

# Mississippi Beef Quality Assurance

*Focused on Safe, Wholesome, Quality Beef*



**Mississippi  
Beef Quality  
Assurance  
Program**

*Certification Manual*



## *Beef Quality Assurance: Putting the Pieces Together*

**A**cross the country, beef producers face the test of making a living from the land while producing safe, healthy beef. This beef must give a great eating experience each and every time for consumers in America and around the world.

To meet that test, the Beef Quality Assurance (BQA) program was created in 1987 to help beef producers raise, feed, and harvest high-quality beef.

Using science, research, and education, the BQA program has identified practices producers can use each day. The major goal of these BQA practices is to improve consumer trust. The BQA pro-

### **The BQA Mission**

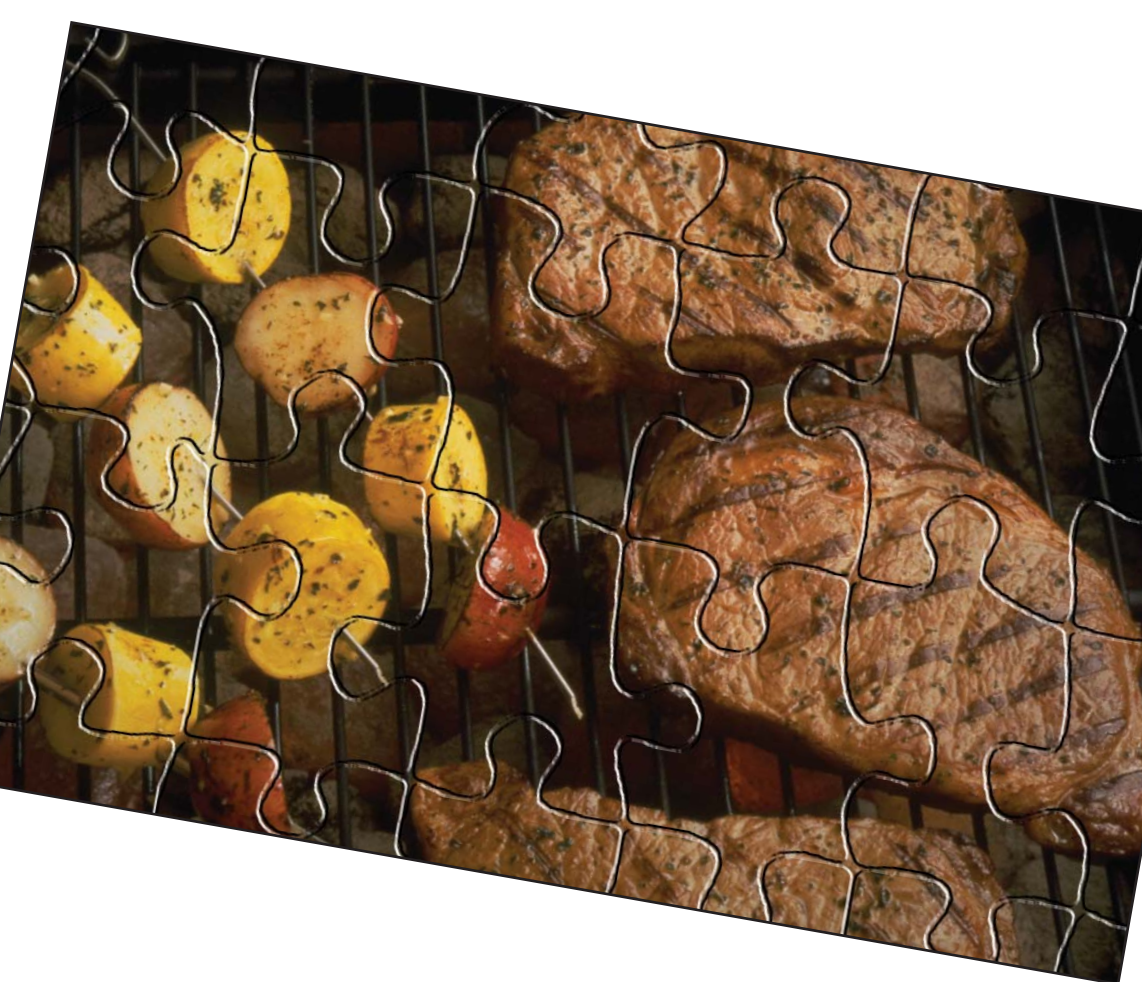
To maximize consumer confidence and acceptance of beef by focusing producers' attention on daily production practices that influence the safety, wholesomeness, and quality of beef and beef products.

gram is a holistic way to produce beef. This means the practices a producer uses can impact the bottom line in all areas, including better profits and returns, lower animal health costs, and improved records that allow for better tracking of production practices.

Foodservice and packing businesses are using similar management principles to ensure the quality and safety of products leaving their production facilities.

The BQA program focuses on good business management practices and includes current FDA, EPA, and USDA regulations.

When you take part in the Mississippi Cattlemen's Beef Quality Assurance (MS-BQA) program and use BQA production practices, you are creating opportunities for your business. Making a commitment to BQA isn't just the right thing to do for the consumer; it also can open doors to new marketing opportunities for participating producers.



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Program and Manual Developed By

## Mississippi Cattlemen's Beef Quality Assurance Program

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This manual was adapted from Nebraska BQA publications through the efforts of the Nebraska Cattlemen's Technical Advisory committee, board of directors, and staff.

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# Mississippi's Role

Since it was founded in the early 1980s, the Mississippi BQA program has been a cooperative effort between beef producers, veterinarians, nutritionists, Extension staff, and other professionals from the Mississippi Veterinary Medical Association, the Mississippi State University College of Veterinary Medicine, the Mississippi State University Extension Service, Mississippi Farm Bureau Federation, the Mississippi Department of Agriculture and Commerce, and the Mississippi Cattlemen's Association.

### *The MS-BQA program is designed to help producers*

1. Set production standards that can be met or exceeded.
2. Set up systems for data retention and record keeping.

The program also provides hands-on training and education on BQA guidelines and technical assistance through Mississippi Cattlemen, MS-BQA certified veterinarians, MSU-CVM Extension staff, and Extension personnel.

Following BQA guidelines helps beef producers give consumers the great eating experience they expect and deserve.



### How can you participate?

Participation in the BQA program is voluntary, and membership in the Mississippi Cattlemen's



**Mississippi  
Beef Quality  
Assurance  
Program**

Association or the National Cattlemen's Beef Association is not a requirement. We encourage any person who regularly works with beef or dairy cattle in a cow/calf, stocker, backgrounding, feedlot, or production-related business to become certified.

To become BQA certified, you must either take part in a training session conducted by an MS-BQA certified trainer or successfully complete the self-study course. You must complete the BQA test and personal checklist and contract. You must agree to all of the program standards on the checklist and sign the contract. Completed tests and contracts should be returned to the address at the bottom of the contract. The BQA manual also can be found at [www.msucares.com](http://www.msucares.com). You will receive your BQA certificate and number through the mail. There is no cost to become certified, and this initial certification is good for 2 years.

This manual also can be used to become recertified in the MS-BQA program. If this manual was mailed to you, it is time for you to recertify in the program. You can do this by completing the MS-BQA test and contract, and mailing these to the address on page 30. Once you are recertified, you will be able to participate in MS-BQA for another 2 years. Plans are under way to make certification and recertification available over the Internet. If you have any questions about the certification process, please contact the BQA coordinator at the MSU College of Veterinary Medicine at (662) 325-1103.

The BQA program connects producers with animal scientists, veterinarians, feed suppliers, animal health companies, packers, retailers, and state and federal regulators. The program encourages producers to use the latest science and technology so their beef will meet quality and safety standards.



In 1982, the U.S. Department of Agriculture's Food Safety Inspection Service (USDA-FSIS) began working with the beef industry in the United States to develop the Pre-harvest Beef Safety Production Program. The beef industry soon adopted the name Beef Quality Assurance (BQA).

In 1985, after 3 years of careful study and adjustment of production practices, three feedlots were certified by USDA-FSIS and called Verified Production Control feedlots.

Lessons learned during those 3 years now serve as the basis for the National Cattlemen's Beef Association BQA program that began in 1987.

Involvement with BQA allows cattlemen to avoid additional government regulation. The FSIS highly praises the national BQA program. More than 45 states now take part in the voluntary program.

## HACCP: The Basis of BQA

The BQA program includes principles of the Hazard Analysis Critical Control Point Program (HACCP). The USDA accepts HACCP (pronounced "hassip"). Many quality assurance programs in the processed food and packing industries follow HACCP guidelines.

At the ranch level, HACCP is as simple as setting up a plan, ahead of time, to deal with something that doesn't go well. It includes making plans to avoid physical, chemical, and biological problems and keeping records of what you did to correct the problem. This manual uses HACCP's seven principles. They are:

1) **Review all management programs to identify production practices that affect food safety, food quality, and the environment.** For example, teach all employees who give injections about the proper technique and injection site.

2) **Identify where problems might occur and take steps to prevent or control these problems.** For example, store vaccines at the right temperatures and do not expose them to sunlight.

3) **Set up guidelines for each control point.** For example, understand and follow withdrawal times for animal health products.

4) **Monitor control points to make sure each control point stays within the guidelines.** For example, keep records on pesticide application withdrawal times so you will know when it is safe for cattle to graze treated forage crops.

5) **Decide what steps you will take if a problem occurs.** For example, train employees not to repeat past problems like using the wrong injection technique.

6) **Set up a record-keeping system that shows your program is working the way it should.** For example, take the time to complete the processing map, record the injection site and dosage, etc.

7) **Review your production system regularly to verify it is working the way it should.** For example, review records, production practices, and treatment practices on a regular basis.

The BQA program encourages producers to use the latest science and technology so their beef will meet quality and safety standards.

