

FREEMAN RANCH LIVESTOCK MANAGEMENT

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Livestock operations at the Freeman Ranch serve three main purposes in order to meet the criteria set forth in the will of Mr. Harry Freeman, our benefactor. The first purpose is to maintain the concept of a working Hill Country ranch by using domestic and wild animals to harvest and manage the ranch's natural resources. The second purpose is to serve as a source of laboratory animals for teaching programs at Southwest Texas State University (SWT). The third purpose is to serve as a source of animals for research programs at SWT. The university further utilizes the livestock at the Freeman Ranch as a commercial enterprise to provide income to offset ranch operating expenses. The university strives to operate the ranch as a typical Texas Hill Country working ranch that additionally supports education and research. Because of this, some practices performed on the Freeman Ranch might not be present on a privately owned commercial ranch. The main livestock enterprise is a commercial cow-calf operation with small herds of sheep and swine also maintained as required for teaching and research.

CATTLE

In the commercial cow-calf operation there are 130 mature crossbred cows and 49 replacement heifers. This number varies yearly and is based on forage availability, drought conditions, and the status of the cattle market. The cows are approximately one-eighth to one-quarter Brahman with the remainder comprised of the Angus, Beefmaster, or Gelbvieh breed. The cattle range between 3 and 13 years of age (average = 5.75 years) and have an average frame score of 6.62 (scale = 1 through 9). The selection of superior seedstock and replacement animals leads to lasting genetic improvement by increasing the frequency of desirable traits while decreasing the frequency of undesirable traits. The Freeman Ranch favors genes that improve biological and economic efficiency of beef production. This superior reproductive fitness involves more than conception; the offspring must survive and reproduce the desirable traits. The improvement of the livestock's genetic base is a primary goal of the Freeman Ranch.

Traits selected for on the ranch are those important to the beef industry and include environmental adaptability, disposition, fertility, calving ease, maternal ability, rate and efficiency of gain, carcass merit, market acceptance, and longevity. The primary traits emphasized when evaluating heifers and cows are fertility, structural soundness, growth, and final mature size. Producing a live, healthy calf every 12 months from every cow exposed to a bull is the ultimate goal of the Freeman Ranch cattle operation. A sound skeletal structure is essential for the animal to remain productive for several years in the rocky Hill Country environment. Growth is an important performance trait in cattle because rapid and economical gains are essential for a profitable year. Selection for replacement females at weaning involves removing any heifers that are structurally unsound, undersized or exceptionally large framed for their age, have a unacceptable disposition or show signs of masculinity or coarseness.

The *Freeman Ranch Publication Series* consists of peer-reviewed research and interpretive monographs related to Southwest Texas State University's Freeman Ranch and the Texas Hill Country. James Kimmel and Richard Earl, editors.

A cow-calf crossbreeding operation, such as the one used at the Freeman Ranch, is excellent in demonstrating to students the use of heterosis, or hybrid vigor (the difference in the performance of offspring and the average of their parental breeds). The base bloodlines are a Beefmaster and Brangus herd. The purchase of six Gelbvieh bulls in 1993 for the crossbreeding program have provided the ranch with first filial generation (F₁) females. These females are then bred to Brangus and Angus bulls to obtain both replacement and terminal market offspring.

For educational and marketing purposes, the ranch has two 60 day breeding seasons which provide fall and spring calves to be utilized each semester in several courses taught through the SWT Department of Agriculture. All bulls must pass a breeding soundness evaluation (BSE) 45 days prior to the breeding season or they are culled (removed) from the herd. Heifers are exposed to artificial insemination (AI) or bulls 30 days prior to cow breeding season. This allows all heifers to be calved out (9 months later) prior to the beginning of the mature cow calving season. More attention is required when calving first-calf heifers. The fall calving cows are exposed to bulls between December 15 and February 15. The spring calving cows are exposed between May 1 and July 1. Artificial insemination is used as well; the extent of which depends on the year. The F1 Gelbvieh replacement heifers are artificially bred with Gelbvieh semen and then placed with "clean-up" bulls which will breed any that did not conceive to AI. All cows and heifers are palpated 60 days after breeding to determine conception rate. Any determined to be "open" (nonpregnant) are culled from the herd. Other reasons a female might be culled at this time include cancer eye, bad udder, or broken mouth (loss of teeth).

