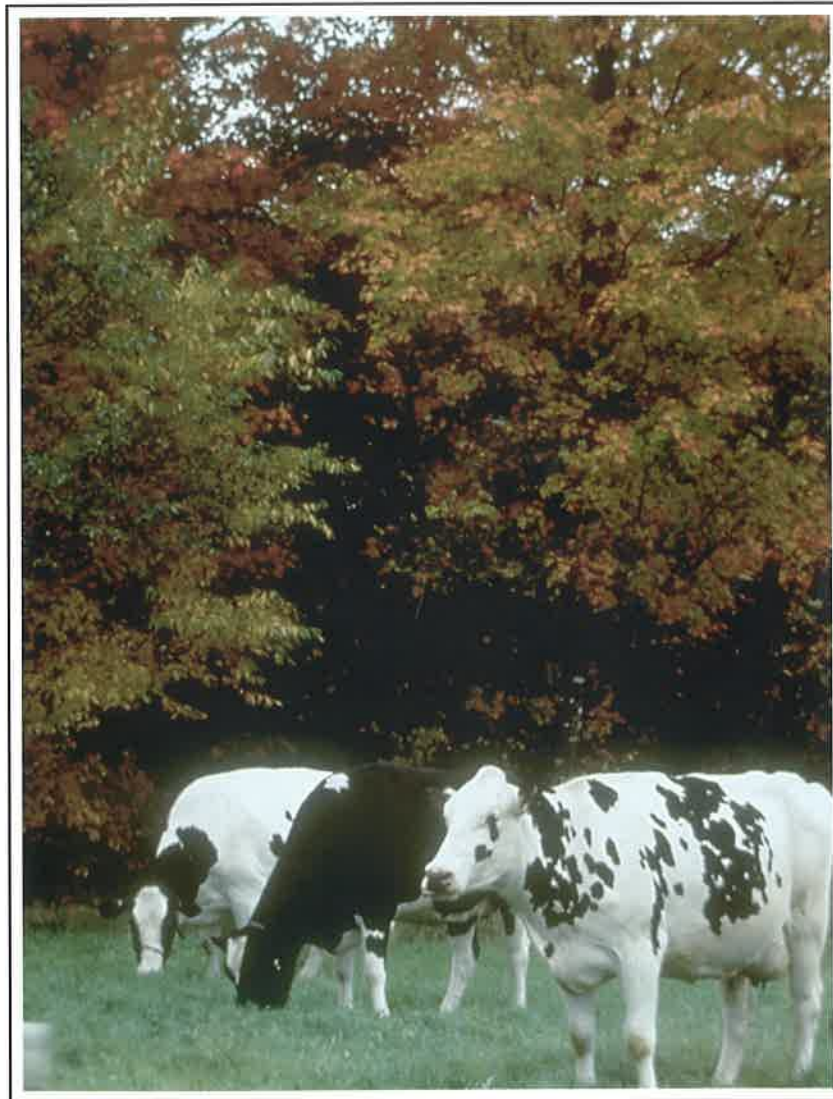




*Opportunities for Enhancing Value  
and Improving the Quality of Beef*

# The National Non-Fed Beef Quality Audit



**SPECIAL SECTION: DAIRY CATTLE**

*Produced by the National Cattlemen's Beef Association  
Funded by the Cattlemen's Beef Promotion and Research Board*

# Get The Job Done Right

**I**n the summer of 1994, the U.S. beef industry launched a massive research project aimed at identifying specific product-quality defects in non-fed cattle and determining the resulting costs of these problems to the beef and dairy industries.

The study, called the National Non-Fed Beef Quality Audit (NNFBQA), demonstrated that quality defects cut deeply into producers' competitiveness, taking nearly \$70 out of their pockets for every cull cow and bull they marketed that year.

Project participants underscored that the majority of concerns, including hide defects, excess external fat, inadequate muscling and bruising, could have been overcome had producers more effectively managed and monitored their cow herds—avoiding problems before they start—and marketed their cattle before they became too lame, too thin or too fat.

*Dairy producers can make substantial contributions to improving the quality of beef by managing, monitoring and marketing their cattle before they become too lame, too thin or too fat.*





The Audit's conclusion is especially relevant to America's dairy producers, because so much of the nation's non-fed beef supply depends on the production and marketing of dairy cattle.

