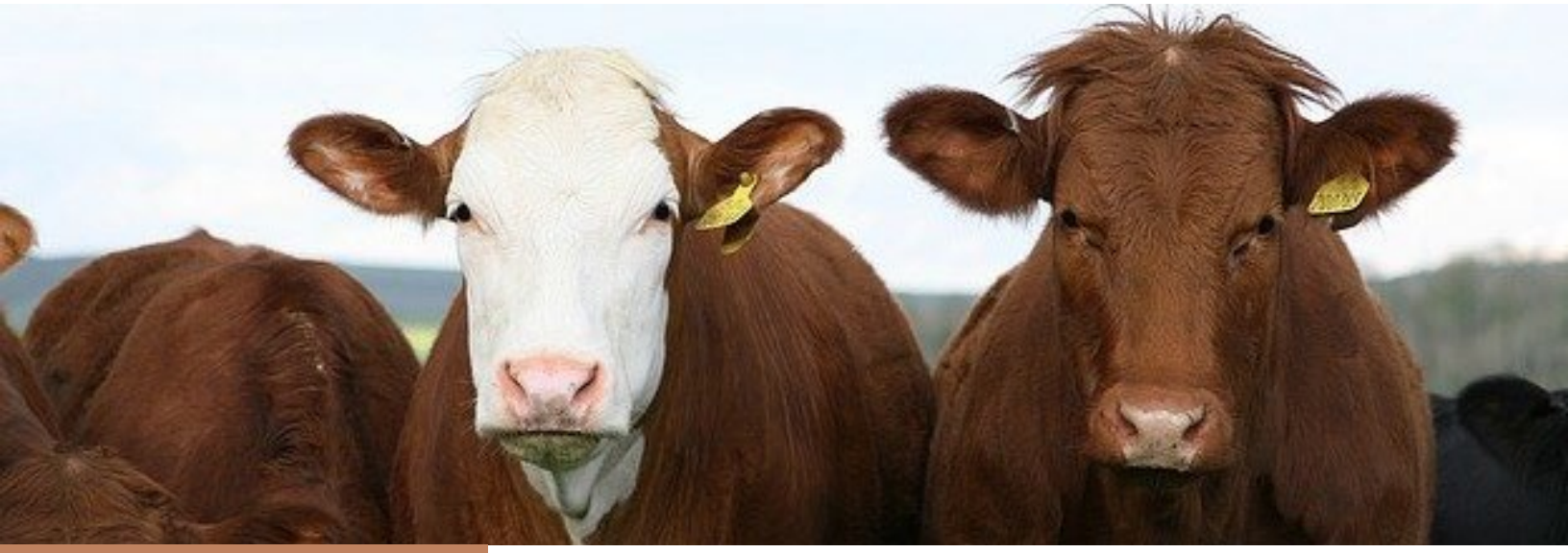
HALE COUNTY

TEXAS A&M AGRILIFE EXTENSION

August 8, 2024 | ISSUE 13

THE GRAZE

A quarterly newsletter with livestock and agronomy updates.



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ALL THINGS LIVESTOCK AND RANCHING

Lunch & Learn

Cattle Vaccinations & Worming

August 26th at 11:00 AM

Floydada Livestock Sales

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TEXAS A&M AGRILIFE

Combination Dewormers: The Time is Now

BY DR. RAY KAPLAN

There is now very strong evidence that using combination treatment is the best method for using dewormers and should be instituted on all farms immediately.

Resistance to dewormers is a fact of life, and the situation has worsened greatly in recent years. Surveys indicate that most farms have worms resistant to at least two of the three major groups of dewormers. Many have resistance to all three groups, and some farms now have resistance to all available dewormers. But, having worms in your animals that are resistant to dewormers does not mean that all the worms are resistant. For instance, when all the commonly used dewormers were first introduced, their efficacy was >99%. Once efficacy falls below 95%, it indicates that drug resistance is present. At 95% the drug is still very useful, but once drug resistance is present, it usually worsens over time as more and more doses of that drug are given.

As the effectiveness of the dewormer decreases, it provides less and less benefit, and once it falls to <50%, it is no longer useful as a sole treatment. Given this situation, what is the best approach for using dewormers? Contrary to popular belief, rotating between dewormers will not prevent resistance from worsening, and is no longer recommended. Rather, dewormers should be used together at the same time in combination.

How and why do combination treatments work?

Research done in New Zealand has convincingly shown that the best approach is to use several different dewormers all at one time as a combination treatment. In fact, in Australia and New Zealand, there currently are few dewormer products sold as single drugs; most products contain 3, 4, or 5 different groups of dewormers (note: other counties have some dewormers that are not available in the US).

