HALE COUNTY

TEXAS A&M AGRILIFE EXTENSION

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THE GRAZE

A quarterly newsletter with livestock and agronomy updates.

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THE RIGHT FIT

Matching cows with available resources takes focus and action

BY MIRANDA REIMAN

One of the cow's greatest assets is her ability to go to work in varied environments — that is until you ask her to work in an environment where she's not well matched.

Dave Lalman, Oklahoma State University animal scientist, says that scenario is probably more common than many cattle producers know unless they're looking at the bigger picture.

"Our industry has been engaged in a never-ending arms race for growth for 50 years," he said, during the Intersection of Cattle and Beef webinar series this summer.

The genetic trend for yearling weight for the seven most common beef breeds in the U.S. has been steadily inclining from 1972 to today. Increased carcass weights lower the beef industry's carbon footprint by producing more beef per cow than 40 years ago, but there is a strong genetic correlation between growth and mature cow size. There is also

There is also a strong relationship between growth and feed intake.

“If we don’t implement control measures for mature cow size or feed intake, input costs for the cow-calf enterprise will continue to increase,” Lalman explained. “The industry has assumed that the increase in production outweighs the costs associated with an increase in appetite and cow size.”

With relatively inexpensive land or feed, that’s probably true, but it “is probably not true in a lot of situations,” he said.

Ranchers typically adjust management and inputs to avoid open cows.

“When cows get thin, they change management — and that typically means increased annual feed cost — so that pregnancy rate does not suffer,” Lalman added.

There are two ways to monitor a cow herd’s match to the environment: 1) Cow body condition at weaning and calving; and 2) Annual purchased and harvested feed inputs.

“If feed costs are increasing over time relative to other variable costs, then we’d suggest selection for genetics that require fewer resources,” Lalman said.

Several studies show in commercial herds each additional 100 pounds of mature cow weight produces somewhere between about 6 to 30 additional pounds of calf weaning weight. The additional 100 pounds of cow weight costs about $40 to $50 to maintain annually.

“For example, the difference in annual forage requirement of a 1,400-lb. versus an 1,100-lb. cow is about 2,300 lb.,” he explained.

Feed costs accounts for more than 50% of the variability in profit, while weaning weight drops toward the bottom of the list at 5%, according to Standardized Performance Analysis from Iowa and Illinois.

“There are a lot of producers I’ve worked with, they get really focused on outputs,” said Travis Mulliniks, University of Nebraska animal scientist, during Beef Improvement Federation meetings this summer. “And a lot of times we disregard the production costs. What did it take to wean that 6- or 700-pound calf?”

“So, we’re driving up feed cost for that 5%,” he emphasized.

A study from Nebraska and South Dakota reinforces that. The top 35% most profitable herds in the dataset had a weaning weight 50 pounds less than those in the bottom 20%.

Growth isn’t bad, but it is important to pair it with the right resources so breeding rates don’t fall off or body condition suffers, Mulliniks explained.

The milk expected progeny difference is one place to look. Selection for milk has been on a steep increase for years, Mulliniks pointed out, suggesting producers in some regions put a cap on that.

“Our environment really plays a big role in being able to capture that genetic potential for growth or milk,” Mulliniks said. “Are we selecting for something that our cows will never, ever perform to?”

Several data sets from Alabama Beef Herd Improvement to Superior Livestock Auction records suggest weaning weights in commercial herds have leveled off in some areas of the country.

“It was a surprise to learn that in some regions, the trend for weaning weight has been flat for about 10 years, while it is still increasing in others,” Lalman said.

But looking at national trends just flags areas every producer should look into himself.

“Regional averages may be irrelevant,” Lalman noted. “What matters is the trend over time for your place.”

Track changes

Many producers don’t know exactly, but Ty Watkins, Vest Ranch near Childress, has made it a point to track, monitor and change cow size on his family’s ranch. He and his wife, Samann Vest-Watkins, run their

commercial cow-calf operation on everything from rolling hills with solid grass resources to rough, rocky country with poor water.

“We’re a constant work in progress,” he said.

For nearly a decade, they’ve captured mature cow weights at weaning, and records show they’ve brought a 1,400-lb. average down to 1,258 lbs. — just 8 lbs. shy of their ultimate goal.

“Our goal around here is to have about a 1,250-lb. mama cow with the ability to travel, with enough structure,” Watkins said. “She’s got to have the ability to maintain herself and then provide enough nutrition to wean a calf that’s going to be at minimum 50% of her body weight.”

A 1,400-lb. cow weaning a 650-lb. calf doesn’t fit that equation.

“We were nervous about everything we were working toward,” he admitted. But once they saw weaning weights improve while cow size decreased, they knew they were on the right track.

