Terminology

• Purebred vs Commercial
  • Purebred is a registered animal whose ancestors are from many generations of a recognized breed
  • Commercial breeds are not registered, more common and tend to be crossbreeds

• Polled vs Horned
  • Polled cattle are born without horns. Cattle that are not polled should be dehorned to prevent injuries to humans and in the feedlot.

• Dairy vs Beef Breeds
  • Just like there are different breeds of dogs, there are different breeds of cattle. Overtime dairy cattle were selected for their milk production while beef breeds were selected for their ability to gain muscle mass.

• *Bos indicus* vs. *Bos taurus*
  • Most beef breeds in the NE are *Bos taurus* which include European continental, British, or a mixture. *Bos indicus* breeds were developed in India and East Asia, and were selected for their heat tolerance and disease resistance.

• Maternal vs Paternal Breeds
  • Maternal traits include mothering ability, fertility, low rates of dystocia, and milk production
  • Paternal or terminal traits are known for their efficient rate of weight gain and carcass yield
Selecting Breeds

• Before selecting breeds, consider:
  • **Production system** - The breeds chosen need to produce calves that are appropriate for their end use.
  • **Market demands** - USDA grade and conformation can influence market prices received and should be considered when selecting breeds.
  • **Quantity and quality of available feed** - Breeds selected should have mature sizes that are appropriate for the operation’s feed resources and environment.
  • **Climate** - *Bos taurus* breeds are better suited for the North East, warmer climates have *Bos indicus*
  • **Cost and availability** of purebred seedstock
Selecting Breeds

• In most cases the income source from a beef operation will come from the calves produced each year.
  • Cows Should:
    • Produce a calf at least every 12 months.
    • Maintain their body condition without becoming overly thin or fat
    • Raise a calf with an average weaning weight that meets your goals.
British Breeds

• British breeds of cattle were developed in England and Scotland and brought to the United States between the 1700-1800’s.
  • Developed to transform forage and grasses into high quality beef. They thrive in environments with limited feed resources.
  • Mostly maternal breeds- they excel in fertility, milking, longevity and have lower rates of dystocia
  • British breeds are generally smaller in size, reach maturity at an earlier age, attain higher quality grades, and tend to yield carcasses with a lower percentage of saleable product.
  • Angus, Hereford, Galloway and Shorthorn are common British breeds.
Continental European Breeds

Continental European breeds were developed as dual purpose animals where the females were used for both beef and dairy. The males were used as draft animals, then processed into beef.

- In general these breeds are larger in size, courser in stature, and heavier in milk production.
- Tend to mature at a later age, produce leaner carcasses with a higher percentage of saleable product, but have lower quality grades and tend to have more calving difficulty.
- Charolais, Gelbvieh, Limousin, and Simmental are common breeds.
Crossbreeding

Crossbred animals combine the strengths of the various breeds used to form the cross. The goal of a well-designed crossbreeding program should optimize the advantages of heterosis and breed complementarity.

- Breed complementary- Ability to combine traits from two or more breeds into one animal.
- Heterosis or hybrid vigor is a percentage of improvement observed over the average of two mated breeds.
- Crossbreeding systems for a beef herd are not a one size fits all. The most common and effective systems used on small beef herds include:
  - Two breed rotations
  - Two-breed back cross
  - Three-breed terminal rotation
Crossbreeding

• Common examples of successful crossbreeding:
  • The Brangus- Developed from Brahman and Angus stocks, is notable for its resistance to heat.
  • Beefmaster-Hereford, Shorthorn and Brahman-well rounded and able to handle tough conditions, good disposition, fertility, weight, conformation, hardiness and milk production.
  • Black (or red) Baldy- Produced by crossing Hereford with an Angus. Have a great mothering ability and produce smaller calves to reduce dystocia
  • SimAngus- Simmental and Angus hybrid that carries qualities of both breeds making leaner, more efficient grain converters
Controlled Breeding Season

Efficiency is key in order to profit from the operation, and managing the cow herd to calve in 90 days or less can be one of the most important steps.

Advantages of a controlled breeding season include:

- Reducing the number of times necessary to gather cattle for vaccinating and weaning, therefore reducing expenses and using labor more efficiently
- Marketing a more uniform calf crop.
- Cow nutritional management can be improved when all cows are in the same stage of production
- Easier to select replacement heifers and identify cows that need to be culled based on performance records
- Average calf weaning weights are increased
- In general herd health and management is better facilitated with a shortened calving season.
Reproduction

• Many factors influence the reproductive success of cows.
  • The season or time of year that calves are born influences the calf crop percentage and should be dictated by the available forage supply, labor and market for the calves.
  • Body condition scoring is important- inadequate nutrition will result in delayed rebreeding, later calving dates and a decreased calf crop percentage.
• Failure to come into heat is the most common reason that first calf heifers and thin cows fail to become pregnant.
• Dystocias are also common in first calf heifers, due to their tendency to have a small pelvic opening.
• Reproductive issues can occur with either the male or female...
Bull Anatomy

