

# CASE

*Curriculum for Agricultural  
Science Education*

**Principles of Agricultural Science – Animal**

# Livestock Breeding Systems

Unit 6 – Lesson 6.2 Generating Generations

# Breeding Systems

- Straight breeding
  - Mating animals of the same breed
- Crossbreeding
  - Mating animals of different breeds

# Straight Breeding

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



# 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
- Used mostly in the production of market animals.



# Livestock Breeding Methods

- Natural Breeding (a.k.a. Live Cover)
  - In natural breeding the male physically breeds the female.
    - Pasture Breeding
    - Hand Breeding
- Artificial Insemination
- Embryo Transfer
- Cloning

# Natural Breeding

- Pasture Breeding
  - The male physically mounts female on his own while animals are in the pasture.
- Advantages
  - Is easiest for producer
- Disadvantages
  - Lower conception rates
- Hand Breeding
  - The males are brought to females in heat and allowed to mount by the breeder.
- Advantages
  - Higher conception rate
- Disadvantages
  - Intensive for producer

# 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

# References

- Gillespie, J.R., & Flanders, F.B. (2015). *Modern livestock and poultry production (9th ed.)*. Clifton Park, NY: Delmar.
- Herren, R. V., & Donahue, R. L. (2000). *Delmar's agriscience dictionary with searchable CD-ROM*. Albany, NY: Delmar.
- Selk, G. Artificial insemination for beef cattle. *Oklahoma cooperative extension service fact sheet*. Retrieved from <http://www.thecattlesite.com/articles/721/artificial-insemination-for-beef-cattle/>
- Taylor, R.E. (1992). *Scientific farm animal production: An introduction to animal science*. New York, NY: Macmillan Publishing Company.