# Assuring Food Safety of Red Meat for Domestic and International Consumers

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# What does this mean?

- Can be very different depending on the product
  - Raw items
    - Chilled
    - Frozen
  - Cured/processed
  - Fully cooked
  - Canned/Shelf Stable
- Covered by different regulatory agencies
  - FDA
  - FSIS
  - Can involve APHIS
  - Can involve EPA

# U.S. Food Safety Management Systems

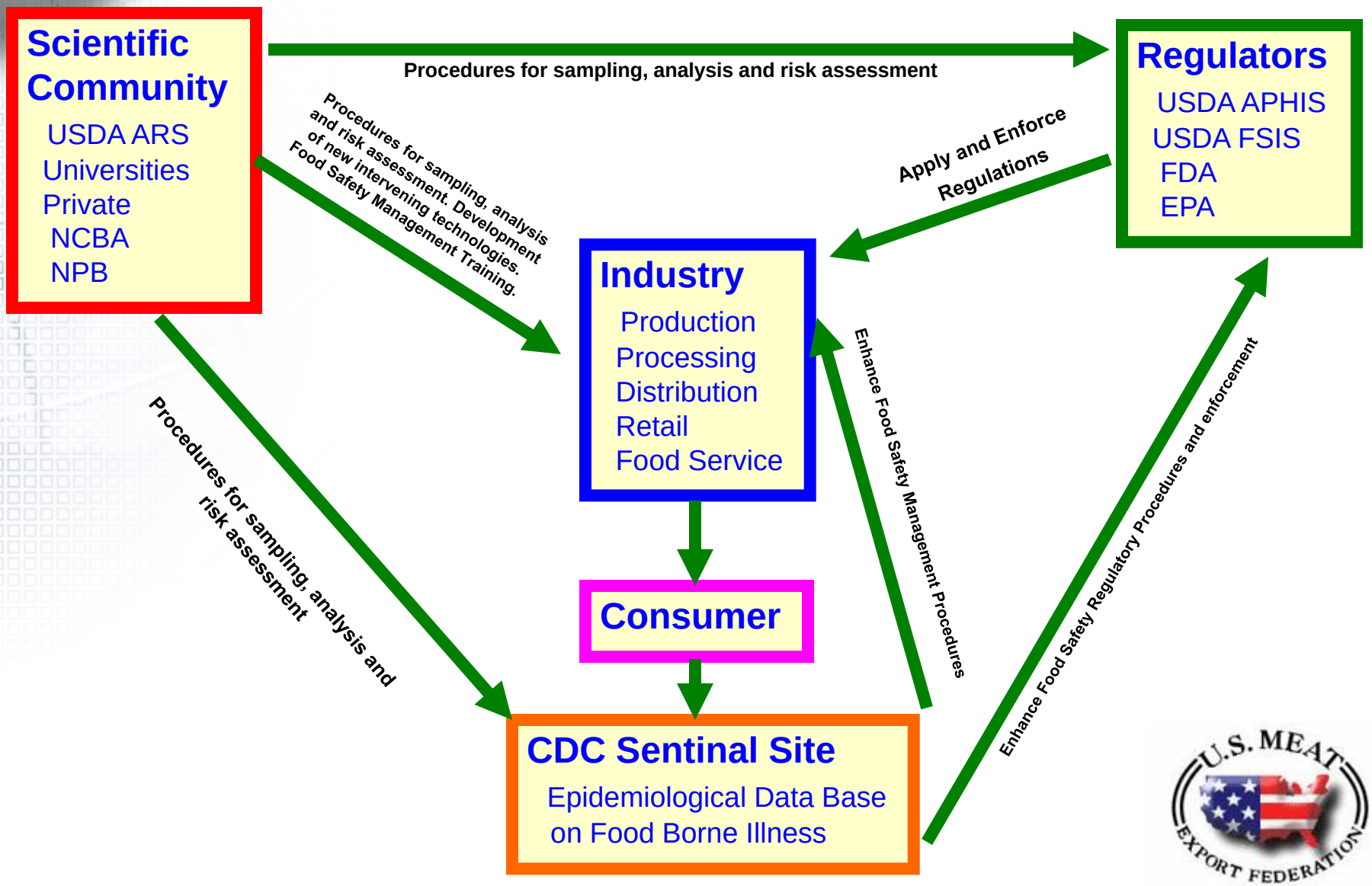


Table 1: Product classes, performance standards/guidance and allowed positives for category 1, 2T, 2 and 3.

