Complying with Regulations on Specified Risk Materials (SRMs)

For the FSIS “How to” Workshops

Spring 2009

Presented by

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Objectives

- By the end of this workshop, you will be able to
  - Describe the causes of Bovine Spongiform Encephalopathy (BSE) and its occurrence in the U.S.
  - Understand how to properly remove specified risk materials (SRMs)
  - Understand how to comply with FSIS regulations on SRMs

Bovine Spongiform Encephalopathy (BSE)

What Is BSE?

- Bovine Spongiform Encephalopathy (BSE), commonly called “mad cow disease,” is a degenerative neurological disease of cattle that is caused by misfolded proteins (called **prions**) that build up in the central nervous system (CNS) and eventually kill nerve cells.

What Is BSE? *(con't)*

- BSE as a potentially novel neurological disease of cattle was first observed in 1984 when cattle on a farm in Sussex, England, began exhibiting unusual behavior.
- However, the disease was not fully described until November 1986 following a postmortem study of an affected cow at the Central Veterinary Laboratory at Weybridge, United Kingdom (UK).

What Is BSE? *(con't)*

- BSE is spread through certain cattle feed ingredients, which have been banned since 1997.
- BSE is a form of Transmissible Spongiform Encephalopathy (TSE).

(21 CFR 589.2000), Animal proteins prohibited in feed.

Transmissible Spongiform Encephalopathies

- Cause a spongy appearance in the brain, which is visible when brain tissue is examined under the light microscope
- Can be transmitted, at least experimentally, to other animals of the same or different species

Transmissible Spongiform Encephalopathies in Humans

- CJD or Creutzfeldt-Jakob Disease
- Kuru
- GSS or Gerstmann-Straussler-Scheinker Syndrome
- Alpers Syndome
- FFI or Fatal Familial Insomnia

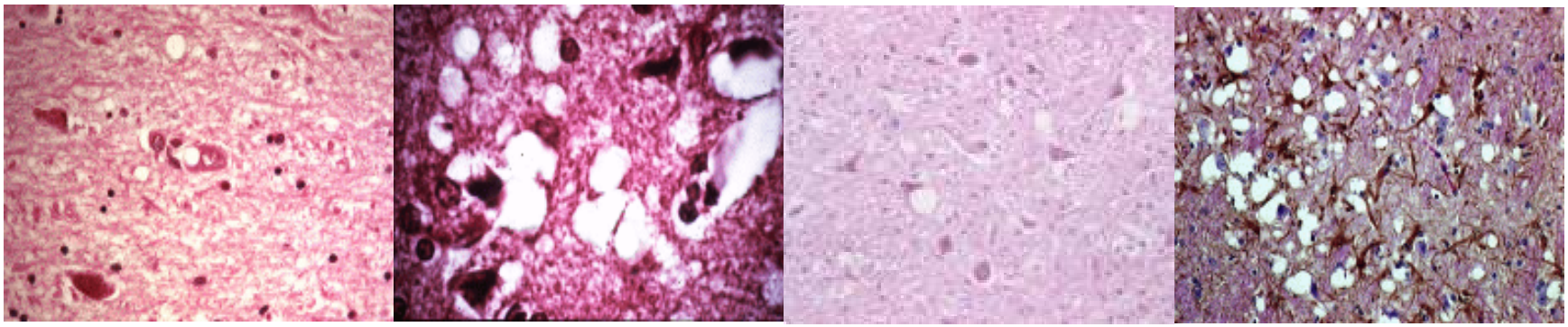
Creutzfeldt-Jakob Disease (CJD)

- Rare neurological disease first identified in the 1920s that usually afflicts people over the age of 55
- Occurs at rate of 1 per million each year worldwide
- Actual rate for people over the age of 55 is much higher

Variant CJD (vCJD)

- Variant Creutzfeldt-Jakob disease (vCJD) is a very rare human TSE that research from the UK has associated with consumption of products contaminated with CNS tissue from BSE-infected cattle.
- There have been about 200 cases of vCJD in the world (most of these in the UK) and zero cases associated with beef consumption in the United States (U.S.).

