

# **BEEF QUALITY ASSURANCE FUNDAMENTALS**

## ***Lesson 6***

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### **Introduction**

Consumers today are very concerned about the safety of the food they eat. Perception of safety and wholesomeness play a major role in buying decisions of an increasingly health concerned and diet-conscious consumer. American beef enjoys an excellent reputation and is consumed by millions of consumers throughout the world. However, most consumers lack the background or technical knowledge to understand scientific details of beef production. Surveys show that consumers respond negatively when a food safety incident occurs and is widely reported by the media.

Cattlemen are highly regarded by the public and the beef they produce is generally regarded as safe and wholesome. With ever increasing competition for the consumer's protein dollar, it is imperative that producers maintain and improve that image. By assuring the consumer that beef is safe and wholesome, from the cow-calf producer to the dinner plate, and increasing the efficiency of production, the beef industry has an opportunity to become even more competitive in the worldwide market place.

In response to this opportunity, the Minnesota Beef Council, in cooperation with the University of Minnesota Extension Service, College of Veterinary Medicine, College of Agriculture, Food and Environmental Sciences, and the Minnesota State Cattlemen's Association, has developed the Beef Quality Assurance educational program to educate producers on how to raise quality cattle that produce the highest quality beef available in the marketplace.

### **What Is the Definition of Quality?**

Beef Quality is the production of beef that consistently meets or exceeds customer expectations. Expectations may include taste, tenderness, nutrition, value, packaging, color, safety, leanness, ease of preparation, and other attributes that are important to the consumer.

## **Total Quality Management (TQM)**

Dr. W. Edward Deming, a world-famous quality management expert who is credited with helping the Japanese become quality-oriented, conceptualized the idea of Total Quality Management. He defined quality in two ways:

- 1) A product that conforms to a set of standards
- 2) A product that meets consumer wants and needs

## **Beef Quality Assurance (BQA)**

This course outlines recommended procedures required by farmers to implement a Beef Quality Assurance program. The goal of this course is to encourage the consistent production of high-quality cattle in Minnesota, enhance the reputation of Minnesota cattle and ensure the safety and wholesomeness of the beef produced.

From the pasture to the dinner plate, every person in the chain must take responsibility for safe and proper practices. Cow-calf producers, feeders, dairymen, livestock market operators, backgrounders, veterinarians and others, all have a role in high-quality beef production. Responsibility for quality beef production is shared with packers, processors, purveyors, restaurateurs and retailers who also have a huge stake in marketing beef to the consumer.

Ultimately, the consumer must be provided with proper cooking and handling information to assure food safety and eating quality. Beef demand will be improved by producing a safe, wholesome and consistently tender product that exceeds consumer expectations with every eating experience. By following the simple procedures outlined in this lesson, beef and dairy producers and veterinarians can ensure that the beef they are producing meets the highest standards of quality, consistency and safety that the American consumer demands.

## **Why is Quality Assurance Important?**

Consumers demand that beef is easy to fix, tasty, tender, wholesome and affordable. Most consumers do not care who raised their food as long as the animals were healthy, well cared for and produced under environmentally-responsible practices. With increasing competition from the poultry and pork industries, and consumer anxieties over the safety of beef, all beef producers, dairymen and veterinary practitioners must be concerned with issues that affect beef quality, consistency and safety.

Some producers and veterinarians may feel far removed from the consumer's eating experience. However, lesions caused by improper injection site placement affect beef tenderness. Abscesses from injection site lesions are not very appealing, and may contain pathogens or antibiotic residues. Harmful pathogens like E. coli 0157:H7 can often be traced to manure-ladened hides that contaminate the carcass during harvesting and processing. The National Non-Fed Beef Quality Audit (1994), demonstrated that quality defects cut deeply into producer profits, taking nearly \$70 out of their pockets for every cull cow and bull marketed.