There are 2 major benefits to using drugs in combination:

(1) You get an additive effect with each drug used, thus the efficacy of the treatment increases with each additional drug given (see Table 1 below); and

(2) By achieving a higher efficacy, there are fewer resistant worms that survive the treatment, thus there is a greater dilution of resistant worms by the susceptible portion of the population (see Table 2).

Furthermore, as seen in Table 2, the sooner you start using a combination, the better off you will be, since you see the greatest difference in the percent of resistant survivors when efficacy of dewormers is high. The more dewormers that are used in combination, the greater the efficacy of treatment will be. However, if all the dewormers individually have poor efficacy, the combination will not reach high efficacy. As seen in Table 1, once efficacy falls to 50%, even a combination of 3 dewormers will still fail to reach a 90% efficacy.

As an illustration of why combinations help reduce the development of resistance, but rotation of dewormers does not, let us look at some numbers. If two drugs each with 90% efficacy are used in rotation, then each time animals are treated 10% of the worms survive (the resistant ones). In contrast, if these same two drugs are used in combination at the same time, then the efficacy increases to 99%. This calculation involves a simple additive function; the first drug kills 90%, and the second drug kills 90% of the remaining 10% [90% + (90% x 10%) = 99%]. Thus the efficacy achieved is now 10X greater and this then yields 10X fewer resistant survivors.

Because fewer resistant worms survive at each treatment, there is a greater dilution of the resistant worms among the majority of worms in refugia that are still susceptible. This then will greatly slow the development of drug resistance in the overall worm population. In contrast, if using a rotation of drugs, you would get 10X as many resistant worms surviving each time you treat. Additionally, given the high rates of drug resistance that are known to exist, it is likely that one or more of the dewormers will have poor efficacy, thus you risk rotating from an effective (or relatively effective) dewormer to an ineffective dewormer. By using dewormers as a combination, you eliminate the risk of rotating to a poorly effective drug, and get an additive benefit that maximizes the effectiveness of each treatment given.

Research shows that combinations are the best approach

But – it gets even better. Dr. Dave Leathwick (AgResearch, New Zealand) published a paper in 2015 in the Journal International Journal for Parasitology: Drugs and Drug Resistance, where seven farms previously diagnosed with resistance to at least two groups of dewormers were enrolled in a study where each farm implemented a tailored program of "best practice parasite management." The aim was to ascertain whether the programs, which included the almost exclusive use of combination dewormers, were able to prevent resistance from developing further. Strategies implemented on each farm varied, but had consistent underlying principles to avoid over-use of dewormers, manage refugia (and to ensure that only effective anthelmintics were used, by administering them only as a combination).

After five years, they demonstrated an overall improvement in the efficacy of the dewormers (when tested individually), indicating that the use of dewormers in combination, when applied with other best practices designed to reduce use of dewormers and maintain refugia, caused a reversion back toward susceptibility. So, there now is very strong evidence that using combination treatment is the best method for using dewormers and should be instituted on all farms immediately.

Precautions and issues to consider

Finally, before using this approach there are a few precautions to be aware of.

(1) In New Zealand and Australia, products are sold that contain a combination of dewormers, so only one product needs to be administered. In contrast, in the USA, no dewormers are yet sold in this formulation, so the dewormers need to be bought and administered separately. This increases the cost as compared to the products available in these other countries. Additionally, the different groups of dewormers are not chemically compatible, thus they cannot be mixed together in the same syringe. Rather, they need to be administered separately, but can be given one immediately after the other.

(2) All dewormers should be administered at the full recommended dose whether administered singly or in combination.

(3) When using dewormers in combination, meat and milk withdrawal times will be equal to the dewormer used with the longest withdrawal time period

(4) If using dewormers in combination, it is critical to maintain refugia; thus, one should be using a selective treatment approach based on FAMACHA© (see FAMACHA© section of the ACSRPC website for more information on this method and for further explanations of refugia). The presence of refugia is essential to realize the full benefits from combinations. In fact, if refugia are not maintained then you will not get the necessary dilution of the resistant survivors, and this will then lead to having multiple-resistant worms that can no longer be controlled with the combination treatment.

(5) If the efficacy of your dewormers are >80%, it is possible you may not notice any difference in the clinical response of treatments when applied singly vs. in combination. However, the impact on the further development of resistance could be quite large (see Table 2).

(6) Any safety precautions that exist for a single dewormer will also exist when used in a combination; however, there are no known additional risks with using more than one dewormer at the same time.