In addition, conclusions of the Audit arrive at a time of serious challenges for America's beef producers. Competition from poultry and pork poses an even greater threat to beef's market-share than ever before. The GATT and NAFTA agreements will result in increased importations of boneless manufacturing beef from Australia, Canada and Central and South America. Concerns over the safety of beef, especially that of ground beef products—most recently brought into the spotlight by outbreaks of *E. coli* O157:H7—mean producers must become increasingly serious about addressing consumer concerns and product quality issues on their farms and ranches.

Still, unprecedented opportunities continue to exist for those producers willing to produce beef in a consumer-responsive and quality-oriented way. Research shows that beef has returned to the forefront as a safe and healthful staple in the diet. For the first time in nearly two decades, beef consumption is on the rise. There is unparalleled growth taking place in the mid-price-range steak restaurant and hamburger business. Exports to Japan and other countries continue to support domestic markets and American cattle producers in their enterprises.

The following pages provide a blueprint for dairy producers to make direct contributions—in their own way, on their own farms—to improve the industry's competitive position like never before. The bottom line of this report is simple: it pays to produce, market and process cattle the right way, because the benefits of doing so not only improve the economic strength of individual operations, but also equate to safe, wholesome and high-quality products for consumers.

## The National Non-Fed Beef Quality Audit: Background

The NNFBQA was conducted in three phases; its principle goal was to identify problems, not point fingers at any one segment of the industry.

Phase I involved a series of interviews with industry leaders, veterinarians, non-fed beef packers and end-users of beef from non-fed slaughter cattle. They were asked to identify quality defects in live cattle, their carcasses and offal.

Phase II consisted of a national audit of packing plants located throughout the United States. Researchers hoped to determine the actual levels of these quality defects. They collected data in holding pens, on slaughter/dressing floors, and in coolers. Live-animal evaluations in the holding pens allowed evaluators to classify animals as to breed type (dairy or beef). In this manner, live-animal quality defects could be evaluated by breed type and appropriate emphasis placed on defects more closely associated with each (See Table 1). Unfortunately, a similar analysis for breed-type information during slaughter floor and cooler room audits was not possible because hides had been removed from the animals.

Finally, Phase III included a strategy workshop convened to identify management practices which could be employed by cattle and dairy producers to correct the quality non-conformities identified during earlier phases of the study.



*Approximately one-third of the total domestic non-fed beef production is derived from dairy cows.*

### Non-Fed Beef and the Dairy Business

#### *The Two Go Hand in Hand*

- Dairy cattle represent a substantial proportion of the non-fed beef produced each year in the United States.
- Approximately one-third of the total domestic non-fed beef production is derived from dairy cows.
- Approximately 75% of domestic non-fed beef is derived from the slaughter of cows, of which, roughly one-half is produced from dairy cows.
- Domestic non-fed beef production accounts for roughly 20% of all beef produced in the United States.
- Six million dairy calves enter the beef production chain each year as feeder cattle or veal calves. Approximately 20% of all fed cattle in 1990 originated from the dairy herd.

**TABLE 1****Frequency of Defects Among Cattle in Packing Plant Holding Pens**

Defect	Dairy Cattle	Beef Cattle
Udder/Teat Problems	14.5%	5.0%
Knots or Abscesses	13.4%	5.8%
Horns	11.9%	24.2%
Hide Damage		
Latent Defects (scars/scratches)	34.1%	26.3%
Insect Damage	11.5%	7.8%
Hot-Iron Brands	20.9%	55.0%
Lame Cattle (stifled/arthritis)	5.8%	3.4%
Disabled Cattle	1.3%	0.9%
Body Condition		
Too Low (Dairy BCS of 1)	4.6%	3.5%
Too High (Dairy BCS of 5)	3.0%	8.6%

Adapted from the NNFBA Executive Summary.

*“Dairy producers **must** take every precaution to adhere to drug withdrawal times in order to ensure that violative drug residues are not present in either milk or beef. Generally, the withdrawal period for most animal-health products is much longer for meat than for fluid milk.”*

— James A. Jarrett, DVM

## Udders/Teats

During holding-pen audits, researchers evaluated cows for udder and teat defects, such as mastitis, overly large and distended udders, lacerated teats and gangrenous quarters.

