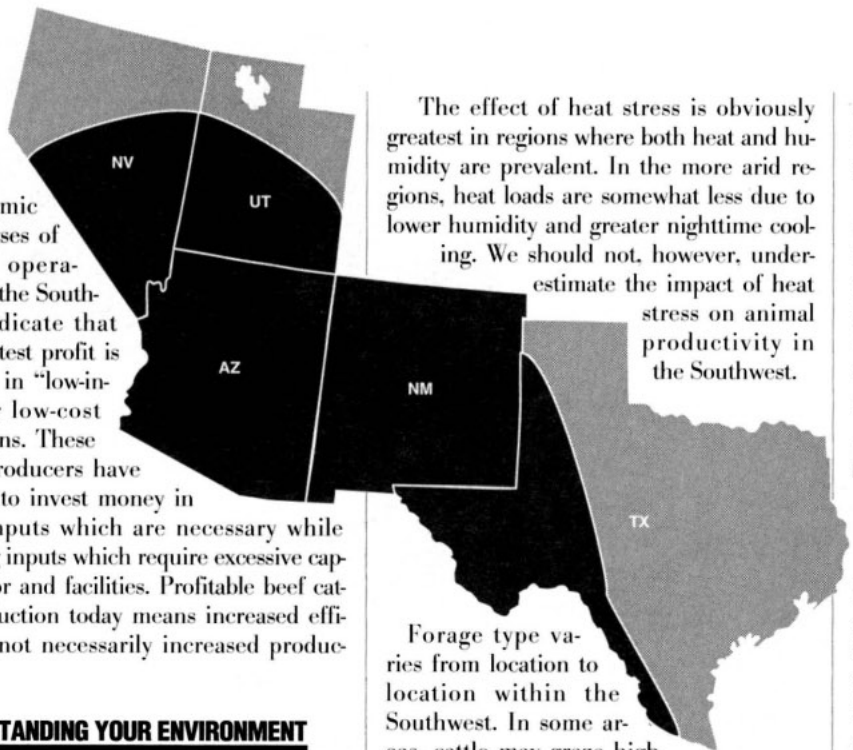
SOUTHWEST



Economic analyses of cattle operations in the Southwest indicate that the greatest profit is realized in "low-input" or low-cost operations. These cattle producers have learned to invest money in those inputs which are necessary while avoiding inputs which require excessive capital, labor and facilities. Profitable beef cattle production today means increased efficiency, not necessarily increased production.

UNDERSTANDING YOUR ENVIRONMENT

In order to develop cattle for the environments of the Southwest, we must first understand these environments. This is not an easy task. The Southwest is a very diverse region ranging from humid coastal plains to high, relatively arid plains and short grass prairies to Chihuahuan deserts. Because of this diversity, it is difficult to discuss in detail all of the characteristics of each environment, but it is possible to give a general overview.

Heat stress is one factor which is common to virtually all of the Southwest in varying degrees. Heat stress affects the efficiency of beef cattle in two ways. First, when cattle are stressed they modify their grazing behavior. They spend more time in shady areas or in ponds attempting to cool themselves. This results in a lower daily intake of forage. Secondly, energy requirements of cattle are elevated under thermal stress as they expend energy in an attempt to remove body heat. The bottom line is that they need greater nutrient intake, but they eat less.

The effect of heat stress is obviously greatest in regions where both heat and humidity are prevalent. In the more arid regions, heat loads are somewhat less due to lower humidity and greater nighttime cooling. We should not, however, underestimate the impact of heat stress on animal productivity in the Southwest.

Forage type varies from location to location within the Southwest. In some areas, cattle may graze high-quality, tame pastures year long. In other areas, we may be dependent upon native rangeland. These rangelands are composed of not only grasses but forbs (weeds) and shrubs as well. All three may be important sources of nutrients for the grazing beef cow.

Some range plants may also be toxic; either acute (often causing death) or more chronic (affecting performance without any outward symptoms).

In much of the Southwest, extensive management is common. In these areas, cattle may be required to travel substantial distances between forage and water. The distance that a cow is willing to travel may have a large effect on the forage available to her. Consider two cows: one is willing to travel one mile from water; the second will travel two miles from water.

The effective grazing area for the first cow is 3.14 square miles. The effective grazing area of the second cow is 12.6 square miles. There is four times as much forage available to the second cow. She is also going to be much easier on the rangeland since her grazing will not be concentrated on a small area.

We need to critically assess the natural environment we operate in prior to making breeding decisions. Try to evaluate how your environment affects the cow. Consider forage availability, forage quality, forage diversity, pasture size, thermal stress and any other factor that may affect the productivity of a cow in your environment.

MATCHING CATTLE TO THE ENVIRONMENT

We tend to generalize when discussing and implementing beef cattle improvement programs often emphasizing only a few traits regardless of location. Most breed associations now have national animal evaluation programs which provide producers with expected progeny differences (EPDs) for growth traits and milk production. Many seedstock producers in the Southwest purchase semen based upon EPDs in this national comparison with little or no thought to region or origin.