Range improvements followed.

In the beginning, they typically needed about 40 acres to carry one cow. In a normal, non-drought year, that’s down to 20.

Watkins said they brought the size down both through both breed type — increasing the Angus makeup in their herd — and selecting sires within the breed. They also culled outlier females.

“If they’re not performing to the level of their peers, then they cost the ranch money and we’re making room for something that’s not performing,” he says.

DNA helped them sire-match calves, and carcass records from feeding their calf crop gives them a complete picture of what genetic combinations were the most successful. They cull outliers that don’t make the grade.

“We’re all susceptible to the markets, just like this year,” Watkins added. “But if you have a product that has greater demand, you’ve got something in the market that will help weather these storms,”

It wasn’t an overnight turnaround, but one they could watch because of the data they collect.

“We just kind of eased our way into it,” he explained. “As we were implementing all these new things and we were seeing the benefits, the positive results, it just kept us eager and hungry to continually improve over the years.”

“Curvebenders” redefined

Culling can help, but the fastest way to improvement is through sire selection.

“We used to say finding a low birthweight, higher calving-ease direct bull with high growth was difficult,” Lalman said. “You can find them everywhere now, right? The industry has basically resolved that issue today.”

(story continues below picture)

Ty Watkins and Samann Vest-Watkins of Vest Ranch are TSCRA members who decided to back down on cow size to better fit their resources.

He suggested that the industry needs to push to do the same with cow size.

“We ought to look at curvebender in terms of cow weight. There aren’t a lot of bulls that are below breed average for mature cow weight and above breed average for growth, but there are some,” he says, noting this would help offset the added cow costs that come with increased performance. “To me, that’s where we ought to be headed in the future.”

The good news is most major breed associations have tools to help.

“We have a lot more information available today to attack these concerns,” he explained “We’re a lot more prepared to deal with these issues today than we were years ago.”

Having roadmap of how and when to use those tools is what takes this from a good idea to an actionable item.

“You have to develop the plan, stay committed to the plan and execute the plan,” Watkins said. “Whenever the team members here on the ranch see progress in the cattle, it just continues to motivate everyone to work to improve year over year.”

Miranda Reiman is a beef industry writer who works from her home office near Cozad, Nebraska.

This story originally appeared in the November 2020 issue of *The Cattleman* magazine, Texas & Southwestern Cattle Raisers Association’s flagship publication. **Join today to start your subscription.**

WINTER PASTURE MANAGEMENT

- Growing Cattle (e.g. stockers and replacement heifers) should have access to a well formulated high calcium mineral; a lack of calcium is often a growth limiting factor in this situation
- If adequate forage is available cow-calf pairs can be grazed full time on cool-season annual grasses
- Cows in the last 3rd of gestation should only be limited to grazing for 2 hours a day on cool-season annual grasses

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CATTLE VACCINES

Floron C. Faries, Jr.*

Veterinary biological products are antigen and antibody products, produced by laboratory techniques, that use microorganisms such as bacteria or viruses.

Vaccine products contain high numbers of modified (live) or inactivated (killed) organisms or subunits (portions) or inactivated toxins (waste products) of organisms known to cause a particular disease. These products deliver antigens that stimulate the body's immune response through the production of antibodies. Antibodies also are found in biological products such as antisera, antitoxins, colostral antibodies and monoclonal antibodies. Biological products can be administered to cattle before exposure to disease to provide protection and after exposure to disease to reduce spread of infection.

A vaccine containing inactivated toxins is called a toxoid. A toxoid is not a killed vaccine or a modified live vaccine.

A vaccine containing killed bacteria is called a bacterin. Adjuvants are added to bacterins to increase effectiveness of the antigens. Adjuvants slow the release of the antigen into the body and prolong the immune response. Antigen-adjuvant mixtures form tissue deposits at the injection site beneath the skin (subcutaneous) that are observed as knots in the skin. Also, injection site lesions in the muscle can be caused by intramuscular injections of vaccines containing an adjuvant.

NONINFECTIOUS VACCINES

Noninfectious vaccines are unable to infect and replicate. They are usually much safer to cattle than live vaccines but may be weaker in their ability to stimulate an immune response. They are approved for pregnant cows and calves nursing pregnant cows.

Noninfectious vaccines include killed vaccines, bacterins, toxoids, leukotoxoids and chemically altered, body temperature sensitive, modified live vaccines that are injected intramuscularly. To be effective, two doses of a noninfectious vaccine administered at a 2- to 4-week interval are necessary. The first vaccination is a priming,

Crowd cattle in a lane chute to properly administer injections in the neck.