- The male reproductive system is controlled mostly by the hormone **testosterone**
  - Responsible for the development and maintenance of the secondary sex characteristics associated with masculinity, such as the crest and heavily muscled shoulders of a bull
  - It is a major factor in the normal sex drive and behavior of the male
  - It increases muscular and skeletal growth
  - It is essential for normal sperm formation.
- If using your own bull, a recommended breeding soundness examination of the bull’s reproductive tract and a semen evaluation can be done by a qualified technician or veterinarian.
- Reduced fertility and sterility can also be caused by:
  - Sickness (fever)
  - Frostbite
  - Overfeeding
  - It only requires a minimal increase in scrotal temperature to cause sperm cell death.
Cow anatomy

The primary female reproductive organ is the ovary. The cow's two ovaries are oval to bean-shaped and located in the abdominal cavity. It has two main functions:

- To produce the female reproductive cell (the egg or ovum)
- To produce the hormones estrogen and progesterone. Normal reproduction in the female depends on these hormones

The secondary sex organs are a series of tubes that receive semen, transport sperm to the egg so it can be fertilized, nourish the fertilized egg (embryo), and allow the calf to be birthed.

- These include the vagina, cervix, uterus, uterine horns, and oviducts
What is estrus period or standing heat?

- **Estrus**: When the female is receptive to be bred. Occurs every three weeks (18-24 days).
- **Estrous cycle**: The time from one heat period (menstrual cycle) to the next.
Beef cow gestation period: 283 – 285 day (9 months)

• Estrus period length: 12-18 hrs. after onset of heat (standing heat)

• Length of estrus cycle: 19 -21 days
Recommendations for breeding success

- Identify all animals with ID.
- Good recordkeeping
- Designate one person in charge of heat detection
- Watch for heat twice daily or more about 30 minutes.
- Have a designated pasture for heat detection.
- Watch for grouping activity
- Use heat detection aids and watch for visual heat.
- Synchronize with prostaglandins to cycle groups of cows.
- Make sure there are no lame cows. Cows with sore feet will not stand to be mounted.
- Follow your protocols and document all activities.
Estrous Cycle

• **Primary Signs**
  • Period of estrus last about 15 hours. (12-18hrs)
  • Watch for standing heat in the early morning and late night.
  • Not a lot of activity in the barn, cows are fed.
  • Ideally; every 6 hours but unrealistic.
Signs to look for before standing heat.

- 6-10 hours before standing
- Will not stand to be ridden
- Bawling and walking a fence line searching for a bull
- Nervous and restless
- Smelling other cows
- Riding other cows
- Moist, swollen, red vulva
Signs to look for during standing heat

• 6-24 hours during standing
• Stands to be ridden
• Nervous and restless
• Grouping
• Rides other cows in standing heat
• Hair is rubbed off tailhead
• Mud on both sides of flanks
• Moist, swollen, red vulva
• Clear mucous discharge
Clear mucus discharge
Signs after standing heat

- 10 hours later after standing heat
  - Will not stand to be ridden
  - Clear mucous discharge

- 1-3 days later after standing heat
  - Bloody mucous discharge
  - Too late to inseminate
Heat Detection Aids

- Crayon Markers
- Tail Paint
- Kamar Patches
- Heatmount Patches
- Electronic mounting activity detector
Crayon Markers

- Tail marking is the most inexpensive method. Comes in several colors.
- Mark in a band on the tailhead from hooks to pins. When the cow is in standing heat the crayon is rubbed off by the animal doing the mounting.
Tail Paint

• Same as a crayon but liquid and aerosol form.
• Comes in several colors
• Mark in a band on the tailhead from hooks to pins. When the cow is in standing heat the paint is rubbed off by the animal doing the mounting.
Kamar Patch

- Glue to the rump of the cow on the tailhead.
- Kamar is activated when cow is standing to be mounted.
- Kamar turns red when pressure is applied to the capsule embedded on a fabric patch.
Heatmount Patches

• Similar to scratch off tickets
• Place sticky patch on tailhead and when in standing heat the surface is rubbed off exposing a neon color.
Electronic Mounting Activity Detector

• A pressure sensitive battery powered patch that mounts to the tailhead.
• Pressure signals a light thru radio signal that is connected to the computer and records activity.
CIDR – Used in Timed AI Synchronization
Reproduction is the most important factor in cattle profitability.

**Natural Service**
- Bull breeds female multiple times during standing heat.
- Use one bull with 30 females.
- Eliminate need for heat detection.
- No investment in semen costs and supplies.
- Bulls behavior are unpredictable.
- Will not know infertility, low libido, or diseases until too late. Have bull tested for fertility.
- If bull hurts themselves, investment is costly.

**Artificial Insemination**
- Human Safety
- Use variety of sires
- Less chance to spread disease; infections.
- Reduce inbreeding
- Reduce dystocia by using calving ease (CE) sires.
- Accurate records: know projected calving dates and dates needed for vet herd checks.
Questions?

"They've got good working conditions here but they have a lousy retirement plan."

~ R. Stubler ~