FOOD SAFETY

The primary concerns associated with food safety are pathogens, residues (antibiotic/chemical) and foreign materials (buckshot/broken needles). It is imperative that food safety control points are identified so preventive and corrective measures can be put in place.

These are called "food safety" control points because a legitimate food safety risk of sufficient severity exists to warrant control. Most cow-calf and stocker operations will only have a few management points that are truly food safety control points. Process control points in cow-calf and stocker production that have potential consequences for the safety of beef are:

Process	Control Point	Potential Food Safety Hazard
Prevention and treatment of health disorders	Calving Herd bull and cow working Calf working Weaning calves Receiving breeding cattle Receiving stocker cattle	Injection site lesions Antibiotic residues Broken needles
Parasite control	Deworming External parasite control	Injection site lesions Chemical residues Broken needles
Feeding/supplementation	Purchasing Receiving Storage Feeding livestock	Antibiotic residues Chemical residues Feed toxins Beef measles
Gathering cattle	Use of firearms to haze cattle	Buckshot/birdshot
Pasture/range management	Brush control Weed control	Chemical residues
Preventing exposure to hazardous materials	Storage Handling Disposal Restricting access to: Petrochemical sites Septic systems Polluted soil and water	Chemical residues Beef measles

There may be other control points in a beef operation. It is important for you to develop your own production chart or list that includes all of the management practices you employ in your operation. That chart can then be used to identify your particular control points.

Managing food safety control points

Areas of food safety addressed in the TBQP program include:

1. ***Injection site management***
2. ***Residue avoidance***
   a) Antibiotic residues
   b) Chemical residues
   c) Feed contamination and residues
3. ***Foreign object avoidance***

Beef Quality Assurance Is Everyone's Job

Injection Sites

Administration of injectable animal health products can lead to food safety and food quality risks. At issue are injection site lesions and residues from injectable products. Although most injection site lesions are concerned with food quality, most consumers would perceive them as health risks. However, residues are a food safety concern. The following guidelines should be followed for both food safety control points as well as quality control points (see more about quality control points on page 41).

Best Management Practices

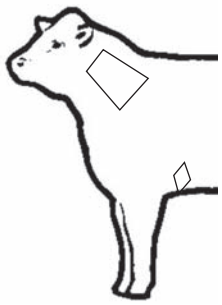
1. Choose orally or topically applied products, if efficacy is at least equal to injectable products.

2. Select injectable products that adhere to BQA recommendations - low irritant, low dose, subcutaneous.

3. Read and follow label directions when administering any animal health product.

4. Properly restrain cattle when administering injections. Improper restraint is the leading cause of broken needles and tissue damage.

5. Administer all IM injections in the NECK. When administering subcutaneous (SQ) injections, use the "tenting" technique (See Figure 1). Other acceptable SQ sites are the dewlap and the elbow pocket.



6. If possible, do not place more than one SQ injection on the same side of the neck to avoid interaction of products or severe tissue reaction.

Figure 1

7. Properly space injections:

a) 3 inches between injection sites on calves and yearlings.

b) 4 inches between injection sites on cows and bulls.

8. Never exceed label recommendation for injection sites. Most products are labeled for a maximum of 10 mL per injection site.

9. Never mix products.

10. Select the appropriate needle size, depending on product viscosity, size of animal and route of administration (IM or SQ).
a) 16-18 gauge 5/8- to 1-inch needles work well for SQ injections.
b) 16-18 gauge 1- to 1 1/2-inch needles work well for IM injections (See Table 1, *Guidelines for Needle Selection*).

11. Change your needle when it becomes contaminated or damaged. Change needles frequently (10 to 12 head per needle) to ensure minimal tissue damage from burrs and minimize the risk of carrying contaminant into the injection site. Change needles on every animal if a blood-borne pathogen (ie. anaplasmosis) is known to exist in your herd. If a needle bends, stop immediately and replace it. Do not straighten it and use it again. Bent needles are much more likely to break off in the animal.

12. Injection sites should be free of soil and manure. Processing cattle in wet weather increases the chance of injection-site contamination.