*Professor and Extension Program Leader for Veterinary Medicine, The Texas A&M University System.

sensitizing dose that may provide no protection or a low protection for 1 to 4 months. The second vaccination is a required booster dose, recommended within 2 to 4 weeks but acceptable within 4 months after the first dose. Immunity following the second dose lasts from 6 to 12 months. To maintain immunity, the vaccinated animal should receive semiannual or annual boosters, depending on the type and risk of disease. The booster vaccine is a noninfectious vaccine.

INFECTIOUS VACCINES

The virulence of an organism in a live vaccine is modified or reduced (attenuated) so that it no longer causes disease, but it is able to infect and replicate. Some live vaccines may possess the ability to revert to a virulent organism and spread disease to unvaccinated cattle.

A modified live vaccine is an infectious vaccine that establishes a desired infection in the vaccinated animal. Immunity prevents the desired infection of a modified live vaccine from being established; therefore an infectious vaccine generally is not effective when administered after a noninfectious vaccine.

The infectious vaccine may give properly vaccinated cattle immunity for life. Repeated modified live infectious vaccinations are unnecessary. However, immunity of the vaccinated animal can be ensured by using a noninfectious vaccine booster every year or an infectious vaccine every 3 years.

Infectious vaccines include modified live vaccines that are not body temperature sensitive and modified live vaccines that are chemically altered, body temperature sensitive, and injected in the nasal passage.

HANDLING VACCINES

All vaccines should be refrigerated. Remove only briefly for dose measurement and administration. Do not expose the vaccine to direct or indirect sunlight for any extended period of time. Sanitary measures help to ensure the vaccine is free of blood, feces, hair and dirt. If handling a live vaccine, do not use chemicals to disinfect syringes, needles, skin or vaccine vials. The unused portion of a vial of vaccine must be properly discarded and not stored for later use.

PROPER VACCINATION PROCEDURES

Follow label directions for proper procedures in administering a vaccine. Use the correct dose and route of administration. The measured volume (dose) of a vaccine is in milliliters (ml) or equivalent in cubic centimeters (cc). The routes of administration are subcutaneous or SQ (inject under skin), intramuscular or IM (inject in muscle), and intranasal or IN (inject in nasal passage). The recommended site for SQ or IM injections is in the side of the neck in front of the shoulder. Do not administer an expired vaccine. Follow the withdrawal time recommendations for slaughter printed on the label.

Systemic protection provided by colostral immunity in calves lasts from 2 to 12 weeks and depends on the quantity and quality of colostrum (first milk) consumed, the disease, and the level of exposure. As this immunity decreases, young calves should be actively immunized by use of vaccines. However, maternal antibodies interfere with active immunity by reducing the effectiveness of administered vaccines. Because the exact time of colostral immunity loss cannot be predicted, young calves must be vaccinated at least twice, beginning at 2 months of age, to ensure successful active immunization.

A subcutaneous injection should be given in the side of the neck in front of the shoulder.

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the amount of feed consumed to produce a pound of gain. Typical rates of feed efficiency may be less than 6 pounds of dry-matter per pound of gain
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Source: APHIS.USDA.gov/feedlot

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Controlling Brown Stomach Worms in Cattle by Management

Floron C. Faries, Jr.*

Protein deficient cattle have a low immunity against stomach worms. However, proper diet and pasture management can result in the control of brown stomach worms without the use of deworming drugs.

Cattle can be protein deficient if they graze pastures low in protein or if they are overgrazed on pastures adequate in protein. Low protein intake results in low protein levels in blood and tissues and a suitable environment in the stomach for worms.

Overcrowding and overgrazing pasture lead to poor nutrition of cattle and to poor sanitation. Excess manure and worm larvae contaminate the pasture. Rain is needed to wash the larvae from the manure onto pasture where they can be ingested by cattle. Weekly rains and moderate temperatures increase the risk that cattle will become infected with worms by grazing contaminated grass wet from rain or dew. Dry weather decreases pasture contamination and the transmission of worm larvae is reduced.

The most important way to control worms in grazing cattle is to maintain good nutrition practices. The rate of infection can be reduced by preventing exposure to heavy levels of larvae on the grass and by interfering with the establishment of larvae and adult worms in the stomachs of cattle.

Good quality pasture with high protein content controls brown stomach worms in cattle.

Begin a worm control program by improving the nutritional condition of cattle as winter ends. Cattle have lost their aging worm infection from the previous fall exposures and are not reinfected during the winter, while the soil temperature is below 55 degrees F and larvae are hibernating. As soil temperatures rise, the larvae on the contaminated pasture become active. Protein deficient cattle become infected with overwintered larvae by grazing contaminated, wet grass in early spring. Then, worm

*Associate Professor and Extension Program Leader for Veterinary Medicine, The Texas A&M University System

Dietary protein supplements help control stomach worms.

