Cull Cow Beef Quality Issues: Injection Sites and Abscesses

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Injection Site Knots

Often cattle will develop a knot at the site of an injection (Figure 1). These knots are usually a result of the body's immune system reacting to the health product that was administered. Injection site knots can occur with both subcutaneous and intramuscular injections; however, the degrees to which they pose problems to beef quality differ significantly depending on the route of administration. Injection site knots are considered a beef quality concern for several reasons.

If the health product is administered properly, these knots will often remain localized in the connective tissue directly under the skin—not within the muscle. In this case, injection site knots are more of a cosmetic or public perception issue until they are healed and absorbed by the body. However, if the product was administered intramuscularly, these knots can become an injection site lesion, which is a major beef quality issue.

USDA Suspect

Although there is no food safety concern associated with injection site knots, inspectors may apply additional scrutiny when they see cattle entering a harvest facility with injection site knots. Since it is obvious to the USDA inspector that these animals were most likely given an injection prior to coming to the harvest facility, these animals may be labeled as “USDA Suspect”. That USDA Suspect animal will be retained and checked by inspectors for possible residues before clearing it for human consumption. USDA Suspect cattle that are retained for testing pose both logistical and economic concerns for the beef packing industry.

Injection Site Lesions

Injection site lesions can occur after administering animal health products. Injection site lesions are often scar tissue that forms in the muscle or subcutaneous tissue following...
an injection. Packers will trim injection site lesions from
the carcass, often trimming muscle tissue. There are three
types of lesions that can form.

1. **Active Fluid-Filled**—These are active sites of inflammation
that are associated with an immunological reaction or an
infection.

2. **Woody Callous**—These blemishes are scar tissue that
develop in the muscle as an active fluid-filled lesion
heals. Woody callous lesions can persist in the muscle for
months or years after the injection was given.

3. **Discoloration**—These lesions appear as a “greening” in the
original location where the product was administered.
They develop while components from the injected
product react with gases used in modern retail meat
packaging. Discoloration appears after the meat has been
placed in a modified-atmosphere package and shipped
to the retail store, not during the harvest or fabrication
process.

### Quality Issues

Despite their differences in appearance, all injection site
lesions pose beef quality issues and must be prevented.
Consider the three following beef quality issues related to
injection site lesions:

1. **Trim**—Although the vast majority of injection site lesions
do not pose a food safety risk, there is a trim loss when
they are removed from the muscle tissue. Many consum-
ers do not know what an injection site lesion is, so their
presence can be a concern. To avoid these consumer
concerns regarding beef quality and food safety, proces-
sors remove the entire lesion from the affected muscle,
which can significantly devalue many high-dollar cuts.

2. **Decreased Palatability**—Injection site lesions, especially
the woody callous lesions, can impact palatability and
consumer eating experiences considerably. Woody
callous lesions are composed of connective tissue that
can be very difficult to chew, which forces packers to
trim the entire lesion from the muscle tissue. Even when
the injection site lesion is completely trimmed from the
muscle, tenderness of the surrounding tissue can also be
negatively affected up to three or four inches from the
lesion. Every time a consumer has a poor eating experi-
ence, they will become less likely to purchase beef again,
and this has a tremendous impact on beef demand and
the beef industry.

3. **Drug Residues and Food Safety**—Active fluid-filled lesions
carry the risk that they may still contain the animal
health product that was administered. These lesions pose
a food safety risk to consumers if they make it into the
beef supply chain. As a result, all injection site lesions are
trimmed from carcasses and these animals are held for
residue testing before any product is released for retail
sale.

### Best Management Practices

Injection site knots are sometimes unavoidable; however,
there are best management practices that cattle producers
can use to minimize the impact of injection site lesions.

1. **Follow Label Directions**—Only use the labeled route of
administration.
   - **No more than 10 cc per injection site.** Some antibiotics
     require large doses for treatment. In such cases, cattle
     producers should divide the dosage into multiple injec-
     tions in different locations to reduce the severity of knots
     that may form.
   - **Administer the correct dosage.** Never exceed the labeled
dosage when vaccinating or treating an animal. Overdos-
ing an animal does not make the product more effective
or treat an animal’s illness faster. It often wastes product
and increases the chance an injection site knot will form.
More importantly, overdosing is illegal and will alter the
withdrawal period for an animal health product.

2. **Administer All Injections in the Neck**—Because injection
site knots cannot always be avoided, injections should
NEVER be administered behind the shoulder. The neck is
a region of lower product value and if a knot forms in the
neck area, it will have minimal impact on meat quality. If
a producer fails to follow Beef Quality Assurance guide-
lines and administers injections behind the shoulder
injection site, knots and subsequent lesions can form in
high-value cuts.

3. **Keep Injection Sites and Equipment Clean**—By practicing
sanitary technique when administering injections, cattle
producers can reduce the incidence of injection site
lesions.

4. **Tent the Skin** (Figure 2) when administering subcutane-
ous injections.
Abscesses and Abnormal Swelling

Abscesses and abnormal swelling, although commonly found on the hocks and rounds of animals, can be found in a variety of places, including the shoulder, knee, hock, and hip. These defects are most likely the result of some type of trauma, which can facilitate bacterial growth at the site of injury and cause an infection. In most cases the trauma can be attributed to one of three causes: (1) injury during transport, (2) improperly administered health products, or (3) chronic lameness that is usually associated with confinement conditions in the dairy industry. Abscesses and abnormal swelling are two beef quality problems for the industry.

Trim Loss

The tissue associated with an abscess may be infected; lean product from the affected area must be removed to ensure food safety.

USDA Suspect

Noticeable swelling and abscesses raise concerns for inspectors, who will hold these animals for residue testing. The first question an inspector is going to ask themselves when they see cattle with visible swelling is, “What caused this?” followed by, “Have they been treated with something?” and “How long ago were they treated?”

Best Management Practices

There are several ways cattle producers can reduce the presence of abscesses in their cattle.

1. Improved Cattle Handling and Facility Design—Usually, abscesses are caused by some type of trauma that the animal incurs during handling or transport. By employing “cow sense” and a little patience cattle handlers can reduce the chance cattle will injure themselves or become bruised through improper handling. Additionally, cattle producers should check their facilities and trailers for anything that could cause an injury, especially sharp or protruding objects that can create a bruise or open wound.

2. Improved Housing Conditions—Frequently, abnormal swelling (especially in the joints) can be due to confinement. Housing conditions that provide traction in high-traffic areas and the use of materials that increase cow comfort while in the milking parlor, bedding, and working areas can reduce abnormal swelling and the impact it has on beef quality.

3. Treatment—Work with a licensed veterinarian to determine what, if any treatment options to implement.

Summary

Management of injection procedures and adequate training are valuable methods to eliminate injection site lesions and the associated concerns. Injection sites lesions are an issue that can be controlled almost entirely by the cattle producer. Likewise, proper handling procedures are important in order to minimize bruising and swelling that leads to suspect animals and de-valued carcasses. Attention to facilities and cattle handling procedures are means to mitigate and decrease the incidence of bruising that originates on the farm or ranch.