13. Do not use chemical disinfectants to sterilize needles or syringes. To sterilize, boil syringe components and reusable needles in water for 20 minutes. Disinfectants can cause severe tissue irritation and will reduce the efficacy of products like Modified Live Virus (MLV) vaccines. It is best not to disinfect the injection site as

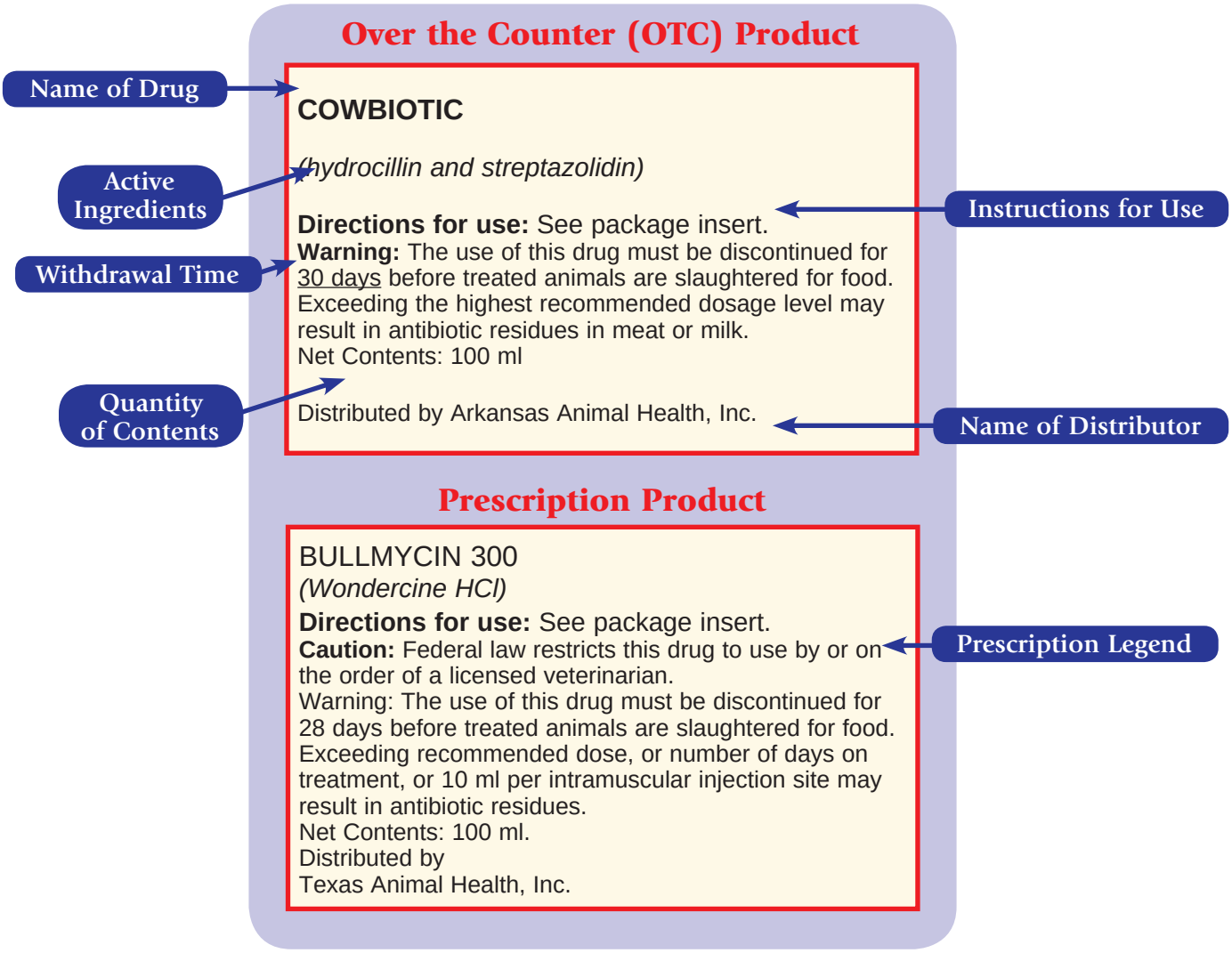
Table 1. **Guidelines for needle selection**

	Route of Administration								
	SQ (5/8 to 1 inch needle)			**IV** (1 1/2 inch needle)			**IM** (1 to 1 1/2 inch needle)		
Viscosity of Injectable	< 300 lbs.	300-700 lbs.	> 700 lbs.	< 300 lbs.	300-700 lbs.	> 700 lbs.	< 300 lbs.	300-700 lbs.	> 700 lbs.
Thin Liquids Example: Saline	18 gauge	18-16 gauge	16 gauge	18-16 gauge	16 gauge	16-14 gauge	18 gauge	18-16 gauge	18-16 gauge
Thick Liquids Example: Oxytetracycline	18-16 gauge	18-16 gauge	16 gauge	16 gauge	16-14 gauge	16-14 gauge	18 gauge	16 gauge	16 gauge

product contamination can occur, as well as increased tissue damage.