Spongiform Tissues



CJD human	Kuru human	BSE cow	Scrapie sheep

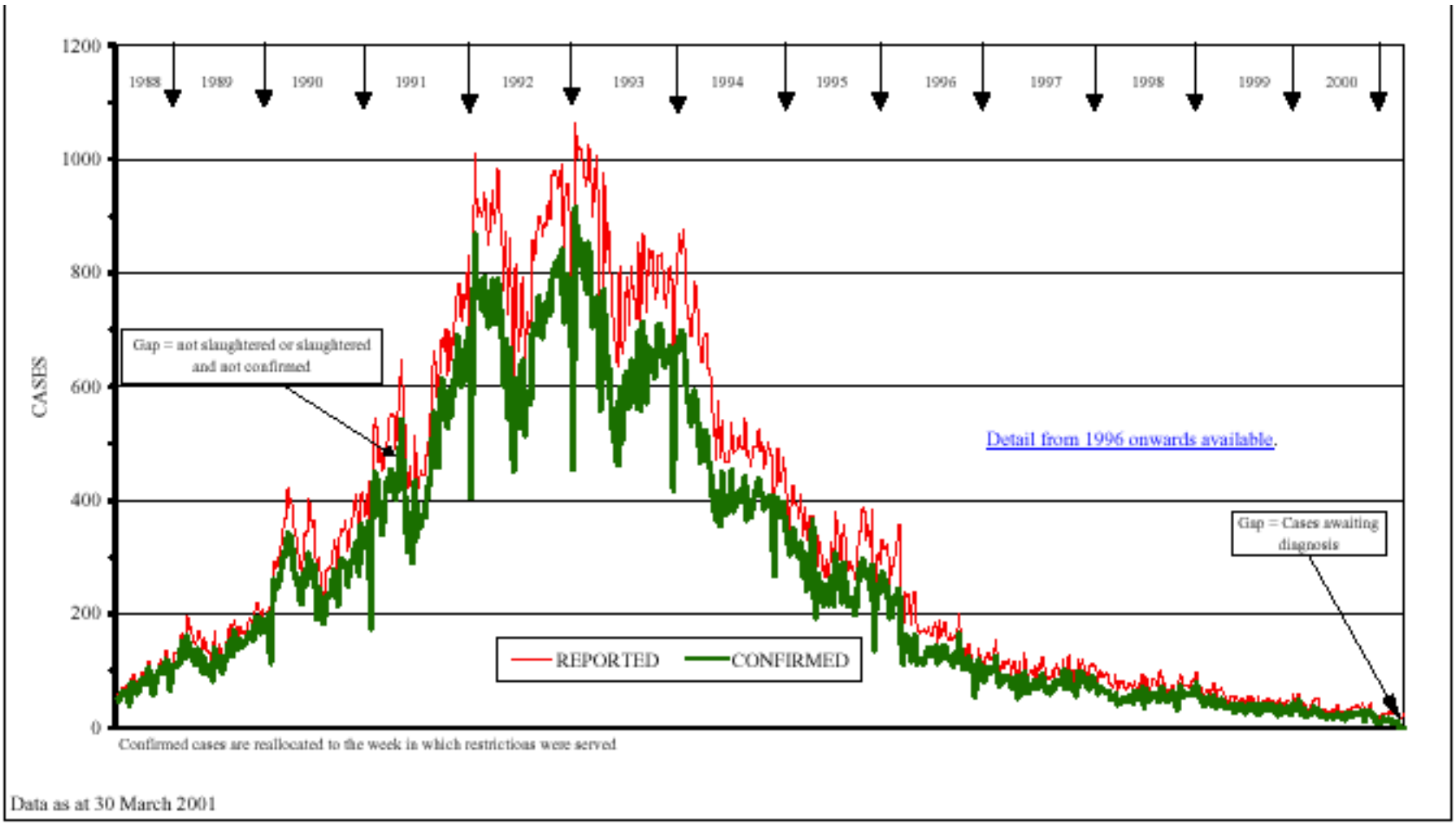
Why BSE in the UK?

