

Cull Cow Beef Quality Issues: Horns, Ocular Squamous Cell Carcinoma, and Lumpy Jaw¹

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Horns

Horns can be classified by the extent to which they pose a threat to beef quality: minor (scurs or small horns) or major (large, protruding horns). Horns are a quality concern for two reasons: (1) bruising and (2) head condemnation.

1. *Bruising*—Horns of all sizes can cause bruising to neighboring animals, both on the trailer during transit and in the holding pens prior to harvest. Bruising is of significant concern to the beef industry, because bruised tissue must be removed or “trimmed” at harvest since it is considered adulterated and unfit for human consumption. Whenever a carcass has to have lean tissue trimmed from it, the trim loss occurs before a carcass weight is taken. This poses a concern because producers and packers are paid on a carcass weight basis, so any product that is removed prior to weighing the carcass is an economic loss. Consequently, bruising caused by the presence of horns can account for an unnecessary and costly trim loss at the packer level, which means decreased cow salvage values for the producer and a loss of retail product at the consumer level.

2. *Head Condemnation*—Horns, especially those classified as “major,” are routinely removed on the harvest floor to expedite the hide removal process. As a result, the sinus cavities on the head of the animal are left open and

exposed to contamination from hair and foreign material. USDA inspectors will condemn the entire head if they suspect or find any contamination in the sinus cavities. When this happens, packers lose the ability to merchandise the cheek meat, which is used in ground beef, as well as the tongue, which is a valuable offal (byproduct) item.

Best Management Practices

Quality defects caused by horns can be minimized or prevented.

1. *Dehorning*—Several techniques are acceptable for dehorning an animal, but the earlier it is preformed the better. Early dehorning, preferably before the animal is three months old, is better for the animal from a stress and well-being standpoint.
2. *Tipping Horns*—This is done by making the end of the horn blunt by cutting off the sharp part of the horn. Tipping is often performed on horned animals when entering a feedlot. It is less stressful and aids in decreasing the incidence of bruising.
3. *Polled Genetics*—The easiest and safest way to remove the quality defects caused by horned animals is through polled genetics. Using a polled bull and/or by raising or purchasing polled replacement females, producers can

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reduce the amount of horned animals that make it to harvest.

Ocular Squamous Cell Carcinoma (Cancer Eye)

Cancer eye is development of tumors on the eye and surrounding tissue (Figure 1). Cancer eye can be classified based on the tumor's stage of development and the degree to which it poses a threat to beef quality. Cancer eye classifications include stages 1 through 5, with stage 1 cattle exhibiting a small blemish on the cornea or the tissue surrounding the eye. Stage 5 cattle exhibit advanced stages of the condition, which can include complete necrosis of the eye. There are several animal health, welfare, and beef quality issues associated with cancer eye.



Figure 1. Ocular squamous cell carcinoma (cancer eye) in a bovine with no pigment surrounding its eye.

Credits: Todd Thrift, UF/IFAS

Head Condemnation

In the advanced stages of cancer eye, the tumor can become malignant and spread to the surrounding bone and lymph nodes. In these advanced stages, the eye may become necrotic and prolapsed. In advanced cases the head of the animal will be condemned, resulting in a substantial loss for the packer.

Whole Carcass Condemnation

Most cancer eye is a squamous cell carcinoma and confined to the eye. However, in the most severe cases of cancer eye, the entire carcass may be condemned (not just the head) due to the spread throughout the body. The loss of a whole carcass can mean the loss of hundreds of dollars in potential retail sales. Consequently, many packers avoid purchasing

cattle that exhibit advanced stages of cancer eye, because it is a primary cause of whole carcass condemnation in the non-fed harvest.

Public Perception and Animal Well-Being

Cattle, especially those in the advanced stages of cancer eye, pose a public perception problem for the beef industry. There are no food safety or product wholesomeness concerns associated with cancer eye. Meat that comes from animals with cancer eye does not contain malignant cells nor can a consumer contract cancer from eating beef. However, the meat processing industry and the USDA Food Safety Inspection Service always strive to err on the safe side to preserve the beef industry's reputation and improve consumer perceptions. As a result, the heads (and sometimes the whole carcasses) of cattle with advanced stage cancer eye are condemned and do not enter the food chain.

Best Management Practices

Quality defects caused by cancer eye can be prevented in several ways, depending on the stage of the tumor as well as stage of production in which the animal is diagnosed.