14. Develop a record-keeping system and processing map (See *Record Keeping for Beef Quality Assurance*, page 35) to document individual animals or entire groups of animals that have been treated. Also, include the route of administration used (IM or SQ), product used, product lot number and serial number (in the event you encounter an episode of product or treatment failure).

Examples of Label Types



Label Provided by Veterinarian
For "Extra-Label" Use

Veterinarian:_____**Phone:**_____
Address:_____**Date:**_____**Exp:**_____
Owner/Farm:_____**Animal ID:**_____ **Species:**_____
Active Ingredients/Concentration: _____
Quantity:_____**Drug Trade Name:**_____
Indications: _____
Directions: Give _____**cc/bolus/oz** _____**times each day for** _____**days**
Drug Withdrawal Time for Slaugher_____**Days**
Test for Residues: Urine_____ **Blood**_____

Calculation example:

A 550-pound calf is sick with respiratory disease and the veterinarian recommends that the calf be treated with "CALFBIOTIC." The directions on the bottle are as follows:

"Directions: Inject subcutaneously in cattle only. Administer a single subcutaneous dose of 10 mg/kg of body weight (1 ml per 30 kg or 1.5 ml per 100 lbs).

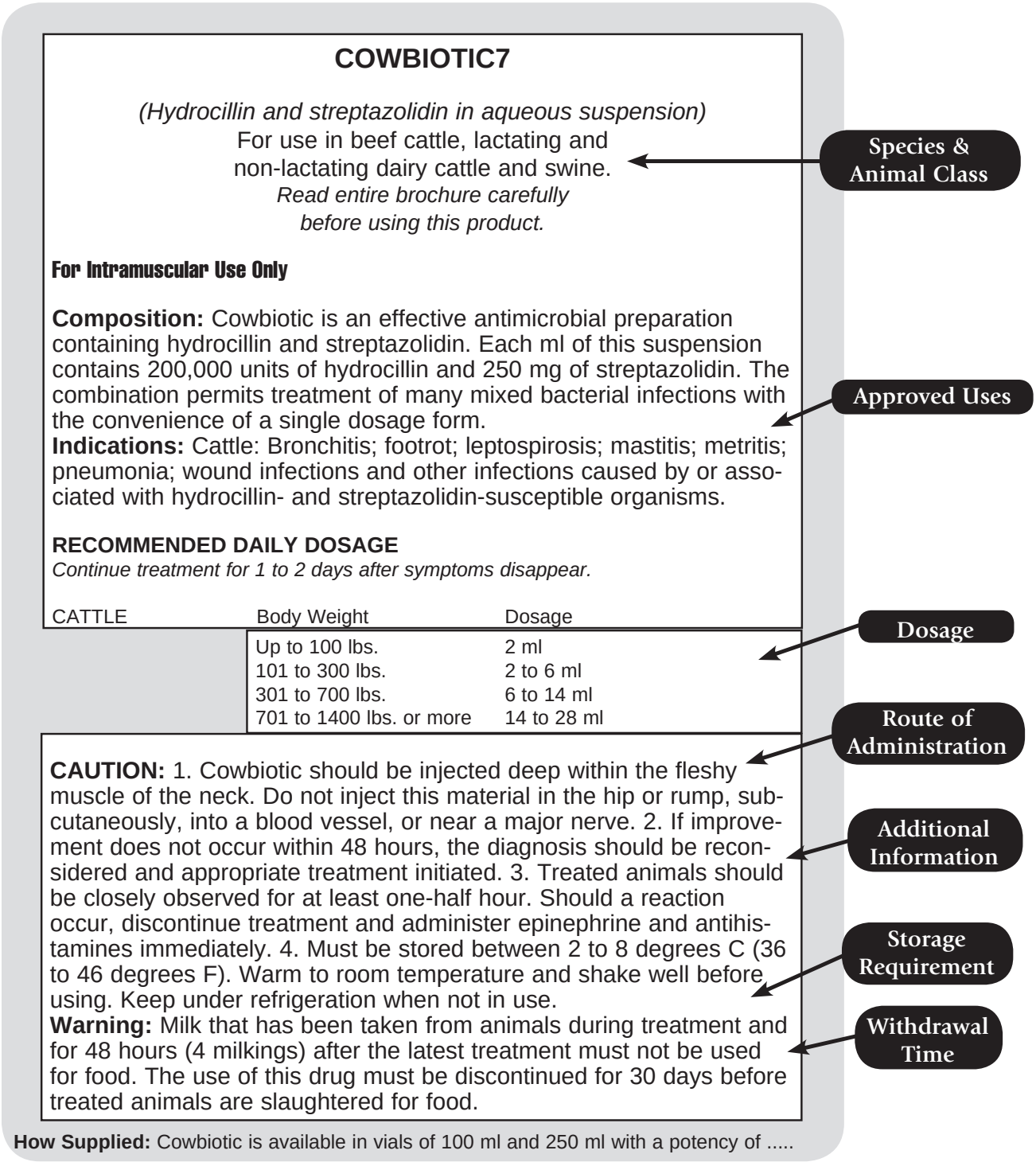
550 lbs = 249 kg **(550 lbs divided by 2.205 lb/kg)**
then
249 kg x 1 ml/30 kg = 8.3 ml **(249/30=8.3)**
550 lbs x 1.5 ml/100 lbs = 8.25 ml **(550/100) x 1.5 = 8.25**