Table 1: Impact of using dewormers in combination on the efficacy of treatments.
The increases in efficacy are due to a simple additive effect as per the equation below:
Where D1 = efficacy of dewormer 1, D2 = efficacy of dewormer 2, D3 = efficacy of dewormer 3, C2 = efficacy of D1+D2, and C3 = efficacy of D1+D2+D3
C2% = D1% + (100-D1%)*D2%
C3% = C2% + (100-C2%)*D3%

Drug 1 (%)	Drug 2 (%)	Drug 3 (%)	Combination (%)
80	80		96
80	80	80	99.2
90	90		99
90	90	90	99.9
60	95		98
60	60	95	99.2
99	99		99.99
60	60	60	93.6
50	50	50	87.5
40	40	40	78.4

Table 2: Impact of combinations on percent of resistant worms that survive.
Table shows the % of worms killed by a single dewormer vs a combination treatment with two dewormers both with the same efficacy, ranging from 80% to 99%. The last column shows the magnitude of the difference between % of worms killed and % surviving when one or two dewormers in combination are used. Note that the higher the efficacy of the drugs, the smaller the difference in efficacy when used in combination, but the greater the difference in the % of resistant survivors.

Efficacy of Dewormer		Single Dewormer	2 Dewormers in Combination	Fold Difference
99	% Killed	99	99.99	1.01x
	% Surviving	1	0.01	**100x**
98	% Killed	98	99.96	1.02x
	% Surviving	2	0.04	**50x**
95	% Killed	95	99.75	1.05x
	% Surviving	5	0.25	**20x**
90	% Killed	90	99	1.1x
	% Surviving	10	1	**10x**
80	% Killed	80	96	1.2x
	% Surviving	20	4	**5x**

HPAI continues to impact dairy, poultry industries

BY TEXAS FARM BUREAU

Both the dairy and poultry sectors are still dealing with cases of highly pathogenic avian influenza (HPAI).

The current outbreak of highly pathogenic avian influenza, which traces all the way back to 2022, is unusual in not only the fact that it's infecting dairy cattle, but also that cases are continuing to be diagnosed in the warmer summer months.

Even though the virus typically scales back in the summer, that's not the case this year, American Farm Bureau Federation Economist Bernt Nelson said.

"Recently, we did have a few cases pop up in Colorado. We had 3.4 million birds affected in a couple of different egg production facilities," he said. "This was the largest outbreak so far in the U.S. concentrated in a single day."

There is, however, some good news on the dairy front, Nelson said.

"Things are slowing down just a little bit. As we went through June, we started to see some days towards the end of June and getting through July where we had a couple of days where we didn't have any detections," Nelson said. "Overall, we're up to about 172 total detections in dairy cattle."

Nelson said dairy markets haven't taken much of a hit, though.

"You know, we see a reduction in milk production, anywhere from 20 to 30%. That's one of the symptoms. And so, in the South especially, that dropped milk production around 2%, and at the same time, we saw demand kind of drop off to about 2%," Nelson said. "So, the prices and whatnot stayed about the same. Now, as things have gone on, detections in the South have slowed. Production has ticked back up."

The markets could get volatile moving into the fall and Thanksgiving.

"The majority of turkey in the United States is consumed on Thanksgiving," Nelson said. "And so, if we look at the July livestock, dairy, and poultry outlook that the USDA puts out, May turkey production was down around close to 10% compared to last year. When we're looking at a 10% reduction and we're still seeing this kind of uptick in avian influenza, this may prove to be kind of a volatile market as we work our way closer to Thanksgiving."

ANSC-PU-444
July 2024

Changes to USDA APHIS Animal Disease Traceability Rule Affecting Beef Cattle

Ron Gill[1] and Karl Harborth[2]

In April, the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) amended the current Animal Disease Traceability (ADT) rule by adding the required use of an Electronic Identification Device (EID) that can be read electronically or visually. A simple "840" EID button tag will be adequate to meet this requirement. Each EID tag also has the assigned number printed on the tag, and that will satisfy the visual requirement. See the original *Title 9 rule on the ECFR website*. It should be further noted that the rule was written and published in the Federal Register on May 9, 2024. The rule will become official 180 days after publication in the Federal Register.

There are exceptions to this EID requirement regarding the use of brands in brand law states and the use of tattoos in registered animals. Since Texas does not require brand inspection prior to shipment, this will not be an option for Texas producers shipping cattle interstate. Details on these options can be found in the *APHIS FAQ summary*.

There is no Federal requirement for animal identification in beef cattle that are not being shipped out of state. The current Federal ADT rule applies to sexually intact cattle over 18 months of age and shipped in interstate commerce. This includes bulls, cows, and heifers.

The current Federal ADT rule covers:

- All sexually intact cattle and bison 18 months of age or older.
  - Note: This rule currently excludes most stocker and feeder cattle.
- All dairy cattle of any age (dairy cattle have been required to have official identification for many years).
- All cattle and bison of any age used for
  - Rodeo;
  - Exhibition; and
  - Recreational events.

