animals maintain qualities of ancestors.
- It is used mostly in the production of breeding stock.
- Purebreds are eligible for registration.

Types of Straight Breeding.

- **Inbreeding** and **line-breeding** involve the crossing of related individuals.
 - Desirable traits more visible, undesirable traits more visible.
- **Out-crossing** is the mating of animals of different lineage within the same breed. It is the most popular system of pairing animals.
 - Animals are not closely related, but are within the same breed.

Crossbreeding.

- Combine qualities of two or more breeds.
- Tends to result in offspring that are superior to the contribution of each parent.
 - Heterosis, or hybrid vigor, is the increase in productivity of offspring above the average of the parents.
- Used mostly in the production of market animals.

Livestock Breeding Methods.

- Natural Breeding (a.k.a. Live Cover)
 - Pasture Breeding.
 - Hand Breeding.

- Artificial Insemination.
- Embryo Transfer.
- Cloning.

Natural Breeding.

- Two methods:
 - **Pasture breeding** – Females are kept in pasture with the male. The male physically mounts female and deposits semen on his own.
 - **Hand breeding** – Females are kept separately from males. The males are brought to females in heat and allowed to mount by the breeder. The breeder controls both animals at all times.

Artificial Insemination (A. I.)

- **Advantages.**
 - Use superior male genetics.
 - Faster genetic improvement.
 - Frozen semen may be stored and transported around the world.
 - Can be less expensive – no need to own a sire.
 - Safety – aggressive males.
- **Disadvantages.**
 - Labor intensive – have to monitor heat cycles of females carefully.
 - Requires training.
 - Decreases genetic diversity.
 - Conception rates.

Embryo Transfer.

- **Advantages.**
 - Takes advantage of superior female and male genetics.
 - Females can have more offspring per year.
- **Disadvantages.**
 - Requires skill – vet may be required.
 - Expensive and may only yield a few viable embryos.

Cloning.

- First vertebrate cloned – Dolly the sheep 1996.
- Cattle successfully cloned in 1998.
- May be done using cells that haven't yet specialized or adult cells.
- Very costly process.
- Many potential benefits.

Estrus (Heat) Detection.

- Done prior to artificial insemination to ensure semen is delivered at the right time.
- Methods vary by species.
 - Visual observation.
 - Teaser (i.e., sterilized or intact male)
 - Heat mount detectors.
 - Computer chip based systems.

Estrus Synchronization.

- The use of synthetic hormones to make a group of females come into heat at the same time.
- Benefits.
 - Large number of calves in the same time frame.
 - Essential for successful embryo transfer programs.

Semen Collection and Freezing.

- Collection methods.
 - Artificial vagina.
 - Electroejaculator.
- Fresh semen only usable for 1-2 days, more practical in most cases to freeze it using liquid nitrogen.
- Semen tanks kept at -112 degrees.

Semen Handling.

- Semen must be kept free of:
 - Chemical threats.
- Cleaners, disinfectants, spermicidal lubricants.

- Thermal threats.
- Temperature can't be increased above body temperature of animal.
- Temperature can't be lowered quickly.

Semen Freezing and Thawing.

- Thawing.
 - Done in warm (i.e., 90-95 degree) water for a minimum of 40 seconds.
 - Must be kept warm until use.

Semen Evaluation.

- Evaluated to determine potential fertility of a sample.
- Based on:
 - Sperm concentration.
 - Sperm motility.
 - Sperm morphology.

ASA Reflection Page

List 5 key points that are important to remember from this presentation.

- 1.
- 2.
- 3.
- 4.
- 5.

List 3 ideas or concepts that this new information has in common with previous things learned.

- 1.
- 2.
- 3.

List questions or ideas that remain unclear about the information presented that should be asked for clarity at the appropriate time.