| Product class | Performance standard (percent positive for *Salmonella*) (%) | Number of samples tested | Maximum number of positives to achieve standard | Category 1§ | Category 2T (letter T standing for transitioning)§ | Category 2§ | Category 3§ |
|---|---|---|---|---|---|---|---|
| Broiler | 20.0 | 51 | 12 | recent two set results ≤6 | last set ≤6 and prior set >6 w/o failing | either last one or two sets ≥6 w/o failing | most recent set ≥ 13 |
| Cow/Bull | 2.7 | 58 | 2 | most recent two set results ≤1 | last set ≤1 and the prior set >2 w/o failing | either the last one or two set results ≥1 w/o failing | most recent set ≥ 3 |
| Ground Beef Φ | 7.5 | 53 | 5 | most recent two set results set ≤2 | last set ≤2 and the prior set >2 w/o failing | either the last one or two set results ≥2 w/o failing | most recent set ≥6 |
| Ground Chicken | 44.6 | 53 | 26 | most recent two set results set ≤13 | last set ≤13 and the prior set >13 w/o failing | either the last one or two set results ≥13 w/o failing | Most recent set ≥ 27 |
| Ground Turkey Φ | 49.9 | 53 | 29 | most recent two set results set ≤14 | last set ≤14 and the prior set >14 w/o failing | either the last one or two set results ≥14 w/o failing | Most recent set ≥ 30 |
| Market Hog | 8.7 | 55 | 6 | most recent two set results set ≤3 | last set ≤3 and the prior set >3 w/o failing | either the last one or two set results ≥3 w/o failing | Most recent set ≥ 7 |
| Steer/Heifer | 1.0 | 82 | 1 | most recent two set no positives | last set no positive and the prior set 1 positive | either the last one or two set results positive | Most recent set ≥ 2 |
| Turkey*Φ | 19 | 56 | 13 | most recent two set results set ≤6 | last set ≤6 and the prior set >6 w/o failing | either the last one or two set results ≥6 w/o failing | Most recent set ≥ 14 |

*Guidance measure set
§Establishment category, which is based on the most recent two sets completed
ΦFSIS is now rounding down the allowable positives for Category 1 status for those product classes having odd numbered standards or guidelines. Therefore the current performance standards will be: Turkey (Category 1: ≤6 vs ≤7 *Salmonella* positive results), Ground Beef (Category 1: ≤2 vs ≤3 *Salmonella* positive results), and Ground Turkey (Category 1: ≤14 vs ≤15 *Salmonella* positive results).