What if the calf actually weighed 400 lbs or 700 lbs?

400 lbs x 1.5 ml/100 lbs = 6 ml
700 lbs x 1.5 ml/100 lbs = 10.5 ml

In this example, if no scales were available to obtain a correct weight, then guessing the weight of an animal can lead to improper treatment. If the calf actually weighed 400 lbs and was given a dose for a 550-lb calf, then additional expense was incurred and the potential for a longer withdrawal time exists. If the calf actually weighed 700 lbs and was given the dose for a 550-lb calf, then most likely the treatment would have failed and the animal's condition may have gotten worse. It is essential that an accurate estimation of the animal's weight be taken to avoid incorrect dosages.

Example of Package Insert Information



COWBIOTIC7

(Hydrocillin and streptazolidin in aqueous suspension)
For use in beef cattle, lactating and non-lactating dairy cattle and swine.
Read entire brochure carefully before using this product.

Species & Animal Class

For Intramuscular Use Only

Composition: Cowbiotic is an effective antimicrobial preparation containing hydrocillin and streptazolidin. Each ml of this suspension contains 200,000 units of hydrocillin and 250 mg of streptazolidin. The combination permits treatment of many mixed bacterial infections with the convenience of a single dosage form.
Indications: Cattle: Bronchitis; footrot; leptospirosis; mastitis; metritis; pneumonia; wound infections and other infections caused by or associated with hydrocillin- and streptazolidin-susceptible organisms.

Approved Uses

RECOMMENDED DAILY DOSAGE
Continue treatment for 1 to 2 days after symptoms disappear.

CATTLE	Body Weight	Dosage
	Up to 100 lbs.	2 ml
	101 to 300 lbs.	2 to 6 ml
	301 to 700 lbs.	6 to 14 ml
	701 to 1400 lbs. or more	14 to 28 ml

Dosage

Route of Administration

CAUTION: 1. Cowbiotic should be injected deep within the fleshy muscle of the neck. Do not inject this material in the hip or rump, subcutaneously, into a blood vessel, or near a major nerve. 2. If improvement does not occur within 48 hours, the diagnosis should be reconsidered and appropriate treatment initiated. 3. Treated animals should be closely observed for at least one-half hour. Should a reaction occur, discontinue treatment and administer epinephrine and antihistamines immediately. 4. Must be stored between 2 to 8 degrees C (36 to 46 degrees F). Warm to room temperature and shake well before using. Keep under refrigeration when not in use.

Additional Information

Storage Requirement

Warning: Milk that has been taken from animals during treatment and for 48 hours (4 milkings) after the latest treatment must not be used for food. The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food.

Withdrawal Time

How Supplied: Cowbiotic is available in vials of 100 ml and 250 ml with a potency of .....

Residue Avoidance

Adulteration of beef products can occur with residues from animal health products, herbicides, pesticides and chemical contaminants of feed and water. Traces of some drugs and chemicals may be allowed in certain tissues. This is known as the tolerance level.

Tolerance levels are usually discussed in terms of one part of drug or chemical to one million or one billion parts of tissue. For some chemicals, no detectable amount is allowed (zero tolerance). The Food and Drug Administration establishes tolerance levels for residues in food products.

Residues are monitored through tissue sampling in beef processing facilities. Violations of the legal limits called violative levels can result in regulatory action, including fines, herd quarantine and possibly criminal prosecution.

To date, violations have been minimal. Continual changes in inspection and monitoring may result in a higher incidence of residue detection.

The Food and Drug Administration and the Environmental Protection Agency approve and establish guidelines for the use of animal health products and agricultural chemical products used in pasture and range management, crop production, feed processing and storage.

During the approval process, withdrawal times are established for livestock treated with or exposed to regulated compounds and products. These times are explicitly defined on the labels for the products. The first step in avoiding residues is to read and follow label directions for all products used in beef and other agricultural production.

