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# Beef Facilities and Management at MARC

W. Gordon Hays and Gary S. Ross<sup>1</sup>

The Cattle Operations Unit functions as a support service to the research scientists and maintains the animal populations necessary for our livestock research. Indirectly, this also involves responsible land management and herd health procedures. All the facilities and procedures employed in maintaining the extensive cattle herd are determined by research needs. Consequently, while providing a function sometimes indirectly related to research, the operations unit is necessary to provide adequate feedstuffs and healthy animals for research studies.

## Cattle Management

The cow herd of 7,300 breeding age females are managed so that 80% of the cows and heifers will calve during the spring season (March through May) and 20% will calve during the fall season (August through early October).

Yearling heifers are bred two to three weeks before the mature cow herd. About half of the heifers and cows are bred naturally and the other half artificially inseminated (A.I.). The A.I. seasons vary from 25 to 45 days depending on experimental requirements. All cows are exposed to natural service sires following the A.I. season.

In many populations all heifers are retained for breeding. Because of the high heifer retention rate a very young cow herd is maintained. Also many prime age pregnant cows become excess to the research needs each year. These females as well as a limited number of bulls are sold in two production sales. The first auction sale is held in late January. Pregnant spring calving cows and mature herd bulls are sold at that time. An early May sale merchandizes excess fall calving cows and yearling bulls.

## Facilities

**Cow-Calf Polesheds.** Nine polesheds at MARC are used for maintenance of the breeding herd. Each barn functions as a working area, with general-purpose facilities designed for calving, artificial insemination, pregnancy checking, data collection, and routine processing of the cattle herd. These facilities generally include a scale, squeeze chute, calf-pulling stall, and individual pens (ranging from 10 to 25, depending upon use in cow or heifer calving areas). Individual pens are used primarily in the spring during the main calving season and are used either after assistance to the cow or heifer during calving or to provide assistance to the calf in cases of severe chilling, poor mothering, or sickness. Corrals are used to hold or sort cattle. Each area is equipped with a "hot house," which is a heated office and supply area.

**Bull Barn.** This area is used for routine processing, semen collection, and special research studies. Pens are available for holding and sorting bulls. A heavily constructed squeeze alley and chute are used for processing and semen collection. The hot house includes an office and lab for semen evaluation.

**Feedlot.** Over 5,000 calves and assorted other cattle are fed in the feedlot, primarily in the winter. This number includes animals which will be used in the breeding herd, animals fed for slaughter and cows for reproduction studies.

<sup>1</sup>Hays is the cattle operations manager, and Ross is the herd health veterinarian, MARC.

Performance and puberty studies are routinely conducted on many of the young calves as part of genetics studies. Approximately 80% of the calves are born in the spring and come to the feedlot in the fall at an average age of six months. Twenty percent of the calves from the fall calving herd enter the feedlot at approximately five months of age.

**Multipurpose Building.** The main processing facility is a pre-engineered metal building, fully lighted and heated, with concrete flooring. The working facility includes a circular squeeze, working alley, scale, and chute. Fifteen pens are used for sorting and holding. There is also an office and lab area. A reproductive physiology lab is a separate, thermally controlled area specifically designed for embryo transfer and other cattle physiology research.

**Scalehouse.** This is a metal building which functions as the main treatment area and as office headquarters for the feed-truck drivers. A working alley, scale, and chute are included in this area, as well as sorting pens and sick pens.

**Poleshed.** This barn functions as a sale facility. There is a heated office and sale ring.

**Cattle Confinement Area.** There are 11 pre-engineered metal buildings with a total animal capacity of 1,500 head. They are used mainly for intensive nutrition, reproduction, or environmental research.

The cattle surgery facility includes a prep room, surgery room, recovery stalls, lab, and office. Four barns are equipped with individual headgates for intensive feeding studies. Two of these accommodate cows with calves and have been used predominantly for cow efficiency studies. The other two are used for postweaning experiments requiring individual feed consumption data.

A specially designed barn includes 12 metabolism crates, used to study animal utilization of nutrients. In addition, 36 stalls equipped with headgates are primarily used for studies requiring frequent collection of blood samples for hormonal determinations. Three hood calorimeters are used for fasting heat production studies. A nursery has been developed for artificial rearing of calves for specific research studies. The barn also contains a laboratory.