Source: FSIS 2011: October to December 2010 Quarterly report

| | | |
|---|---|---|
| **PURPOSE:** | Suppliers of slaughter cattle must certify non-use of "prohibited mammalian protein" in their cattle finishing rations (i.e., ruminant meat & bone meal). In 1997, FDA banned the use of such ingredients in feed for ruminant animals. The FDA ban was implemented to prevent the introduction of BSE (Bovine Spongiform Encephalopathy) into the U.S. cattle herd. This initiative is intended to support U.S. efforts to keep the nation's cattle herd BSE-free. | |
| **PROCEDURE:** | All direct suppliers of cattle are required to certify their compliance to the FDA ruminant feeding ban for "prohibited mammalian protein" (ruminant meat & bone meal). This requirement applies to the owner/agent of cattle that are slaughtered at any beef slaughter facility (USA & Canada). | |
| **FDA REQUIRMENTS** | Cattle feeders are required to keep invoices and labeling for all feed they receive that contains animal protein products, whether or not the animal protein is prohibited (required by CFR 589.2000). *www.access.gpo.gov/nara/cfr/waisidx_00/21cfr589_00.htm* | |
| **AFFIDAVITS - FREQUENCY:** | "Prohibited Feed" Affidavits are required initially for all current suppliers (by 04/01/01).<br>"New" suppliers (after 04/01/01) are required to complete affidavits before cattle are slaughtered.<br>Affidavits must be renewed annually for all cattle suppliers. | < |
| **MONITORING:** | Verification of this program will monitored as follows:<br>1. Affidavit Audit: Will conduct random audits of direct cattle suppliers for *signed and current* "Prohibited Feed Affidavit". This will apply to cattle slaughtered at facilities within 6 months of when the audit is initiated. This audit will be conducted minimally twice per year.<br>2. Feedlot Audit: Individual cattle suppliers will be randomly selected for an on-site "feeding record" audit. These reviews will consist of an audit of feedlot rations for presence/absence of animal proteins, and associated review of purchase invoices and labels of feeds containing any animal protein products. This will apply to cattle slaughtered at facilities within 6 months of when the audit is initiated. This audit will be conducted minimally twice per year. | |
| **BQA EXEMPTION** | Feeders participating in sanctioned Beef Quality Assurance (BQA) programs, and that have a defined CCP for "prohibited mammalian proteins", can be exempted from the "Feedlot Audit". BQA status must be current and an audit of the "prohibited protein" CCP conducted within the past 12 months. | < |
| **NON- COMPLIANCE** | If a current, signed affidavit from an owner/agent is not on-record with, cattle will not be slaughtered until the "Prohibited Feed" affidavit is completed. | < |

# New Technologies and Research

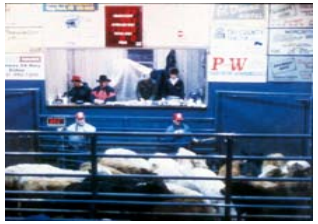
- 2010 Beef Industry Food Safety Summit:
  - Tracing pathogen contamination through post-harvest environment
  - Effect of wet or dried distiller's grains on fecal prevalence of E. coli O157-H7
  - Quantitative herd-level evaluation of Salmonella shedding on dairies
  - Evaluation of different temperatures and exposure times of hot water to reduce pathogen levels
  - E. coli O157-H7 and S. Typhimurium survival and transfer during marinated beef production
  - Industry practices being used to address E. coli O157-H7
  - Dietary orange peel and pulp can reduce Salmonella in Sheep
  - Evaluation of an experimental sodium chlorate product with and without nitroethane
  - Evaluation of gallium maltolate on fecal shedding of Salmonella in experimentally-infected cattle
  - Effect of vitamin D Supplementation on fecal shedding of E. coli O157-H7 in naturally colonized cattle

Source: 2010 Beef Industry Safety Summit Executive Summary

# New Technologies and Research

- The National Pork Board reports project such as:
  - Optimization of antimicrobials for control of Listeria monocytogenes and for acceptable pork product quality
  - The development of a novel immunosensor to detect Salmonella
  - Surface Material, Temperature, and Soil Effects on Pathogen Growth in Condensate
  - Use of ationic peptides as feed additives to improve innate immunity and reduce gut colonization with Salmonella and Campylobacter in weaned pigs

# Industry Response to Pathogen Risk

| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-harvest | Ranch |  | Auction Market |  | Feedlot |  |
| Pre-harvest to Harvest Interface | Holding Pens |   | Washing |  | Dehairing |  |
| Harvest | Steam Vacuum |  | Acid Wash |   | Hurdles |   |
| Post-harvest | Fabrication |  | Grinding |  | At Retail |  |

SOURCE: G.C. Smith (Beef Industry *E. coli* Summit, San Antonio, TX, 2003)

# Audits

National Beef Quality Audit

## NBQA 2000

### Gaining Ground

**Audit shows improvements in beef quality and identifies key challenges to overcome**

U.S. cattle producers have responded to the marketplace, delivering higher quality products to consumers than they did in the mid-1990s, the 2000 National Beef Quality Audit says.