# Quality Control Points

Process	Control Point	Potential Hazard
Feeding/ supplementation	Purchasing Receiving Storage Feeding livestock	Antibiotic residues Chemical residues Feed toxins
Preventing and treating health disorders	Calving Weaning calves Receiving breeding or stocker cattle	Injection-site blemishes Antibiotic residues Broken needles
Processing and handling cattle	Working cows and calves Weaning calves Shipping cattle	Injection lesions Bruises Hide damage Carcass defects Poor health
Using pasture chemicals	Herbicide/Pesticide applications Container disposal	Water quality Soil contamination Residues

BQA uses the HACCP program as a model for finding ways to improve the beef production system. This means we have to look at control points throughout the production process.

These control points are the common steps in an overall management plan, such as calving, purchasing feedstuffs, weaning calves, and transporting cattle. Use BQA practices during these control points to prevent problems with food safety and quality.

The chart at left gives some examples of control points. For example, animal health products given at weaning time may prevent or treat health disorders. Giving health products correctly during this control point should get rid of any food safety problems, such as injection-site lesions or antibiotic residues.



## Quality Losses Per Head on Market Cows and Bulls

Quality Defect	Cost Per Head
Inadequate muscling	\$18.70
Excess external fat	10.17
Arthritic joints (trim loss)	9.72
Yellow external fat	6.48
Hide losses: brands, injury, disease	6.27
Condemnation of edible offal	4.49
Whole cattle/carcass condemnation	4.14
Bruises (trim loss)	2.24
Injection-site blemishes	1.46
Dark cutters	1.41
Lightweight carcass	1.28
Trim loss-birdshot/buckshot, zero tolerance	.98
Antibiotic residue	.92
Disabled cattle	.56
<b>TOTAL</b> .....	<b>\$68.82/hd</b>

Source: 1999 Non-fed Beef Quality Audit

A series of landmark studies called the National Beef Quality Audits are taking a closer look at the quality and consistency of production practices.

The National Cattlemen's Beef Association commissioned the audits. Leading meat science departments, including those at Colorado State University and Texas A&M University, began the audits in 1991. More studies followed in 1995, 2000, and 2005.

The results were shocking. In 1991, 21.6 percent of all top butts in the evaluated fed cattle had injection-site blemishes. The majority of those blemishes were fluid-filled. The 1995 audit found that injection site blemishes cost the beef industry \$188 million annually and cost producers about \$7.05 per head.

Since then, BQA guidelines have improved management practices and reduced economic loss while raising carcass quality. In the 2000 audit, injection-site lesions were reduced to less than 3 percent. The audit also showed a loss of \$100.10 per slaughtered steer or heifer due to carcass inconsistency, which was 15.73 percent better than the economic losses reported in the 1995 audit. In those 5 years, the industry recovered \$20.96 per marketed fed animal.

The 2005 audit showed the lowest amount of carcass quality defects since the audits began.

## Beef Quality Audit Findings

### Management Issues BQA Can Influence

Hide defects	\$1.70/head
Injection-site lesions	3.59/head
Dark cutters	5.43/head
Bruises	.75/head
<b>TOTAL</b>	<b>\$11.47/head</b>

Source: National Beef Quality Audit, 2000

## Quality Control: Market Cows and Bulls

The industry's first market cow and bull audit took place in 1994. That audit, called the National Non-fed Beef Quality Audit, found the industry lost about \$70 for each cow or bull that was marketed because of quality defects. A 1999 study showed the economic loss was \$68.82. The 1999 audit identified specific areas where the quality of market cows and bulls could be improved.

No matter what size the herd is, all beef cow operations produce some cull animals. Many of these animals are marketed because they are beyond their prime producing years. Cull cows and bulls make up 15 to 20 percent of producer revenue.

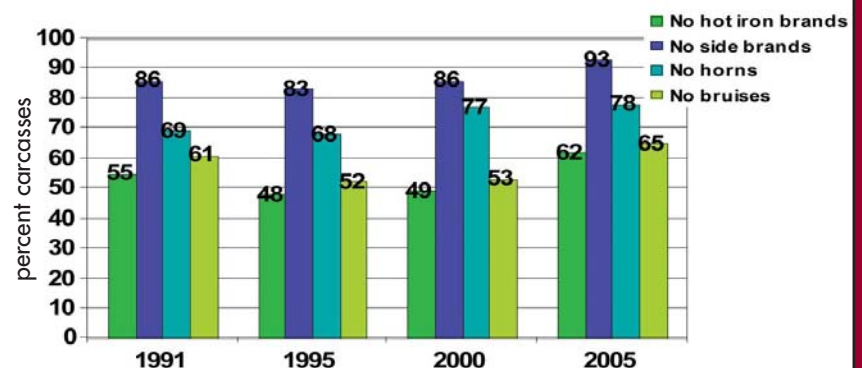
In addition, cull animals supply between 15 to 20 percent of the total U.S. beef production, depending on market conditions.

Ground beef is an important product of cull cattle and makes up 43 percent of the total beef eaten in the United States. However, cull cow packers today also are selling tenderloins, rib eyes, and strip loins to steakhouses.

Bruising is one of the major causes of quality loss among non-fed cattle. Bruising often occurs with non-fed cattle because

- Non-fed cattle often have less fat cover.
- Many cattle are culled due to lameness, which can cause situations leading to bruising, such as falling and stumbling.
- Groups of horned cattle bruise twice as easily as groups of non-horned cattle.

## Comparison of Past Audits: Brands, Horns, and Bruises



Source: National Beef Quality Audit -- 2005

# Beef Quality Assurance Guidelines

The following is a review of the Mississippi Beef Quality Assurance Program guidelines. These guidelines are very much like the National BQA program's guidelines, which the National Cattlemen's Beef Association uses. The next sections of this manual look at the details of each of these guidelines.

See the Appendix on page 31 to learn how to get more information or help on these topics. You also can find information about the BQA guidelines at the Web sites of the National Cattlemen's Beef Association ([www.beefusa.org](http://www.beefusa.org)) or the Mississippi State University Extension Service ([www.msucare.com](http://www.msucare.com)).

## 1. Feedstuffs/Feed Additives

- Keep records of any pesticides or herbicides you use on pasture or crops that could possibly leave violative residues in grazing cattle or feedlot cattle.
- Make sure adequate quality control programs are in place for incoming feedstuffs. Design these programs so that molds, mycotoxins, or chemicals do not contaminate incoming feed ingredients. Be sure your supplier guarantees the quality of the feed ingredients.
- Test feedstuffs before using them if you think they may have been contaminated.
- Avoid the use of ruminant-derived protein sources because FDA regulations prohibit this.
- Avoid the use of by-product ingredients for feed unless you have scientific proof that the ingredients are safe.
- Use only FDA-approved medicated feed additives in rations.
- Use medicated feed additives according to the FDA Good Manufacturing Practices (GMP) regulations.
- Follow sensible guidelines for using antibiotics.
- Avoid using feed additives in an extra-label manner because this is illegal and strictly prohibited.
- Strictly follow withdrawal-time guidelines to avoid violative residues.
  - Keep complete records when formulating or feeding medicated feed rations.
  - Keep feed records for at least 3 years.
  - Withdraw all additives at the correct times.

## 2. Processing/Treatment and Records

- Follow all FDA/USDA/EPA guidelines for the products you use.
- Follow label directions for all products.
- Employ extra-label drug use only when prescribed by a veterinarian, working under a valid veterinarian-client-patient relationship (VCPR).



- Avoid the extra-label use of aminoglycosides because this is strictly prohibited.
- Strictly follow guidelines for extended withdrawal periods.
- Keep individual treatment records with the following information:
  - 1) Individual animal or group identification.
  - 2) Date treated.
  - 3) Product used and manufacturer's lot/serial number.
- When cattle are processed as a group, record the following:
  - 1) Dosage used.
  - 2) Route, location, and person giving the product.
  - 3) Earliest date animals will have cleared the withdrawal period.
- Check all cattle (fed and non-fed) shipped to slaughter to make sure that all treated animals meet or exceed label or prescription withdrawal times for all animal health products they have been given.
- Transfer all processing and treatment records with the cattle to the next production level. Inform possible buyers of any cattle that have not met withdrawal times.
- Keep records for at least 3 years. Examples of records to keep include processing and pesticide application records.



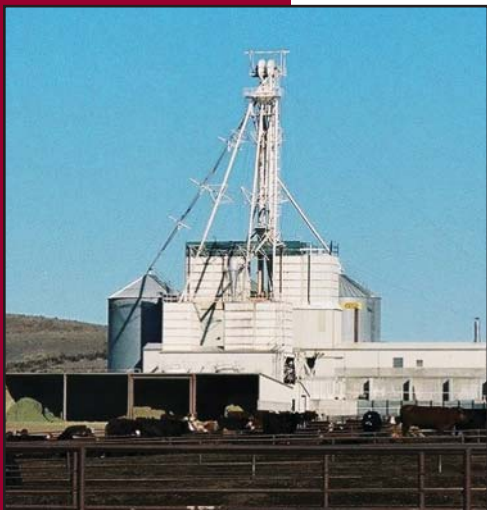
### 3. Injection-Site Management

- Give products labeled for subcutaneous or intramuscular (SQ or IM) injection in the neck region only (no exceptions, regardless of age).
- Avoid IM injections if possible because all products cause tissue damage when injected into muscle.
- Try to use products that can be given orally or through SQ or intravenous (IV) injection.
- Try to use products with low dosage rates.
- Follow proper spacing guidelines when giving more than one injection.
- Give no more than 10 cc of products in each IM injection site.
- Try to choose the dewlap for a SQ injection site.

### 4. Care and Husbandry Practices

- Follow the Animal Care and Well-Being Guidelines to make sure you are using good veterinary and husbandry practices.
- Handle and transport all cattle in ways that will reduce stress, injury, and bruising.
- Regularly inspect facilities (fences, corrals, load-outs, etc.) to make sure animals can be handled easily and safely.
- Do your best to keep feed and water handling equipment clean.
- Properly manage nutrition and feedstuffs.
- Do your best to keep an appropriate production environment.
- Use a system to ensure biosecurity, and regularly evaluate that system.

