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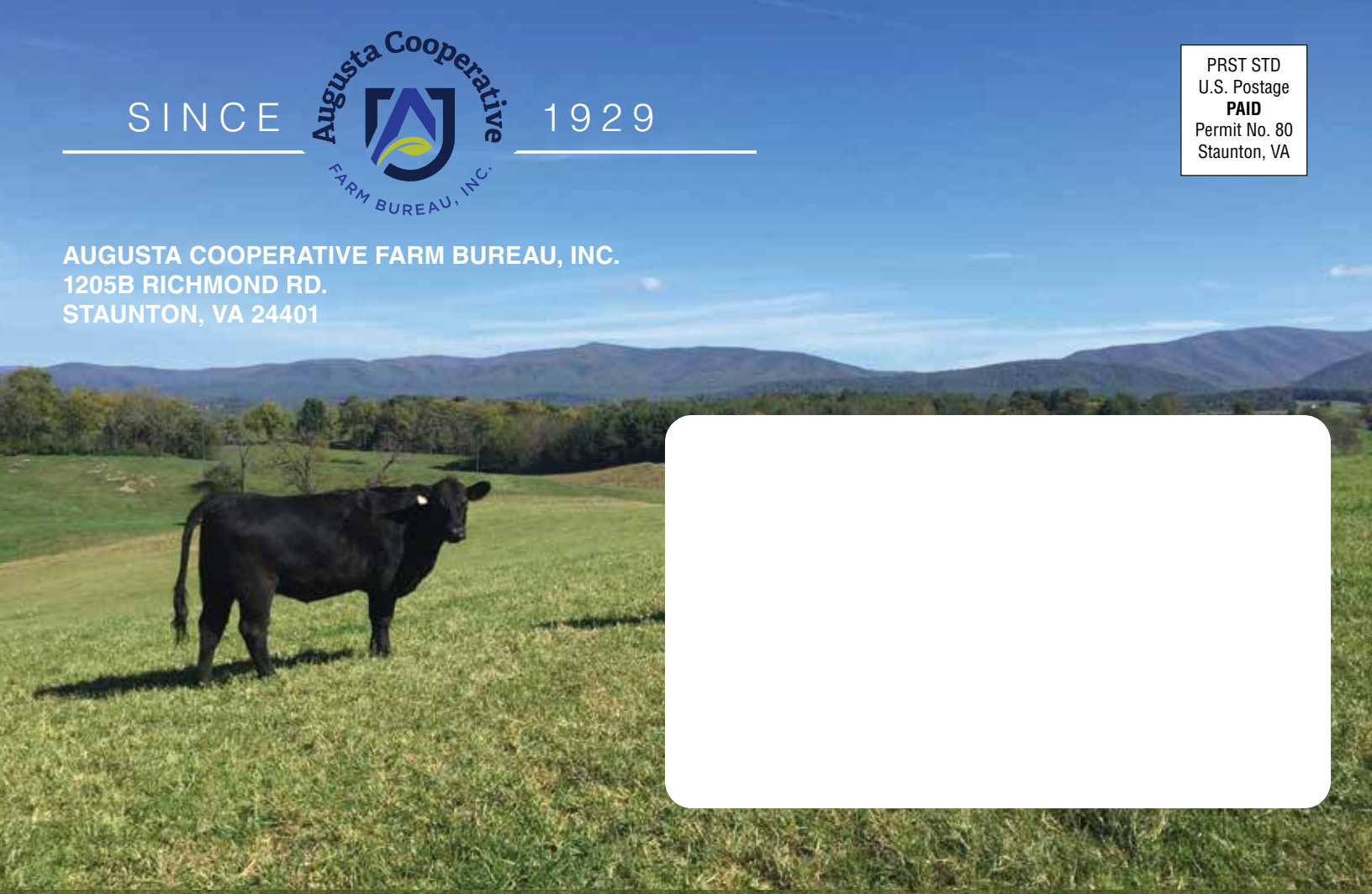

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AGRONOMY & BEEF BULLETIN

January 2025

SINCE 1929

Augusta Cooperative Farm Bureau, Inc.

CATTLE SUPPLIES IN FOCUS HEADING INTO THE NEW YEAR

Cattle prices showing signs of strength, and beef demand matrices point to robust beef demand heading into 2025.

The recently released U.S. Department of Agriculture National Agricultural Statistics Service (NASS) Dec. 1 "Cattle on Feed" report was received as neutral when compared to industry analysts pre-report expectations.

