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Cattle Management at MARC

Margaret S. McAlhany, W. Gordon Hays, and William G. Kvasnicka¹

The Cattle Operations Unit is designed to function as a support area to the research scientists. The operations personnel maintain 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.

Facilities

Cow-Calf Polesheds. There are nine polesheds at MARC employed in maintenance of the 7,000-cow breeding herd. Each area functions as a working area with general-purpose facilities designed for calving, artificial insemination, pregnancy checking, and routine processing of the cattle herd. These facilities generally include a scale, manual 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 for holding or sorting cattle. Each area is equipped with a "hot house," which is a heated office and supply area.

Construction of the polesheds (and other polesheds at the center) makes use of military surplus railroad ties for supports and surplus sheet metal for siding and roofing. Rafters are made of wood, and floors are all dirt except for concrete in office and working areas.

Bull Barn. Construction is similar to cow-calf polesheds. 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. A special area is designed for libido evaluation. The hot house includes an office and lab for semen evaluation.

Feedlot. Five thousand five hundred 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 which will be fed for slaughter, cows for reproduction studies, and breeding bulls. Performance and puberty studies are routinely conducted on many of the young calves as part of genetics studies. Approximately 80 percent of the calves are born in the spring (3,900) and come to the feedlot averaging 6 months of age in the fall. Twenty percent (800) of the calves from the fall calving herd enter the feedlot at approximately 5 months of age.

Multi-Purpose 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 pre-engineered metal building which functions as the main doctoring 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 and physiology facility. It includes a working alley and chute. There is a heated office and a sale ring. Holding pens are used predominantly for embryo transfer donor cows.

Cattle Confinement Area. There are 11 pre-engineered metal buildings in this area. Total animal capacity is 1,500 head. It functions mainly as an area for intensive nutrition or reproduction research.

One building is designed for research as a cattle surgery facility. This building 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 are designed to accommodate cows with calves and have been used predominantly for cow efficiency studies. The other two are used for post-weaning experiments requiring individual feed consumption data.

A specially designed barn includes 12 metabolism crates used to study animal utilization of nutrients. In addition, thirty-six stalls equipped with headgates are primarily used for studies requiring the frequent collection of blood samples for hormonal determinations. Three 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 lab.

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

Laboratory Complex. Of the four buildings in the main office and laboratory complex, two are used frequently for beef cattle studies. The meats complex contains an abattoir and a sensory evaluation area (taste panel) which are used extensively for carcass evaluation studies. The ag engineering unit has an animal laboratory area equipped with environmental chambers. These chambers can be adapted for any of the animal species studied at MARC, but cattle studies have focused on the effect of the thermal environment (temperature and humidity in particular) on the performance of feedlot and breeding cattle.

Necropsy Building. This building is equipped with a dissection room, holding cooler, lab, and office area. It is used by MARC veterinary staff to autopsy any animals that die and to determine the cause of death. This is a routine procedure to monitor any changes that might occur with regard to herd health status.

Land Management

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

Six thousand acres of land are irrigated for crops and hay production. The two main feedstuffs produced at MARC are alfalfa (2,300 acres) and corn (3,000 acres). The first cutting of alfalfa is chopped for haylage and subsequent cuttings harvested for hay. Corn acreage yields an annual 35,000 tons of silage and 200,000 bushels of corn. (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.

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General Management Practices

The cow herd is managed so that 80 percent of the cows and heifers (4,200 head) will calve during the spring calving season (March through May). Another 1,000 head will calve during the fall season (August through early October). Calf survival each year ranges from 92 to 93 percent.

First-calf heifers are managed to start calving two weeks ahead of the cows, so the breeding season begins the end of May for heifers. They are bred during a 45-day mating season with yearling bulls. The breeding season for cows starts with 30 days of artificial insemination and ends with a 30-day natural mating period. Average conception rate, combining heifers and cows, is 88 percent.

A very young cow herd is maintained to meet research objectives. Approximately 40 percent of the breeding herd is composed of yearlings and two-year-old cows. Many prime-aged (three- to six-year-old) pregnant cows are merchandised each year in a bred cow sale. Excess breeding bulls are also sold in this manner.

Herd Health Procedures

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 killed BVD-IBR-PI3 (bovine respiratory disease-infectious bovine rhinotracheitis-parainfluenza), 5-way leptospirosis, vibriosis in oil, 7-way blackleg, and Haemophilus vaccines. Approximately 70 days after the end of 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 heifers are given

E. coli, 7-way blackleg, and vitamins A and D.

Cows. After calving and before breeding, cows are given the same injections as heifers. At 70 days postbreeding, they are pregnancy checked and treated for external and internal parasites. Prior to calving, they receive the same treatment as heifers. They are also culled after pregnancy detection if they fail to conceive or are no longer needed for research needs.

Calves from Birth to Maturity. At birth, all calves are dehorned (paste) and vaccinated against viral scours, and the navel is treated with iodine. Depending upon research projects, some calves may be castrated. Prior to the cow breeding season, the calves are vaccinated with 4-way blackleg and 5-way leptospirosis. Three weeks preweaning, calves are preconditioned with a parasite control agent and are vaccinated with killed BVD-IBR-PI3, 4-way blackleg, 5-way leptospirosis, and Haemophilus. This year one-half of the calves are also being vaccinated with an experimental serum for bovine respiratory syncytial virus (BRSV) when preconditioned and again at weaning. At weaning time, they are vaccinated a second time with killed BVD-IBR-PI3 and Haemophilus. One month postweaning, brucellosis vaccine is given to heifers. At one year of age, some of the bulls and heifers enter the breeding herd. Some of the bulls are sold as breeding stock, and the rest of the heifers, bulls, and steers are either used for research studies or are fattened for slaughter.

Bulls. At the end of the growing period (one year), bulls are vaccinated with killed BVD-IPR-PI3, 4-way blackleg, and 5-way leptospirosis. Subsequently, they are treated for parasites and vaccinated with 5-way leptospirosis prior to each breeding season.