In addition to animal health products and pasture and range pesticides, contamination or residues may result from accidental or negligent exposure to feed, water or soil that has been contaminated with heavy metals, petrochemicals, PCBs, PCPs, insecticides, fungicides, herbicides, mycotoxins or other hazardous materials. Careful management and oversight is necessary to prevent exposure to these compounds.

Traces of some drugs and chemicals may be allowed in certain tissues. This is known as the tolerance level.

Residue monitoring in non-fed cattle (cull cows/bulls)

Residues in fresh meat and poultry are monitored by the Food Safety Inspection Service through the National Residue Program (NRP). The NRP helps prevent the entry of animals containing violative residues of pesticides, drugs or potentially hazardous chemicals into the food chain through *monitoring* and *enforcement.*

Random samples are tested for *monitoring* the national residue incidence. Specific samples are collected for *enforcement* based on clinical signs and previous herd history.

Traditionally, animals were selected for testing based on pre-harvest evaluation only (down, disabled, recent surgery). Inspectors were instructed to check for residues after harvest in animals with any of the following 11 conditions:

1. **Suspects**
2. **Mastitis**
3. **Pneumonia**
4. **Body-cavity lining inflammation**
5. **Heart sac lining inflammation**
6. **Skin inflammation**
7. **Twisted stomach disease**
8. **Septicemia (blood poisoning)**
9. **Pyemia (blood poisoning)**
10. **Injection sites**
11. **Uterine infection**

Violations of the legal limits called violative levels can result in regulatory action, including fines, herd quarantine and possibly criminal prosecution.

In cull cows and bulls, residues are monitored and can be traced back to the owner through back tags that are applied at the auction market or packing plant. The majority of violative residues for antibiotics occur in tissue samples from dairy cows. But, violative residues are found in beef cattle as well.

Nationally there are approximately 6 million cull cows/bulls harvested (remember, that means slaughtered) every year. Relying on inspection and testing goes against the principles of TQM, which stress prevention rather than inspection. These problems can and must be solved at the producer level, and progress in reducing residues will only be accomplished if producers pay strict attention to guidelines for proper use of animal health products and other potential contaminants.

Avoiding *antibiotic* residues

Overall, the beef industry is doing an excellent job of controlling violative drug residues by placing emphasis on the identification and handling of individually treated cattle. This includes identifying each animal treated, accurately recording the treatment, date, and following proper withdrawal times. It is important that beef producers establish a working relationship with a licensed veterinarian. Find and use a veterinarian who is willing to be involved with your Beef Quality Assurance program. Be cautious about cattle treatment advice from anyone who is not highly acquainted with your operation and the proper use of animal health products.

Overall, the beef industry is doing an excellent job of controlling violative residues by placing emphasis on the identification and handling of individually treated cattle.

Preventative Herd Health Plan

The most effective way to reduce the potential for antibiotic residues is to control the need to use them. Every effort should be made to prevent disease and infection in the cattle herd. To accomplish this a herd health plan needs to be developed for each individual ranch operation. One herd health plan will not fit all operations across the state.

Preventative herd health plans will consist of herd management and immunization recommendations. Work with your veterinarian to develop a herd health plan including a biosecurity program.

Included in this plan should be:

1. Diseases of concern
2. Recommended vaccines
3. Appropriate time frame to protect (vaccinate) against diseases of concern
4. Recommended feed additives (if any)
5. Additional management considerations to aid in the prevention or spread of diseases of concern
6. Development of management protocols in the event of failed prevention efforts

Management and treatment considerations will need to be discussed and developed on and for each operation.

Any medication that requires a use other than as directed on the label must have revised administration procedures. Your veterinarian must supply a revised label including the veterinarian's name, address, phone number, revised directions for use, name of drug and withdrawal time.

Animal health products have specific label instructions including the period of time that must pass after the last dose is given until harvest of the animal. This period of time is known as the *withdrawal period* and is usually stated in hours or days. The withdrawal period allows time for elimination of the drug from the animal, or reduction of residues to below tolerance levels before harvest.

Extra-label use requires extended withdrawal periods in order to reduce the level of residues below violative levels. Revised withdrawal times should be established by the authorizing veterinarian. Withdrawal times may also be extended for animals that have been severely impaired by stress, disease, malnutrition or age.

Extra-label drug use is using a drug at a dose, by a route, for a condition or indication, or in a species not on the label.

Avoiding tissue residue of antibiotics is simple to manage; observe and follow label directions and ensure that cattle are not marketed until the appropriate withdrawal time has elapsed. On the next page are basic management practices necessary to ensure that no violative antibiotic residues will be present in carcass tissues.

<u>Withdrawal period</u>: the period of time that must pass after the last dose is given until harvest of the animal. The withdrawal period stated on the label allows time for elimination of the drug from the animal, or reduction of drug residues to below tolerance levels before harvest.