November cattle marketings came in 26,000 head (-1.5%) below the prior year at 1.725 million head, which was close to the -1.8% decline in average pre-report estimates for cattle marketings. Part of the decline in cattle marketings can be explained by one less slaughter day in November compared to last year. November cattle marketings were higher than the prior year in Idaho (+1,000 head), Iowa (+3,000 head), Nebraska (+40,000 head), Oklahoma (+4,000 head) and Washington (+3,000 head). These were overshadowed by declines in California (-4,000 head), Colorado (-20,000 head), Kansas (-15,000 head), South Dakota (-3,000 head) and Texas (-35,000 head).

The number of cattle on feed as of Dec. 1 in feedlots of 1,000 head or more capacity was reported down slightly by 34,000 head (-0.3%) from a year ago to 11.982 million head. This was in line with pre-report estimates, which were expecting cattle on feed to be down, on average, less than 1% (-0.1%) from a year ago.

At the state level, increases in cattle on feed in December were reported for Colorado (+30,000 head), Iowa (+20,000 head), Nebraska (+20,000 head), Oklahoma (+40,000 head), Minnesota (+5,000 head) and South Dakota (+5,000 head). These increases were more than offset by declines in cattle on feed numbers in Arizona (-34,000 head), Kansas (-80,000 head), Texas (-30,000 head) and Washington (-10,000 head). California and Idaho remained level with the prior year.

In November, the number of cattle on feed over 120 days was calculated to be just over 4 million head, which is a decline of about -3% from the prior year. This marks the first month of 2024 where cattle on feed over 120 days was below year-ago levels.

Pre-report estimates were all expecting November placements to decline from a year ago, with estimates ranging from down -7.4% to down -1.1%, with an average of -4.1% to about 1.789 million head. The actual number of cattle placed during the month of November was reported at 1.796 million head, a decrease of 69,000 head (-3.7%) from the prior year and within 0.4% of pre-report expectations. Of the 1.796 million head of cattle placed in November, 1.290 million head weighed less than 800 lb., a decline of 60,000 head from last year. The remaining 506,000 head of placements in November weighed over 800 lb., a decline of 9,000 head from the previous year.

USDA's Animal & Plant Health Inspection Service (APHIS) reporting the detection of New World Screwworm (NWS) in Mexico has resulted in a temporary suspension of bovine imports from Mexico, which took effect on Nov. 25, 2024. Last week APHIS released further information on the next steps in the process to start resuming the importation of ruminants from Mexico to the U.S.

A few key provisions from the new protocol include the identification and configuration of pre-export facilities by Mexico along with APHIS inspection of these facilities prior to use. As part of the protocol, administration of ivermectin will be required prior to cattle being delivered to the pre-export facilities. Then, before cattle are allowed to cross, they will go through a final inspection and get dipped.

APHIS anticipates a gradual resumption of cattle imports from Mexico could occur in January. Weekly data released by the USDA Agricultural Marketing Service (AMS) has reported no cattle imports from Mexico since the last week of November. Seasonally, cattle imports from Mexico reach their highest levels of the year in November and December. Last year, the U.S. imported 144,181 and 125,155 head of cattle in November and December, respectively, for a total of 269,336 head.

As the year ends, cattle prices have been showing signs of strength. Since the start of November, steer calf prices (500-600 lb., medium and large #1) in the Plains region have seen gains of about $30-40/cwt. Compared to a year ago, recent weekly steer calf prices in the Plains region are tracking approximately $40-60/cwt. above year-ago levels. Feeder steer prices (700-800 lb., medium and large #1) in the Plains region are also posting gains over year-ago levels, with the last few weeks reporting increases of about $30-50/cwt. The fed steer weekly price (5-area weighted average) has risen about $10/cwt. since mid-November. Compared to a year ago, the fed steer price over the last few weeks has been tracking about $20-25/cwt. higher.

As we move into the new year, NASS will be releasing the annual "Cattle" report at the end of January, which details national inventory levels. This will be a key report for the cattle industry, giving a snapshot of available supplies for 2025, and will also start to paint the supply picture for subsequent years.

On the other side of the equation is demand. From a larger macroeconomic perspective, inflation, interest rates and the unemployment rate are just a few factors that will be watched closely in 2025. Looking closer at beef demand, retail beef prices over $8.00/lb. in recent months will be a driving factor into beef demand for 2025. Currently, evaluation of the various matrices for beef demand points toward robust beef demand heading into 2025.