# 1. Feedstuffs/Feed Additives



Monitoring feed sources is the best way to prevent chemical residues and ensure high-quality feeds. If you purchase feeds, you should set up a sampling program that tests feed quality. Most good suppliers have a quality control testing program of their own. For example, bonded suppliers often test for polychlorinated biphenyls, chlorinated hydrocarbons, organophosphates, pesticides, herbicides, and microbes (*Salmonella*).

Pesticides, chemicals, and other products that are used on raised feeds must be FDA/USDA/EPA approved. The Federal Worker Production Standard requires proper training for all people who work with pesticides.

A quality control program for feedstuffs can help prevent chemical residues and make sure the quality of feeds is high.

Create a checklist that includes characteristics such as color, odor, moisture, temperature, and any signs of foreign material or bird, rodent, or insect contamination.

It is not practical or cost-efficient to test every load of forage or grain for contaminants. But it makes good sense to store a sample of each batch of newly purchased feed. Having samples to test will make it easier to investigate feed-related problems later.

Here is one idea for sampling purchased grains, supplements, or complete feeds: Randomly sample each batch of feed in 5 to 10 locations, and then combine the individual samples into a larger sample (2 to 5 pounds). Place the combined sample in a paper bag or small cardboard box and label

it. Keep dry samples in a dry area. Freeze samples that have high moisture levels. Attach a feed tag, including the date the sample was taken, to the sample for future reference.

**High Risk Feeds** include fats, rendered by-products, plant by-products, supplements, and additives. These may come in single loads or batches that you will feed cattle over a long period of time.

If you purchase fats and oils, monitor them for possible contaminants. Ask your supplier to give you a letter of guarantee that states the materials have been tested.

## Feed Contamination

The EPA requires pesticide products to be registered and pesticide applicators to be licensed. As a result, the U.S. feed grain supply is very well protected from pesticide residues.

## Ruminant By-Products

Do not feed any ruminant-derived protein sources. As of 1997, federal regulations prohibit using certain mammalian protein sources in feed. These regulations mainly deal with the feeding of meat and bone meal derived from ruminants. This rule was designed to prevent Bovine Spongiform Encephalopathy (BSE) from entering and establishing itself in the United States. The federal regulations were revised following the discovery of the first BSE-positive cow in the United States in 2003. Approved tallow and tallow derivatives, blood by-products, gelatin, milk products, and porcine or equine protein products are not included in the regulation and can be used in ration formulations.

Note: This manual briefly outlines state and federal rules and regulations. The information here is not meant to be taken as legal advice. In addition, this manual does not cover all aspects of the legal issues that relate to beef production.

## Handling Feedstuffs

- 1) Keep up a quality control program for incoming feed ingredients.
- 2) Store feed properly so molds and mycotoxins will not develop and feed will not be exposed to chemicals.
- 3) Build feed handling facilities that lower the risk of feed contamination.
- 4) Store all chemicals (pesticides, lubricants, solvents, etc.) away from feed supplies. Follow the label directions when using and throwing away chemicals.
- 5) Before using any feed ingredient you think could be contaminated, have it examined by a qualified laboratory.
- 6) Thoroughly clean feeding equipment that is used for other jobs (like cleaning pens) before using it to handle feed again.
- 7) Do your best to protect feedstuffs, feed troughs, and water supplies from contamination.

### Chemical Residues

Use only agricultural chemicals that are approved to be used on land grazed by livestock or on land where feedstuffs are removed for animals to eat at a later time.

Follow label directions and obey grazing restrictions on pastures, rangeland, and crops that have been treated with pesticides.

Keep records of your pesticide use, and be sure you allow the correct withdrawal time before marketing your cattle.

Use only approved products to control internal or external parasites.

### Feed Toxins

Mycotoxins are natural chemicals that are produced by fungi. They can be found in grains and forages.

In large quantities, mycotoxins can reduce feed consumption, lower production, and cause health problems that may result in residues in meat and milk products.

Mycotoxins can be produced in feedstuffs before harvesting or during storage. Examples of mycotoxins include vomitoxin, aflatoxin, and fumonsins.

## Feed Additives and Medications

The term “medicated feed” includes all feed products that are meant to be a large source of nutrients in an animal’s diet. Medicated feeds include products commonly called supplements, concentrates (grain mixtures that contain medication), premix feeds (concentrated medications mixed with additional roughage or concentrates), and base mixes. A medicated feed does not have to be a complete feed (pre-condition feed used at receiving/weaning).

Feed additives often are used in the industry to increase weight gain, enhance feed conversion, and improve the health of cattle on feed.

- No extra-label use of feed additives is allowed. Use only FDA-approved additives.
- No one—not even a veterinarian—can legally prescribe the extra-label use of any feed additive.
- Keep records with the following information: additive used, date used, ration name or number, name of person responsible for adding the additive or mixing the feed, and amount produced.
- Large beef operations that use certain highly concentrated medications may be required to register with the FDA by getting an FD-1900 permit.
- Make sure all additives are withdrawn at the proper time to avoid violative residues.
- Identify treated individuals or groups using the guidelines in the record-keeping section of this manual (pages 12-17).

**Withdrawal time:**

The amount of time that must pass between when an animal receives an application or feeding of a drug or additive and when the animal is harvested. The purpose is to make sure no residue of the drug or additive remains in the carcass. The FDA sets withdrawal time regulations.

**Aminoglycosides:**

The MS-BQA program does not allow the injectable extra-label use of products such as neomycin, gentamicin, or kanamycin because of the possible violative residues. The NCBA and several veterinary groups have policies against the use of these antibiotics in cattle.

The FDA does not allow extra-label use of fluoroquinolones. Examples are Baytril and A180.

Below: This is a sample label from a veterinarian for "Extra Label" use of a product.

## 2. Processing/Treatment and Records

Calves moving through the production chain must stay healthy. Sickness requires treatment and increases the chances of death loss, poor performance, injection-site lesions, and residues. A very important part of the BQA program is handling and giving vaccines correctly. A very high-quality vaccine is useless if it is not handled and given correctly. Many treatment systems use vaccines to stimulate immune system response and lower the chances of having to re-treat for illnesses.

Choose a veterinarian who is willing to take part in the Beef Quality Assurance program. Your veterinarian must be a team player and understand that each animal can impact the reputation of your business and the beef industry. Use only FDA-, USDA-, and EPA-approved products in your processing and treatment programs.

**Extra-Label Drug Use**

There are two classes of drugs: over the counter (OTC) and prescription. You can buy and use OTC drugs without a veterinarian's permission. (See the example label on page 13.) You can use prescription drugs only as ordered by a veterinarian in a valid veterinarian-client-patient relationship.

**FDA Rules for Extra-Label Drug Use**

- 1) The attending veterinarian must make a careful diagnosis within the context of a valid veterinarian-client-patient relationship. All of the following must be true for a veterinarian-client-patient relationship to be valid:
  - a) The veterinarian is responsible for making clinical judgments about the health and medical treatment of the animal, and the client agrees to follow the veterinarian's orders.
  - b) The veterinarian knows enough about the animal to
    - give at least a general or preliminary diagnosis of its medical condition.
    - c) The veterinarian will make a timely follow-up evaluation if the animal has a bad reaction or the treatment does not work.
- 2) The veterinarian must determine one of the following:
  - a) No available drug is specifically labeled to treat the condition diagnosed.
  - b) The label's treatment dosage has been proven clinically ineffective.
- 3) You must take actions to make sure the identity of the treated animal is carefully maintained.
- 4) You must assign a longer drug withdrawal period before marketing the treated animal.

The Food Animal Residue Avoidance Databank can help your veterinarian make these decisions.

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 Slaughter _____ days		
Test for Residues: Urine _____	Blood _____	

## Example of an Over the Counter (OTC) Label

**COWBIOTIC** (hydrocillin and streptazolidin)

**Directions for use:** See package insert

**Warning:** The use of this drug must be discontinued for 30 days before treated animals are slaughtered for food. Exceeding the highest recommended dosage level may result in antibiotic residues in meat or milk beyond the withdrawal time.

Net Contents: 100 ml

Distributed by ABC Animal Health, Inc.

**Note:** A prescription label would include this additional warning: "Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian."

Name of Drug

Active Ingredients

Directions for Use

Withdrawal Time

Name of Distributor

Quantity of Contents

### Implants

Research and actual use in the beef industry have proven that implants are safe and effective. The proper administration of implants is important to achieve the desired results.

#### Where to Place an Implant

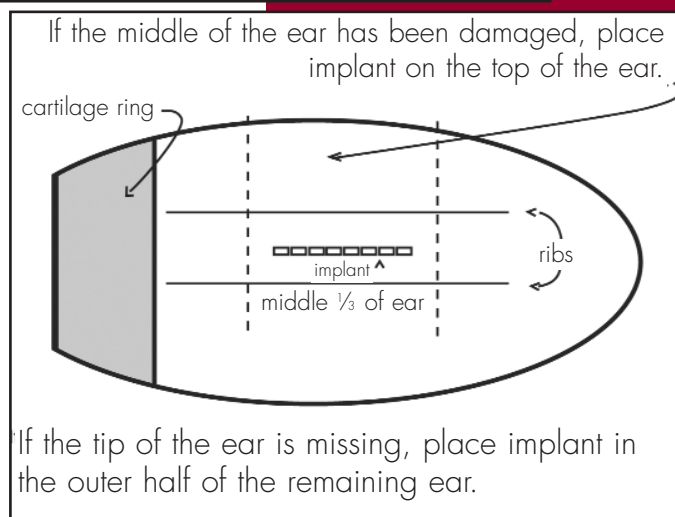
The only approved location for an implant is the middle third of the back of the ear. (See the illustration at right.) Never place implants anywhere else. All implants must be placed subcutaneously.

Adding restraint bars to processing chutes can make it easier to place implants correctly. The processing chute should be able to hold different cattle weights. You can complete other health procedures while cattle are run through the chute system for re-implant.

Sanitation is important. Use sharp, clean needles. Between uses, place the needle on a sponge that has been soaked with disinfectant. (See the photo below).