The current USDA ADT rule only applies to the interstate movement of covered classes of cattle and bison. The new EID rule will apply to the same covered classes of cattle and bison moving interstate.

There has been some confusion due to the current testing and movement restrictions on lactating dairy cattle. This requirement is laid out in the *APHIS "Requirements and Recommendations" document*. There are no additional ADT requirements for EID tags, as all dairy cattle are required to have an EID tag.

Texas Animal Disease Traceability

There are no additional requirements for animals and movement of cattle adopted by the Texas Animal Health Commission (TAHC). The TAHC amended its rules in June 2012 to enhance the effective traceability of beef cattle movements in Texas. There have been no additional changes in the identification/traceability requirements since that time.

Cattle being tested or managed through TAHC programs requiring official animal identification include:

- All dairy cattle of any age;
- Cattle tested for brucellosis;
- Cattle tested for tuberculosis;
- Bulls tested for trichomoniasis;
- Calfhood brucellosis-vaccinated heifers; and
- Adult brucellosis-vaccinated cows.

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It should be noted that TAHC will be responsible for assisting with the requirement for EID tags in cattle being shipped out of Texas. Cattle moving out of Texas will have to meet the new USDA rule stipulations. Cattle will also have to have a Certificate of Veterinarian Inspection (CVI).

An additional requirement specified in the TAHC ADT rule requires adult breeding cattle in Texas to have an approved form of permanent identification within 7 days of a change of ownership. Effective January 1, 2013, all cattle that are parturient (pregnant) or post parturient or 18 months of age and older must be identified with an official ear tag or another form of official permanent identification as approved by the TAHC within 7 days of the change of ownership (§50.3(a)), unless otherwise exempted.

There are several options for meeting this permanent identification requirement with approved techniques and products. To offer a cost-effective alternative, the TAHC has made the official metal clip ear tags accessible to producers at no charge. These tags have been consistently utilized for years for initial brucellosis testing. Acceptable tags in the TAHC ADT program can be found in the *TAHC document "Acceptable Forms of Official Identification."*

These metal clip ear tags have been made available from TAHC through multiple locations in most counties. To assist producers across the state in gaining easy access to these metal clip tags, the Texas A&M AgriLife Extension Service agreed to assist in tag distribution. Livestock auction barns and interested veterinary clinics will also partner with TAHC in the distribution of tags. Participating AgriLife Extension offices along with other partners are listed on the *TAHC document "Acceptable Forms of Official Identification."*

Although metal clip tags are still considered official tags, TAHC has been transitioning to official EID for most of its programs. Calfhood-vaccinated heifers currently receive the orange official 840 EID tag at the time of vaccination. Adult animals will use the official 840 EID tags when worked through one of their programs as well.

While there has not been a mandated requirement to use EID tags in Texas, TAHC has been moving that way for several years. TAHC will serve as an official EID tag source for the USDA requirement for EID on interstate shipment of covered classes of cattle.

Currently, TAHC can provide free orange "840" EID tags for heifers that are calfhood vaccinated (these are distributed to veterinarians only) and white "840" EID for breeding cattle over 12 months of age. These tags are currently available, free of charge, to producers. Note: Official EID tags for the Federal ADT program all begin with the number 840. Only 840 tags are accepted as approved tags for ADT use.

If cattle are already tagged with an official USDA tag (such as a metal clip tag), they will not be required to replace that tag or add an EID tag. All official tags currently in cattle will be honored as official tags and meet requirements for intrastate and interstate shipment in Texas.

This link leads to the TAHC website on ADT: *https://www.tahc.texas.gov/adt/*

This link leads to a list of approved official ADT tagging options for TAHC programs: *www.tahc.texas.gov/adt/pdf/ADT_OfficialIdentification.pdf*

This link leads to the USDA ADT site in the Federal Register: *https://www.ecfr.gov/current/title-9/chapter-I/subchapter-C/part-86*

AGEC-PU-191
August 2023

CUSTOM HARVEST AGREEMENT CHECKLIST

Photo courtesy of Kat Smith

Tiffany Dowell Lashmet[1] and Karli Kaase[2]

One common way that cattle producers enter into the direct beef sales world is by selling a live calf to the consumer and then delivering it to a custom processing facility where it will be processed. As we discussed in detail in the "Where's the Beef? Legal and Economic Considerations for Direct Beef Sales" handbook, this approach can be attractive to producers as it allows them to avoid many of the additional requirements that come when selling beef, as opposed to selling the live animal.