Beef Magazine

CAN THE COMMERCIAL COW HERD BENEFIT FROM REPRODUCTIVE STRATEGIES?

A look at how AI, synchronization, sexed semen, ET, and IVF benefit commercial cattleman.

When we think about reproductive strategies to improve the beef cow herd, we usually think about AI, synchronization, sexed semen, ET, and IVF. These technologies may seem to lend themselves to the seedstock industry more than commercial herds, but what is the value of those technologies to the commercial cattleman?

Maybe one of the biggest benefits is the genetic improvement potential from using artificial insemination. AI allows for the use of the top proven bulls in an effective crossbreeding rotation or pure bred system regardless of operation size, at a fraction of the cost of purchasing and maintaining a bull year-round. The commercial herd may use AI to produce top-quality crossbred replacement females while purchasing natural service bulls focused on producing high growth, carcass merit calves for the feedyard. However, utilizing AI successfully requires good estrus detection, manpower to implement the process, and good working facilities.

Estrus synchronization is typically paired with AI, however it doesn't have to be. The initial benefit of synchronization is in shifting the calving distribution to earlier in the season, resulting in more older and therefore heavier calves at weaning time. What is this worth? Assuming nursing calves are gaining about 2 pounds per day, a calf that is 21-days older than herdmates results in an additional 42 pounds of weaning weight. At a value of $3 per pound, these older calves could result in an additional $126 per calf. These early-born steer calves also produce heavier carcasses with greater marbling scores, and the heifer calves breed earlier in their first breeding season (Funston et al., 2012).

Research by Day (2024) showed a wide range of cows (17-67%) were not cycling at the start of the breeding season, thereby preventing them from calving at the start of the next calving season. Estrus synchronization protocols using progesterone have the ability to induce cycling in these cows setting them up to breed sooner and calve earlier. To demonstrate this, Rogers et al. (2012) exposed one group of cows to a natural service breeding season and another group received the 7-day CO-Synch + CIDR synchronization, and AI followed by natural service. The group synchronized and AI resulted in 44% of the cows calving in the first 21 days, compared to 25% of the natural service cows, plus the synchronized cows weaned additional 38 pounds per cow exposed. A secondary impact is that heifers that calve in the first cycle as a heifer will continue to calve early throughout their lifetime, further increasing lifetime weaning weights.

Estrus synchronization is not without costs – product, labor, trips through the chute, semen, and possibly more bull power. Protocols vary greatly and can be very simplistic or quite elaborate. Typically, the more elaborate the protocol, the more trips through the chute and more product used. Probably the biggest factor in success of synchronization is implementing the protocol accurately and precisely. For instance, if a protocol says to remove a CIDR 7 days after insertion and breed 60-66 hours later, you need to follow that exactly. The Estrus Synchronization Planner can assist in calculating timing of trips through the chute for various protocols. So what is the cost vs return? Again, it depends on the protocol, but for example the Select Synch with timed AI requires an injection of GnRH, followed by an injection of PGF2a 7 days later, then heat detect and AI cows who come into heat, 72-84 hours post PGF2a shot, AI remaining cows and inject GnRH on any cows who failed to express estrus. The cost of one PGF2a and two GnRH injections is roughly $12, semen cost of approximately $30, plus the time and labor of three trips through the chute along with heat detection.

A more simplified synchronization protocol may actually work better for commercial producers who still want to bull breed but move more cows to calving earlier in the calving season. In this case bulls are turned out with cows for 5 days, and anything that conceives then will not be affected by the protocol. On day 5, cows are gathered and given one injection of PGF2a which will shorten the cows estrous cycle and cause any cows not bred by the bull in the first 5 days to go into heat a few days after receiving the shot of PGF2a. Bull power needs to be adequate (1:25 for mature bulls, 1:15 for yearling bulls) and bulls must have been breeding soundness evaluated prior to turnout. Fort Keogh Research Center at Miles City, Montana, implemented this protocol for three years resulting in a pregnancy rate of 85% in a 32-day breeding season.

Embryo transfer may not have as much of a direct impact for commercial herds, however several producers have been able to capitalize on ET by producing quality recipient cows for ET programs. Cows that aren't producing the quality of calves that fit your own market, may perform well as a recipient provided they maintain their weight well and milk adequately.

One reproductive technology we seldom discuss but is fundamental for all herds is a bull Breeding Soundness Exam (BSE). The BSE includes a semen evaluation including both morphology (structure or defects) and motility (movement) of the sperm. But it also needs to include observations of feet, legs, eyes and an exam of the scrotum and penis to ensure there are no defects or signs of disease that would inhibit breeding.