Body condition scores (BCS) are also determined monthly to aid in ascertaining the nutritional status of all cattle. A monthly fecal sample is collected and analyzed using near infrared spectroscopy (NIRS) techniques along with Nutritional Balance Analyzer (NutBal) software to develop a forage quality profile. This profile is then utilized to develop and update the supplementation program for the cattle operation.

All calves born on the ranch are identified and weighed within the first few days after birth. Identification is by eartag with a number corresponding to their dam's eartag number. Weight is collected by hanging scale and by coronary band measurement above the front hoof. First calf heifers are dry-lotted at the ranch headquarters for calving. This allows constant monitoring for dystocia (difficult calving) or other problems that might arise with the heifers. All mature cows are allowed to have their calves on pasture; the accepted manner of calving on most commercial cow-calf ranches. Spring born calves are vaccinated, dewormed, castrated (males only), and dehorned in early May of each year. Fall born calves are processed as above in early December of each year. Vaccinations given to cows and calves include 7-way blackleg (Blackleg, malignant edema, enterotoxemia and Clostridials), vitamin A, D, and E complex and shipping fever complex (IBR, BRSV, PI3 and BVD plus vibriosis and leptospirosis). While processing cattle during the spring all cows are given a chemically treated eartag for fly control. These tags are removed in the fall of the year. Fly tags are rotated each year between an organophosphate and a permethrin tag to eliminate resistance by flies to the chemicals within the tags. All calves are mechanically dehorned and are dewormed with an avermectin injectable. All male calves are castrated (by knife and emasculator) and given a growth implant (Synovex-C). Computerized production records are maintained on all animals from birth throughout their productive life. Standard Performance Analysis (SPA) is currently used for all cattle production and financial performance analysis. Calf production records include dam and sire identification, date of birth, birthweight, presence of horns, weaning weight, 205-day adjusted weaning weight and selling price. Records on mature cows include weight, frame score, body condition score, and efficiency (pounds of calf produced per cow).

There was an 85% weaned calf crop (number calves weaned divided by number of cows exposed) at the ranch in 1999. The average 205-day weaning weight of calves was 536 pounds; 68 pounds heavier than the previous year (468 pounds) and is 87 pounds heavier than in 1994 (449 pounds).

In 1997, 15 steers were placed in the Texas A&M Ranch to Rail Retained Ownership Program. This was the fourth year to participate in this program that gives carcass and other information to ranchers and

producers. Steers from the ranch ranked in the top quarter of all ranches participating for net profit per steer, yield grade, and quality grade. Freeman Ranch steers ranked in the top of other categories such as average daily gain (3.06 pounds/day), total cost of gain (\$0.57 per pound), fat thickness (0.33 inches), and ribeye area (14.03 inches). The 15 steers averaged a yield grade of 2.10 with a quality grade of 47% choice, 46% select and 7% standard. The program provides valuable performance and carcass information to aid in future breed and bull selection for the ranch.

The ranch also retains females for replacement heifers. Yearling measurements of weight, frame size, body condition score, and pelvic area are collected on all replacement heifers. This information is used to aid in the culling of less desirable animals.

Cattle at the Freeman Ranch are maintained on approximately 4200 acres with 3500 under a modified short-duration grazing system. The system contains three grazing cells each consisting of from three to six paddocks each. Paddocks are grazed for approximately three to ten days and are then deferred (not grazed) for 50 to 60 days. Fencing, excessive brush stands, and general forage condition determine grazing periods. The majority of cross fencing is accomplished via two-strand electric fences. Brush, wildlife, and other factors make maintenance of these cross-fences a very demanding task. Heavy brush encroachment (primary species = *Ashe juniper*) onto the ranch over the last 60 years also poses a problem for the grazing program. Due to the undesirable brush problem, all grazing areas are determined on total grazable acres, not simply on acres alone. The ranch leases an adjoining parcel of land (700 acres) consisting of one large and one small pasture that are also utilized in the grazing program.

