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Cotton has judged most of the major cattle shows in the U.S. as well as the prestigious Palermo International Exposition, Buenos Aires, Argentina.

The ultimate goal of all beef cattle producers is to make a reasonable return on their investments. Research projects are designed, data is published, genetic improvement is sought and selective mating programs are initiated in order to achieve success. Owners, managers and herdsmen alike strive to obtain maximum productivity of each animal in the herd.

Beef cattle improvement can be achieved two major ways: (1) By genetically improving the animal or herd through selection and (2) by providing a superior environment through proper management. We at Premier Purebred Angus recognize the value of incorporating genetic superiority through proper selection and performance programs. In this article, however, I am primarily interested in maximizing the value that comes from providing a proper environment or management system. And in management, it should be remembered that good operators not only eliminate the

Beef Cattle Improvement Through Management

by Larry Cotton

guesswork, they also do things today that should be done today.

This is what we expect each female entering our herd to do: Breed at 16 months, calve at two years, rebreed within approximately 60 days after calving, raise a calf to approximately 200 days of age, calve unassisted each consecutive 12 months and develop into a large-framed productive adult that has eye appeal and buyer acceptability.

In order for our females to do this, we must provide proper management.

I have outlined our management program using the following general subjects: I. Feeding and Nutrition, II. Herd Health, III. Breeding, IV. Calving and V. Observation.

I. FEEDING AND NUTRITION

A sound and complete nutrition program is an integral part of achieving the desired level of reproductive performance in a set of cows. And the real key to that is using a proper blend of energy, protein, minerals and vitamins. Since nutritional needs vary,

let's examine the beef cow year by dividing it into four distinct periods.

Period 1—82 days (post-calving). Most important nutritional period. Cow is milking heaviest, must recycle and breed.

Period 2—123 days (pregnant and lactating). Cow should gain weight and lay on reserve energy to prepare for winter, assuming a spring calving situation. **Period 3**—110 days (mid-gestation). Nutritional needs are at the lowest level of any stage. **Period 4**—50 days (pre-calving). During this period, 70-80% of fetal growth occurs.

A. Energy

This most important ingredient is also the most expensive in terms of maintaining a herd of beef cows. Energy plays an extremely important role in reproductive performance, calf weaning weights and over-all productivity per cow. In most cattle operations, the bulk of the energy consumed by cows comes from grazed forage or by feeding harvested forage.

B. Protein

This is often the nutrition ingredient purchased, but in many cases we put too much emphasis on protein and not enough on the level of energy fed. Protein, however, does play a major role during lactation. A cow in mid-gestation requires only .8-1 lb. of crude protein per day; but when she calves, her requirements for protein double.

C. Vitamins and Minerals

These are needed for both maintenance and growth. It is important here only to recognize the need for vitamin and mineral mixes for maximum performance. Free-choice supplements should be available at all times.

D. Forage

Cattle, of course, can convert roughage into meat and milk. In our program, we emphasize forage quality along with improvement of quantity produced. It takes about 2-2½ tons of hay to feed a beef cow for a



6-month period from late fall to spring.

E. Sample Rations

1. For coming 2-year-old pregnant heifers:
 - a. high-quality pasture
 - b. 5 lb. hay plus 35 lb. corn silage plus $\frac{3}{4}$ lb. soybean meal or equivalent
 - c. 15 lb. hay plus 15 lb. corn silage
2. For dry 1,100-lb. mature cow, middle third of pregnancy:
 - a. low- to medium-quality pasture
 - b. 17-25 lb. hay
 - c. 40 lb. corn silage (30% dry matter)
3. For dry 1,100-lb. mature cow, last third of pregnancy:
 - a. medium- to high-quality pasture
 - b. 25-30 lb. hay
 - c. 15 lb. hay and 15 lb. corn silage

II. HERD HEALTH

A. Vaccination

Once disease occurs, losses are invariably incurred—so the main emphasis in reducing disease-caused production losses must be on prevention. This gives the best protection and savings per dollar invested. And vaccination is true prevention. It is of utmost importance to consult your local veterinarian for specific recommendations and for administration of a program that will be effective under the environmental and management conditions prevalent in your particular area.

Following is an example of a beef herd vaccination program.