Finally, these reproductive technologies are effective tools to assist both the commercial and seedstock herd to improve reproduction and therefore profits. A sound foundation of nutrition, health, and management are critical for the success of any of these technologies. Adequate forage and feeds to support a body condition score of 5 to 6, a healthy immune system backed with a good vaccination protocol, low stress handling practices, and protection from weather challenges are all required to optimize reproduction efficiency. No technology can override management mistakes.

Beef Magazine

INFORMED DECISIONS HELP MANAGE RESISTANCE DEVELOPMENT

To ensure that disease management protocols continue to effectively treat diseases such as BRD, resistance management must remain top of mind.

Maintaining cattle health is a constant challenge. Beef producers understand that managing disease is key to maintaining healthy cattle and protecting profitability potential. Informed, knowledge-based decisions about antimicrobials coupled with optimized management and animal husbandry can serve to ensure continued antimicrobial efficacy and utility.
To ensure that medications critical to disease management protocols continue to effectively treat diseases such as Bovine Respiratory Disease (BRD) in cattle, resistance management must remain top-of-mind.
The first step to maintaining the efficacy of these medically important medications is to understand the mode of action of a product's active ingredients.

How Macrolides Work

The macrolide mode of action, which includes tulathromycin and tilmicosin, is a class of antibiotics that inhibit bacterial protein synthesis, preventing bacterial growth. The macrolide mode of action binds to the 50s ribosomal subunit of bacteria, disrupting the translation of mRNA and protein production. In general, macrolides are time dependent, which means to be effective they require concentrations to be above the minimum inhibitory concentration (MIC) for an extended time.
In most instances, macrolides are considered bacteriostatic, meaning that they control the growth of a bacterial infection, allowing time for the animal's natural immune system to respond and overcome the infection. There are notable, well-established exceptions at certain concentrations when specific bacteria macrolides are considered bactericidal.

How Fluoroquinolones Work

Fluoroquinolones attack the enzymes that control DNA replication and transcription, DNA gyrase and Topoisomerase IV. Fluoroquinolones are concentration dependent and bactericidal. Meaning the activity is dependent on the highest concentration achieved above MIC levels, rather than the length of time above MIC. The bactericidal component that kills the bacteria relies on the animal's system to clear the dead bacteria.

How Pradofloxacin Differs

Traditional fluoroquinolones, such as danofloxacin, only target DNA gyrase in gram negative organisms.
In comparison, pradofloxacin is a third-generation fluoroquinolone that targets DNA gyrase and attacks Topoisomerase IV in the same organism, with the same efficiency. That translates to having two targets in the same pathogen causing the infection. Pradofloxacin reaches maximum concentrations within 45 minutes of injection, much faster than the other fluoroquinolones. And it has dramatic killing properties, killing 99% of organisms exposed in a laboratory test within five minutes.
Pradofloxacin also quickly achieves high concentrations above another laboratory measure - mutant prevention concentration (MPC). MPC is a laboratory measure, much like MIC. However, with MPC, you are testing a billion organisms, rather than the 100,000 being tested with MIC, better reflecting what is happening at the infection level. Because pradofloxacin reaches high above-MPC concentrations very quickly, we reduce the probability for choosing for resistant bacteria. Having those two targets of activity also results in a more potent active ingredient, and therefore enhanced in-vitro killing.

Why it Matters

Macrolide antimicrobial concentrations must remain above the minimum inhibitory concentration level for an extended period to be effective. Fluoroquinolones only need to reach concentrations above MIC for a short period to have the same effect. Pradofloxacin has the advantage of quickly reaching therapeutic levels, showing tremendous bacterial killing in laboratory tests. When treating sick animals, we can take advantage of these attributes by addressing the bacterial infection quickly and efficiently. The additional benefit of reducing the probability of choosing for resistant bacteria aids in resistance management.
In summary, pradofloxacin acts quickly and efficiently to address sick animals. Because it is concentration dependent, it doesn't have to last for a long time. Pradofloxacin attacks two separate targets in the disease pathogen's DNA, which improves product efficacy and benefits resistance management.

Beef Magazine

LOOKING AHEAD TO 2025'S STARTING INVENTORY

Cow/calf producers are in the driver's seat for the foreseeable future.

