Proper Injection Procedures Raise Cull Values

Although the primary value of a dairy cow lies in her ability to give milk, producers should not underestimate her value as a source of meat when she leaves the herd. Twenty percent of the nation's beef and 30% of its hamburger are produced from dairy breed cattle. On the farm, cull cattle account for 4% of the gross income each year (Roeber et al. 2000a).

But this part of the business could return more dollars to producers if the industry focused on sending more saleable cull cows to market. The most recent injection-site study funded by the National Cattlemen's Beef Association (NCBA) in 2000 showed that 57.7% of all dairy cull-cow carcasses have at least one injection-site lesion in the round.

These blemishes reduce profits and yields from expensive cuts like the round because they must be trimmed out before the meat can be marketed. The waste is especially costly when one considers that today's dairy cow is increasingly being used for whole-muscle cuts like ribeyes and rounds, not just for hamburger.

The issue is compounded by the fact that injection-site lesions are not found when the animal is sold or processed, but rather at the wholesale or retail level. Since individual dairy producers cannot be accountable for the hidden defects, processors pay dairy producers less for their cull cows in anticipation of the waste.

Quality defects, including injection-site lesions, are estimated to cost dairy producers $70 for each and every cow culled (1999 National Market Cow and Bull Beef Quality Audit).

As costly to the entire beef industry is the eroded consumer confidence that comes from injection-site lesions that are not found by the packing plant, but rather show up at the dinner table as tough, unpalatable roasts and steaks.

So what can dairy producers do to increase cull-cow returns and ease the pain that comes from "sending a cow to town"?

Follow the lead of the fed-cattle industry, which has significantly reduced the frequency of injection-site blemishes since the Beef Quality Assurance (BQA) program was adopted in the 1980s. Following BQA protocol, ranchers have lowered injection-site blemishes from 21.6% of fed-cattle rounds in 1991 to just 2% of the rounds processed in 2005 (Beef Quality Audits).

Inject in the "Triangle"

The BQA has two primary recommendations for administering health care products. First, give all injections in the neck. Second, administer them under the skin when subcutaneous delivery is an option.

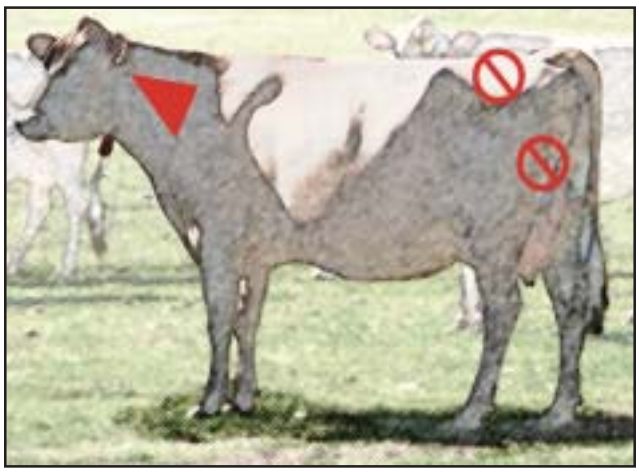
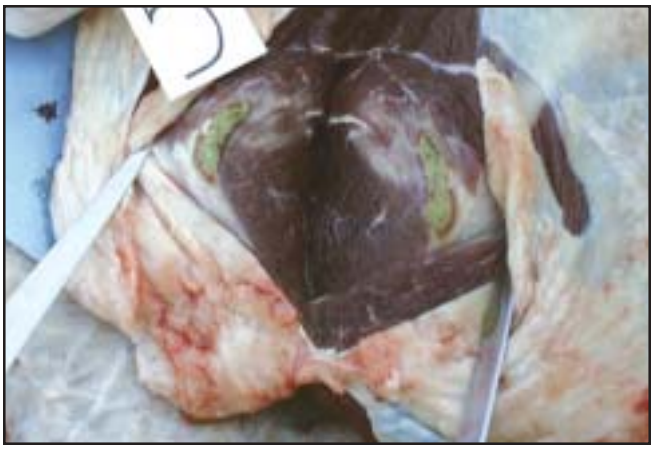


Figure 1: To preserve dairy beef quality, administer all injections in the "injection triangle" in the neck. The target is in front of the slope of the shoulder, below the nuchal ligament (about three inches below the top of the neck) and above the neck vertebrae. Never administer injections between the hooks, pins and hocks.