Keep the needle sanitized while implanting by placing it on a disinfectant-soaked sponge between uses.



Ear implant location

### Implants can fail because...

- Implant is placed in the cartilage.
- An abscess forms because of poor sanitation. This prevents the active ingredients from absorbing.
- Implant is misplaced (through the ear).
- Implant is not fully inserted because of bad technique or gun failure.
- Pellets are bunched or crushed.
- Implants were stored incorrectly.

## Record Keeping

Keeping records, either by computer or by hand, is a very important management tool. To ensure consumer confidence and maintain market share, beef producers must be able to document the safety and quality of their product.

Good records show that you are aware of risk factors and are taking steps to prevent residues. You can control violative drug residues by correctly identifying and handling individually treated cattle.

Record all processing products (vaccines, de-wormers, pour-ons, etc.) you use. When the FDA, USDA, EPA, or OSHA conducts a regulatory inspection, you will understand the importance of good records. Good records that show your compliance with training, inventory control, use orders, animal identification, withdrawal, and disposal will help you avoid being liable for a residue contamination.

The only sure way to know if you are in compliance with withdrawal times is to record exactly what was given, how much was given, where it was given, and how and when it was given.

The key to keeping good records is finding a method you like so it will be easier for you to use on a regular basis.



Record all processing products (vaccines, de-wormers, pour-ons, etc.) you use.

## Treatment records should include:

- **Animal treated**
- **Treatment type**
- **Treatment date**
- **Treatment dose**
- **Prescribed withdrawal time**

## Treatment Protocol Book

Ask your veterinarian to develop a Treatment Protocol Book for your operation. Keep the Treatment Protocol Book on file at the treatment facility.

Treatment Protocol Books often are used in feed yards and large stocker operations. But this can be a valuable management tool for cow-calf producers as well. The book includes a written plan for what treatments you will use when cattle get sick.

Also write down your plan for follow-up and/or alternative treatments if the first treatment does not work.

Regularly review the book and update it at least every 90 days, or as often as you need to. Keep old versions of your protocol book on file for a year or more so you can look back to see which treatments worked before. Your veterinarian must sign and date the Treatment Protocol Book each time it is updated.

## Veterinary Drug Order

A Veterinary Drug Order (VDO) is a veterinarian-approved list of medications used in your operation that fit BQA guidelines.

The VDO should include all products that have a withdrawal time, including vaccines, antiparasitic drugs, and all injectables (including vitamins). You get an additional measure of quality assurance and safety when you manage all medications, vaccines, and other products as though they are prescription items.

Have your VDO updated at the same time as your Treatment Protocol Book.

## Why Are Treatment Records Important?

- 1) If treatment does not seem to be working, cattle may need a delayed drug clearance. Good records can show if a delay is needed.
- 2) Extra-label drug use is allowed only under FDA guidelines and a veterinarian-client-patient relationship. Individual animal identification and treatment records can prove you are following the guidelines.
- 3) If your operation is wrongly cited for a residue violation, good records may be the only way to prove you are following FDA guidelines.
- 4) Records can serve as proof that certain drugs are not used.
- 5) Careful records let you know exactly what is going into each animal. These records can help you avoid giving treatments that have not worked in the past.
- 6) Good records show your consultant or veterinarian what treatments you are using so they can make sure you are following the treatment plan and decide if they need to make any changes to the plan.

## Contact Information for Beef Quality Assurance Team

Name

Phone

Name of Operation: \_\_\_\_\_

Owner/Manager: \_\_\_\_\_

Feed Employee: \_\_\_\_\_

Cattle Employee: \_\_\_\_\_

Maintenance Employee: \_\_\_\_\_

Office Employee: \_\_\_\_\_

Veterinarian: \_\_\_\_\_

Extension Educator: \_\_\_\_\_

Nutrition Adviser: \_\_\_\_\_

University Specialist: \_\_\_\_\_

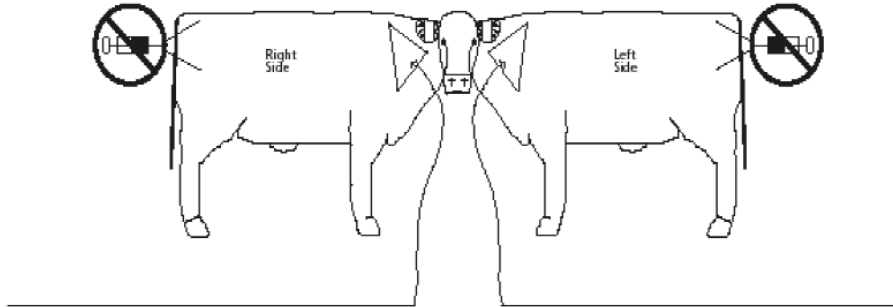
BQA Trainer: \_\_\_\_\_



# Mississippi Veterinary Certified Health Assurance Plan

## Cattle Health and Information Transfer Record

Name \_\_\_\_\_ Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_  
Identify brand and indicate location. Premises ID \_\_\_\_\_



List procedure number on the lines above that correspond to the side of the cattle the injection was given on. For procedures done on the cattle's right side, write the procedure numbers on the left line. For procedures done on the cattle's left side, write the procedure numbers on the right line. Give all injections within the Injection Triangle.

**When possible, select SQ products, and never give injections in the rear leg or top butt.**

**On the illustration above, indicate the procedure(s) performed by marking the site with the corresponding procedure number from the table below.**

Procedure/ Procedure #	Lot or Serial #	Company	Date Given	Route of Admin.	Dose	Booster Date Given	DVM Initials
1. Castrate							
2. Dehorn							
3. 7-way Clostridial							

### Feed Records

- 1) Keep all feed records for at least 3 years from the date you transfer or market cattle.
- 2) It is a good management practice to require that all feed products have an invoice that includes the
  - Date.
  - Amount.
  - Lot/batch number.
  - Signature of the person who delivered the product.
  - Signature of the person who received the product.

### Chemical Records

Private pesticide applicators must keep a record of each restricted-use pesticide or general-use pesticide application for 3 years. You must have

a private applicator's license to apply restricted-use pesticides. Records must include the

- Brand or product name and the EPA registration number of the pesticide used.
- Total amount of pesticide applied.
- Location and size of the treated area.
- Crop, commodity, stored product, or site on which the product was applied.
- Month, day, and year of application.
- Name and certification number of the certified applicator who made or supervised the application.
- Animals that were exposed to the pesticide and the withdrawal time.

Pour-on product use also can be included on the processing record for a group of cattle.

For more forms and records, visit [www.msucares.com](http://www.msucares.com) or contact the College of Veterinary Medicine at (662) 325-1103.

### 3. Injection-Site Management

The 1991 National Beef Quality Audit was the first to identify injection-site lesions as a serious problem. The work of BQA and the efforts of cattle producers have greatly lowered the number of lesions.

In March 1991, injection-site blemishes were found in 22.3 percent of the top-sirloin butts studied in the audit. The 2000 audit found these blemishes in fewer than 3 percent of top-sirloin butts.

#### Economic Loss Per Retail Cut

\$0.71	top-sirloin butts
\$2.88	bottom rounds
\$3.59/head	TOTAL

(Source: *National Beef Quality Audit, 2000.*  
Based on each steer/heifer slaughtered,  
30.31 million head.)

This lesion from an IM injection travels deep into the tissue. Studies show steaks cut from up to 3 inches from the center of a lesion are tougher than steaks with no lesions.



Injection-site lesions don't hurt just one steak. IM injections in the hind quarter can damage many high-priced cuts.

More studies showed that losing beef at the lesion site was not the only problem caused by injection-site lesions. These lesions also greatly lowered the tenderness of the wholesale cut.

In 1994, Colorado State University researchers found that cooked steaks cut from up to 3 inches from the center of a lesion had a much higher Warner-Bratzler shear force value (toughness) than steaks without lesions.

Factoring in the impact on tenderness, the 1995 quality audit showed a loss of \$7.05 for every fed steer and heifer marketed that year.

Injection-site lesions are the result of injections, such as clostridial bacterins, antibiotics, and vitamins, given intramuscularly (IM). Irritation in the muscle caus-

An injection-site lesion is scar tissue that forms because an intramuscular injection was given too deeply in the muscle tissue.

es scar tissue (lesions) to develop. The lesions can be caused by giving the injection too deeply in the muscle or by using contaminated needles and syringes. Although packers identified the lowered frequency of injection site lesions to be the greatest improvement in the industry, abscesses and lesions in meat cuts remained one of the top five beef quality defects identified by end-users in the 2005 audit.



Injection-site lesions may look small, but in this case, the lesion is in the center of the eye of the round and damaged all of this retail cut.

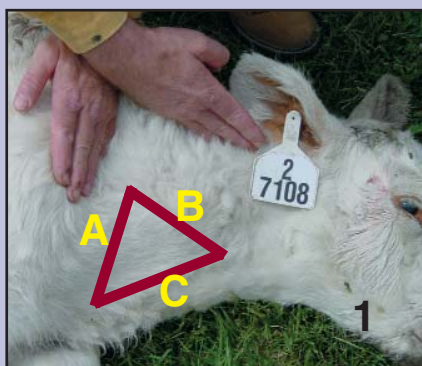
## Guidelines for Administering Injections

Follow these guidelines when giving injections:

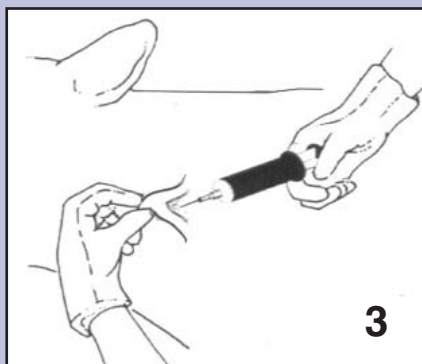
- 1) Regardless of an animal's age, give injections (all IM and SQ medications and vaccines) in front of the shoulders in the neck area. Never give injections in the rump, top loin, or back leg.
- 2) When possible, use injections that can be given SQ, IV, or orally.
- 3) Never give more than 10cc per IM injection site. (If 24cc is needed, use three 8cc injections instead of two 12cc injections).
- 4) When using a modified live virus product, do not use chemical disinfectants in syringes. This decreases the effectiveness of the product.
- 5) Restrain animals properly to avoid breaking needles in animal tissue.
- 6) Use the correct needle size for each situation. When choosing the needle size, think about how you are giving the product, the size of the animal, the site of injection, and the product you are using. The amount of fluid you are injecting also may determine what size needle to use:
  - a) 16- to 18-gauge x 1/2- to 3/4-inch needles for SQ.
  - b) 16- to 18-gauge x 1- to 1 1/2-inch needles for IM.
- 7) Space injections at least 4 inches apart. (See photo below.)
- 8) Never mix products. Mixing products can cause unnecessary tissue damage and make products less effective. It also may increase withdrawal times.
- 9) Process cattle in a clean area. Wet, muddy conditions can increase the chance of injection-site contamination.
- 10) Follow good record-keeping guidelines (see pages 12-17). Records should show individual and group treatments. Include route of administration, product used, and product lot number and serial number.