Number Six: The beef industry has witnessed five consecutive years ('19-thru-'23) of declining beef cow inventory. Sooner-or-later that trend has to reverse course – right? And during the past year, there's been lots of discussion in the ag media about the overall decline in cow slaughter numbers. So, surely 2024 must have been the year for that to happen – also right? Not so fast; 2024 is shaping up to be year number six.

Slaughter Rate: While it's true that cow slaughter sharply declined during the past year, the absolute number doesn't really tell us much; it's the relative number that matters. That is, the true indicator of producer intentions is the slaughter rate (total slaughter as proportion of beginning inventory). It's not a perfect predictor (more on that below), but it's a fairly reliable indicator of which direction the cowherd is headed.
The chart below highlights annual slaughter rate versus the next year's starting inventory. Through November, beef producers have marketed 9.35% of 2024's starting inventory. And if we assume another .85% through December (we'll

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know the final numbers in mid-January from USDA), that'll bring the slaughter rate to 10.2% for the year. Based on the data, beef cow inventory will likely have declined another .85% during the year. Net-net: the U.S. beef cow inventory will likely start 2025 with fewer cows (~28M) versus last year's mark (28.2M head).
That directional trend is further reinforced by the quarterly heifer feedlot inventory. Heifers have comprised roughly 39.5% of total feedyard population during the past several years (the most recent reading occurring in October). No matter how you slice it, producers aren't signaling any meaningful intention to start rebuilding the nation's cowherd.

Survey: As noted above, none of that is a perfect marker. Don't go betting the 28M number; there's lots of room for some over-or-under. Primarily, it's contingent on last year's starting number. And depending on how the cattle inventory survey shapes up, the 2024 benchmark is subject to revision (which some years can be sizeable).
Surveys are an imperfect tool (albeit far better than nothing) and there always exists possibility of corrections. Therein lies the next important part of all of this – response rate. It's key to ensuring the estimates are as accurate as possible.
Of course, that has broader implications for the entire industry. USDA explains the survey, "helps packers and government leaders evaluate expected slaughter volume for future months and determine potential supplies for export, as well as aid in determining program and resource needs in times of emergencies. Obtaining the current count of cattle will serve as an important decision making tool for the entire agricultural industry."
There is no such thing as a perfect count. However, active producer participation in the survey helps ensure that "close" really is just that. Ultimately, better response rate leads to more precision, and that benefits all stakeholders.

Big Picture: Whatever the number turns out to be, cow/calf producers still have not turned their attention to rebuilding. The question that immediately follows is something like, "What will it take to make that happen?" There's no perfect answer because every operation is different, but it includes regulatory certainty, interest rate stability, slowing equipment cost inflation, and long-run confidence that drought will quit rearing its ugly head.
Then, question number two goes something like, how will we know when the trend changes course? My response is typically something like, "We'll know it when we see it."
But in the meantime, I don't hear too many producers complaining. In the big picture, continued tight numbers (along with stellar consumer demand) means cow/calf producers are in the driver's seat for the foreseeable future.

Beef Magazine

SHOULD LIVESTOCK FARMERS BUY A SURPLUS OF HAY FOR NEXT YEAR?

Nutrient content should be the number one consideration when purchasing hay.

Most of North Dakota received good moisture over the growing season, producing ample hay availability. As a result, the hay market has slowed and prices have dropped, indicating a buyer's market. This has some livestock growers speculating whether they should purchase hay now to create a carry-over surplus as a forage insurance policy if forage supplies are tight in 2025. Considering moisture conditions across the state since July have been low and spring moisture conditions are unknown, North Dakota State University Extension forage crops specialist James Rogers says they should buy, provided some caveats be met.

First, Rogers advises producers to determine whether the price is good by looking at their own cost per bale of production. Per bale production costs are determined by yield, input costs, machinery and labor. The higher the yield, the lower the per bale cost.

It is difficult to produce a typical 1,500-pound bale of hay at a cost less than $40/bale, and depending on crop input costs and yield, per bale cost can go over $100/bale. If the cost of a bale is equal to or less than the cost of production, does that imply it's a good buy? Maybe, says Rogers, but bale weights and dry matter content are other key factors. It is best to purchase hay on a per ton dry matter basis. Assuming 100% dry matter, a 1,200-pound bale at $40/bale is $0.033/pound. ($66/T) compared to a 1,500-pound bale at $40/bale is $0.027/pound ($54/T).

The nutrient content of the hay should be the number one consideration when purchasing hay.

"Ask for forage test results prior to purchasing hay," says Rogers. "Then you can compare one hay to another based on price per pound of crude protein and energy content reported as total digestible nutrient."
This year, due to good spring moisture, hay harvest was often delayed, increasing plant maturity and lowering nutrient content.