Quality issues affect the producer's economic bottom line. The price of beef may increase to compensate for reduced carcass yields resulting from bruised or abscessed carcasses that must be condemned. Also, plant shutdowns due to burst abscesses on the fabrication tables, or bacterial contamination from hides, lead to increased production costs that must be passed on to the consumer. Producers are affected directly by receiving less for the beef they sell due to condemned carcasses and quality defects.

Public perception becomes reality, regardless of the truth, when enough people perceive something to be true. Consumers are bombarded with incorrect information and half-truths about agriculture in general and animal production in particular. The beef industry has to manage issues ranging from concerns with animal care/welfare, bovine spongiform encephalopathy (BSE) in Europe, the perception of chemical, hormone and antibiotic residues, periodic outbreaks of foodborne illness from pathogen contamination, cholesterol and saturated fat content, and the impact of cattle production on water and soil pollution, water and grain use, grazing and deforestation, and global warming.

## **Minnesota Beef Quality Assurance**

Minnesota's Beef Quality Assurance program focuses on improving management practices that will enhance beef quality and help manage issues that may affect consumer attitudes toward beef. The program emphasizes the following topics:

- Preventing injection-site lesions and abscesses
- Residue prevention
- Elimination of bruises
- Hide quality improvement
- Early culling of beef and dairy cows to prevent lameness and disabled cattle

### **Preventing Injection-Site Lesions and Abscesses**

Injection-site lesions damage beef tissue in at least five ways:

1. Abscesses contaminate the meat and can lead to condemnation of carcasses.
2. Muscle tissue surrounding the lesion or abscesses become toughened. Data from Colorado State University shows that tissue up to three inches away from a lesion site in the round is almost three times as tough as sections cut out from non-injected muscle (NBCA, 1995). Beef cuts derived from surrounding areas have a greater chance of leading to a bad eating experience. The impact of these experiences is probably most damaging as consumers who have them may give up eating beef.

3. Abscesses on these lesions may contain fluid which, when cut into, contaminate equipment and tables causing fabricating and packing plants to shut down for mandatory clean up. These problems result in millions of dollars in losses for unproductive time.
4. Antibiotic residues may be found in scar tissue or in fluid samples, thereby compounding the problem and level of contamination.
5. Injection site lesions damage consumer confidence. Meat cutters, foodservice management and consumers have complained to industry officials about the high incidence of injection site blemishes in beef cuts.

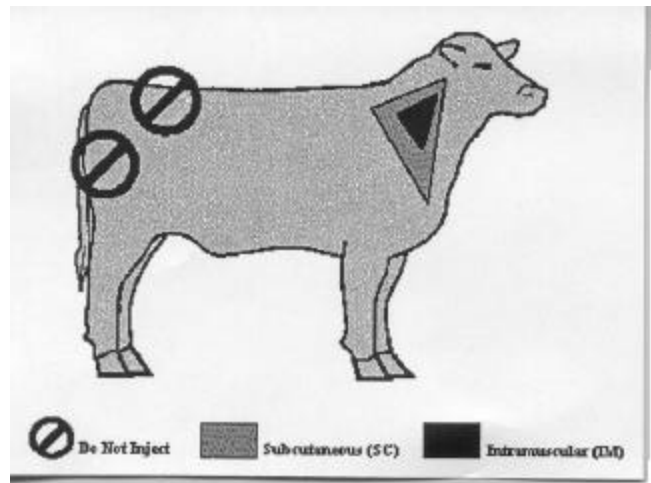
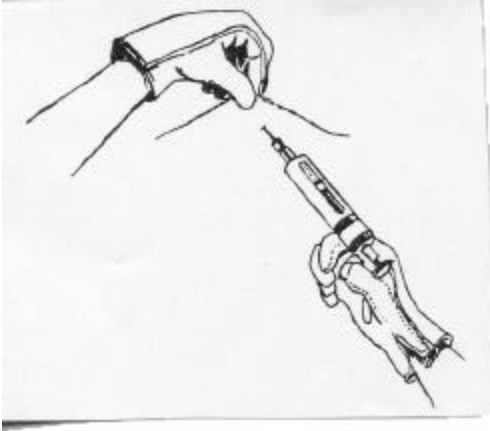
All vaccines and other pharmaceutical products that are injected intramuscularly cause tissue damage. Extending the interval between time of injection relative to harvesting/processing time does not reduce the damage to muscle tissue. In a Colorado State University study, vaccines and vitamin injections applied intramuscularly in the round and top butt at branding time (50 days of age), developed lesions or abscesses that were evident at harvesting/processing time (between 300 and 400 days later).