The ranch is partially enclosed (approximately 60%) by an eight foot high fence with approximately 1400 acres completely enclosed. The spring herd consists of 88 cows that are rotated in what is referred to as the low fence area (outside the enclosed 1400-acre area). This area consists of approximately 2633 acres divided into 12 paddocks. The fall calving herd consists of 39 cows rotated inside the enclosed high fence area. This area consists of approximately 1400 acres divided into 7 paddocks. The remaining cows and heifers are rotated on hay fields and improved cool-season pastures located on the University Farm, a facility located at Hunter Road and Interstate 35.

SHEEP

The Freeman Ranch maintains thirty-four mature ewes and fifteen replacement ewe lambs for use in classes and research at SWT. Three of the ewes are Rambouillet and Suffolk crosses and the other females are commercial Rambouillet ewes. These sheep graze the pastures around the headquarters and paddocks number two and three. Ewe lambs are grazed in a small enclosed area near the cattle working facilities.

Currently the ranch uses a Rambouillet ram from the Texas A & M sheep program for breeding. After passing a breeding soundness evaluation, the ram naturally services all ewes from September 15th to October 30th each year. The ram is not housed on the ranch for the remainder of the year. A colored grease marking harness is placed on the ram to determine which ewes the ram has bred during the breeding season. A new color is placed in the harness every 17 days to note during which part of the breeding season a ewe conceived. The ewes are placed on a higher protein diet via supplementation thirty days prior to breeding in order to increase conception rates.

The mature sheep receive a booster vaccination of clostridials (enterotoxemia and tetanus) each year. Additionally they are dewormed with Ivomec or Safeguard approximately three times per year. Prior to breeding, ewes also receive a vibriosis-leptospirosis vaccine. Hooves are trimmed three times yearly and all sheep are sheared in May. Although the harvested wool is only of average quality, it is marketed to provide income to the ranch's livestock operation.

Lambs are born from January to March each year and are tagged at birth and ear notched. Lambs are vaccinated with clostridials (enterotoxemia and tetanus) and soremouth. Tails are docked with an elastrator

within seven to ten days after birth. Weaning weights are collected at 120 days of age on all offspring. Several females are retained as replacements each year with the remainder of the lamb crop being marketed at the local auction barn or sold as club lambs to local 4-H and FFA students.

SWINE

Freeman Ranch has a complete, modern farrow to finish facility consisting of four farrowing crates, four nursery pens and two finishing pens. A concrete lagoon, which catches all waste material leaving the facility, is pumped out regularly to remove the liquid waste material. A feeding and working room is located between the farrowing crates and the nursery pens for educational and storage purposes.

Currently, the ranch maintains three sows, two gilts, and one boar. All mature pigs are housed in outdoor pens behind and at a distance from the swine barn. A few replacement gilts are kept each year with all other pigs being sold at auction in San Antonio.

Natural service is used in the breeding program. Two weeks prior to being placed with the boar, sows and gilts are vaccinated for leptospirosis. Three days prior to farrowing, females are moved into the farrowing crates and remain there for four to five weeks to rear their piglets. Piglets are processed at three days of age. Each is ear-notched and given an iron injection as well as injections for atrophic rhinitis and erysipelas. Weights are collected at day three and at weaning to determine average daily gain. When the piglets are weaned and moved to the nursery, sows are moved back to the outdoor holding pens for rebreeding. This system allows sows to average 2.5 litters per year.

CONCLUSIONS

Freeman Ranch serves as a unique outdoor learning laboratory for the study of domestic and wild animal systems, as well as for the study and implementation of range management principles. The livestock operation has been developed with education in mind. It allows students to gain as much or more “hands-on” experience than they would at any other university.

Because of the location of Freeman Ranch directly over the Edwards Aquifer recharge zone, the livestock operation also serves as a model for other ranches located in our unique corner of the Texas Hill Country.