Reviewing the results from several hay forage tests submitted from the 2024 crop, Rogers sees that a portion of the 2024 hay crop has crude protein levels that dipped down into the 5-6% level and total digestible nutrients (TDN) level below 55%. Hay of this type requires both crude protein and energy supplementation which is a cost that should be added back to the cost of the hay. On the other hand, forage test results also reveal there is plenty of hay from the 2024 crop that is high in nutrient content and therefore requires no supplementation depending on the class of livestock it will be fed to. There is no other way to know this without having it tested.
The final consideration is storage and feeding waste. If hay is purchased now, what condition will it be in six months to a year from now when it is fed? Round bale dry matter loss increases linearly with spoilage depth. A round bale that is 6 feet

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in diameter with a 2-inch spoilage loss around the bale has lost 10% dry matter. At 4 inches this increases to 20% and at 6 inches 30%.

Loss due to spoilage is often unaccounted for. If a 1,500-pound bale priced at $0.027/pound loses 20%, or 300 pounds, the financial loss is $8.10 a bale. Round bales wick moisture from the ground leading to dry matter loss when stored outside; this is simply unavoidable.

The longer outside storage goes on, the higher the loss, which can reach 50% levels at a year or longer. For long term storage considerations, bales should have a good round shape and are dense with a good wrapping. Storage areas should be well-drained with minimal ground contact if possible. The ultimate long-term storage would be in a barn. If bales are maintained in good condition during storage, little change in nutrient content will occur.

Is it a good idea to purchase hay during a down hay market? Rogers says it very well can be if the following is true:

- A comparison can be made between on farm cost of hay production and purchase hay cost.
- The bale weights and dry matter are known and can be purchased by the ton rather than by the bale.
- It has a forage test so that it can be purchased based on cost per pound of crude protein and energy content.
- The forage test shows no anti-quality issues such as nitrates or heat bound protein.
- It can be stored long-term to minimize storage loss. It is always a good idea to have a surplus on hand as long as it is taken care of during storage.
- Feeding losses can be minimized.

Beef Magazine

PACKERS FACING PERFECT STORM

Sharply higher prices for cash steers and feeder cattle expected.

I'll cut right to the chase. Entering 2025, the beef fundamental makeup is such that beef packers are facing a perfect storm. I visualize sharply higher cattle prices reaching price levels never dreamed of. Below is a list of 10 bullish fundamentals that are coming into play:

- The 2024 calf crop, reported in the cattle inventory report on Jan. 31, should be record small.
- The beef cow herd is down over 10% from the peak.
- Due to drought in the U.S., the industry has placed a decade-high percentage of the calf crop, more than 80%.
- The Mexican border closure is disruptive to feeder imports and will continue to restrict imports even after the border is reopened due to safety protocols.
- Plentiful rain in the southern Plains since November, boosting winter wheat crop ratings, will limit placements this winter.
- Potential tariffs imposed against Mexico and Canada will shut down beef imports from the northern and southern border.
- JBS/Brazil shut down 11 beef plants during November to break the cash steer market in Brazil. Steer prices rallied more than 50% in four months. This is expected to severely curtail U.S. beef imports from Brazil during December and spilling over into January.
- Dressed cattle weights have peaked.
- U.S. beef demand remains stronger than expected. In the wake of the U.S. presidential election, U.S. consumer confidence has soared.
- Two new beef slaughter plants are scheduled to come on line in April, expanding industry slaughter capacity at a time when on-feed numbers are likely to be dropping sharply.

Beef packers are incredibly good at what they do: Buy live cattle for as little as possible, and sell beef for as high as possible, assuring profits. During 2024, nearly everyone, including me, expected cattle supplies to get tight and prices to soar, with packers losing control of the market and bleeding red ink in the process. That did not happen.

While prices were strong at times, beef packers utilized the tool of slowing chain speed to prevent wholesale beef prices from falling sharply while keeping the cash steer market under wraps. This tool had three impacts on the market:

1. Constantly slowing the marketing rate in combination with larger placements than expected allowed on-feed inventory to remain near year-ago levels.
2. The slower chain speed over time forced cattle weights upward and into all-time record highs. This was engineered by the packers to help preserve margins.
3. While still a challenging environment, beef packer margins for much of the year remained profitable.