Best Management Practices – Antibiotic Use

1. Strictly follow all recommendations and guidelines from your veterinarian for selection of products.

2. Follow label directions for use of product. Use product at recommended dosage for required time period. Treatment regimens must comply with label directions unless otherwise authorized by a veterinarian. Use of drugs in an extra-label manner must be authorized by a veterinarian under a valid vetrinarian-client-patient relationship. (The requirements for a valid veterinarian-client-patient relationship (VCPR) are covered in the Appendix, page 112.) All cattle treated in an extra-label manner must comply with established withdrawal times, which have been set by your veterinarian under the guidelines of a valid VCPR.

The Texas Beef Quality Producer program does not support extra-label drug use of injectable aminoglycosides (such as neomycin, gentamicin or kanamycin) because of the potential violative residues related to extremely long withdrawal times. Some studies have shown withdrawal times on these types of products could be as long as 18 months.

3. Calculate dose requirements based on the animal's weight and the specific health problem being treated. Providing the same drug simultaneously by injection, feed or water may result in overdosing and, thereby, create a residue problem.

4. When administering injectable products, follow the ***Best Management Practices – Injections*** outlined on page 13.

5. All animals treated for problems unique to the individual animal should be recorded by the animal's ID, treatment date, drug and dose administered, product serial/lot number, weight of animal, route and location of administration, and the earliest date the animal would clear the withdrawal period. (See page 37 for sample treatment records). Record treatments either by individually identifying each animal and/or individually identifying each animal when or if they are treated. The ID number should be unique to that animal and tie it to the group from which it came.

6. Identifying each animal individually is not *required* to participate in this program. Cattle can be identified by group. However, if treated cattle are not individually identified, then the entire group must be managed together until the appropriate withdrawal times have elapsed for every animal in the group. **The withdrawal time applies to the entire group of animals.** (See forms for recording group treatment history on page 38).

7. All cattle marketed from the ranch can potentially go directly to slaughter.

Therefore, records for any cattle to be marketed should be checked by ranch personnel to ensure that treated animals will meet label withdrawal times for all products administered. A release slip should be signed and dated by the person who checks records prior to shipping cattle from the operation. The examination should include processing records, feeding records, treatment records and all other records that may apply.

8. Extended withdrawal times should be expected for emaciated or severely debilitated animals. Attempting to salvage value by treatment and prompt slaughter requires an accurate diagnosis and careful selection of drugs. Should there be any question about withdrawal period, the veterinarian will evaluate the treatment history against information provided by the Food Animal Residue Avoidance Databank (FARAD), and the animal may have to pass a residue screening test, such as the Live Animal Swab Test (LAST). The results will determine whether the animals can be released for shipment, but cannot be used to shorten the labeled withdrawal time.

9. Make sure that all employees are aware of the proper use and administration of antibiotics and withdrawal times, and they have the ability to check appropriate withdrawal restrictions before moving cattle to market. Use charts or software to help track withdrawal dates.

Feed additives and medications

The term "medicated feed" includes any feeds containing animal health products. This includes products commonly referred to as supplements (medicated mineral), concentrates (grain mixture that contains medication), premix feeds (concentrated medications mixed with additional roughage or concentrates) and base mixes, as well as complete feeds (preconditioning feed used for receiving/weaning).

For more detail on FDA regulations concerning feed additives and medicated feeds, see Appendix, page 114. The following recommendations relate specifically to the use of medicated feeds.

Any animal marketed from a cow-calf or stocker operation could potentially go immediately into a meat product. You may sell an animal with no intent of it going to slaughter; however, the person you sold the animal to could resell it within a matter of days to someone else who sends it to slaughter. This applies to cows, bulls, calves and yearlings. That's why it is so important to observe withdrawal times whenever you sell cattle.

Best Management Practices – Medicated Feeds

1. Only FDA-approved medicated feeds and feed additives can be used in rations.
2. Feed only at recommended rates. Exercise caution when calculating rates for medicated feeds.
3. All medicated feeds and feed additives will be used in accordance with the FDA-approved label. Extra-label use of feed additives is prohibited by federal law. **No one has the authority to adjust the dose as labeled, including veterinarians.** All directions for the use of a medicated feed or feed additive will be on the label attached to the bag or will be supplied with a bulk order. Medications added to water are not considered feed medications; follow label directions or directions from your veterinarian.
4. Follow withdrawal times stated on the label or provided by your veterinarian.
5. For operations formulating and mixing rations on site, medicated feed additives will be used in accordance with the FDA Good Manufacturing Practices (GMPs). These include a formula record of all medicated feed rations produced and records of all batches of feed produced that contain medicated additives. Records must include additive used, date run, ration name or number, the name of the person adding the additive or responsible for mixing the feed and amount produced. Use separate mixers for mixing medicated feeds and non-medicated feeds, or clean mixers between batches of each.
6. Pre-mixed or formulated supplements do not require FDA registration of any type. Larger operations that use certain highly concentrated medications may be required to register with the FDA via a FD-1900 permit.
7. Identify treated individuals or groups as described in the antibiotic use section, page 23.