For example, Bob in Dallas wants to purchase beef from ABC Ranch located in Amarillo. If ABC Ranch wanted to sell beef by the pound to Bob, the slaughter and processing of the animal would have to occur in an inspected facility since the owner of the animal (ABC Ranch) would not be the end consumer. ABC Ranch would also need to deal with licensing, labeling, and additional insurance considerations, as it would be selling beef. However, if ABC Ranch sold the live calf to Bob prior to slaughter, then custom-exempt processing would be allowed because Bob is both the owner of the animal and the consumer of the beef. If Bob wanted to purchase less than a whole beef, the producer could sell the remaining percentage of the animal to another person. So long as this transaction occurs before slaughter, the custom-exempt processing option would be available.

Many cattle producers are currently selling their cattle using this custom-exempt method. Anyone doing so should have a custom harvest agreement they use for each of these types of transactions.

This agreement is simply a contract between the beef producer and consumer laying out the terms of the sales agreement. It need not be overly complex, but it serves an important role of ensuring everyone is on the same page and protecting both parties should something go south.

The following topics should be considered when drafting a custom harvest agreement.

- **Names and contact information of the parties.** List the names of the parties to the agreement and their contact information.
- **Description of the product being sold.** Be clear in the agreement that it is the live animal being sold to the consumer, not the processed beef. Clarify what percentage of the animal the customer is purchasing. For example, is the sale for a whole animal or ¼ share of the animal? If selling a specific animal, be sure to include the ear tag number or other description of the animal.
- **How will payment be calculated?** Be clear exactly how the price for the animal will be calculated. Will it be a flat, pre-set price? Will it be a per-pound price and, if so, will that be based on the live weight or hot carcass weight of the animal?
- **Educational information.** One thing many cattle producers find when beginning direct beef sales is the lack of education many consumers have about purchasing and cooking beef. This agreement may be a good place to include some of that information in order to avoid surprises later. For example, it may be helpful to explain the difference between live animal weight and boxed beef weight and manage expectations so that the consumer does not think that just because the calf weighs 1,200 pounds,

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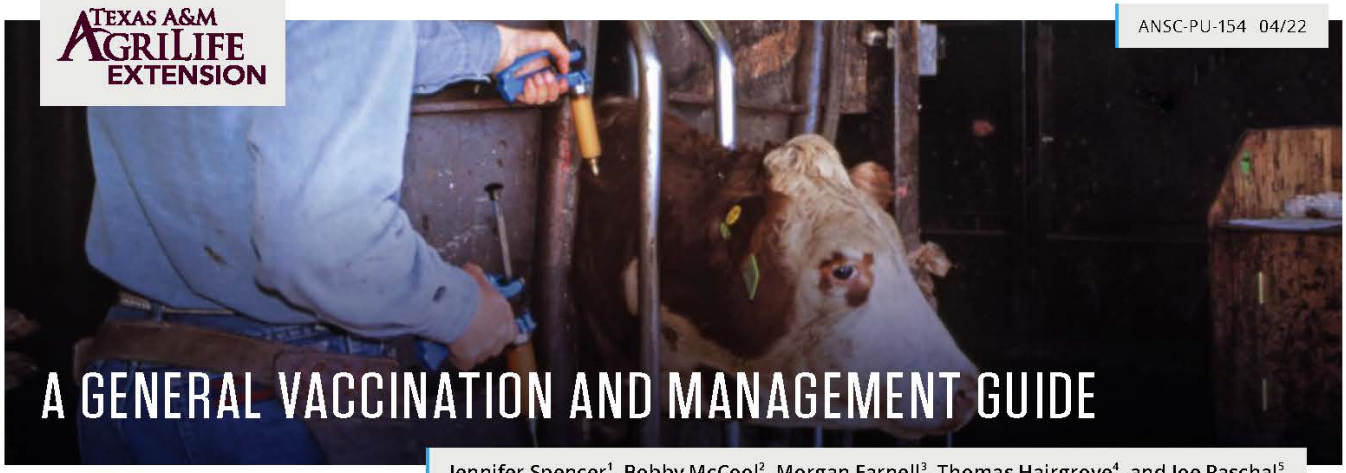
there will be 1,200 pounds of boxed beef. Giving consumers a ballpark range of what calves typically weigh when delivered to the processor and what the typical yield percentage is can be helpful, with the caveat that these are only ballpark estimates and actual measurements and costs will be based on their specific animal. Information on how much freezer space is typically needed for a quarter, half, or whole beef may also be useful. Having a sample cut sheet for people to review may also provide added value.