1. *Genetic Selection*—Cancer eye most frequently affects cattle that have no pigment around their eyes (i.e., those with white faces). By using breeding stock that have dark pigmentation around the eye and culling cattle that have cancer eye, the incidence of cancer eye can decrease in a herd over time.
2. *Timely Marketing*—The degree to which cancer eye impacts quality and creates value losses in the industry can be managed by timely marketing. Producers should immediately market animals that exhibit signs of cancer eye, especially before it reaches the advanced, malignant stages that frequently cause condemnations and raise public perception concerns. By monitoring and marketing cattle before cancer eye becomes a quality defect issue, producers can capture more value for that animal at the time of sale as well as preserve its carcass value and quality.
3. *Treatment*—One treatment method is to surgically remove the eye. If identified early enough, surgery can be performed to salvage the animal and it may have several more years of production. However, most animals do not exhibit cancer eye until they are older (7 or 8 years), and it may be more economical for the producer to market the animal and preserve its salvage value before the cancer eye reaches an advanced stage.

4. *Euthanasia*—If producers have cattle that exhibit the advanced stages of cancer eye on their ranch, they should humanely euthanize those animals and not attempt to market them. Euthanasia is a responsible production practice that all producers should consider when a cow exhibits signs of cancer eye that will lead to condemnation at the time of harvest.

Lumpy Jaw

Lumpy jaw, especially in the most severe forms, is characterized by an abscess located on the cow's jaw or side of the face (Figure 2). Such an abscess is caused by a bacterial infection that results from an injury to the mouth or jaw. The quality defects associated with cases of lumpy include condemnation.



Figure 2. Lumpy jaw in a cow.

Credits: Todd Thrift, UF/IFAS

Condemnation

Cattle that have lumpy jaw typically have their head condemned due to the presence of infected tissue and lesions on the jaw. Although rare, if the condition is severe and the infection has spread to other parts of the body, the whole carcass can be condemned. Consequently, the presence of lumpy jaw in cattle at the time of harvest can be of great concern to the packer due to the economics of condemnation.

USDA Suspect

Cattle that are deemed “Suspect” at the time of antemortem (live) inspection pose both beef quality and logistical concerns to the industry. Suspect cattle raise concerns to USDA inspectors since they are in a reduced state of health. Such incidents usually force inspectors to retain the carcasses of suspect animals for residue testing, since the

likelihood that these animals were treated with an antibiotic is much greater than healthy animals. Carcasses that are held for residue testing are required by law to be separated from other carcasses and cannot be further processed or fabricated until the carcass has been cleared. Separating carcasses can be difficult and very inconvenient for harvesting plants that are designed to operate on a large scale and as one continuous process. Additionally, a significant economic loss (\$12/hundredweight live basis) is also incurred with USDA Suspect carcasses because the offal cannot be saved while the carcass is being held for testing—even if the carcass eventually passes inspection. The loss of offal is of huge concern because it is one of the primary ways processors can make a profit on animals they harvest.

Best Management Practices

Quality defects caused by lumpy jaw can be avoided through several management practices.

1. *Treatment*—Preventing lumpy jaw can be difficult because it is a bacterial infection that results from an injury to the mouth. The bacteria create an infection in the bony tissue of the jaw and mouth, which can spread, swell, and create an abscess that can impair jaw function. Cattle that have lumpy jaw may lose body condition. It is a best management practice to treat the animal before their condition deteriorates and a severe abscess develops. An iodine wash and antibiotics can help clear the infection. When cattle producers treat animals with antibiotics and other pharmaceuticals, they *must follow appropriate withdrawal times* before marketing the affected animal.
2. *Timely Marketing*—With more advanced stages of lumpy jaw or a recurrence of the infection, treatment may be not effective. Cattle producers should utilize timely marketing strategies to minimize the effect lumpy jaw has on an animal's value and product quality. Cattle producers should monitor their animals closely throughout the year to identify infections and treat early or market affected animals before their condition results in quality defects and animal well-being issues.

Summary

The defects of horns, cancer eye, and lumpy jaw are all manageable defects. In the case of horns, timely dehorning, tipping of the horns, or marketing are appropriate management outcomes. Cancer eye and lumpy jaw are conditions that need to be identified quickly, and the best management outcome is to salvage those animals prior to the defect growing larger.