- 1) Give injections in the injection zone triangle in the neck. The corners of the triangle are:

- A) slope of shoulder
- B) nuchal ligament (or about 3 inches below top of neck)
- C) vertebrae



- 2) All SQ and IM injections must be given in the triangle area in front of the slope of the shoulder.



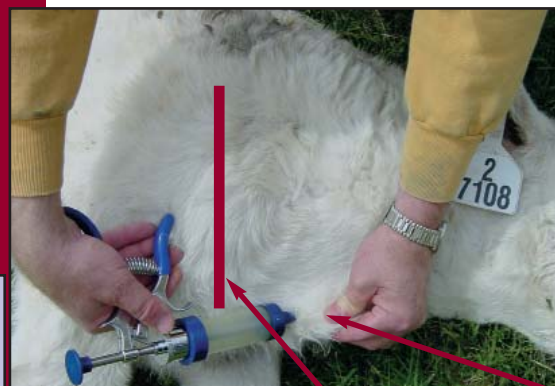
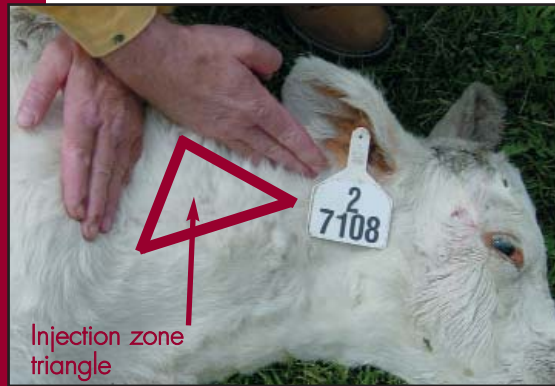
- 3) Tent skin for all SQ injections.
- 4) Space injections at least 4 inches apart.



## Dewlap Technique

MS-BQA approves giving SQ injections in the dewlap as long as the injection site is in front of the point of shoulder. To give injections in the dewlap:

- 1) Restrain the calf on its side. Pull the front leg back and find the dewlap. The dewlap is the flap of skin that starts at the calf's throat and follows the neck down to the brisket region.
- 2) Find an injection site that is in front of the slope of the shoulder.
- 3) Grasp the skin using the tenting technique and give the SQ injection.
- 4) Use the correct needle size. An 18-gauge x 5/8-inch needle is recommended.
- 5) If more than one SQ injection is given in the dewlap, space injections at least 4 inches apart (the width of one hand).



Top photo: The triangle represents the approved injection zone for IM and SQ injections.

Bottom photo: Subcutaneous injections may be given in the dewlap region by tenting the skin and staying in front of the point of shoulder (area to the right of the red line).

## Avoiding Foreign Objects

**Birdshot/Buckshot** - The 1999 Market Cow and Bull Quality Audit showed more than 10,000 head of slaughter cattle were condemned because lead shot was found in their bodies. Lead birdshot/buckshot poses a food safety threat. If it is found, the entire carcass will be condemned.

**Broken Needles** - Under no circumstances can animals carrying broken needles be sold or sent to a packer. Broken needles can migrate in the tissue. If broken needles are not removed immediately, the needle fragment will be impossible to find. Animals carrying broken needles must be destroyed rather than sold.

## Needle Know-How

**Gauge** – diameter of the needle; adjust to cattle weight.

**Length** – should fit the route of administration; adjust to cattle weight.

### Change needles

- Immediately if the needle bends.
- Immediately if the needle becomes contaminated with feces, dirt, or irritating chemicals.
- Immediately if the needle point becomes damaged or a burr develops.
- Before the needle becomes dull (every 10 to 15 head).
- Between cattle with known blood-borne infectious diseases.

Injectable Viscosity	Route of Administration								
	SQ (1/2 to 3/4 inch needle)			IV (1 1/2 inch needle)			IM (1 to 1 1/2 inch needle)		
	Cattle Weight			Cattle Weight			Cattle Weight		
	<300	300-700	>700	<300	300-700	>700	<300	300-700	>700
<b>Thin</b> Example: Saline	18 gauge	18-16 gauge	16 gauge	18-16 gauge	16 gauge	16-14 gauge	20-18 gauge	18-16 gauge	18-16 gauge
<b>Thick</b> Example: Oxytetracycline	18-16 gauge	18-16 gauge	16 gauge	16 gauge	16-14 gauge	16-14 gauge	18 gauge	16 gauge	16 gauge

SELECT THE NEEDLE TO FIT THE CATTLE SIZE (THE SMALLEST PRACTICAL SIZE WITHOUT BENDING)

## Syringe Care

Localized infections often are caused by vaccine syringes that were not cleaned properly. Severe infections can spread and even kill an animal.

Injection-site swelling is common, especially when vaccines like clostridial bacterins are given SQ. If the swelling is hard, you may have given the injection too deeply and penetrated part of the first layer of muscle. If this is the case, you should try using a “B-Bevel”  $\frac{5}{8}$ -inch needle or a short ( $\frac{1}{2}$ - or  $\frac{3}{4}$ -inch) regular bevel needle. The injection point on the B-Bevel needle is shorter than on a regular injection needle.

Sterile disposable syringes will prevent almost all injection-site infections. If you require multiple-dose syringes, several brands of disposable sterile automatic vaccine syringes are available.

### To clean multiple-dose syringes:

1) Clean the outside syringe surface with soap, water, and a brush.

2) Rinse the inside of the vaccine syringe, including tubes and connectors, with distilled or de-ionized water that is near the boiling point. To do this, draw water that is greater than 180° F into the syringe and squirt it out. Repeat three to five

times. Squirt out as much water as possible from inside the syringe, and let the syringe cool before using it again. Heat kills modified live virus (MLV) vaccine products. Do not use soap or disinfectant on internal components because residues may kill MLV vaccines.

3) Store the vaccine syringe in a dust-free, dry (low-humidity) environment. It is best to store freshly cleaned vaccine syringes in zipper-sealed plastic bags in a freezer.



To clean a syringe, draw the boiling water into a syringe and squirt it out several times. Heat without pressure will not kill bacterial spores.

## Vaccines

Even experienced producers overlook key steps when they prepare and give vaccines. With the increased use of modified live virus (MLV) and chemically altered (CA) vaccines, you need to re-evaluate how everyone involved with your operation handles products.

First, purchase vaccines from a reputable dealer. A vaccine will be less than 100 percent effective if it has been stored incorrectly. Good management practices can increase the percentage of cattle that respond to vaccine. An effective vaccine greatly improves immune response in cattle.

You can increase the chances that animals will respond to the



(Source: Thrift, University of Florida)

Do not allow vaccines or syringes to sit in direct sunlight. Instead, use a styrofoam cooler to keep syringes cool and out of direct sunlight.

vaccine by reducing exposure and stress, improving nutritional management, and timing vaccinations correctly.

## Handling Vaccines

Always transport animal health products in closed, refrigerated containers. Protect vaccines from UV light by storing them in a refrigerator and using cold packs to transport them.

Keep vaccines cool while you process cattle. Keep the working bottle of vaccine and syringes in a cooler. Keep unused and unmixed products in a closed, refrigerated container until you are ready to use them.

Do not mix MLV products more than 1 hour before you use them.

If you are processing a small number of cattle, purchase vaccines in small containers that have fewer doses.

The Texas A&M University Ranch to Rail program found that healthy calves were \$93.20/head more profitable than sick calves. (12,595 head tested)

### Comparison of Top 20% and Bottom 20% of Cattle in the Mississippi Farm to Feedlot Project Based on Net Returns (2003-2004)

	Top 20%	Bottom 20%
Average Daily Gain, lb.	4.16	2.98
Net Returns/Head, \$	231.27	-3.76
% Treated for Illness	8.2	41.2
Medicine Cost/Head, \$	43.18	45.01
Quality Grade		
% Choice	79.8	30.1
% Select	20.2	62.7
% Standard	0.0	7.2

## 4. Care and Husbandry Practices

Good animal husbandry practices improve the well being of cattle, individual animal health, and herd productivity. These practices are based on research and many years of hands-on experience.

Cattle are produced using a variety of management systems in many different places in the United States. As a result, all cattle producers should not use the same set of production practices. Personal experience, training, and professional judgment are very important for giving good animal care.

### Feeding and Nutrition

Cattle must have plenty of quality nutrients (energy, protein, water, minerals, and vitamins) to maintain their bodies and to grow.

The nutrient needs of cattle depend on age, sex, weight, body condition, stage of production, and environmental conditions.

A nutritionist can tell you what nutrients your cattle need and what nutrients are in your feed ingredients.

Give cattle enough clean drinking water. Water needs vary greatly, but a good rule of thumb is to give 1 gallon of water for every 100 pounds of body weight during cold weather; give nearly 2.5 gallons for every 100 pounds of body weight during hot weather.