- **When and how will payment be due?** Will a deposit be required? If so, when and how much? When will payment be due? What payment methods are accepted? Can a consumer pay by cash, check, card, or Venmo (or other app)? What is the result of failure to remit timely payment?
- **Processing fees.** Make sure the parties are clear on whether the processing fees are included in the selling price or whether the customer will be responsible for paying the processing fees directly to the processor.
- **Obligations of the parties.** Who will be responsible for delivering the animal to the custom processing facility? Who will pick up the beef once processing is complete? Who will pay the processing fee to the facility? Who will complete the cut sheet?
- **Reselling/donating meat from the animal is prohibited.** Make clear in the custom harvest agreement that the beef from this animal may not be resold or donated. This is based on the fact that any beef processed at a custom harvest facility may not be sold or donated, and the purchaser needs to be clear on that limitation.
- **Point at which the animal is property of the buyer.** Make clear at which point in time the animal officially becomes the property of the buyer. Certainly, this has to be done at least by the point in time when it is delivered to the custom processing facility. But is it when the initial deposit is made? Is it when the animal is loaded into the trailer to head to the facility? This may be important if there is an injury or the death of an animal before it is delivered to the processing facility.
- **Dispute resolution clauses.** In the event of a legal dispute, the parties may wish to agree to dispute resolution. This would typically be either mediation or arbitration.
- **Choice of law/venue clauses.** When the parties may be from another county or state, the parties may want to agree on which state's law will apply to any legal dispute and determine where any lawsuit must be filed.

ANSC-PU-154 04/22



A GENERAL VACCINATION AND MANAGEMENT GUIDE

Jennifer Spencer[1], Bobby McCool[2], Morgan Farnell[3], Thomas Hairgrove[4], and Joe Paschal[5]

The purpose of this publication is to provide valuable information when developing a vaccination protocol. When developing this protocol, consult with your large animal veterinarian and your local County Extension Agent to create a vaccine protocol based on personal herd health risks. A few considerations are listed in Table 1.

TABLE 1. VACCINATION PROTOCOL CONSIDERATIONS
1. General biosecurity: fences, neighbors, wildlife.
2. Nutritional, health and vaccination status, and age of the animal.
3. Type of operation (e.g., dairy, cow-calf, stocker/feeder, horses, sheep) and location.
4. Causes of stress include: weaning, transportation, environmental challenges and water availability, and quality.

Vaccines stimulate an animal's immune system to produce a protective response against bacteria, viruses, and parasites if they are exposed. The effectiveness of vaccines in stimulating an immune response will vary, which is why your veterinarian's advice is important. Vaccines help the immune system to identify and "remember" how to respond to a specific pathogen if infected. Although a vaccine cannot prevent exposure to an infectious organism, it may improve the animal's ability to fight off and reduce the severity of an infection if it occurs.

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TYPES OF VACCINES

There are two types of vaccines: killed vaccines (**KV**) and modified live vaccines (**MLV**). The disease-causing organism is dead in killed vaccines. These vaccines are safer to use with ***at risk*** cattle. Killed vaccines usually require two doses (an initial followed by a booster) administered according to the label to be the most effective. Modified live vaccines contains altered viruses/bacteria that reduce the risk of causing disease. However, the organism in the vaccine is still replicating and can cause immune suppression.

CORE VACCINATION PROGRAM

Core vaccines are those used to provide protection from diseases that are common to beef and dairy cattle in the U.S. These vaccines are safe and effective. Because they are "core," they have similar antigens and labels, and they may be in killed vaccines or a modified live vaccines form.

- Infectious Bovine Rhinotracheitis (**IBR**)
- Bovine Viral Diarrhea (**BVD**)
- Parainfluenza (**PI3**)
- Bovine Respiratory Syncytial Virus (**BRSV**)
- Clostridial (7-Way)

There are other diseases of importance to dairy and beef producers that the veterinarian, herdsman, or manager will want to vaccinate against the risk factors associated with these diseases, which will vary from location-to-location.

ROUTES OF VACCINE ADMINISTRATION

When administering vaccines (or giving injections), always refer to the *Beef Quality Assurance* manual for proper technique and placement of injections. Additionally, to prevent residues, always refer to the label for proper milk and meat withdrawals—and keep a record of when vaccines are administered.

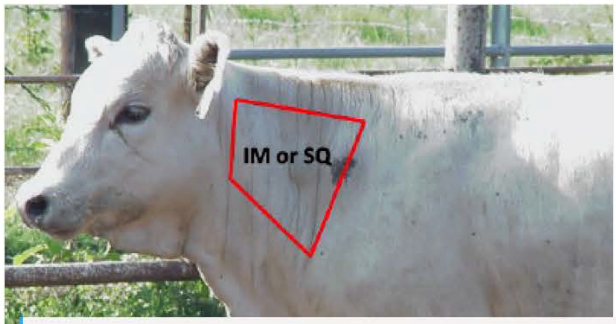


Figure 1. A intramuscular (IM) injections should only be given in the neck area. *(Image courtesy of Dr. Joe Paschal)*

There are three main ways to administer vaccines: intramuscularly (**IM**), subcutaneously (**SQ**), or intranasally (**IN**). Intramuscular injections should only be given in the neck area (Fig. 1). Subcutaneous injections can be given in the neck, elbow pocket, or dewlap. Intramuscular injections need to penetrate the muscle where the vaccine is deposited. Subcutaneous injections are administered into the subcutaneous fat between the muscle and skin and can be done by pinching the skin away from the muscle to create a pocket using the tenting technique (Fig. 2).

