Injection Practices in U.S. Cattle Feedlots[1]

The Beef Quality Assurance (BQA) program is a State and national industry-led effort that provides guidelines for the production of quality beef. The goal of the program is to raise consumer confidence in beef quality through recommended management techniques and a commitment to quality within segments of the beef industry, including feedlots. Guidelines included in a BQA program focus on issues such as feedstuffs, feed additives and medications, processing and treatment records, injectable animal health products, care and husbandry practices, and guidelines for the general care and handling of cattle. Participating in the BQA program can help ensure that quality beef reaches consumers through safe handling, feeding, and care of cattle. In addition, the BQA program helps to improve food safety and supports animal welfare and well-being, major concerns of consumers. Using the BQA program can positively impact all that are involved, including cattle, feedlot operators, and consumers.

Injection-site blemishes in beef products were the catalyst behind the development of the BQA program. These blemishes were unsightly and resulted in loss of value for the affected beef products. Many products injected into the muscle can cause blemishes at the injection site and loss of tenderness near the injection site. Because of these findings, the BQA program recommends administering injections subcutaneously (SQ) in the neck region whenever feasible. When the SQ route is not feasible and an intramuscular (IM) injection must be made, the recommended location is the neck region, which will spare the higher value cuts of meat. While nearly all injectable products can adversely affect beef quality, vaccines for clostridial diseases were of particular concern because of severe reactions seen with these products. The Feedlot 2011 study collected data on clostridial vaccine use, route and location of injections, and the use of injections greater than 10 mL.

The U.S. Department of Agriculture's National Animal Health Monitoring System (NAHMS) conducted the Feedlot 2011 study, an in-depth look at large feedlots (1,000 head or more capacity) in 12 States[2] and small feedlots (fewer than 1,000 head capacity) in 13 States.[3] Large feedlots accounted for 82.1 percent of the January 1, 2011, inventory of feedlot cattle in all U.S. feedlots, but only 2.8 percent of all feedlots. The 12 participating States accounted for over 95 percent of the inventory of cattle in large feedlots (NASS Cattle on Feed report, February 18, 2011). Study results presented in this information sheet reflect only large feedlots, which were divided into two groups: those with a capacity of 1,000 to 7,999 head and those with a capacity of 8,000 or more head.[4]

Objectives of the Feedlot 2011 study included assessing producers' familiarity with the BQA program, their perceptions about the effectiveness of various management practices used to help ensure beef quality, and their use of BQA management strategies. Producers' familiarity and perceptions about the BQA program have been reported in another information sheet from the study (Quality Assurance in U.S. Feedlots, 2011; http://www.aphis.usda.gov/animal_health/nahms/feedlot/downloads/feedlot2011/Feed11_is_Quality.pdf). This information sheet discusses injection practices on U.S. feedlots.

Clostridial vaccine use

Overall, 84.4 percent of feedlots used clostridial vaccines on at least some of their cattle, resulting in the vaccination of 62.4 percent of all cattle. (For more information see the "Vaccine Usage in U.S. Feedlots" info sheet at: http://nahms.aphis.usda.gov). Of vaccinated cattle, 97.5 percent received the vaccine SQ in the neck region. The remaining cattle were vaccinated IM in the neck region. Less than one of five cattle (14.9 percent) received more than one clostridial vaccination while in the feedlot. There were no differences in clostridial vaccine use by feedlot capacity or by geographic location.

Other injection management

While in the feedlot, cattle may receive a variety of other injections based on health status and other factors (table 1).

[1] Feedlots with a capacity of 1,000 head or more.
[2] Arizona, California, Colorado, Idaho, Iowa, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, Washington.
[3] Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, Pennsylvania, South Dakota, Texas, Wisconsin.
[4] Information on small feedlots is available at: http://www.aphis.usda.gov/animal_health/nahms/feedlot/index.shtml

Table 1. Percentage of feedlots and percentage of cattle by injections given at the feedlot as either a preventive or treatment measure

Injection	Percent feedlots	Percent cattle
Anthelmintic (e.g., Ivomec®)	54.8	75.8
Prostaglandin (e.g., Lutalyse®)	36.4	7.5
Corticosteroid (e.g., dexamethasone)	56.3	3.3
Nonsteroidal anti-inflammatory (e.g., Banamine®)	63.4	2.1
Other*	2.7	0.0

*Excluding vitamins, vaccines, and antibiotics.

For all injectable products listed below, the majority were given either SQ in the neck region or IM in the neck region (table 2).

Table 2. For feedlots that gave cattle the following injections as either a preventive or treatment measure, percentage of feedlots by route and location of injection

Route and location	Percent feedlots	Percent cattle
Anthelmintic (e.g., Ivomec)		
IM in neck region	7.7	1.5
SQ in neck region	88.1	98.2
IM in other location	1.9	0.0
Any other route or location	2.4	0.3
Prostaglandin (e.g., Lutalyse)		
IM in neck region	59.0	75.2
SQ in neck region	40.2	22.0
IM in other location	0.8	2.8
Any other route or location	0.0	0.0
Corticosteroids (e.g., dexamethasone)		
IM in neck region	57.5	62.3
SQ in neck region	37.2	37.4
IM in other location	1.6	0.0
Any other route or location	9.8	0.4
Nonsteroidal anti-inflammatory (e.g., Banamine)		
IM in neck region	41.0	23.0
SQ in neck region	40.2	46.6
IM in other location	0.0	0.0
Any other route or location	24.0	30.4

Historically, concerns have arisen about delivering more than 10 mL of product in a single injection site, because of the potential effects on beef quality. Consequently, recommendations were made to limit the volume of injections per site, and to partially withdraw and redirect needles before additional product is injected. With more injections delivered SQ in the neck region, however, the potential impact of large-volume injections on beef quality has lessened. Still, only 10.9 percent of feedlots gave injections of more than 10 mL per site to any cattle, and only 0.7 percent of cattle received such injections.

Summary

The beef industry has focused a great deal of research and education—especially through the BQA program—on injection-site blemishes. At the same time, the pharmaceutical industry has pursued label-change approvals to allow the injection of products SQ rather than IM. Regulators have approved such label changes based on data submitted by the product sponsors, which show the efficacy of products using alternate delivery methods. The issue of injection-site blemishes in beef products has all but disappeared. It appears that research, education, and collaboration have resulted in improved product quality.

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