Injections should be given in the area in front of the shoulder known as the "injection triangle," shown in Figure 1. The top border of this triangle is the nuchal ligament, the large ligament at the top of the neck. The front border is the vertebrae

Injection-site blemishes extend well beyond the injection site itself. Since they must be trimmed out to obtain a saleable retail product, they greatly reduce yields of the entire carcass. Quality defects, including injection-site lesions, cost producers an estimated $70 for each and every cow culled. *Above photos courtesy of Dr. Jerry Woodruff, Fort Dodge Animal Health Field Service Veterinarian.*



Injection-site blemishes are found in more than half of all cull cow carcasses. This is damaging to the dairy industry as today's dairy cow is not just used for hamburger. Nearly 44% of cow and bull beef is sold as roasts and steaks (1999 National Market Cow and Bull Beef Quality Audit) and the balance is used for ground beef and sausage.

of the spinal column. And the rear border is the front edge of the shoulder blade.

In cull-cow carcasses, there are far too many injection-site lesions in the round muscle - the area between the cow's pins and her hocks. This comes with the practice of administering medications from behind while the animal is restrained in a head lock or in the milking parlor.

While convenient, this is not best to preserve the most valuable cuts of meat.

Subcutaneous is First Choice

All intramuscular injections cause blemishes, so dairy producers should administer health products subcutaneously. Some products can be given either intramuscularly (IM) or subcutaneously (SQ or Sub-Q) while others must be administered one way or the other. Check the label and if both options are given, select the subcutaneous route.

The recommended technique for subcutaneous injections is the two-handed "tent" method. To use this method, lift a fold of skin in the neck with one hand to form a tent and then insert the needle through the skin into the space under the tent with the other hand. Lifting the skin assures the product will be administered under the skin.

There is also a one-handed tent method that can be used when the safety of the person administering the injection is compromised. Insert the needle just through skin but not deep enough to penetrate underlying tissue. Lift the tip of the needle to raise the skin up from the underlying tissue and then give the injection. Use the shortest needle possible so the product is not injected into the muscle mass.

Injection sites in young animals do not disappear, as many believe. A study by Dr. Matthew George determined that 93.2% of lesions at the retail level were chronologically older and the balance were more recently administered. *Photo courtesy National Cattlemen's Beef Association.*

Correct Needle Size for Injections

	Subcutaneous ½-¾ inch needle *Cattle Weight*			Intramuscular 1-1½ inch needle *Cattle Weight*		
Injection Viscosity	<300	300-700	>700	<300	300-700	>700
Thin (needle gauge) *Example: saline*	18	18-16	16	20-18	18-16	18-16
Thick (needle gauge) *Example: oxytetracycline*	18-16	18-16	16	18	16	16

Chart 1: Administer health products subcutaneously and use the smallest needle possible to minimize muscle damage. Use a needle just once annd administer no more than 10 cc per site. *Source: Website of the Ohio Beef Quality Assurance Program.*

Other Considerations

The manner in which products are administered impacts meat quality too. Keep these tips in mind when administering pharmaceuticals:

- Make sure you use the proper size and length needle as recommended in Chart 1.
- Use needles just once to prevent the spread of disease and the contamination of bottles of vaccines or antibiotics.
- Space injection sites at least four inches apart, or the width of a hand. If more than one product is being administered, inject both sides of the animal so the products do not mix and the efficacy of the product is not reduced.
- Administer no more than 10 cc per site. If more injections are required, use multiple injection sites.
- Restrain animals properly.
- Always use good sanitation.

Blemishes Don't Heal

Injection sites will not heal and disappear, even when products are administered early in life, contrary to what many believe. Most sites can be detected for years and may actually increase in size as the animal grows.

Research done at Colorado State University by Frank Garry, D.V.M., showed that 92% of animals injected with a common antibiotic at 50 days-of-age had visible injection-site blemishes when they were slaughtered at 430 days-of-age. Of the animals that were injected with an antibiotic at 200 days-of-age, 51% had blemishes at slaughter.

Not only do injection-site lesions remain, but the trim that is required to obtain a saleable retail product extends far beyond the actual lesion itself.

Another Colorado State University study done by Matthew H. George, D.V.M., showed that meat tenderness and quality is compromised three inches or more beyond the site of the injection.

George used Warner-Bratzler shear-force tests to examine meat tenderness in lesion-afflicted and normal beef rounds. A shear-force reading of 8.5 lbs. or less is indicative of the quality of restaurant-style steaks, with 10 lbs. being the upper limit of acceptability for tenderness.

The values for readings taken at the blemish site and one, two and three inches away were 30.6, 22.2, 16.7 and 12.8 lbs., respectively, for the lesion-afflicted steaks. Shear force values of 8.8, 9.0 and 8.6 lbs. taken at similar locations were found in normal round steaks.

The quality of the beef that is offered to the consumer begins with the first day of the animal's life and is preserved every time it is injected with a health care product.

Work Together

In the dairy business, it is a given that all dairy cows eventually become beef cows.

Following BQA protocol, you can eliminate the losses that come from trimming injection-site lesions from expensive cuts of meat and earn more from this often overlooked and underappreciated source of income.

Just as the production of a wholesome, nutritious dairy product begins on the farm, so does the production of a tasty, high-quality beef product.