Figure 2. A subcutaneous (SQ) injection. *(Image courtesy of Dr. Ron Gill)*

The needle gauge diameter and length are dependent on the size of the animal receiving the injection, viscosity of the vaccine, and the volume being administered. Intranasal vaccines are administered directly into the nostrils to stimulate a localized immunity. These vaccines cause an immediate response but are not long-lasting. Certain types of vaccines containing zoonotic diseases (e.g., Brucellosis or Anthrax) should be managed with extreme care.

MANAGING VACCINATIONS

The storage, handling, and administration of vaccines is particularly important to ensure the maximum effectiveness of vaccines given to cattle. Most vaccines are stored in the refrigerator, where the temperature should stay between 35 to 45 degrees F. Both extreme heat and cold will affect vaccine effectiveness and safety. To ensure that vaccines are stored at the correct temperature, vaccines should be stored in the center of the refrigerator, as the temperature does not fluctuate as frequently when the door is opened. A high-quality thermometer should be used to check the temperature. Do not store food or drinks in the same refrigerator as the vaccines. Also, reduce the exposure to light, as it will inactivate the vaccine.

When transporting vaccines, maintain temperature control and avoid exposure to sunlight. Transport vaccines in a cooler with ice packs to help maintain the temperature, but prevent direct contact with vaccine vials. The cooler should be stored in areas of the vehicle that are less likely to change temperature (for example: Not in the bed of a truck).

Preparing vaccines requires cleanliness. Make sure to use a new, sterile needle when first puncturing the vial, and always use a new needle to draw up the vaccine to avoid contaminating the vial. Also, always use high-quality needles and syringes. The best types of needles to use have aluminum hubs. Keep in mind that the smaller the needle (i.e., larger gauge) are more likely to break or bend if the animal is not *properly restrained*. Once vaccine vials have been used, follow the label directions for storage and disposal. Syringe sizes will vary and depend on the volume being administered. Labelling syringes with the vaccine name and amount to administer will reduce the risk of mistakes.

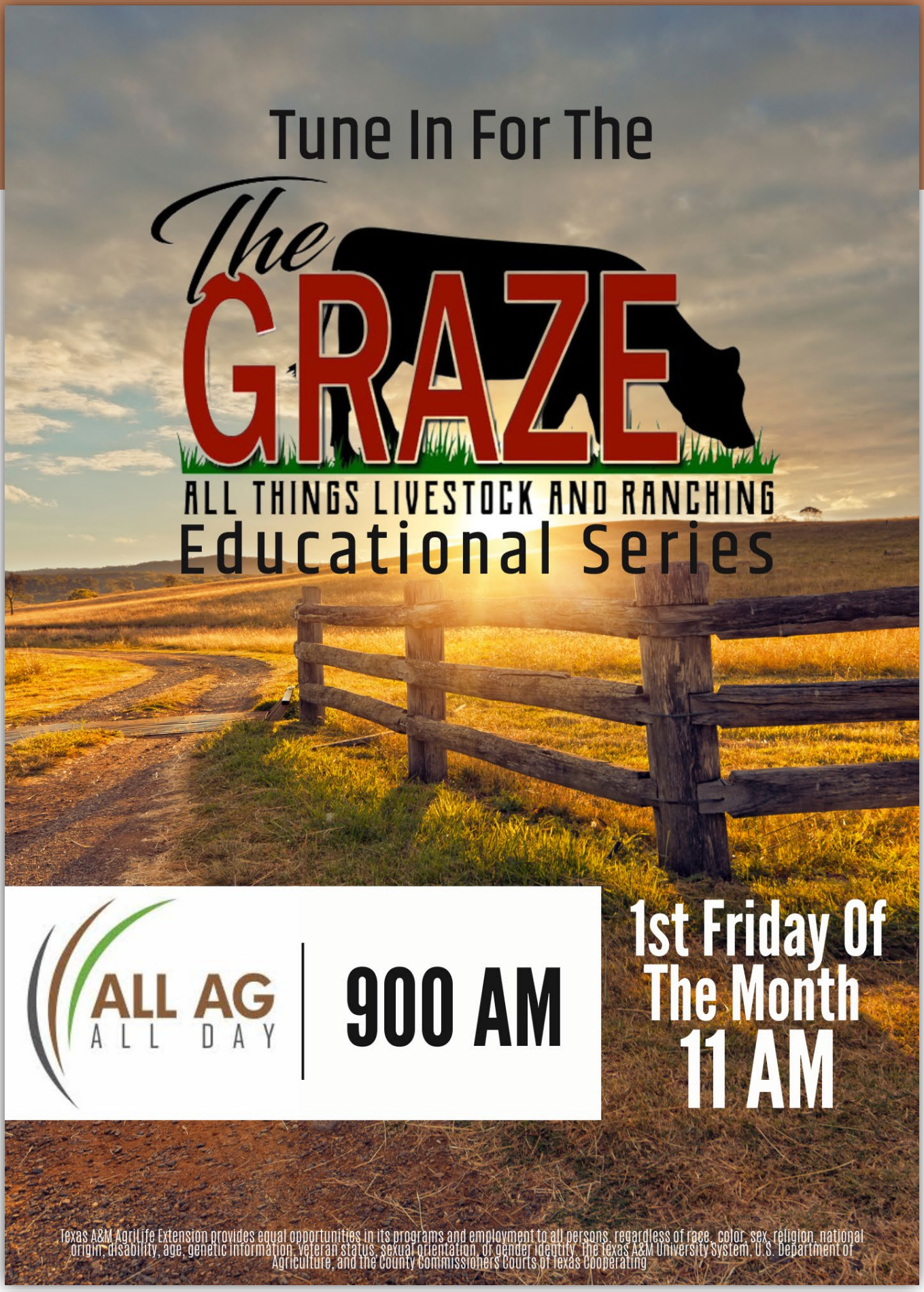
Once the vaccine has been given to cattle, single-use needles should be disposed in a container designated only for needles. If using a pistol-type grip syringe, it can be cleaned by rinsing in hot water several times and allowing them to air dry. When cleaning a syringe, do not use disinfectants or detergents they will inactivate vaccines.