Though national cattle evaluation and artificial insemination programs have been very successful, they have also resulted in a mixing of genetic material from throughout the United States. The bottom line is that we are losing the inherent adaptability of our Southwestern cattle.

MATURE COW SIZE

In an effort to improve growth potential, we have allowed cow size to escalate dramatically. Large cows may be efficient producers in northern climates when forage quality and availability are not limiting; however, excessive size can be quite detrimental under most Southwestern conditions for two reasons.

First and perhaps most obvious, larger cows require more energy for maintenance. Energy required to maintain a cow is largely a function of its weight. Forage which is used as a source of energy for maintenance is a drain on efficiency.

In a study at the New Mexico State Uni-

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versity ranch, larger cows produced heavier calves at weaning, but they required so much more forage for maintenance that they actually weaned fewer pounds of calf per pound of daily intake. They were more productive, but much less efficient.

The second reason why excessive mature size is detrimental in the Southwest is related to heat tolerance. Larger animals actually have less surface area relative to their body mass. Animals which are native to northern climates tend to be larger than their southern counterparts. This is because it is simply easier for them to stay warm in the winter.

By contrast, smaller animals have more surface area per unit of weight. This allows them to more efficiently dissipate their body heat. Thus, smaller cows are more heat tolerant.

We have become obsessed with the idea that bigger is better. We must learn to produce cattle with desirable growth rate without maintaining excessively large cows. Producers should avoid large-framed bulls when buying replacements.

Another means of keeping mature size in check is to avoid bulls with large birth weights. Birth weight and mature weight are genetically correlated, meaning that some of the same genes affect both traits. Heavy birth weight bulls will tend to sire heavy birth weight heifers, which in turn will tend to become large cows.

Optimal mature size is difficult to pinpoint because of differences in environments and economic conditions. In most cases, there is little utility to cows with mature weights in excess of 1,200 pounds. In many cases, ideal mature cow weights may be substantially less.

MILK PRODUCTION

Research results have characterized milk production potentials of most breeds. Milk EPDs also allow us to select for milk production within a breed. But before we begin blindly to pursue milk production, we need to ask how much is needed to maximize production efficiency. We all know that heavy-milking cows raise large calves. But are they efficient?

Milk contains a substantial amount of fat carbohydrates, protein, minerals and other substances. These constituents do not appear out of thin air. They ultimately come from the cow's diet. Thus, higher levels of milk production directly increase the nutritional stress on the cow.

Heavy-milking cows are also anatomically different. They tend to have larger internal organs, especially those metabolically active organs such as the liver. As a result, they require more energy for maintenance than cows with lower milk production. This increased energy requirement even exists when the cow is dry.

Optimal milk production levels will vary depending upon forage quality and availability as well as certain economic factors. Most producers will discover optimal levels are in the moderate range. If we do not have enough milk, calf weaning weights are too low. If we have too much milk, cow maintenance requirements are excessive and reproductive failure is more common.

GRAZING BEHAVIOR

There are numerous behaviors exhibited by grazing beef cattle which are probably under partial genetic control. At this time these are poorly understood. These traits are also difficult to measure, thus selection on the basis of these traits is not currently feasible. Some aspects of these behaviors are distribution patterns, distance traveled during grazing, diet selection and avoidance of toxic plants.

Though producers cannot directly select for grazing behavior, there is one thing they can do. When cattle are reared and selected for performance (growth rate and reproductive efficiency) in a specific environment for an extended period of time, they tend to develop those attributes needed to cope with their environment. This includes certain aspects of grazing behavior. Even though grazing behavior is not directly selected for, improvement is realized.

Commercial producers realize most of their genetic gain by sire selection. Most often, their bulls are purchased from another breeder. If management is much different in this seedstock herd, favorable aspects of grazing behavior may be diluted or lost. Commercial producers should always buy replacement bulls from herds with similar management and production goals.

GROWTH TRAITS

We have become very efficient at genetic improvement of growth traits. The only problem is that we have not learned how to increase growth rate without increasing mature size. When commercial producers buy bulls, they need to identify high growth-, moderate frame-sized individuals.

Selecting for increased growth rate within limits on birth weight can also be effective in restricting mature size. We will soon see EPDs for mature size in some breeds. This will be a major aid in selection for growth without associated increases in mature size.

CARCASS TRAITS

We can produce cattle which are quite acceptable to packers without sacrificing adaptability, but we should not let carcass traits drive our breeding programs. Be especially concerned about breeding programs which focus on fat reduction.

Range beef cows need to be able to store excess dietary energy in the form of fat for times of need. Furthermore, subcutaneous fat is an indicator of maturity. Selecting cattle for less fat at a specific age has the net effect of delaying physiological and sexual maturity.

SUMMARY

In the Southwest, profitable cow-calf operations tend to be low-cost (low-input) operations. It is impossible to keep inputs down unless cattle are adapted to your environment. Profitable herds are reproductively efficient, but reproductively efficient herds are not always profitable.

If our cattle are not adapted, we can achieve high levels of reproductive efficiency only through added inputs such as supplemental feeding. This adversely affects profitability. On the other hand, truly adapted cattle should require fewer inputs in order to maintain their reproductive efficiency while better utilizing forage resources.

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