- Changes in rendering practices in the UK in late 1970s/early 1980s.
- High sheep-to-cattle ratio (3.5/1 in the UK; 0.1/1 in the U.S.).
- Sheep with scrapie, a TSE known to exist since 1700s, high in the UK.
- Meat and bone meal (MBM) fed in UK calf rations (soybean meal in U.S. calf rations).

Theories Regarding BSE Introduction in the UK

- Scrapie from sheep through MBM to cattle after changes in rendering practices in late 1970s/early 1980s
- Originated spontaneously from cattle in early 1970s (*The BSE Inquiry*, 2000)
- Human to cattle from medical waste being rendered

BSE Cases Reported and Later Confirmed—1988 to 2001



BSE Incidence/Cases

- According to the World Animal Health Organization (OIE) through the end of 2006, 190,129 diagnosed cases of BSE (including domestic and imported animals) have been recorded worldwide.
- Of these, 97% or 184,484 cases occurred in the UK.
- BSE cases in the UK have declined from a peak of 37,280 cases in 1992 to 114 cases in 2006.

BSE Cases in the U.S.

- The first case of BSE in the U.S. was announced December 23, 2003, and was found in a dairy cow imported from Canada.
- Two cases of BSE in cattle born and raised in the U.S. also have been reported: one in 2005 and another in 2006, both with an unusual form of BSE that is different from the typical form.
- All cases were detected through the U.S. Department of Agriculture (USDA) BSE surveillance program.

BSE Surveillance in the U.S.

- Since 1990, USDA has conducted a science-based surveillance program to detect BSE in the U.S.
- Animals targeted for BSE testing include those exhibiting signs of CNS disorders, non-ambulatory animals, and others exhibiting symptoms consistent with BSE that die on-farm.

BSE Surveillance in the U.S. *(con't)*

- The program also focuses on cattle older than 30 months of age. Since tests can only detect abnormal prion protein a few months prior to clinical disease, testing younger animals has limited or no value.

BSE Surveillance in the U.S. *(con't)*

- USDA maintains an ongoing BSE surveillance program and currently tests about 40,000 high-risk cattle each year.
- The ongoing BSE surveillance program is designed to detect BSE at a prevalence level of one case per 1 million adult cattle.

BSE Surveillance Data for the U.S.

Year	Number of Tests Conducted
2006	7,988
2007	44,499
2008	34,140
Total	86,627

Reported Cases of BSE in the U.S.

Year	Location
2004	Washington State
2005	Texas
2006	Alabama
Total	3 cases

Question?

- Can you explain how an establishment can support that BSE is not reasonably likely to occur the U.S.?

Specified Risk Materials (SRMs)

Specified Risk Materials (SRMs)

- SRMs are the items from bovine animals that may contain the BSE agent if an animal had BSE.
- Because SRMs are different for cattle that are 30 months of age or older, establishments must identify the age of the cattle being slaughtered.