Overall, NBQA found the industry has reduced costs due to quality defects in fed cattle by 15 percent since 1995. Much of this is due to reductions in producer-related problems, such as injection-site lesions, bruises, dark cutters and horns.

This good news comes on the heels of the National Beef Tenderness Survey, which shows beef tenderness has also improved by 20 percent since the early 1990s.

"Cattle producers have taken seriously their commitment to meeting and exceeding expectations of consumers," says Ran Smith, chairman of the industry's Quality Assurance Advisory Board. "Thanks to the national beef quality assurance program, state BQA programs, extension specialists, veterinarians and the tireless energy of producers, beef is better than it used to be."

The audit, sponsored by NCBA and funded by the beef checkoff, was conducted by Colorado State University, Oklahoma State University, Texas A&M University and West Texas A&M University.

To identify quality problems, researchers organized the audit in three phases: surveys of producers, packers, purveyors, restaurateurs and retailers; on-site audits at packing plants; and a strategy workshop with representatives of all industry sectors to discuss findings and develop recommendations.

***The audit found several positive trends:***

- More Choice and Prime carcasses. The percentage of Choice and Prime carcasses climbed from 48% in 1995 to 51% of the total fed population in 2000. The percentage of Prime-grade carcasses rose from 1.3% to 2% in 2000.
- Fewer undesirable "hardbone" and B-maturity carcasses. The percentage of B-maturity carcasses dropped from 4.3% in 1995 to 2.5% in 2000.
- No major shifts in excess fat production. While carcass fat thickness is slightly higher than it was in 1995, it remains well below 1991 when it was a primary quality concern.
- Substantial improvements in horns. The percentage of cattle with no horns improved dramatically from 68% in 1995 to 77% in 2000. Cattle with horns cause carcass bruising during transport and handling.
- Substantial improvements in the frequency of injection-site lesions. Less than 3% of all top butts contained an injection-site lesion in 2000. That's down from 22% in the early 1990s. While not a food-safety problem, injection-site lesions negatively impact tenderness and product presentation.

***The audit also identified top 10 quality challenges:***

1. Low overall uniformity and consistency of cattle, carcasses and cuts. With the industry moving to case-ready products, the need for greater uniformity is a pressing issue.
2. Inappropriate carcass size and weight. Carcasses that weigh 950 pounds or more are difficult to handle, transport and especially process because they produce cuts that are too big.
3. Inadequate tenderness of beef. Despite hea
sirably tough beef remains a problem that must be
4. Insufficient marbling. While there are more
Prime carcasses, there is still great need for well m
5. Reduced quality, grade and beef tenderness
often caused by overly aggressive implanting, poo
health, and inappropriate weight loss.
6. Excess external fat cover. Cattle were sligh
2000 than they were in 1995, and producers should
seek genetics and production practices that result i
quality grade while diminishing excess fat.
7. Inappropriate USDA quality grade mix. Th
still needs to eliminate Standard carcasses and pro
higher-quality grade carcasses.
8. Too much hide damage due to brands. Prod
brand should move the location from the rib to the
they cause less damage.
9. Too frequent and severe bruises. While their
has dropped, bruises still negatively impact beef. P
should manage and transport their cattle to continu
improvements in this area.
10. Too frequent liver condemnations. Produce
proactively strive to prevent liver fluke infestations

"The industry should be pleased with our prog
ments Bob Kerschen, chairman of NCBA's quality
subcommittee. "But it's also important for all prod
ognize that commitment to quality is something th
There's still opportunity for improvement, and still
deliver higher-quality products in the future."

## IT'S YOUR PRODUCT

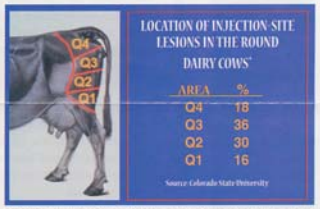
### Injection-site quality control in dairy cows

Injection-site lesions should be a major product-quality concern for dairy producers, especially when it comes to their cull cows.