Auditors found that approximately 14.5% of dairy cows had a defect of the mammary system, with mastitis being the most prevalent problem. Not only are large, distended udders prone to injury and a leading cause of animal discomfort and mobility problems, they pose significant challenges to the packing industry as well. Large udders—those weighing 50 pounds to 80 pounds—are difficult to remove during processing.

In addition, cows with mastitis are often treated with a wide variety of pharmaceutical products, and, in some cases, these products are used in an extra-label manner in order to return the cow to the milking string as soon as possible.

“Dairy producers **must** take every precaution to adhere to drug withdrawal times in order to ensure that violative drug residues are not present in either milk or beef. Generally, the withdrawal period for most animal-health products is much longer for meat than for fluid milk,” says James A. Jarrett, DVM.

## Residues

As suppliers of both milk and meat products, dairy producers play an extremely important role in maintaining consumers’ confidence in the safety and wholesomeness of both food products. Extreme caution is advised when using animal-health products in an extra-label manner; this should be done only after a

valid Veterinarian/Client/Patient Relationship (VCPR) has been established with the veterinarian. Extra-label use of animal-health products can result in the presence of violative drug residues in edible tissues, and, as a result, can cause irreparable damage to consumer confidence.

According to data compiled by the USDA through the National Residue Monitoring program, the classes of cattle with the greatest violative residue rates for antibiotics are dairy cows and bob veal calves (see Table 2).

The primary reason for residue violations is the failure of producers to allow adequate time for drug compounds to clear an animal's system. Violations can also be caused by the use of animal-health products which are not specifically cleared for use in cattle.

For example, aminoglycosides (such as gentamicin) are of particular concern because this class of drugs often requires an extended period of time (up to 18 months) to clear from the kidney. The kidney is the principle target organ for antibiotic residue testing. The threshold for "violative" residue levels of extra-label compounds (those not specifically labeled for use in beef cattle) is zero. For these reasons, aminoglycosides are one of the most common causes of violative residues among dairy cows and veal calves.

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## Injection-Site Lesions & Abscesses

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Observations made during the holding-pen audits revealed that 13.4% of all dairy cattle had visible abscesses. Abscesses were most often identified in the

**TABLE 2**

### Violative Residues of Antibiotics

Class of Cattle	Violative Residues of Antibiotics (%)			
	1990	1991	1992	1993
Bulls	0.00	0.00	0.00	0.00
Beef Cows	0.68	1.38	0.00	0.15
Dairy Cows	1.70	2.20	—	1.54
Fed Heifers	0.00	0.00	0.00	0.00
Fed Steers	0.00	0.53	0.00	0.09
Bob calves	2.19	2.58	1.36	1.84
Formula-fed veal calves	1.29	0.79	0.31	0.19

Adapted from USDA/FSIS Domestic Residue Data Book(s)



*Inspect fences, free-stalls, gates, and working chutes for protruding nails, bolts, broken boards and pipe, and other blunt objects that can cause bruise damage.*

hindquarters of dairy cattle and appear to be the result of swelling associated with intramuscular injections (see photo on page 4).

This outside round or “flat” portion of the carcass is predominately sold as a press-formed or cooked deli product, and therefore is a valuable subprimal cut.

Personnel at a large Northeastern packing plant, harvesting substantial numbers of dairy cattle, noted that 25% of beef rounds fabricated at their facility contained an injection-site lesion. Lesions of the round can often result in two pounds of trim loss. More importantly, when lesions are found, the round can no longer be marketed as a value-added subprimal; instead, it is used for the production of lower-valued hamburger.

Although the use of freestalls and stanchions may hamper a dairy producer’s and veterinarian’s ability to administer injectable animal-health products in the lower-valued neck and shoulder of the animal, management practices should be scrutinized and changes made to minimize this quality defect.

In addition, abnormal swelling and abscessation of the hock region is common among dairy cattle and likely associated with the confined housing environments under which dairy cattle are often managed. These abscesses can result in condemnation of the carcass at processing.

USDA inspection data reveal that 0.15% of all non-fed slaughter cattle are condemned because of abscesses. Producers should employ the following to avoid this problem:

- ✓ Use properly designed and maintained housing and handling facilities to prevent injuries.