Avoiding Chemical Residues

Pesticide or herbicide residue is not a major problem in the beef cattle industry. Areas of risk include products applied to the land, applied to the animal, or accidental or negligent exposure to hazardous materials. To avoid potential risk of residues, the following guidelines are recommended.

Best Management Practices – Chemical Residues

1. Use only agricultural chemicals approved for application to land grazed by livestock or on land where feedstuffs are harvested for animal consumption.

2. Follow label directions and observe grazing and harvest restrictions when applying pesticides to pastures, rangeland and crops treated with pesticides.

3. Prevent accidental exposure to agricultural chemicals by proper storage and disposal of containers. Thoroughly clean sprayers between application of agricultural chemicals and application of livestock pesticides.

4. Only use products *approved* for cattle to control internal and external parasites. In backrubbers or other self-treatment devices, it is preferred to use vegetable oil or mineral oil as a carrier.

5. Apply topical, oral and/or injectable livestock pesticides at label dose rate. Overdosing constitutes extra-label usage with unknown withdrawal times. Individual animal weights can help determine appropriate calculation of doses.

6. Document usage and observe all appropriate withdrawal times before marketing cattle.

7. Prevent consumption of hazardous chemicals and heavy metals by proper storage and disposal of paint, batteries, chemical containers, used petrochemical products and other materials. Restrict access to any site that may provide the opportunity for exposure to hazardous chemicals.

8. Prevent contamination of feedstuffs and water.

Feed Contamination

The *potential* for adulteration of beef from contaminated feed is greater than most producers realize. However, contamination is not common at the ranch level. *Accidental* contamination is much more common than any other type of problem.

EPA pesticide product registration and licensed pesticide applicator requirements provide significant protection from pesticide residues in the U.S. feedgrain supply. In addition, costs associated with pesticides discourage over-application.

To make sure you do not buy a residue problem in a load of feed, grain, by-products, hay or crop residues, deal with a reputable feed commodity supplier. In addition, you may wish to ask suppliers about their use of grain protectants during storage and their monitoring procedures.

Fluid leakage and other potential contamination

The leakage of transmission and transformer fluid poses a potential problem in residue avoidance. Both types of fluid contain polychlorinated hydrocarbons (PCBs), which can leave a violative residue in cattle. While the occurrence of PCB residue from this source is small, the possibility still exists.

Another potential problem is transmission/hydraulic or radiator fluid that leaks from farm equipment and contaminates feed. Lead and other heavy metals may be picked up through spills and leaks; batteries, paint and other materials may inadvertently contaminate feed or be picked up elsewhere by cattle.

Products used for bird and rodent control are another potential problem. While no residues have been reported from these products, they are toxic substances. Adhering to the following guidelines can reduce the risk of residues from contaminated feed.

Best Management Practices – Feed Contaminants

1. Maintain a quality control program for incoming feed ingredients in an attempt to eliminate contamination resulting from molds, mycotoxins, chemicals and other contaminants.
2. Store feed in a manner that prevents development of molds and mycotoxins and exposure to chemicals and other potential contaminants.
3. If contamination is suspected, submit the feed ingredient for analysis by a qualified laboratory before use.
4. To avoid accidental livestock exposure, treat all chemicals as potential hazards. Never store chemical products where leakage or breakage can contaminate feed products. For example, don't store batteries, fuel containers or paint next to feedstuffs.
5. Regularly check all feed-handling equipment for fluid leaks.
6. Clean spills to prevent potential contamination.
7. If a feed-related poisoning is suspected, it is critical for the producer or veterinarian to contact a diagnostic laboratory for assistance in confirming the suspicion.
8. If purchasing fats and vegetable oils, monitor for potential contamination. Letters of guarantee from companies supplying these materials may be requested that state these materials have been tested.

Ruminant by-products

As of 1998, federal regulations prohibit the feeding of certain mammalian protein sources. The regulations primarily impact the feeding of meat meal and bone meal, and blood products derived from ruminants. Tallow, gelatin and milk products are excluded by the regulation and are acceptable for use in ration formulations. (More information on ruminant-derived by-products and their use is available in the Appendix, page 114.)