Among cow carcasses, the problem is especially prevalent in the round, where many injections occur. Rounds from cows and bulls are economically important, because they are commonly processed and marketed as whole muscle products, not as ground beef. Injection-site lesions not found through normal fabrication procedures may not be discovered except by end-product users or consumers.

When injection-site defects occur, meat processors must trim and discard the damaged tissue. This greatly reduces the marketability and economic value of the round.

Tenderness is also significantly reduced in an area that extends out at least three inches in all directions from an injection-site lesion.



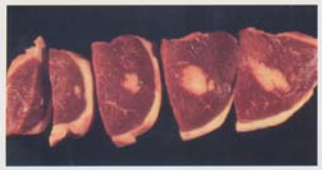

LOCATION OF INJECTION-SITE LESIONS IN THE ROUND DAIRY COWS*

| AREA | % |
|---|---|
| Q4 | 18 |
| Q3 | 36 |
| Q2 | 30 |
| Q1 | 16 |

Source: Colorado State University

*Total incidence of injection-site lesions was 57.3%; lesions may have been found in more than one quadrant.

*Injection-site defects are lesions or scars found in cuts of beef. They result from tissue irritation caused by the administration of intramuscular (IM) injections. These defects are a food quality problem, not a food safety concern.*



To determine the extent of the problem, NCBA's Quality Assurance Advisory Board recently requested Colorado State University to conduct audits in seven different packing plants in all regions of the country.

Researchers obtained untrimmed rounds from each plant. A total of 679 rounds, about half of which came from dairy cows and half from beef cows, were sampled.

The researchers then evaluated these cuts, using a "slice audit" technique, to quantify the number and location of injection-site lesions in each piece. The slice audit allows researchers to identify essentially all of the injection-site lesions in the muscle. It's a much more comprehensive process than methodology used in previous audits. In addition, researchers divided the round into four quadrants: Q1, near the hock, through Q4, at the upper end of the round, near the backbone and including the cap muscle of the top sirloin.

Researchers found an alarming statistic: more than half, or 58%, of the rounds from dairy carcasses had at least one injection-site lesion. The majority of these were in the back of the leg or in the lower quadrants. This was expected, because most injections for dairy cattle are given while the animals are in headgates/stanchions, and the rear of the animal is accessible. The incidence in beef cows was somewhat lower.

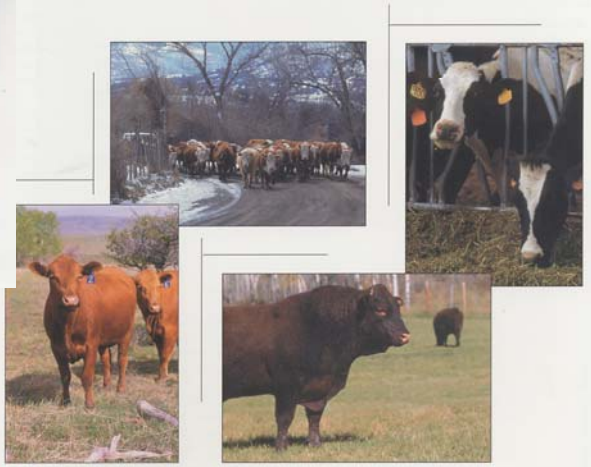
"Injection-site defects are a serious product-quality problem that all dairy producers need to be concerned about — because a significant amount of the beef produced in this country comes from dairy cows," says dairyman James "Skip" Prichard, DVM, member of the Quality Assurance Advisory Board. "Dairy producers can reduce the occurrence of injection-site defects by following simple, quality assurance control steps when treating cattle. By doing so, they'll improve the quality of beef for consumers."

