

# Injection Site Reactions

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## INTRODUCTION

Beef producers and their animal health care providers are becoming more keenly aware of the responsibility they bear in maintaining healthy, productive livestock for a consuming public which expects (demands) a wholesome, appetizing food product. Among the tools available to accomplish this goal are a variety of animal health products, (i.e. vaccines, antibiotics, medications and nutritional supplements). The optimum benefit of animal health products is achieved when they are properly employed and administered. Products delivered by injection are of particular concern. Even when properly administered, a potential exists to produce an injection site blemish in the carcass. This is damage which may not be observed by the producer nor by the packer, but is encountered in the fabrication process resulting in millions of dollars worth of product trim.

## WHY ARE BLEMISHES A PROBLEM?

The issue revolves around consumer demand for aesthetically pleasing, wholesome food products. To assess the status of beef, the National Cattlemen's Association conducted the now famous beef quality audit In 1990. The audit found that for each market animal slaughtered there is a loss of \$256, that is \$21.36 per cwt on a 1200-lb steer or 27% of the carcass value. These losses result from excess fat, poor marbling, hide defects, bruises, pathology and injection site blemishes. Injection site blemishes were responsible for a \$1.74 loss per carcass, as much as \$40 per individual carcass. These blemishes cost the industry \$35.7 million per year. When retailers and packers were queried as to their top-10 quality complaints, the issue of injection site blemishes appeared on both lists: retailers, #3; packers, #2. These losses and complaints are

reflected in lower cattle bids, loss of consumer confidence and loss of market share.

Education of producers and veterinarians has led to dramatic reductions in blemishes. Since the results of the beef quality audit were published over a year ago, injection site blemishes have fallen from 21% of all carcasses to 14%. The improvements have been predominantly realized due to changes in feedlot handling and processing. We still have a ways to go in the stocker, cow-calf and dairy beef segments of the industry.

A recent survey of cow-calf producers showed that 58% of producers owning 79% of cattle gave some form of injection to their cattle in the past year. Of these injections, 79% of them were given intramuscularly, 46% of them in the upper hip. Packers are having to trim those blemishes from top butt cuts. There are fewer blemishes, but they are still there. We still need to get the message to those giving injections.

## WHAT ARE INJECTION SITE REACTIONS?

Injection site blemishes result from the bodies response to injury, specifically from the passage of a needle through tissue and the deposition of foreign compounds (vaccine/antibiotics) in the tissue. The body responds by becoming inflamed. Inflammatory cells move into the injection site; there is swelling and heat. Subsequently, there is a healing process requiring weeks to months. Connective tissue (scar tissue) is laid down in place of the damaged tissue. This scar tissue can still be seen 200 to 300 days following injection.

Blemishes come in two forms. The first, and most flagrant departure from normal is the fluid/pus filled cavity at the site of an injection. These will be

observed within the first sixty days following an injection. If the packer/processor finds one of these, they can usually point the finger at the feedlot. The second form is a dry, scarred, woody-appearing pale area in the muscle. It is sterile, meaning there are not bacteria at the site. These are mild reactions but may require trimming at processing. These blemishes are more significant in young injected calves because they are more sensitive to injected compounds. Calves are rapidly growing and the scar may actually expand with muscle growth.

## HOW DO THEY OCCUR?

The blemishes result from: 1) irritating/inflammation-causing animal health products, or 2) administration techniques, or 3) both. It becomes easy to blame the product or veterinarian or the cowboy administering the injection but finger pointing is not what we need. Pharmaceutical companies, veterinarians and producers need to work together to insure a favorable solution for all working in the beef industry.

Our observations at the IFAS beef units suggest that 7-way clostridial vaccines (5cc doses) are most likely to produce injection site reactions. Many calves (40-50%) will have some swelling and an observable knot, 5-10% may have larger more pronounced swellings, but fewer than 1% should require lancing of fluid filled abscesses. Those animals with abscesses requiring lancing are probably due to poor vaccination technique. Blemishes were more readily noted when we began giving clostridial vaccines subcutaneously. We had to adjust to the fact that we may see blemishes, but the packer would not have to trim a carcass. We began improving our administration technique and selecting products and dosages which would reduce blemishes.

## WHAT CAN WE DO TO AVOID BLEMISHES?

**Read the label.** Administer products carefully, as per the label recommendation- dosage, timing, route of administration, warnings or indications, withdrawal period, storage, disposal, shelf life.

**Select products that will minimize blemishes.** This may require some product evaluation in the field. Use caution with irritating or large volume products, (ie oil based vaccines, antibiotics, vitamins). Don't combine vaccines, except as instructed by manufacturer since vaccine efficacy may be destroyed. Mix the product thoroughly to begin with and periodically through the working period.

**Restrain animals properly.** Poor restraint is a hazard to animals and personnel. Proper facilities reduce cattle bruising, facilitate vaccine/pharmaceutical delivery and reduce stress.

**Select the best route.** Read the label, determine the best route of administration. If you have a choice select a subcutaneous route (under the skin).

**Choose the best site.** This does NOT mean the fastest and easiest location but the most effective and least apt to damage muscle (meat). The preferred sites are in the neck muscle, in front of and behind the shoulder. If regular or large quantities are to be injected, you may use the thigh (lower round). Avoid the top butt (the rump). Injections given into the muscle should be given straight into and deep into the muscle. Avoid excessive quantities in single sites. Remember that all parts of the carcass are valuable.

**Choose the correct needle.** Injections given SQ should be given with a 16 or 18 gauge, 1/2" to 3/4" needle. Injections given IM should be given with a 16 or 18 gauge, 1" to 1-1/2" needle. Select the smallest needle through which product will flow easily.

**Use proper injection technique.** If injections are given SQ, "tent" the skin, inject under skin. If injections are given IM, inject straight and deep into muscle. If multiple injections are given, keep them several inches apart. Do not give more than 10 ml per injection site. If injections are given on multiple occasions over several days, vary injection site day to day. Antibiotics (penicillin or LA-200), vitamins and clostridial vaccines seem to have the greatest potential for irritation of tissues. Use these especially carefully. Recent studies suggest that clostridial vaccines should not be given late in the feeding period, should be given SQ in all age cattle and preferably in front of the shoulder.

**Sanitation is essential.** Only clean needles should enter the vaccine/medicine bottle. Change needles frequently, 10-20 uses or syringe full of vaccine. If needles are burred, dulled or contaminated, change them; these cause trauma, reaction and leakage of product. Sharp needles and clean equipment make a difference! If killed vaccines are being used, an alcohol sponge may

be used to clean needles between injections; note, this is not an option when administering modified live vaccine. Inject only into clean areas- avoid mud, manure, etc. Thoroughly clean and disinfect equipment between uses. Keep working facilities clean, from the work table surface to the holding chute.

**Maintain treatment records and identify treated animals.** Know what products have been given, where and how they have been given. Know and observe slaughter withdrawal time periods. Treatment records should follow the cattle.

Implement employee/family awareness of proper drug use and annually review YOUR quality assurance plan.

## **CONCLUSION**

Our goal is to realize maximum animal health product effectiveness, with a minimum of carcass damage. The industry has saved (or avoided loss) of \$9 million in the past year. We now have only \$27 million to go.