Repeated exposures to larvae on the grass only occur when weekly rains wash the larvae from the manure. Larvae remain active until the soil temperature drops below 55 degrees F. Then, the larvae hibernate on the pasture during the winter.

To kill larvae on a contaminated fall pasture, disk the soil and plant a small grain or ryegrass for winter grazing. Worm infections in cattle grazing winter planted pasture are stopped because of the soil cultivation, cold soil temperatures and high protein diet.

To reduce worm exposure to young nursing calves, maintain a 2-month calving period for a cow herd grazing a single pasture. When the calving period is in the fall, nursing calves can be weaned and removed from the cow herd before the high risk of exposure to pasture larvae in the spring.

Calves and young cattle are more susceptible to worms and pass more eggs in their manure than adult cattle. Older nursing calves are a major source of pasture contamination. Young nursing calves have a higher risk of becoming infected with worms when they occupy the same pasture with older nursing calves.

Separate young cattle from the cow herd. Not only is the cow herd pasture a possible source of infection to them, but they are source of pasture contamination for nursing calves. Separate replacement heifers from the cow herd until their second calving is the same 2-month calving period as the cow herd.

Extreme cold and hot temperatures, as well as lack of rain, control the transmission of the brown stomach worm. Control by management works well for grazing cattle in high risk areas with periodic rains, soil temperatures between 55 degrees to 85 degrees F, and larval activity during the spring, fall and warm winter. Regardless of pasture management, worms occur in greater frequency in cattle in high rainfall areas than in cattle under the same type of management in low rainfall areas.

To reduce rates of contamination to pastures, prevent overcrowding and separate cattle by age groups. If cattle are exposed, infections can be killed by increasing immunity of cattle by ensuring proper nutrition, which also causes the environment of the cattle's stomachs to be unsuitable for worm development. If these management practices are followed, then the use of deworming drugs in cattle is not necessary, nor economical.

Older calves should be separated from younger calves to control worms.

eggs passed in their manure become a continual source of pasture contamination during the spring if weekly rains occur to wash the larvae from manure. To ensure cattle maintain noneconomic, low levels of brown stomach worms, feed a protein supplement during late winter and early spring to fortify the cattle's diet of hay and /or grass. When the spring grass emerges and haying stops, do not overcrowd cattle and overgraze pasture.

If manure piles on the pasture are difficult to find, there is probably a low contamination level of larvae in the pasture. Conduct soil tests and fertilize pastures as needed to maintain adequate protein and grass growth throughout the grazing season.

Cattle on overcrowded pastures should be fed hay and supplements during the spring. If manure on the pasture is easy to find, there is probably a high contamination level of larvae. Use a drag implement to break up dense manure piles on the pasture. Breaking up manure when there is no rain helps dry and kill larvae before they can be washed by rain from manure and contaminate wet grass.

Overcrowded conditions lead to overgrazing, increased manure concentrations and increased larval contamination.

Give pasture a rest to relieve the grazing pressure of cattle on grass. Divide the pasture into four cell pastures. Rotate the cattle every week to allow 3 weeks of uninterrupted grass growth in each cell. A high percentage of worm larvae die during the resting of a cell pasture. Infective larvae, if not swallowed by cattle within a few weeks, will die from starvation or from drying. Grazing of a cell for 1 week does not provide enough time for worm eggs in fresh manure to hatch and develop into infective larvae. Therefore, concentrated cell grazing for 1 week does not increase exposure of cattle to worms.

As ingested larvae of brown stomach worms invade the cattle's stomach linings, an immunity against the worms in healthy cattle is stimulated. Repeated low exposures to larvae boost the level of immunity. High immunity in cattle interferes with the invasion of infective larvae and reduces the egg-laying ability and life span of adult worms.

In late summer, cattle lose their aging adult worm infections acquired from the previous spring exposures. They are not exposed to pasture larvae during July and August because, during times of no rain, larvae on the pasture die from dryness and heat. Also, during dry weather, manure piles dry, creating a crust that inhibits larvae from being washed out by rain, and the larvae die from dryness and bacterial decay.

Maintain normal protein and immunity levels of cattle during August and September by feeding hay and supplements to cattle grazing short, summer pasture. Continue the feeding during the fall if the growth of summer grass is not boosted by fall rains.

However, in the fall, the infection cycle begins again. Larvae swallowed in June and inhibited in cattle's stomach linings will emerge and mature into adult worms in September as cattle's immunity decreases because of protein deficiencies. High immunity in supplemented cattle interferes with the emergence of inhibited larvae. This results in less damage to cattle's stomach linings and a reduced adult worm population. Eggs from these reduced numbers of adult worms are passed in the cattle's manure and become a source of pasture contamination during the fall.

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