BEEF

MANAGE MONITOR MARKET

## Executive Summary of the 1999 National Market Cow and Bull Quality Audit

*Improving the Consistency and Competitiveness of Market Cow and Bull Beef & Increasing the Value of Market Cows and Bulls*



# PQA Plus is broken into Good Production Practices (GPP)

- GPP #1: ***Establish and implement an efficient and effective herd health management plan.***
- *GPP # 2:* ***Use an appropriate veterinarian/client/patient relationship (VCPR) as the basis for medication decision-making.***
- *GPP #3****: Use antibiotics responsibly.***
- *GPP #4:* ***Identify and track all treated animals.***
- *GPP #5****: Maintain medication and treatment records.***

Source: National Pork Board PQA Plus Training Module: 2009

# PQA Plus GPP (continued)

- GPP #6: ***Properly store, label, and account for all drug products and medicated feeds.***
- *GPP #7:* ***Educate all animal caretakers on proper administration techniques, needle-use procedures, observance of withdrawal times and methods to avoid marketing adulterated products for human food.***
- GPP #8: ***Follow appropriate on-farm feed and commercial feed processor procedures.***
- *GPP #9****: Develop, implement and document an animal caretaker training program.***
- *GPP # 10:* ***Provide proper swine care to improve swine well-being.***


Source: National Pork Board PQA Plus Training Module: 2009

# Procurement

## "Prohibited Feed" Affidavit

I _____(print), attest that to the best of my knowledge, the "finishing ration" fed to cattle under my authority, direction, or ownership and which are supplied slaughter have not been fed "prohibited" mammalian protein as defined by FDA 21 CFR 589.2000.

My role in the cattle supply chain is (check one) :

_____ Feedlot owner/operator
_____ Order Buyer or Trader *(independent)*
_____ Other *(describe)* _____

I agree that authorized [ officials may conduct inspection of feed records and feed facilities at locations from which cattle under my direction (or ownership) are fed and which were slaughtered at an

Signature: _____ Date: _____

Address: _____ Phone Number _____

Affidavits are to be renewed annually. Failure to have a current, signed affidavit on-record is cause for the "company" to refuse to slaughter cattle under your direction or ownership. The owner/agent should keep the yellow copy of this affidavit for your records.

Note: FDA CFR 589.2000 requires ruminant feeders to keep records for all feed they receive that contains animal protein products, whether or not the animal protein is prohibited material. Such records would include purchase invoices and labeling for all feeds containing animal protein products received. Copies of these records are to be made available to FDA upon request. The complete FDA rule can be accessed on the web site => *(www.access.gpo.gov/nara/cfr/waisidx_00/21cfr589_00.html)*.

*All cattle producers are urged to secure similar "prohibited feed" assurances from their suppliers.*

For questions t .
(01/09/04)

# Definition of Food Safety is Key

- Different definitions create multiple standards, multiple certifications, and greater complexity
  - Creates more opportunities for document errors
- Have alternative programs to manage different standards, but not optimal
  - Affidavits
  - Export Verification Programs

| Product | Active Ingre. | U.S. Wthdr. | Rec. Wthdr. (JP) | Company |
|---|---|---|---|---|
| ChlorMax® 50 | Chlortetracycline | 0 days | 10 days | Alpharma |
| Chloratet 50 | Chlortetracycline | 0 days | 10 days | ADMAH |
| Dectomax® inject | Doramectin | 24 days | 60 days | Pfizer |
| Benzathine Penicillin inject | Benzathine Penicillin | | 50 days | FARAD |
| Draxxin® inject | Tulathromycin | 5 days | 33 days | Pfizer |

## Roles of U.S. Government in Controlling BSE

**Food & Drug Administration (FDA)**

**Monitor & Enforce Feed Ban**

**Animal & Plant Health Inspection Service (APHIS)**

**Conduct BSE Surveillance to Determine Prevalence & Verify Effectiveness of BSE Firewalls in U.S.**

**Protecting the health of the U.S. cattle herd**

**Food Safety & Inspection Service (FSIS)**

**Monitor & enforce the Removal of SRM's & Other New BSE-Related Regulations**

**Protecting the human food supply**

**Agriculture Marketing Service (AMS)**

**Provide auditing service to certify marketing programs (e.g., BEV)**

U.S. MEAT EXPORT FEDERATION

# Questions?