The same is true for antibiotic medications dosed intramuscularly into the hind leg or round. This is a special area to remind us about the importance of properly placed injections. Some producers and veterinarians dismiss the importance of properly placed antibiotic injections, especially to growing heifers, or cows because they feel that by the time these cattle enter the food chain the lesions have either disappeared, or are not of importance. Recent data (Spring, 1998) indicate that the overall incidence rate of injection-site lesions in gooseneck rounds from beef and dairy cows was 60 percent. Carcasses of beef cows had an incidence rate of 45 percent, while those of dairy cows had an incidence rate of 71 percent.

## **Injection-Site Lesion Prevention Checklist**

- Move all intramuscular (IM) injections to the neck area. Never give shots to the animal behind the front of the shoulder. (This means all animals, including calves.)
- Never inject more than 10 cc of any product in any one site.
- Choose the right needle. Use a 16 or 18 gauge needle. Subcutaneous (SQ) injections should be administered with 1/2" to 3/4" needles; IM injections should be given with 1" or 1 1/2" needles. Thick SQ injections can be administered with a 1 inch 16 gauge needle.
- Use the "tenting" technique to give subcutaneous clostridial injections in the neck region (see Figure 2). Subcutaneous injections do not cause damage to muscular tissue unless there is an abscess caused by infection.
- Never mix animal health products. Mixing incompatible products can cause tissue damage and reduce the effectiveness of animal health products.
- Request tissue reaction data from all injectable animal health product manufacturers.
- Detect abscesses as early as possible and treat them quickly.
- Use surgical drainage and antimicrobial therapy to ensure the problem is treated properly.

**Figure 1. Suggested tenting technique Figure 2. Proper injection sites for subcutaneous or intramuscular injections in cattle of all ages.**



## Residue Prevention

There is growing concern in the scientific community and from the media about the potential presence of antibiotic residues in meat products. While violative residues in fed cattle are rare, the incidence in beef and dairy cows and veal calves is higher than desirable. These concerns can be reduced or eliminated by following BQA practices:

- Elimination of injection site lesions and abscesses directly reduces the potential for contamination of meat with antibiotic residues present within the abscess or lesion.
- Use of animal health products in an extra-label manner should be done only after a valid Veterinarian/Client/Patient Relationship (VCPR) has been established with the veterinarian. This relationship also helps establish good management practices for ensuring that label recommendations and proper withdrawal times for animal health products are observed before making cattle available for harvesting. The outcome of this relationship is that off-label product use is completely avoided until this relationship is established.
- Cattle must be individually identified at time of treatment. Individual processing records should be kept and made available to future buyers. If cattle can not be individually identified, the withdrawal time for treated animals applies to the entire group.
- The extra label drug usage policy of the Food and Drug Administration (FDA), requires that:
  1. A determination must be made that there is marketable product specifically labeled to treat the condition diagnosed.
  2. A diagnosis is made by a veterinarian within the context of a valid veterinarian/client/patient relationship.
  3. Procedures are in place to assure that the identity of the treated animal is carefully maintained.