### Livestock Facilities

Keep your facilities (fences, chutes, etc.) in good working condition to allow ease of movement and to reduce stress when working cattle. Whenever possible, remove sharp or protruding objects because these can cause bruising.

The equipment you use should let you restrain cattle quickly and securely. This will minimize stress or injury to the animal or the operator.

Allow only experienced, trained personnel to operate restraining equipment.

### Shelter

Beef cattle are produced in a variety of settings, from pasture and range to dry lot and confinement facilities.

When behavioral and physiological characteristics of cattle are matched to local conditions, beef cattle do well in just about any environment without man-made shelter. However, during severe weather conditions, give cattle access to well-drained resting areas and/or natural or constructed shelter.

### Animal Health Practices

Producers must practice herd health programs to prevent and treat disease. These programs will vary depending on the type of operation and the prevalence of disease. A veterinarian can help you establish an effective herd health program.

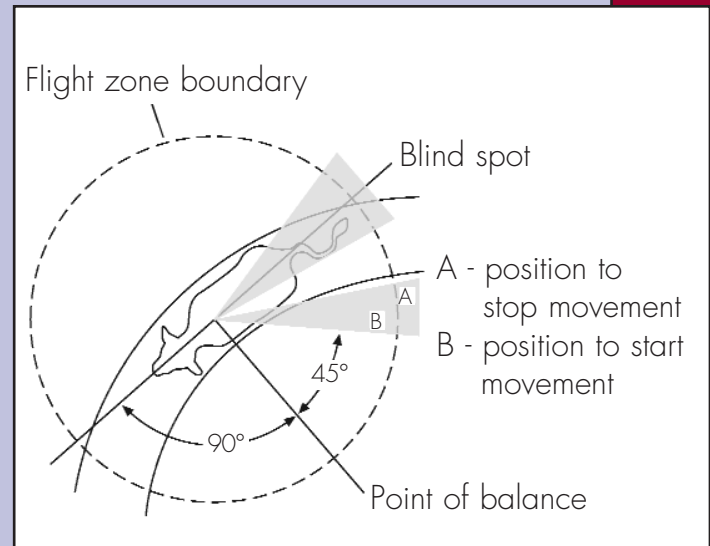
Observe cattle regularly, especially in critical times of the year such as during calving season or severe weather.

Use correct techniques and/or equipment for procedures like vacci-



## Key Points for Handling Cattle

- 1) Know the flight zone for cattle. To make a cow go forward, move toward its rear, behind the point of balance (shoulder). To stop or back up a cow in a chute, move in front of its point of balance.
- 2) Never fill a crowding pen more than three-quarters full; cattle need room to turn around.
- 3) Cattle should move easily up the chute. Avoid things that might prevent movement, such as dangling chains, shadows, backstops, noises, dogs, or people.
- 4) Make sure loading ramps and handling chutes have solid walls so animals cannot see distractions outside the working area.
- 5) Use cattle prods as little as possible.
- 6) Reduce animal stress to lower the risk of injuries and sickness and to increase your overall efficiency.



Understanding an animal's flight zone can make handling cattle easier. It also puts less stress on the animal.

nation, castration, dehorning, and branding. Only experienced or properly trained personnel should do these procedures.

Beef producers are encouraged to follow state or national BQA guidelines.

### Handling Sick, Disabled, or Dead Livestock

As a cattle producer, you are responsible for the humane care of your animals. You must do everything you can to get veterinary care for sick or injured animals.

Cattle that show signs of advanced disease and those that cannot walk ("downers") should not be transported to market facilities.

Sick or injured cattle that do not respond to medical treatment for a reasonable period of time should be euthanized in a humane way on the farm or ranch. Euthanasia is defined as humane death that occurs without pain or suffering. If you must euthanize an animal, follow the guidelines of the American Veterinary Medical Association and the American Association of Bovine Practitioners.

Follow federal, state, and local regulations to dispose of dead livestock. If you use a rendering service, keep dead livestock in a screened area away from public view.

### Transportation

Use good handling and transportation techniques when moving cattle to and from farms, ranches, feedlots, and marketing facilities. This will keep the animals safe and comfortable.

Move cattle as quietly and patiently as possible to prevent stress or injury during loading and unloading.

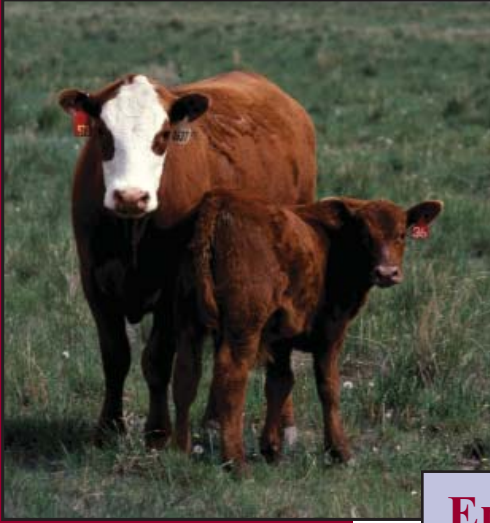
Separate cattle by size or gender and, if you can, load the different groups into separate compartments of the truck or trailer. Avoid sudden starts and stops and sharp turns to keep livestock from falling during the drive. Make sure the floors of trucks and trailers are clean and slip-resistant.

Stop from time to time during the drive to make sure cattle are still standing and not crowded together.

Consider severe weather conditions when transporting livestock. Provide ventilation and protection as needed during the drive.

Improper handling causes more than 50 percent of all bruises.

For the safety and welfare of the animals, use good handling and transporting techniques when you move livestock to and from farms, ranches, feedlots, and marketing facilities.



## Training and Education

Make sure all the people who work with your livestock understand correct care and handling techniques. Closely watch your employees to make sure they know how to handle cattle and they use proper techniques.

Your management plan must include ongoing education for anyone who works with your livestock.

Make sure all of your employees understand the

**Every management plan should include ongoing education for people who work with livestock.**

flight zone for cattle. (See page 23).

Avoid sudden movement, loud noises, or other actions that could frighten or confuse animals. Use handling devices humanely. These include canes, prods, sorting sticks, and paddles.

## Environmental Quality

Environmental management is important to the success of a cattle operation. Examples of environmental issues include stocking rates, grazing systems, soil conservation, and water quality. Look at each of these areas on a regular basis to decide if you need to make changes that will improve the overall system.

## Breeding and Genetics

Industry targets were set up to help the beef industry produce cattle that meet standards for portion size, marbling preferences, and efficiency in the packing industry. Knowing the industry targets and understanding how to reach them are the first steps to building a good, sensible breeding program. (See Fed Cattle Targets below.)

Some specialty targets, such as high-yielding cattle, extra-lean cattle, or “all-natural” cattle, may have different standards.

Cattle that are in the undesirable category, often called “out cattle,” usually are discounted significantly.

One way to find out how your cattle will perform once they leave your business is to talk with the calf buyers, stocker operators, and feed yard owners that purchase your calves and feeder cattle. There are many opportunities to receive feedback, performance, and carcass data.

Carcass traits have become the focus of many information feedback programs, especially in branded beef programs. Using this information in breeding programs is important because more than half of all cattle are sold “on the grid” or “in the beef” (NCBA, 2005).

Tools such as Expected Progeny Differences (EPDs) can be used to estimate how the offspring of an individual will compare to the offspring of other animals within a breed. Ultrasound also can be used to help evaluate heritable traits such as marbling and ribeye area (REA).

You also should measure performance traits that determine quality. These traits include daily weight gain, feed efficiency, and health.

According to the 2005 audit, improved genetics using performance, physical traits, and ultrasound were at the top of listed changes made since 1991 by seedstock producers to address quality challenges.

## Fed Cattle Targets

	Desirable	Undesirable
Carcass Weight	650-850 lbs.	less than 600 lbs. or more than 950 lbs.
Quality Grade	Select or higher	Standard
Yield Grade	1, 2, or 3	4 or 5
Ribeye Area	11 - 15 sq. in.	less than 11 sq. in. more than 15 sq. in.
Fat Thickness	.25 - .49 in.	less than .25 in. more than .50 in.

Source: National Beef Quality Audit

## Management Practices

**Dehorning:** Cattle with horns can cause significant bruising damage in all segments of the industry. Bruises are trimmed from the beef, which results in lost carcass weight, devalued prime cuts, and reduced carcass value. If calves are born with horns, use electrical or surgical dehorning to stop horn growth. Horns also can be removed through genetic selection.

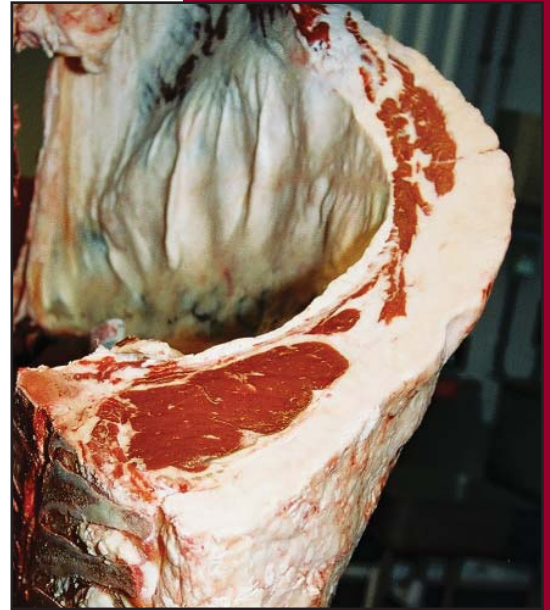
**Castration:** The need for intact males in feed yard and stocker settings is very low. Beef from intact bulls has a coarse texture, low marbling score, and uneven tenderness. Castrate males early, between birth and 4 months of age, to reduce stress for the animal.

**Branding:** Branding inspection is required in some areas of the United States. Branding is a permanent way to identify cattle and prove ownership. Where you place the brand can impact the value of the hide. Place the brand (freeze brand or hot iron) high up on the hip, close to the tailhead. This allows the brand to be cut away from the hide without losing very much of the valuable portions. Freeze branding causes less damage to the hide than hot iron branding and should be used when appropriate.