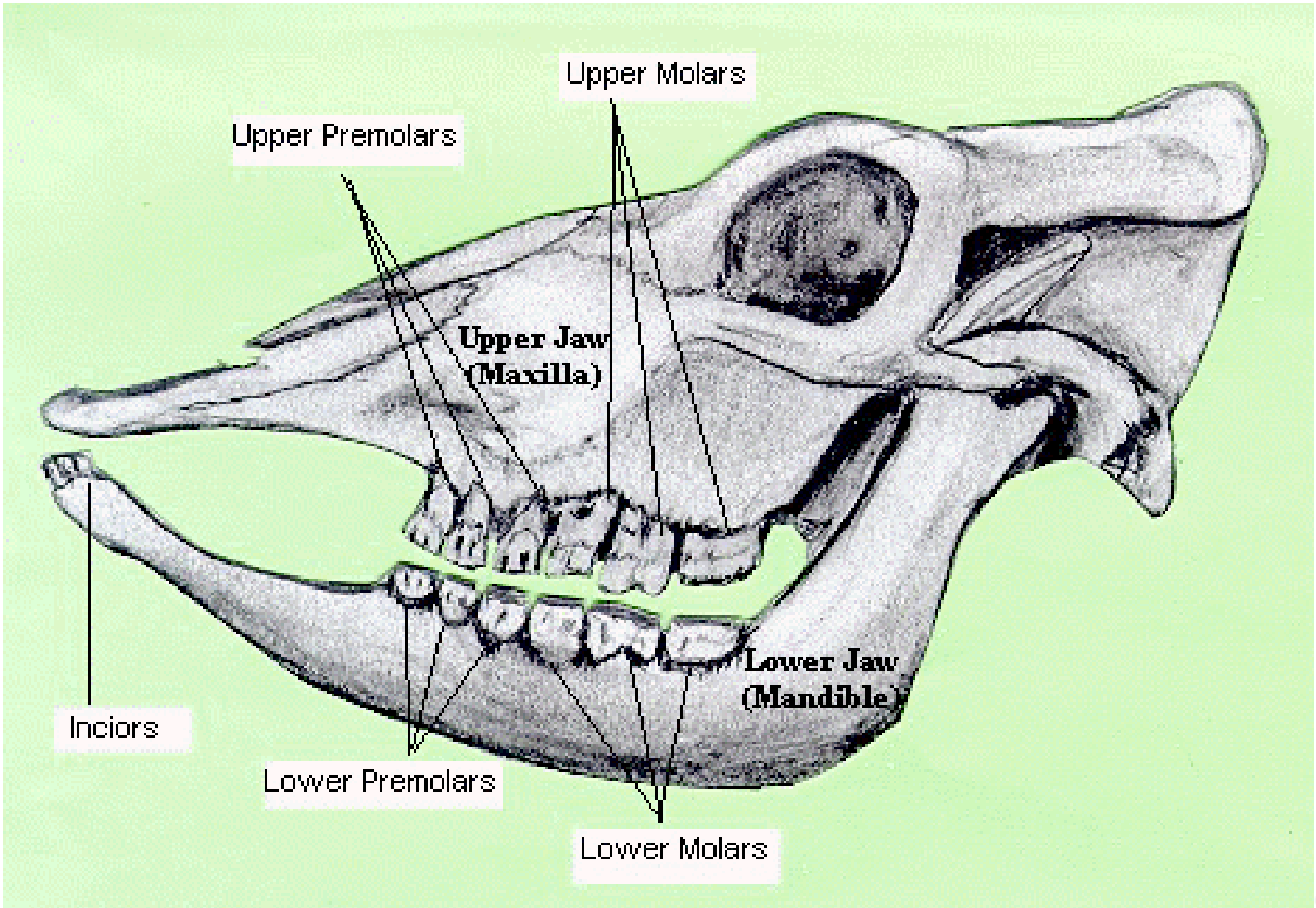
Specified Risk Materials (SRMs) *(con't)*

- For cattle 30 months or older:
  - Brain, skull, eyes, trigeminal ganglia, spinal cord, dorsal root ganglia (DRG), and vertebral column (excluding vertebrae of the tail, the transverse processes of the thoracic and lumbar vertebrae, and the wings of the sacrum)
- For all cattle:
  - Tonsils and distal ileum of the small intestine

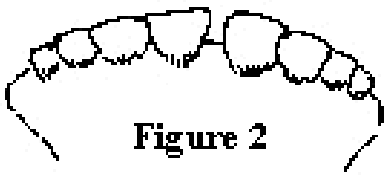
Age Determination

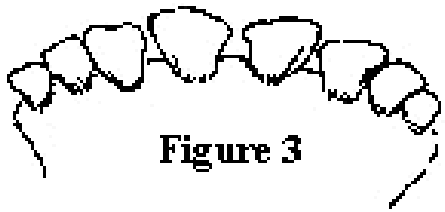
- FSIS Public Health Veterinarian (PHV) will first review any documentation the establishment has on age (birth certificate, cattle passport, etc.).
- If there are serious concerns about the establishment's records, the PHV will conduct an examination of the cattle's teeth.
- "When the examination of the detention of the animal shows at least one of the second set of permanent incisors," the animal will be deemed to be 30 months of age or older.