To ensure human and animal safety, and vaccine effectiveness, chutes, headgates, and headlocks should be maintained to ensure they are functioning correctly and allow cattle to move with the least amount of stress. Even with perfect conditions, there is still a risk that the incorrect quantity is administered. To reduce that risk: store vaccines properly, limit light exposure, do not use expired vaccines, follow protocols to prevent contamination of the vaccine vial, and always follow the manufacturer's label.

REFERENCES

American Association of Bovine Practitioners. 2021. AABP Vaccination Guidelines.

Beef Quality Assurance National Manual (*https://www.bqa.org/resources/manuals*).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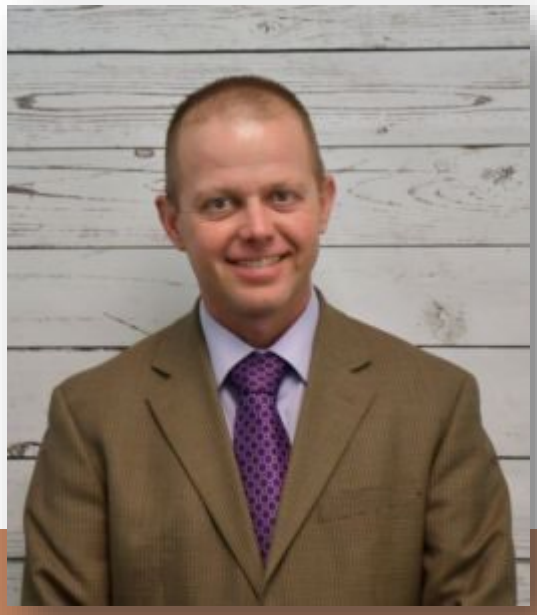

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http://hale.agrilife.org

All Ag, All Day
900 AM KFLP

Subscribe!

Upcoming Programs/Events:

Please call (806) 291-5267 to sign-up or if you have any questions.

Lunch & Learn: Cattle Vaccinations and Worming

August 26, 2024 (11AM) RSVP – 806-983-4912
Floydada Livestock Sales
703 N. 12th
Floydada, Texas 79235

The Graze Conference – *All Things Livestock and Ranching*

September 12, 2024
Ollie Liner Center
2000 S. Columbia
Plainview, Texas 79072

Grazing School Promo

September 25, 2024
Hale County Extension Office
225 Broadway, Ste. 6
Plainview, Texas 79072

AM Radio - Caprock Beef Cattle Educational Series

First Friday of Every Month @ 11:00 AM
Aired on Radio: All Ag, All Day – 900AM

Hale County Ag Committee:

Shane Berry	Mark Mahagan
Greg Cronholm	Joe Mustian
Chance Crossland	Leo Ruijne
Donald Ebeling	Mark True
Steven Ebeling	Robert Unterkircher
Jessica Finck	