1. Replacement heifers from nine months old to no later than two weeks prior to

first breeding season:

- a. IBR-PI₃
 - b. BVD (consult veterinarian first)
 - c. leptospirosis
 - d. vibriosis (two injections two weeks apart)
2. Adult cow herd in the fall or no later than two weeks prior to spring breeding season:
 - a. annual leptospirosis injection
 - b. annual vibriosis injection
 3. Female calves three to six months old:
 - a. blackleg and malignant edema
 - b. brucellosis
 4. Male calves, three to six months old:
 - a. blackleg and malignant edema
 5. In addition to those already listed, the following injections may be indicated, depending on local conditions (consult your veterinarian for advice):
 - a. selenium-tocopherol (Bq-Se) injection for new-born calves to prevent white muscle disease
 - b. scours vaccine for new-born calves (Reo and Corona viruses)
 - c. pasturella bacterin (two injections for calves three to four weeks before weaning)
 - d. IBR-PI₃ nasal vaccine for calves three to four weeks before weaning
 - e. enterotoxemia vaccine to prevent over-eating disease in calves

B. External Parasite Control

Cows infested with grubs and / or lice during the wintering period suffer reduction

in feed efficiency, milk production, weight and fertility. These production losses occur even though parasites are not always obvious. Such losses are unnecessary, because these parasites can be easily, effectively and economically controlled. The secret to complete winter-long control is that, without exception, every animal to be wintered must be treated. Treatment can be applied any time in September or October or by Nov. 1. A pour-on application of a systemic insecticide is all that's needed.

Flies are a persistent continual annoyance and irritation to cows, and there is no real way to measure the magnitude of production losses and expense for which they are responsible. Fly control is never 100% effective. However, proper planning and attention to detail will provide good results. Properly placed cattle rubbers with insecticide are effective. And combining spray and self-application systems generally will result in effective control.

C. Intestinal Parasite Control

Suffice it to say that infestation with internal parasites will reduce performance. Consult your veterinarian for routine examination of your cow herd.

III. REPRODUCTION

The reproductive cycle of a cow must be understood. Reproduction has been cited as being 10 times as important economically as growth traits. And since the percent calf crop weaned is probably the most important factor in determining profitabili-

ty, the cow's main purpose is simply to breed and deliver a live calf.

If late calving is to be avoided, our cows must calve every 365 days. If the gestation period is about 280 days, that leaves about 85 days from calving to rebreeding.

Our best time to calve is from Jan. 1 to April 15. This gives calves ample time for growth prior to the time cows go to pasture. Maximum use is then made of high-quality growing forage.

Careful heat detection is the key to high conception rates. Observation is extremely important—and you have to watch the cows more than 20-25 minutes a day. It is important to check them early in the morning, at mid-day and in the evening after the heat of the day. Cows at Premier are bred 12 hours after standing heat.

We breed heifers to calve at approximately two years of age. In order to grow heifers without getting them fat, we feed them to gain about 1½ lb. a day from weaning to breeding. All females are examined 30-45 days post-partum. We have increased our conception rate about 15% by identifying and clearing up problems early.

IV. CALVING

This is the initial pay-off for 280 days of management. Observation is again the key. We have expected calving dates available on all cows and group them accordingly. And cows are sorted into clean dry areas.

The most common factor associated with calving problems is calf size and, as

earlier stated, our goal is to produce cattle with size and growth potential. We do, however, select bulls that have correct skeletal structure. Our intention in genetic selection and physical structure of the beef cow is to produce fast-growing cattle that calve easily.

Approximately 21 days prior to calving, all cows are fed only hay—they get 25-30 lb. of high-quality first-cutting hay.

Calving assistance is given to any cow that does not deliver within two hours of first calving signs.

A. Processing Calves at Birth

1. Dip navel cord in iodine.
2. Make sure the calf gets colostrum (first milk after calving) during its first one to four hours. We keep frozen colostrum available at all times.
3. Administer Scour-Vac vaccine within 12 hours of birth.
4. Inject 2cc of vitamins A, D and E.
5. Weigh calf.
6. Ear tag and tattoo.

B. Calf Scours

Scours occur when a calf's resistance is lowered by some stress, allowing infection to establish itself. All calves are unavoidably subjected to stress—birth fatigue, chilling from wind or wetness, severe temperature extremes, etc., so we use some preventative measures in our herd.

1. Cows are kept in small groups of 15-25 head. Mixing is avoided as much possible.

2. Cows are calved out in protected dry areas.
3. We make sure the calf gets colostrum as soon as possible.
4. We observe two or three times a day and treat as soon as a calf is identified as having scours.

The treatment of your calves' specific scour problem should, first of all, be recommended by your local veterinarian. Again, we stress early diagnosis. Calves will dehydrate fast, and failure to react to first signs of problems will result in losses. Also, continue treatment for two or three days even if the scours have cleared up.

V. OBSERVATION

The man in management generally determines success. Most of the time, however, the man gets involved in so many other things that he lets his cows manage themselves.

We often hear that, for a working ranch horse or dog to be of value, he needs to have cow sense. So it is with people; cow sense is necessary. In management, we try to emphasize the simple act of observation. A properly defined, well-planned program will not succeed without the act of observing and reacting to what is observed. Inadequate labor, facilities and time may be used as excuses for poor management, but all that is really needed for good management is a will to do better and the determination to get things done. 