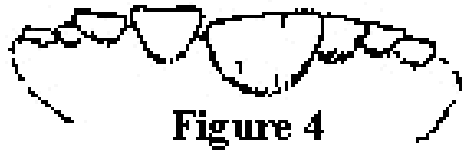
Cattle Dentition

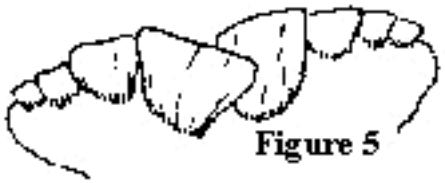


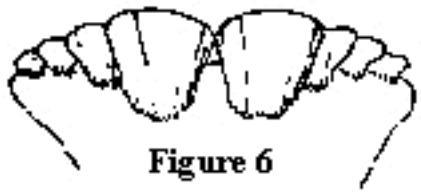
Dentition for Cattle That Are Under 30 Months of Age

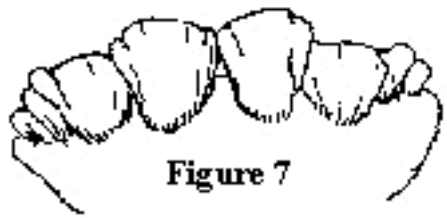






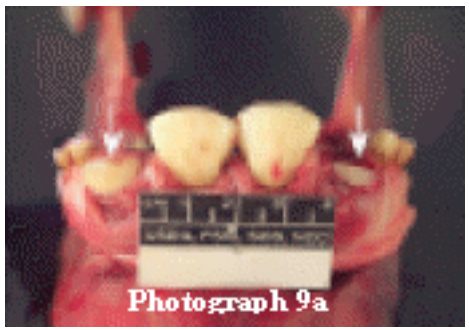


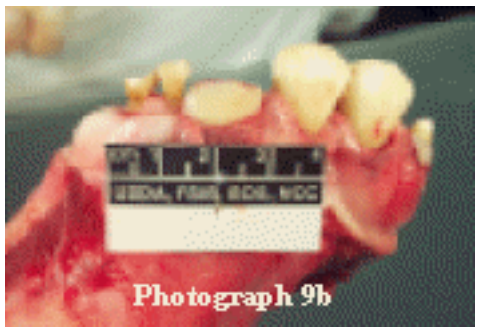


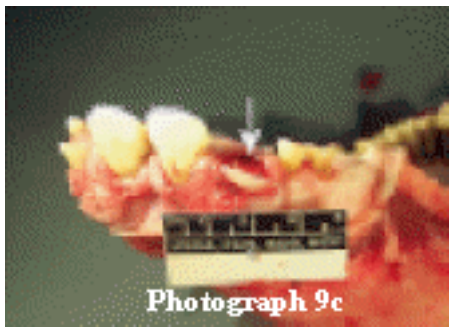


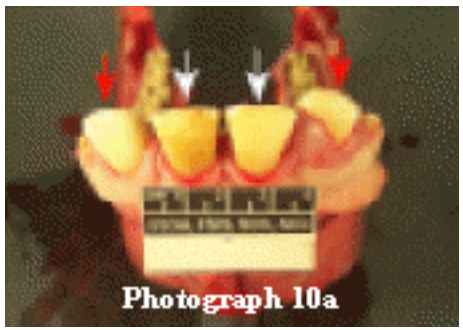
Source: USDA, FSIS—Using Dentition to Age Cattle

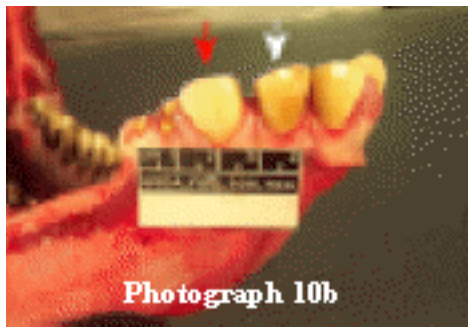
Cattle That Are 30 Months of Age or Older











Source: USDA, FSIS—Using Dentition to Age Cattle

Cattle Passports

Cattle Passport

IMPORTANT: Please keep this document safe – it must accompany the animal when moved. It is an offence to falsify its contents or to alter it in any way.