- ✓ Detect abscesses as early as possible and treat them quickly.
- ✓ Use surgical drainage and antimicrobial therapy to ensure the problem is treated properly.

## Horns and Bruises

Results of the NNFBQA indicate that, in 1994, 11.9% of all dairy cattle were horned. This is a significant quality concern because research clearly shows that horned cattle cause a greater incidence of bruise damage than cattle without horns.

Bruising is a serious quality problem facing the beef industry. In fact, packers identified bruise damage as their No. 1 quality concern with non-fed slaughter cattle.

Results of the slaughter-floor audits found that 80% of all cow carcasses (beef and dairy) were bruised, with the majority having multiple bruises. Bruise damage is estimated to cost the non-fed beef industry roughly \$75 million annually, or \$11.47 for every head of non-fed cattle harvested in 1994.

Here are a few strategies for overcoming these problems:

- ✓ Handle and transport live cattle properly, with as little stress and crowding as possible.
- ✓ Inspect fences, free-stalls, gates, and working chutes for protruding nails, bolts, broken boards and pipe, and other blunt objects that can cause bruise damage.
- ✓ Remove horns from calves when they are young. This not only reduces the frequency of bruises and the stress on the animal, it also diminishes the incidence of head condemnation. Packers report that horn removal at slaughter often results in head condemnation, because hair and other foreign material can enter into the exposed sinus cavities. Under current inspection requirements, if such material enters the sinus cavities, the inspector must condemn the head. This results in significant devaluation (roughly \$16/animal) of total animal value.

## Hides and Brands


Hides from dairy cattle— especially those from Holsteins— are particularly valuable to the tanning industry because of their large surface area and consistent thickness.

According to results of the NNFBQA, however, hide defects among dairy cattle were estimated to cost \$16.6 million annually, or \$5.21 for every salvaged dairy cow and bull marketed in 1994. Hot-iron brands were identified on 20.9% of all dairy cattle, with the majority of branded dairy cattle found in packing plants in the western United States.

Of even greater concern were hide defects caused by latent defects (scars/scratches) and insect/parasite damage. More than a third of dairy cattle were found to have latent defects to the hide, and insect damage was evident in 11.5% of all dairy cattle.

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*“Cows with sore feet spend less time eating and more time lying down— usually in unclean areas— which exposes them to greater bacterial loads and decreases their nutrient intake. Lamé cows become weak and especially more susceptible to injury during transportation. Stress and commingling also cause these animals to become non-ambulatory, bruised or stifled.”*

— Dr. Bill Henning,  
Pennsylvania State University

These problems can be reduced or eliminated by doing the following things:

- ✓ Maintain proper housing and milking facilities to eliminate sharp, protruding objects that cause scratches or cuts to the hide.
- ✓ Implement an effective external parasite control program to reduce the incidence of insect-related hide problems.
- ✓ Move the location of brands from the rib to the rump.

## Lameness and Disabled Cattle

Lameness and associated defects of the feet and legs represent major costs to both dairy producers and packers. Lamé cattle generally don't produce well and pose difficulties during transport. The result is substantial carcass trimming due to bruising and the removal of affected joints. In addition, lamé cattle are generally discounted at market because government inspectors require extensive trimming of inflamed, infected and/or arthritic joints.

Disabled or non-ambulatory cattle (often referred to as “downers”) pose significant challenges to the entire beef industry. This quality problem is one of the most visible lightning rods used as a basis for criticism of the beef industry by critics and the media.

Results of the NNFBA clearly demonstrate that this problem is one that both the dairy producer and the cattleman equally share; roughly 1% of all cattle evaluated in the study were found to be disabled. These cattle were unable to stand on their own due to physical injury, which may have occurred in transit, or because of health and/or dystocia related reasons.

On average, \$70 is lost for every disabled animal that is processed due to additional packing plant labor costs, trim loss (disabled cattle are often severely bruised), and the increased likelihood of condemnation.