Best Management Practice – Ruminant By-products

1. Do not use ruminant-derived protein sources in manufacturing ruminant feeds.

Beef measles

Occasionally, feeders are notified by packers that some of their cattle have "measles." Cysticerosis, or "beef measles," refers to the immature larvae stage of the human tapeworm found in the form of cysts in the muscles of cattle. It results from cattle consuming feedstuffs contaminated with tapeworm segments or eggs, or cattle coming in contact with water or ground that has been contaminated by infected humans.

USDA regulations prohibit contaminated carcasses from being approved for human consumption.

Investigations have indicated that the majority of cattle with measles were infected *prior* to entering the feedyard.

Best Management Practices – Beef Measles

1. Fecal/oral contamination should be avoided regardless of the source.

Potential microbial contamination

As the beef industry strives to produce a safe and wholesome product, many areas of quality assurance take on new importance. Contamination of beef with various organisms of importance in human health is an increasingly grave concern. Recognized pathogens, such as *E. coli* 0157H7, *Listeria* spp. (all species) *Salmonella* spp. and *Campylobacter*, may enter the beef supply in a number of ways.

Attention to basic sanitation practices and proper animal health techniques can decrease the chance of microbial contamination.

Potential feed toxins

Mycotoxins are naturally occurring compounds produced by fungi. Mycotoxins can be found in grains and forages, and if present in sufficient concentration, can cause reduced feed consumption, poor production and adverse health effects that may result in residues in meat and milk products.

Environmental conditions that are conducive to the growth of fungi and the production of mycotoxins are quite variable. Mycotoxins can be produced in feedstuffs prior to harvesting or during storage. Mycotoxins common in Texas include aflatoxin, vomitoxin, zearalenone and fumonisins. These primarily occur in grain, peanuts and cotton by-products. Stress during critical stages of crop development often leads to aflatoxin development.

Best Management Practices – Feed Toxins

1. Store feedstuffs in a manner to prevent mold formation and avoid feeding moldy feed.
2. Maintain a quality control program for incoming feed ingredients in an attempt to eliminate contamination. It is important to keep in mind that mycotoxins can be present in feeds without visible mold growth; conversely, visibly moldy feed may not always contain detectable mycotoxins. Texas AgriLife Extension Publication B-1279, *Mycotoxins in Feed and Food-Producing Crops.*

Foreign Objects

There are two major types of foreign objects to be concerned with: (1) buckshot or birdshot and (2) broken needles. On rare occasion, rifle bullet fragments and arrow tips have also been found in carcasses.

Birdshot/buckshot

Lead cannot be detected by metal detection devices used in packing and processing facilities. Lead is considered an adulterant by the Food and Drug Administration. If the shot is detected on the slaughter floor, the entire carcass is condemned, or special measures must be taken to complete remove shot.

If metal is detected during ground beef production, the *entire* lot of ground beef must be condemned. In large slaughter and processing plants, this can be several thousand pounds in one batch! The presence of buckshot/birdshot ranks high on the list of packer concerns.

Regardless of who is at fault, this defect should be prevented with education about the consequences. To ensure that foreign objects are not found in carcasses, adhere to the following guidelines.

Best Management Practices – Birdshot/Buckshot

1. Never use firearms to gather cattle. Develop alternative methods to control and capture animals.

2. Work with hunters to prevent shooting cattle with any weapon. Educate hunters to the potential safety concerns associated with adulterated carcasses. Remove cattle from hunting areas when possible to avoid accidental shootings.

Broken needles

You and your veterinarian must determine how animals will be handled if a needle breaks off when giving an injection. A broken needle is an emergency which should be handled immediately. Broken needles migrate in tissue, and, if not handled immediately, the needle fragment will be difficult to find, requiring the animal to eventually be destroyed if the broken needle is not recovered, rather than sold at market.

Under no circumstances should animals carrying broken needles be sold or sent to a packer. Refer to the following guidelines for best management practices to avoid broken needles.

Best Management Practices – Broken needles

1. Restrain animals properly and adhere to injection site management as outlined on page 13.

2. Do not straighten bent needles. Replace immediately.

3. Develop a standard operating procedure for dealing with needles broken off in cattle.

a) If the needle remains in the animal, mark the location where the needle was inserted.

b) If a broken needle cannot be removed at the ranch, contact a veterinarian immediately to have the needle surgically removed.

c) If a broken needle cannot be extracted from the tissue, record the animal's ID to ensure that it is never sold or leaves the ranch. At the end of its productive life, the animal should be euthanatized and disposed of properly.

Beef Quality Assurance Is Everyone's Job