Two self-cleaning buildings are equipped with flushing gutters and are used for total confinement research. Working facilities include an office, lab, crowding area, working alley, scale, chute, and sorting pens.

## Land Management

The land is managed so that 27,000 acres of cool and warm-season grasses are used as pastures. Twenty-five thousand acres are used for the cattle herd. Cows are maintained on pastures year-round and supplemented with hay and/or silage in the winter. Heifers are supplemented with a haylage-corn silage diet through their first calving. Bulls are managed similarly to the cows.

Six thousand acres of land are irrigated for crops and hay production. The two main feedstuffs produced at MARC are alfalfa and corn silage. The first cutting of alfalfa is chopped for haylage and subsequent cuttings are harvested for hay. Corn acreage produces 50,000 tons of silage. (All feedstuffs are used for both the sheep flock and the beef herd. Corn is also a major component of the swine diet.) Additional acreage includes irrigated pasture and small grains used for forage and feed.



## Herd Health Procedures

The herd health veterinarians and staff work closely with cattle operations personnel to assist in the efficient managing of these areas. The University of Nebraska Great Plains Veterinary Education Center faculty and Kansas State University College of Veterinary Medicine students work closely with the MARC herd health veterinarians to provide care for the research populations.

Quarantine of purchased animals and testing for evidence of disease; monitoring the causes of sickness and death; and the monitoring of blood antibodies to various important diseases are procedures used to prevent disease and to determine which diseases need to be controlled by vaccination programs. The following are the vaccination and routine processing procedures for heifers, cows, calves, and bulls.

*Heifers:* Prior to their first breeding season, yearling heifers are injected with modified live virus (MLV) IBR-BVD (infectious bovine rhinotracheitis - bovine viral diarrhea), 5-way leptospira/vibrio in oil, and 7-way clostridial vaccines. Approximately 70 days after the end of the breeding season, heifers are palpated for pregnancy, injected with ivermectin for parasite control, and vaccinated against *E. coli* bacteria. Prior to calving, brands are clipped, and the heifers are given a booster *E. coli* and 7-way clostridial vaccine and a Vitamin A and D injection.

*Cows:* After calving and before breeding the cows are given the same vaccines as the heifers (except the MLV IBR-BVD which is given to the cows on even numbered years). At 70 days postbreeding, they are pregnancy checked and treated for external and internal parasites (ivermectin). Prior to calving they receive the same booster vaccinations and vitamin injections as the heifers. Fly control among breeding stock is achieved by the use of insect impregnated ear tags and periodic group spraying with appropriate insecticides. Cows become excess for research if they fail to conceive or are no longer needed for their projects.

*Calves from Birth to Maturity:* At birth, all calves are identified, weighed, dehorned (caustic paste), the navel disinfected with iodine, and vaccinated against viral scours. Depending on the research project, some bull calves may be castrated. Prior to the cow breeding season, the calves are vaccinated with 7-way clostridium and 5-way leptospira vaccines. Approximately three weeks prior to weaning, they receive a second dose of clostridial and leptospira vaccines along with (MLV) IBR-BVD. At weaning no vaccines are given, but the calves are weighed and sorted to group pens in the feedlot. One month postweaning the calves receive a booster (MLV) IBR-BVD vaccination and are given ivermectin for parasite control. Strain 19 brucella vaccine is given to heifers at approximately 8-9 months of age. A majority of the bulls are castrated following weaning with a bloodless banding technique. At one year of age some of the bulls are sold as breeding stock, and the rest of the heifers, bulls, and steers are either used in research studies or are fed out for slaughter. Standard disease identification signs and treatment procedures are used in the cow-calf areas and at the feedlot for all calves to ensure uniformity of treatment and compliance with accepted meat quality assurance programs.

*Bulls:* At the end of the growing period (1 yr), bulls are vaccinated with (MLV) IBR-BVD, 7-way clostridium, and 5-way leptospira. Subsequently, they are treated for external parasites in the fall, and vaccinated with (MLV) IBR-BVD on even numbered years prior to breeding season. Breeding soundness examinations are conducted on all bulls prior to the breeding season.

Each fall all cows and heifers 24 months of age and older and all bulls nine months and older are tested for brucellosis. This has been done since 1988 and the MARC cattle herd is Certified Brucellosis Free.