Eartag
UK AB1231 54321

Electronic Id
For future use

British Cattle Movement Service

Animal Details

Breed: BELGIAN BLUE
Sex: MALE
DoB: 10 10 1998

Genetic Dam Id: UK AB1201 10301
Issue / Version: 20 10 1998 / 1
Re-issue / Version:

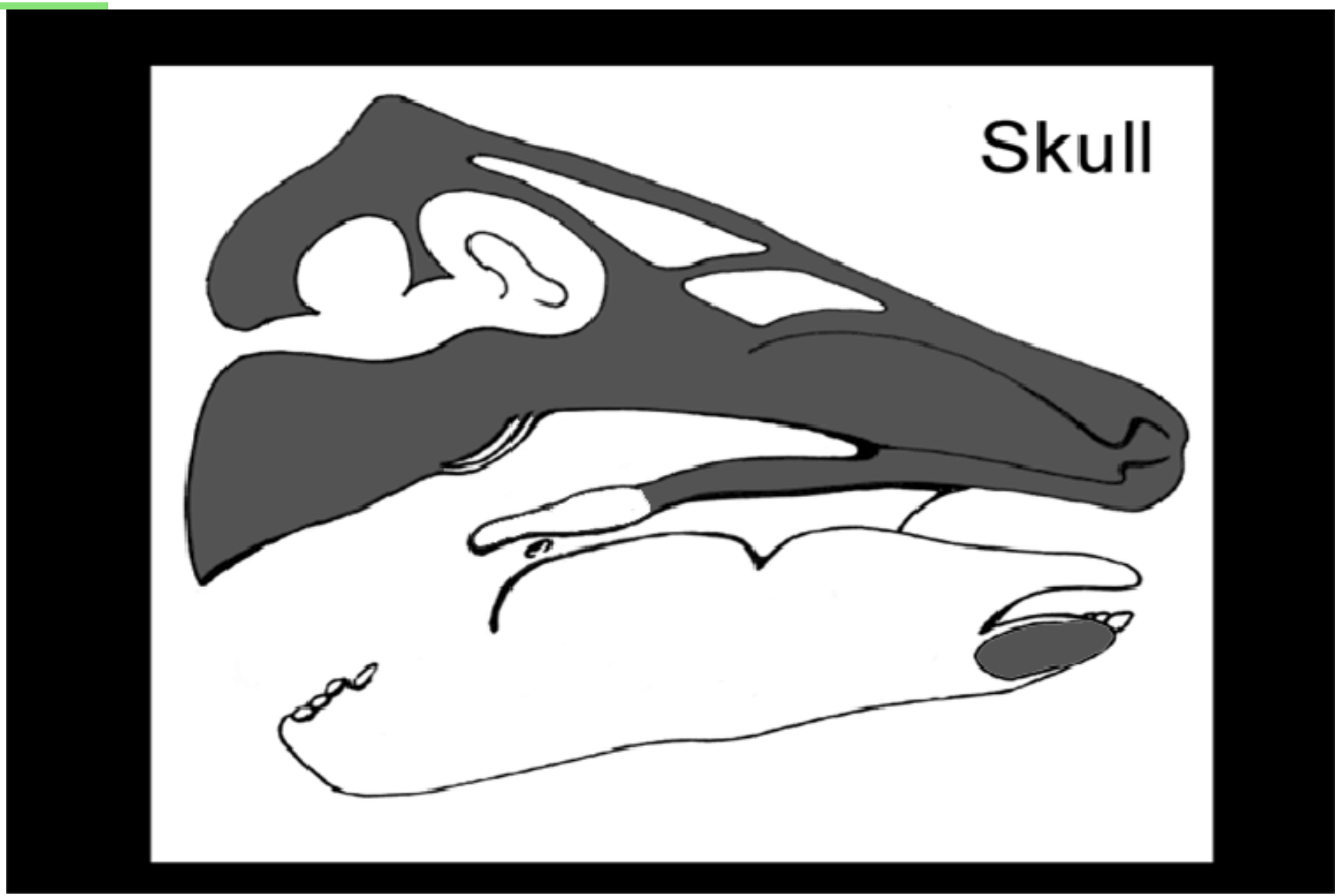
specimen

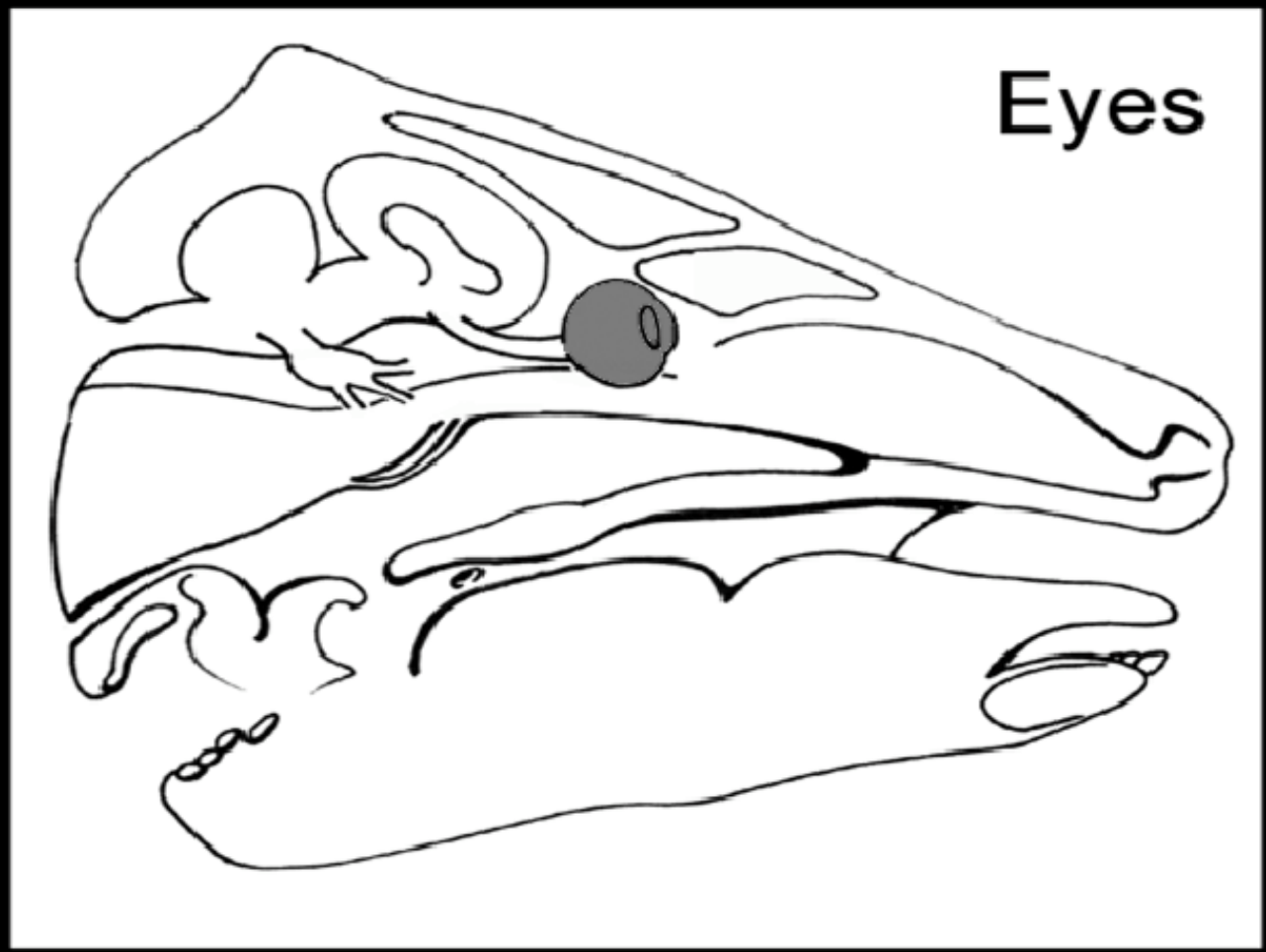
Beef Special Premium Scheme
8 months old: 10 06 1999
21 months old: 10 07 2000