Mathematically, in my opinion, it will be impossible to keep on-feed inventory near 2024 levels during 2025. The cattle inventory report, scheduled for release on Jan. 31, will confirm another decline in the calf crop. As stated above, both feeder cattle imports and beef imports from Mexico and Canada will be hampered next year. Beef imports from Brazil are also expected to decline.

Sharply lower placements, fueled by excellent wheat pasture and fewer numbers of calves available, will drive on-feed inventory sharply lower early in 2025. At the same time, industry slaughter capacity is expected to increase, creating more competition for fewer cattle.

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As beef production falls, one should expect sharply higher cash steer prices and sharply higher feeder cattle prices. Both will see unheard-of record highs in 2025. At times, beef packer processing margins will be highly unprofitable. When it gets to an extreme, wholesale beef prices will have to soar higher to ration the tight supply.

If the Corn Belt has another good growing season, keeping feed prices from moving sharply higher, the onset of heifer retention will throw another bullish log on the fire. Historic price levels and historic volatility lie ahead.

Beef Magazine

HOW DOES SALT INTAKE IMPACT BEEF CATTLE ON LOW-QUALITY FORAGES?

Giving beef cattle increasing levels of dietary salt may result in lower forage intake and less efficient rumen fermentation.

The most common method to regulate beef cattle intake of self-fed supplements is the use of salt, since it is readily available, generally safe and the salt level can be modified to achieve desired levels of intake (Kunkle et al., 2000).

However, research has demonstrated that the daily individual intake of salt-limited supplements can be highly variable, which can reduce animal performance and/or decrease profit margins for producers (Williams et al., 2018; Wyffels et al., 2020). Little is known about the effects of high salt levels on subsequent intake and digestion of low-quality roughages.

Recent Montana State University research evaluated the impacts of increasing supplemental salt levels on forage intake, water intake, digestibility and rumen fermentation of beef cattle consuming high-fiber, low-quality forages.

In this study, six ruminally cannulated Angus crossbred heifers (14 months of age; 831 lb. of bodyweight) were housed in individual pens and randomly assigned to three supplemental treatments in a dual 3 x 3 Latin square design. Two animals were assigned to each treatment per period. Prior to the initiation of each period of the Latin square, all heifers were weighed following a 16-hour shrink.

Salt treatments were mixed into a protein supplement of 50% cracked corn and 50% soybean meal and fed at 0.3% of shrunk bodyweight. The salt treatments consisted of: 1) control, no salt (CON); 2) 0.05% of bodyweight salt (LOW), and 3) 0.1% of bodyweight salt (HIGH). Chopped, low-quality grass hay (7.4% crude protein and 64.2% neutral detergent fiber) was used as the base ration and was provided daily at 120% of the average daily intake of the previous three days. The supplement/salt treatments were fed at 8 a.m., and then after total consumption of supplement, the basal hay diet was offered. The diets were formulated to meet or exceed nutritional requirements for yearling heifers gaining 1.10 lb./day.

Before the start of the experiment, heifers were adapted to a salt-limited (25% salt) supplement for 14 days prior to the initiation of the trial. Each 22-day period included 14 days of diet adaptation, six days of sample collection (feed, orts and feces), one day for collection of rumen fluid samples for ruminal fermentation characteristics, and one day of complete ruminal evacuations.

Supplemental salt did not influence forage intake ($P = 0.19$) or total intake ($P = 0.20$) expressed as pounds per day. However, both forage and total intake expressed as grams per pound of bodyweight tended to decrease linearly ($P = 0.06$) with increasing levels of salt in the supplement. In contrast, water intake increased linearly ($P < 0.01$) by approximately 18.8%, with increasing salt levels ranging from 13.43 to 15.95 gal./day.

These researchers also reported that ruminal pH and ammonia levels both decreased linearly with increasing salt ($P < 0.01$). Acetate concentration and acetate:propionate ratio increased linearly with increasing levels of salt ($P < 0.01$). In contrast, isobutyrate and butyrate concentrations decreased linearly with increasing levels of salt ($P < 0.01$).

They concluded that these “results demonstrate that high-salt diets alter rumen function by impacting digesta kinetics and ruminal fermentation. While salt may be a tool to assist in supplement intake regulation, the addition of dietary salt may also result in lower intakes and less efficient rumen fermentation of beef cattle consuming low-quality forages.”