**Nutrition:** Body Condition Score (BCS) is a tool used to measure the nutritional status of cattle. The range

is from 1 (very emaciated) to 9 (overly fat). The best range for cows at calving time is BCS 5. The colostrum produced by cows calving below a BCS 5 is lower in volume and quality. These cows also have decreased milk production and rebreeding rates. Nutritional stress can hurt the animal's health and immune system. A correct balance of protein and energy is very important to the nutritional needs of cattle.

**Calf Nutrition:** Weaning is one of the most stressful periods of time for young calves. Stress will decrease immune response. In a short period of time, a calf is removed from its mother's daily nutrition and often shipped to a new environment. The calf joins many other calves at the new location, and it is started on a new ration or feeding method. Preconditioning prepares a calf for the transition into the next phase of its life cycle. The industry accepts preconditioning programs with a 45-day post-weaning period. This preconditioning time improves animal performance, health, and carcass quality. Healthy calves need fewer medications, have a better survival rate, perform better, and could have higher-valued carcasses.



Excess fat cover makes cows less profitable.

Common quality defects in mature cows and bulls:

- Inadequate muscling
- Excessive fat trim
- Lightweight or heavy carcasses
- Lameness and downer animals
- Eye lesions
- Horns
- Brands
- Bruising

## Culling Management

- 1) Do not market cull animals that pose a public health threat or have a terminal condition.
- 2) Make sure ALL animals shipped to market have cleared correct withdrawal times.
- 3) Do not market cull animals that are disabled or have advanced eye lesions.
- 4) Market cull animals BEFORE they become severely emaciated.
- 5) Prevent violative residues by using products correctly and following withdrawal-time guidelines.

## Food-borne Infections

Thoroughly cooking food will kill bacteria in each of these food-borne infections:

***E. coli* 0157:H7** - A virulent strain of bacteria found in the intestinal tract and feces of animals and humans.

***Salmonella*** - A family of bacteria that includes more than 2,000 strains. Ten of these strains are responsible for most cases of reported illness associated with bacteria. *Salmonella* can be found on any raw food of animal origin.

***Listeria*** - A bacterium that grows in a damp environment and is most commonly found in dairy products, raw meats, and poultry.

### Food Safety

Food safety continues to be a challenge for the beef industry. Ongoing research is designed to identify new and improved technologies and to explore opportunities to strengthen the safety of today's meat supply. The 1996 Pathogen Reduction - HACCP Final Rule was developed because of public concern over *E. coli* 0157:H7 being found in the food supply in the early 1990s. This rule required producers throughout the meat industry to follow HACCP guidelines. (See page 5 for HACCP information).

The USDA-FSIS examines all meat produced and sold in the United States and re-inspects imported products to make sure they meet all U.S. food safety requirements.

FSIS inspectors visit packing plants every day to make sure the products are safe for people to eat and comply with all federal laws governing food safety.

Current ways to decontaminate meat include

- Spot cleaning carcasses by knife trimming or steam/hot water vacuuming.
- Spraying/washing/rinsing carcasses with water, chemical solutions, and/or steam or hot water during carcass processing.
- Animal cleaning.
- Chemical dehairing at slaughter.



One way to reduce the incidence of *E. coli* 0157:H7 is to steam vacuum carcasses.

Contamination can enter packing plants on the hide of an animal or through an animal's digestive tract. Current research focuses on lowering pathogen levels in and on live animals.

### Management and Emergency Preparedness

**Security** is designed to prevent the intentional introduction of organisms that cause disease into an operation. You should develop a security management strategy to deal with such an event.

To develop this strategy, you must first identify any possible threats. Next, think about the steps you would take to manage each threat. Finally, make a written security plan that you will follow in the future.

At the very least, you should take the following steps to help keep your operation secure:

- Create a buffer zone or perimeter fence to separate livestock from the public.
- Lock all access gates.
- Set up visitor and intruder policies.

**Biosecurity** management and practices are designed to prevent the spread of disease. The goal of biosecurity is to prevent, minimize, or control cross contamination of body fluids (feces, urine, saliva, etc.) between animals, between animals and feed, and between animals and equipment that may directly or indirectly contact animals.

## Biosecurity

To implement a biosecurity program, consider these practices for—

### 1) Controlling disease within the herd:

- Vaccinate the herd against all common diseases (BVD, Clostridial disease, etc.).
- Keep stress low when moving and processing cattle.
- Provide enough feed, water, and shade.
- Separate all sick animals.
- Maintain a closed herd, if possible.
- Purchase feed from reputable sources.
- Minimize fence line contact with neighboring animals.
- Do not place cattle of different ages in the same pen.
- Keep records of all disease occurrences.

### 2) Purchasing replacement animals:

- Quarantine all new animals for 30 to 60 days.
- Test new animals for disease (BVD, Johne's, *Salmonella*, etc.).
- Purchase animals from healthy and reputable herds.

### 3) Environmental and pest control:

- Provide human footbaths at entrances and exits of confinement facilities.
- Remove manure and dead animals in a timely fashion.
- Keep grounds and feed bunks as dry as possible.
- Use an insect control program (insects can be carriers for diseases such as anaplasmosis and bluetongue).
- Use a rodent control program.

### 4) Disinfection:

- Before disinfecting, clean and remove as much organic material as possible.
- Choose a disinfectant that will work on the pathogen you want to control.
- Be aware of any toxic, harmful, or corrosive effects of the disinfectant.
- Follow the label on the disinfectant package.

### 5) Visitors:

- Minimize the number of visitors to the facility and their contact with animals.
- Be sure all visitors have clean clothing/coveralls, boots, and hands.
- Be sure all vehicles or equipment brought onto the farm are disinfected.
- Do not allow foreign visitors on the farm until they have been in the country for 5 days.
- Do not allow foreign visitors to bring onto the farm any clothing, food, or accessories they have had in another country.

### 6) Employees:

- Be sure all employees understand and follow your biosecurity guidelines.
- Realize that employee-owned animals (horses, dogs, etc.) could be a possible source of contamination to your facility.



Posting check-in signs at livestock entry points can help your animal health biosecurity program.

Maintaining a biosecurity program is the cheapest, most effective way to control disease, and no disease prevention program will work without it.

## Carriers of Infectious Diseases

Infectious diseases can be spread by—

- Diseased cattle or healthy cattle that are incubating disease.
- Healthy cattle that have recovered from disease but are now carriers.
- Vehicles, equipment, clothing, and shoes of visitors or employees who move between herds.
- Contact with non-living objects that are contaminated with disease organisms.
- Bodies of dead livestock that have not been disposed of correctly.
- Feedstuffs, especially high-risk feedstuffs, that could be contaminated with feces.
- Contaminated water (such as surface drainage water).
- Manure and dust particles in the air.
- Non-livestock animals, such as horses, dogs, cats, coyotes, raccoons, other wildlife, rodents, birds, and insects.

## Potential Disease/Infection Risks

Many foreign animal diseases and bacterial and viral pathogens threaten the safety and economic success of the U.S. livestock industry. The following is a list of some of the more common threats and any available treatment or prevention methods.

**BVD - Bovine Virus Diarrhea** is a viral disease that affects the respiratory, reproductive, digestive, immune, and nervous systems of cattle. It is spread through urine, feces, nasal secretions, and semen. Persistently infected (PI) cattle often spread and keep the disease in a herd. Control BVD with biosecurity, vaccination, and testing.

**TSE - Transmissible Spongiform Encephalopathies** are a group of uncommon, degenerative brain diseases that affect both animals and humans. Researchers believe that these diseases may be spread rarely through feeding of contaminated high-risk materials (BSE), or through direct contact (CWD).

- **BSE - Bovine Spongiform Encephalopathy** is in the TSE family. BSE is an uncommon, chronic degenerative disease that affects the central nervous system of cattle. BSE often is called Mad Cow Disease. It was found first in Great Britain in 1986. Following years of intensive testing, few cases of BSE have been identified in the United States, and research has shown that the United States is at very low risk for the establishment of the disease in cattle populations. One form of human TSE is Creutzfeldt-Jakob Disease (CJD). An additional TSE in humans that may be associated with BSE in cattle is new variant (nv)CJD. The United States does not allow imports of beef, ruminant animals, or rendered animal products from countries that have confirmed cases of BSE. In 1997, the United States stopped allowing mammal-derived animal protein byproducts in cattle feed. Common symptoms of animals that have BSE include aggression, lack of coordination, difficulty standing up, decreased milk production, and weight loss. There is no way to treat or prevent the disease, and no test can find the disease in a live animal. BSE is confirmed by postmortem microscopic examination of brain tissue protein.
- **CWD - Chronic Wasting Disease** is another form of TSE. It was found first in Nebraska's deer and elk population in 1998. The disease is progressive and always fatal. The main symptom is weight loss over time. CWD has never been known to infect cattle.

**FMD - Foot and Mouth Disease** is a highly contagious viral disease that is devastating to cloven-hoofed animals such as cattle, swine, sheep, goats, and deer. FMD usually does not affect humans. The last U.S. case of Foot and Mouth Disease happened in 1929. Infected animals, contaminated vehicles, and contaminated facilities used to hold animals can spread FMD. People can carry the virus on clothing and other surfaces. You can greatly reduce the economic losses from an outbreak of FMD by reporting it immediately. The main symptoms of the disease in animals include excessive slobbering, not eating, and lameness. Affected animals may have blisters in the mouth or other areas of tender skin such as udders, nostrils, and between the hooves.

**Johne's Disease** - Johne's is an infectious bacterial disease of animals that mainly affects the intestinal tract. It is caused by *Mycobacterium avium* subsp. *paratuberculosis*, a distant relative of the bacterium that causes tuberculosis (TB) in humans and animals, but it is a different disease than TB. There are no vaccines or treatments for Johne's, but there are several tests to diagnose it. Cows get Johne's Disease only when they are young, but clinical signs do not develop until they are adults. Johne's usually is spread through colostrum and feces. Rarely, it is spread from cow to calf through the placenta.