## Elimination of Bruises and Hide Damage

Producers must check their handling facilities to prevent carcass bruises. Bruise damage is estimated to cost the non-fed beef industry roughly \$75 million annually, or \$11.47 for every head of non-fed cattle harvested (NCBA 1994). In fact, packers identified bruise damage as their number 1 quality concern with non-fed slaughter cattle. Results of the slaughter-floor audits found that 80 percent of all cow carcasses (beef and dairy) were bruised, with the majority having multiple bruises.

Bruises give the impression that cattle are mistreated. However, inspecting facilities for sharp angles, edges, exposed boards, nails or bolts is the easiest way to eliminate bruises. This procedure should focus on the alleys, corrals, layout, chutes, scales, calving pens, hospital or other special use pens. While conducting this inspection, producers are encouraged to walk these facilities thinking about the height, width and length of the animals in the herd. Broken boards, exposed nails and bolts are hazards that must be eliminated. Producers must be aware that this inspection procedure takes time and keen observation. For this reason, it is suggested that other producers, veterinarians or extension personnel be consulted in making observations while walking and evaluating the facilities.

Here are a few strategies to eliminate bruises:

- Handle and transport live cattle properly, with as little stress and crowding as possible.
- Inspect fences, gates, and working chutes for protruding nails, bolts, broken boards and pipe, and other blunt objects. Broken boards, nails, and exposed bolts should be eliminated from all fences, gates, and corrals.
- Never "throw" a gate into the side of an animal. Tie-backs should be installed on all gates to hold them flush with the fence.
- Corners can be padded by cutting strips from old tires or conveyor belting.
- Remove horns from calves when they are young.
- Horn buttons should be removed from young cattle as soon after birth as possible. All cattle should be dehorned. Overcrowding horned cattle on trucks will greatly increase bruising. Dehorning also reduces the incidence of head condemnation at packing plants. Packers report that horn removal at slaughter often results in head condemnation, because hair and other foreign material can enter into the exposed sinus cavities. Under current inspection requirements, if such material enters the sinus cavities, the inspector must condemn the head. This results in significant devaluation (roughly \$16/animal) of total animal value.

Other common sense recommendations to prevent injuries to cattle include:

- Use plastic paddles or stock canes instead of whips or sticks.
- Avoid the mixing of strange animals.

## Hide Quality

Hides, especially from larger animals such as large beef cattle and especially dairy cows, are particularly valuable to the tanning industry because of their large surface area and consistent thickness.

According to results of the Audit, hide defects among dairy cattle were estimated to cost \$16.6 million annually, or \$5.21 for every salvaged dairy cow and bull marketed in 1994. Hot-iron brands were identified on 20.9 percent of all dairy cattle, with the majority of branded dairy cattle found in packing plants in the western United States.

Of even greater concern were hide defects caused by latent defects (scars/scratches) and insect/parasite damage. These problems can be reduced or eliminated by doing the following things:

- Maintain proper housing and facilities to eliminate sharp, protruding objects that cause scratches or cuts to the hide
- Implement an effective external parasite control program to reduce the incidence of insect-related hide problems
- Do not brand cattle - use other forms of herd identification

## Preventing Lameness and Disabled Cattle

- Keep cattle on dry, non-slip, concrete floors with proper bedding and non-slip stalls.
- Develop veterinarian-approved herd health programs to prevent disease and decrease the frequency of sick animals.
- Practice good hygiene, keeping stalls, corrals and other facilities clean, dry and comfortable.
- Employ the use of foot trimming and care to reduce foot problems.
- Maintain clean, comfortable, and cool facilities, trailers and trucks, when transporting cattle to markets or slaughter facilities.
- Prevent slippery surfaces by keeping lots clean and dry.
- Use cattle loading ramps that are curved or have a 15 degree bend. Chutes and loading ramps should be wide enough for single-file walking.
- Install permanent loading ramps with no more than a 20-degree slope. Portable or adjustable loading ramps should have no more than a 25-degree slope.
- Use a self-aligning dock bumper or bullboard (crossover-bridge) to bridge the gap between the chute and the truck.

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