Beef Magazine

HOW MOLDY HAY OR BALEAGE CAN IMPACT LIVESTOCK PRODUCTION

Hay can become moldy when it is baled too wet, left in the field for too long, or stored outside in shaded areas where rain or humidity can slow down the drying process and increase the risk of mold. Hay that is cut and baled with a high amount of dirt or hay where the plant shows signs of fungal diseases could also contain spores that will germinate if exposed to moisture during storage. Hay that is stored in high stacks or ensiled at high moisture can also become moldy. Under the ideal moisture conditions spores from different mold species can germinate within 24 to 72 hours.

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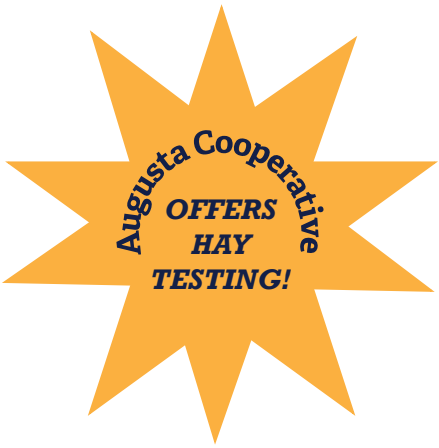
Depending on fungal species, moldy hay can be dangerous to different livestock species and should not be fed, but the direct negative effects of moldy hay are difficult to document. Some types of molds produce mycotoxins, which are toxic compounds that can cause health problems in livestock. Some of the issues caused by moldy hay include feed refusal, low fertility, increased water consumption, poor hair coats, estrogenic effects, lameness, poor kidney or liver function, respiratory problems (pneumonia-like respiratory issues such as hacking or coughing), diarrhea, and colic (horses). Cattle and small ruminants (sheep and goats) are less affected (except during pregnancy) by moldy hay since many mycotoxins are broken down in the rumen, but it can cause mycotic abortions or aspergillosis. Horses, which are cecal digesters, are at the highest risk of mold susceptibility among common livestock. They can develop a respiratory disease called Recurrent Airway Obstruction (RAO), also known as heaves. Symptoms include coughing, nasal discharge, and labored breathing. Lactating dairy cows should never be fed moldy feeds to avoid any trace of mycotoxins in milk. Across all species, pregnant animals and young animals are at higher risk, and animals in poor condition are more likely to be affected by moldy hay. In livestock producers, spores in moldy hay can cause a condition called "farmer's lung," where the fungus can grow in lung tissue after breeding too many spores.



Feeding moldy hay to livestock is a tough decision and testing for molds in forages is quite difficult. The only way to determine the type and amount of spores and the presence of mycotoxins in hay is by taking a sample for analysis. Visual appraisal (smell and color) might provide visual cues to determine mold severity but might not provide a complete picture and the use of a black light is not the best method of detection and assessment. If the presence of mycotoxins is unable to be verified, it is important to carefully monitor herd health regarding reproductive efficiency, feed utilization and gain, and overall health status. Even if mycotoxins are not present in the hay, mold can lower the nutritional value such as lower digestibility of feeds, and result in nutrient loss such as total digestible nutrients (TDN) and lower vitamin levels (A, D3, E, K, and thiamine). Mold can typically appear as a white, gray, or black powdery substance on the surface of the hay. Large mold problems that have unusual mold colors are more cause for concern as they may potentially produce mycotoxins. The most common types include Alternaria (dark green or wooly black), Aspergillus (yellow-green to white, powdery texture), Penicillium (green or blue and has a fuzzy texture), Cladosporium (olive green or black mold with a velvety texture), Claviceps (umbrella-shaped mushroom that contains a large number of alkaloids), Fusarium (Shades of pink, red, and purple, wooly or cottony texture), Mucor (white to beige or grey and fast-growing while older colonies become grey to brown due to the development of spores), and Rhizopus (black, highly toxic to horses). These molds can produce mycotoxins which can be harmful to animals if ingested in large quantities.

Many of the mold issues and the mycotoxin issues start in the field before or during baling. Although it might be too late in the season, mold can be prevented by baling at the right moisture (12 – 18%), stacking hay in well-ventilated areas, alternating bales so air can circulate, avoiding placing tarps tightly and completely enclosing the hay that prevents air movement, not stacking hay too high, using a hay preservative if hay is baled too wet, and inspecting the hay for mold before feeding it to animals. Moldy hay becomes less palatable, which can result in lower feed intake or higher animal refusal. Reduced feed intake can lead to poor weight gain, decreased milk production, and diminished animal performance (more susceptible to health issues and nutritional deficiencies). Use common sense and good observation as your best decision aids concerning feeding or testing moldy hay.

Beef Magazine

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