Producers can prevent cattle from becoming disabled by selling them prior to deterioration of health. This decreases the economic losses associated with non-ambulatory cattle and more importantly, safeguards the image of the dairy industry. In addition, dairy producers should follow these steps for preventing lamé cattle:

- ✓ Keep cattle on non-slip, concrete floors with proper bedding and non-slip stalls— these things decrease the risk of bruises from falls.
- ✓ Develop veterinarian-approved herd health programs to prevent disease and decrease the frequency of sick animals.
- ✓ Practice good hygiene, keeping stalls, corrals and other facilities clean, dry and comfortable.
- ✓ Employ the use of foot trimming and care.
- ✓ Maintain clean, comfortable, and cool facilities, trailers and trucks when transporting cattle to markets or slaughter facilities.

## Hardware Disease

Non-fed beef packers identified pericarditis, or Hardware Disease, as a serious quality concern that was most prevalent among dairy cattle. In fact, a representa-



tive of a large Northeastern packing plant, where 95% of processing capacity is dairy cattle, reported that Hardware Disease was responsible for one-third of carcass condemnations in that plant. The problem also resulted in a 50% increase in the likelihood of causing significant problems during the evisceration process. When this occurs, carcass trim loss is substantial.

Dairy producers must become more aware and concerned with opportunities for cows to ingest metal. A few suggestions include:

- ✓ Administer magnets to all dairy cattle in order to localize objects made of ferrous metals.
- ✓ Take special care to ensure that non-ferrous metals, such as copper and aluminum, do not enter feeds because magnets are not of use in attracting and holding these metals.

## Body Condition

According to results of the NNFBQA, roughly 4.6% of dairy cattle had insufficient body condition scores (BCS) of 1. Generally, these cattle were in a serious negative energy balance, and, as such, were utilizing muscle tissue (through protein degradation) for their maintenance energy.

Here are a few points to consider:

- ✓ Cows in poor body condition have a higher incidence of disablement and, therefore, sustain increased amounts of carcass bruising.
- ✓ Cows in poor condition produce extremely small ribeye/loineyes and poor red meat yields.
- ✓ Severely emaciated cattle are generally too weak to withstand the rigors of transportation and are more apt to receive disabling injury and severe bruising during transport. The result is excessive carcass trim, with increased rate of condemnation.
- ✓ In the worst-case scenario, severe emaciation can result in livestock death.

Conversely, overly fat cattle cause a number of other problems. According to audit results, 3.0% of all dairy cattle are simply too fat (body condition score of 5) when producers market them. When this happens, packer costs increase because the fat from these overly conditioned cows must be trimmed to derive an acceptable lean content for marketing whole-muscle cuts and boneless manufacturing beef.

A solution to these problems lies in managing thin cows with low body condition scores to more desirable, better-conditioned endpoints and keeping better-conditioned cattle from becoming too fat.

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## Improving the Quality and Salvage Value of Non-Fed Cattle

### *Manage, Monitor and Market*

Participants at the strategy workshop (Phase III of the NNFBQA) determined that the majority of producer-controllable quality problems with non-fed cattle could be best minimized if cattlemen and dairy producers would:

- 1) Manage cattle to minimize defects and quality deficiencies;
- 2) Monitor the health and condition of their cattle; and
- 3) Market non-fed cattle in a timely and prudent manner.

“It all boils down to timely marketing and management,” says Colorado State University’s Dr. Gary Smith. “When a cow’s productivity goes downhill, get her to market. When you know her teeth are gone, get her to market. When she’s a little bit lame, get her to market. Don’t always send cull or salvage cattle to market September through December; if you can, wait until January through March, because there’s historically been a \$6/cwt. upward swing in the price. These are the little things that add up to industry-wide competitiveness, and this is what we hope cattle producers will do to capitalize on the results of this Audit and improve their product and competitiveness.”



The entire beef industry must begin the task of improving the quality and consistency of non-fed beef by attacking the numerous non-conformities and quality defects identified by the NNFBQA.

Enhancing the quality of beef and beef products harvested from salvaged cows and bulls can provide improved economic returns to individual dairy producers through increased value of the cattle that they market. More than ever before, now is the time to get the job done right!

Producers interested in receiving a copy of the Executive Summary of the National Non-Fed Beef Quality Audit should call (303) 694-0305, or write the National Cattlemen's Beef Association, P.O. Box 3469, Englewood, CO 80155.



Document prepared by Eric Grant of Old West Communications, Berthoud, Colo.

Photos provided by Cornell University, Pennsylvania State University, and University of California at Davis.

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