For more information about these or other diseases, contact your local veterinarian or see the Appendix on page 31 for a list of Internet references.

*Return test and contract to the BQA coordinator, MSU College of Veterinary Medicine.*

*Write the letter for your answer to each of the following questions.*

1. \_\_\_\_ True or False: All products labeled for intra-muscular (IM) use should be given in the neck region only (no exceptions, regardless of age). (Page 9, 19)
2. \_\_\_\_ Who can legally prescribe the extra-label use of any feed additive? (Page 11)  
a) feed supplier      b) veterinarian      c) both a and b      d) no one
3. \_\_\_\_ When giving a subcutaneous (SQ) injection to a calf that weighs 500 lbs., which needle is recommended? (Page 20)  
a) 18 gauge x 1-inch      b) 18 gauge x  $\frac{5}{8}$ -inch      c) 20 gauge x 1-inch      d) 16 gauge x  $1\frac{1}{2}$  inch
4. \_\_\_\_ Which of the following is NOT true when giving injections? (Page 9, 19)  
a) give injections within the injection zone triangle      c) when possible, use IM injections  
b) tent skin for all subcutaneous (SQ) injections      d) space injections 4 inches apart
5. \_\_\_\_ For a vaccine to be most effective it must be: (Page 21)  
a) kept out of direct sunlight and UV light      c) given in a clean injection site  
b) kept cool at all times      d) all of the above
6. \_\_\_\_ Non-fed beef (cull cows and bulls) must follow MS-BQA regulations. Non-fed beef makes up what percentage of total U.S. beef production? (Page 7)  
a) 30-35 percent      b) less than 5 percent      c) 7-12 percent      d) 15-20 percent
7. \_\_\_\_ True or False: All products cause tissue damage when injected IM. Therefore, avoid IM use if possible. (Page 9)
8. \_\_\_\_ Bruising in non-fed cattle is a big problem because: (Page 7)  
a) they have less fat cover      c) they have a higher incidence of lameness  
b) they encounter more situations where bruising can occur      d) all of the above
9. \_\_\_\_ The MS-BQA program is designed to assist producers to (Page 4)  
a) set production standards      c) be educated on industry issues and practices  
b) establish systems for data retention and record keeping      d) all the above
10. \_\_\_\_ Under MS-BQA guidelines, records should be kept for at least: (Pages 8-9, 16)  
a) 3 years      b) 2 years      c) 1 year      d) until the cattle have been transferred
11. \_\_\_\_ True or False: Over the counter (OTC) drug dosage can be adjusted by a veterinarian within the context of a valid veterinarian-client-patient relationship. (Page 12)
12. \_\_\_\_ The federal mammalian protein ban prohibits the use of what by-products in formulating ruminant feed products? (Page 10)  
a) Dried distillers grains      b) Meat and bone meal      c) Whole cottonseed      d) Rice bran
13. \_\_\_\_ Which of the following is a desirable industry target for carcass characteristics? (Page 24)  
a) Ribeye area (REA) > 15 square inches      b) Carcass weight between 650-850 lbs.  
c) Highest yield grade (YG) 4 or 5      d) Fat thickness < 0.25 inches  
e) All of the above are desirable carcass characteristics
14. \_\_\_\_ Responsible culling includes all of the following except (Page 25)  
a) marketing cull animals after they have a terminal condition or pose a public health threat  
b) marketing animals before eye lesions become advanced  
c) marketing cull animals after all withdrawal times have been cleared  
d) performing annual health checks on your animals for eye, feet/leg, udder, and reproductive concerns  
e) marketing cull animals before they reach a poor body condition score (BCS 1-2) or become severely emaciated
15. \_\_\_\_ Infectious disease can be spread by (Page 27)  
a) footwear      b) feedstuffs      c) sick cattle      d) healthy cattle      e) all of the above

## Mississippi Cattlemen's Beef Quality Assurance Program Checklist and Contract

- I am committed to producing beef cattle that are safe, wholesome, high quality, and consistent. I will produce beef cattle in an environmentally sound manner. To do this, I will strive for the following:

### Feedstuffs/Feed Additives

- I will keep up a quality feed control program for all incoming feed ingredients.  
 I will use only FDA-approved medicated feed additives in rations.  
 I will observe proper withdrawal times for all additives and pesticides/herbicides to avoid residues that violate guidelines.  
 I will not feed ruminant-derived protein sources.

### Processing/Treatment and Records

- I will take part in extra-label drug use only when prescribed by a veterinarian with a valid veterinarian-client-patient relationship.  
 I will keep records for all treatments (individual or group) following BQA-suggested record-keeping guidelines. I will keep these for at least 3 years.  
 I will make sure all processing and treatment records move with the cattle to the next production level.

### Injection-Site Management

- I will give all injections in the neck region only. This includes both subcutaneous and intramuscular injections.  
 I will strictly follow only FDA, USDA, or EPA guidelines for all individual treatments. I will avoid using products that cause tissue damage.

### Care and Husbandry Practices

- I will follow animal care and well-being guidelines that conform to good veterinary and husbandry practices to avoid bruising, stress, or injury.  
 I will regularly evaluate and implement biosecurity practices.

*By signing the BQA contract, I agree to follow all BQA program standards and guidelines listed above.*

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ BQA Certification #: \_\_\_\_\_

Name: \_\_\_\_\_ Business Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ ST: \_\_\_\_ Zip: \_\_\_\_\_

E-mail: \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Circle those that apply to your business:      Feedlot      Cow/Calf      Seedstock      Stocker      Other

Employees, please list employer's name and address:

\_\_\_\_\_  
 \_\_\_\_\_

Please mail completed test and contract to  
 Mississippi Beef Quality Assurance Program  
 Dr. Carla Huston, BQA Program Coordinator  
 P. O. Box 6100 · College of Veterinary Medicine · Mississippi State, MS 39762  
 huston@cvm.msstate.edu

## For More Information

Biosecurity information.....	www.biosecuritycenter.org
Centers for Disease Control and Prevention.....	www.cdc.org
FDA – Food and Drug Administration.....	www.fda.org
Great Plains Veterinary Educational Center.....	www.gpvec.unl.edu
Johne’s Information Central.....	www.johnesdisease.org
Mississippi Cattlemen’s Association.....	www.ms cattlemen.org
Mississippi Board of Animal Health.....	www.mbah.state.ms.us
Mississippi State University College of Veterinary Medicine.....	www.cvm.msstate.edu
Mississippi State University Extension Service.....	www.msucare.com
National Animal ID System.....	www.animalid.aphis.usda.gov/nais/
NCBA – National Cattlemen’s Beef Association.....	www.beefusa.org
USDA – United States Department of Agriculture.....	www.usda.gov

## Glossary

**Additive:** An ingredient or substance added to a basic feed mix, usually in small amounts, to fortify it with certain nutrients, stimulants, and/or medications.

**Antibiotic:** A class of drugs, such as penicillin, used to control or cure disease.

**BQA:** Beef Quality Assurance.

**Cutability:** An estimate of the percentage of salable meat (muscle) from the round, rib, and chuck compared with the percentage of waste fat.

**EPA:** Environmental Protection Agency.

**Extra-label use:** Giving a drug or other substance in a way that is not printed on the label.

**FSIS:** Food Safety and Inspection Service.

**HACCP (Hazard Analysis and Critical Control Points):** A systematic, science-based approach to make sure the food produced on a farm is safe. The USDA Food Safety and Inspection Service

(FSIS) requires that all U.S. meat and poultry processing facilities use this system.

**Immunity:** The ability of an animal to resist or overcome an infection that most members of its species could not.

**Immunization:** The processes and procedures that create immunity in an animal. Vaccination is a form of immunization.

**Intramuscular injection (IM):** An injection into the muscle.

**Intravenous injection (IV):** An injection directly into a vein.

**Medicated feed:** Any feed with drug ingredients that is used to cure, mitigate, treat, or prevent diseases in animals.

**OTC (over the counter):** Drugs and other substances that anyone can buy because instructions for using them can be printed on the label.

**Pesticides:** A broad class of compounds used to fight crop insects, fungus, and rodents.

**Residues:** Leftover parts of drugs and other substances that are found in animal fluids, tissues, and feeds.

**Route of Administration:** The method you use to give a drug or other substance to an animal (oral, subcutaneous, intramuscular, topical, etc.).

**Rx (prescription drugs):** Drugs that must be prescribed by a licensed veterinarian.

**Subcutaneous (SQ):** An injection under the skin.

**Vaccination:** An injection of vaccine, bacterin, antiserum, or antitoxin to produce immunity or tolerance to disease.

**Vaccine:** A drug that is given to an animal to increase its immunity.

**Zero-Tolerance:** The standard that U.S. beef producers must adhere to when it comes to fecal and ingesta carcass contamination. In layman’s terms, no visible contamination is allowed on beef carcasses.



# Producer Code of Cattle Care

**Beef cattle producers take pride in their responsibility to correctly care for cattle on their farms and ranches. The following are general recommendations for producers to consider when raising and handling cattle:**

- \* Provide needed food, water, and care to protect the health and well-being of animals.
- \* Protect herd health by using disease prevention practices, including access to veterinary care.
- \* Provide facilities that allow safe, humane, and efficient movement and/or restraint of livestock.
- \* Use approved methods to euthanize sick or injured livestock, and dispose of them correctly.
- \* Train workers to correctly handle and care for cattle.
- \* Regularly observe livestock to make sure basic needs are being met.
- \* Minimize stress when transporting cattle.
- \* Be aware of improvements and changes in the industry.
- \* Make decisions based on sound production practices and animal well-being.
- \* Do not allow workers to mistreat animals intentionally.

**Mississippi Beef Quality Assurance Program**

**Dr. Carla Huston**

**BQA Program Coordinator**

**P. O. Box 6100**

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**Mississippi State, MS 39762**

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**Mississippi  
Beef Quality  
Assurance  
Program**