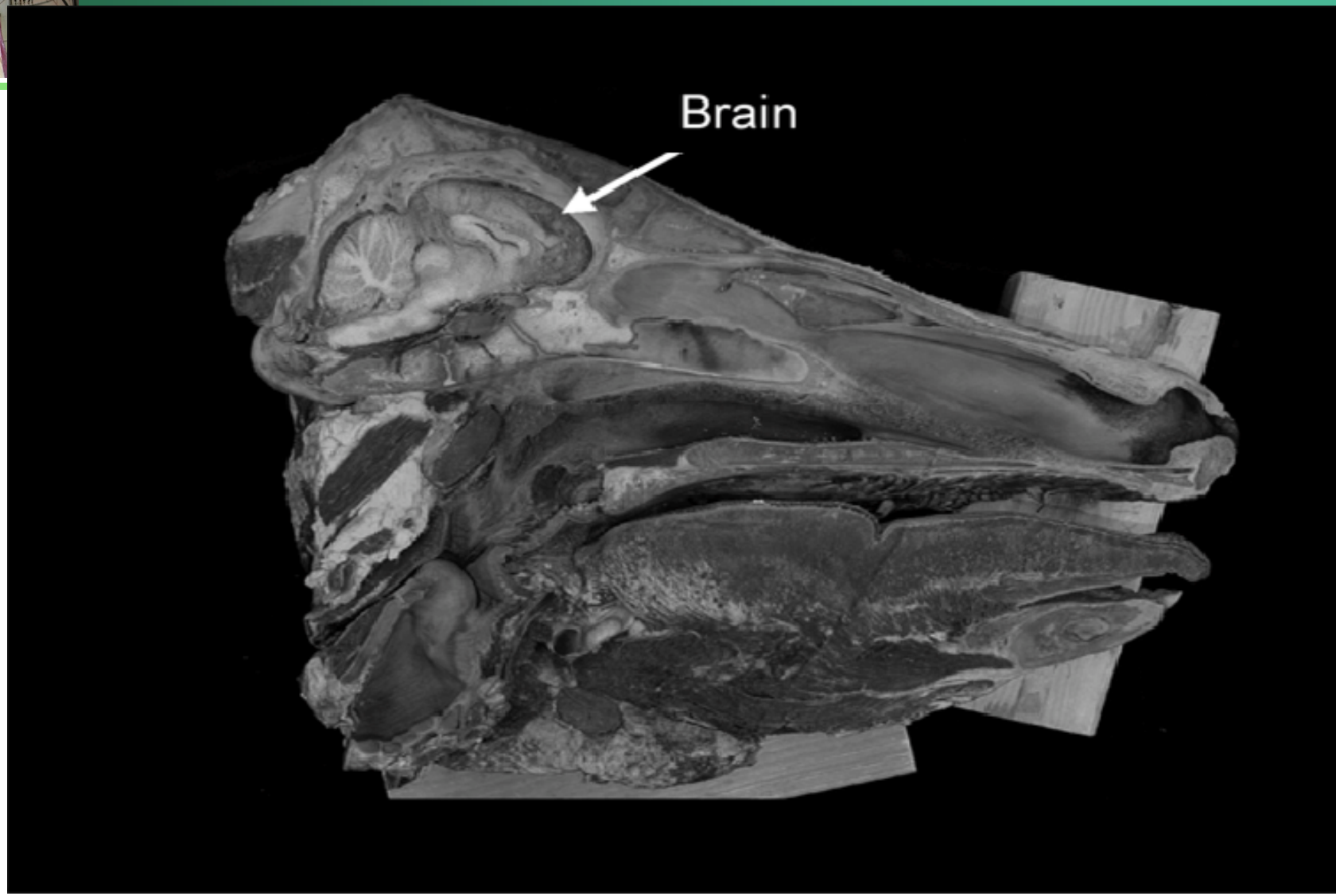
UK AB1231 54321 Page 1 CPP 13 2/98

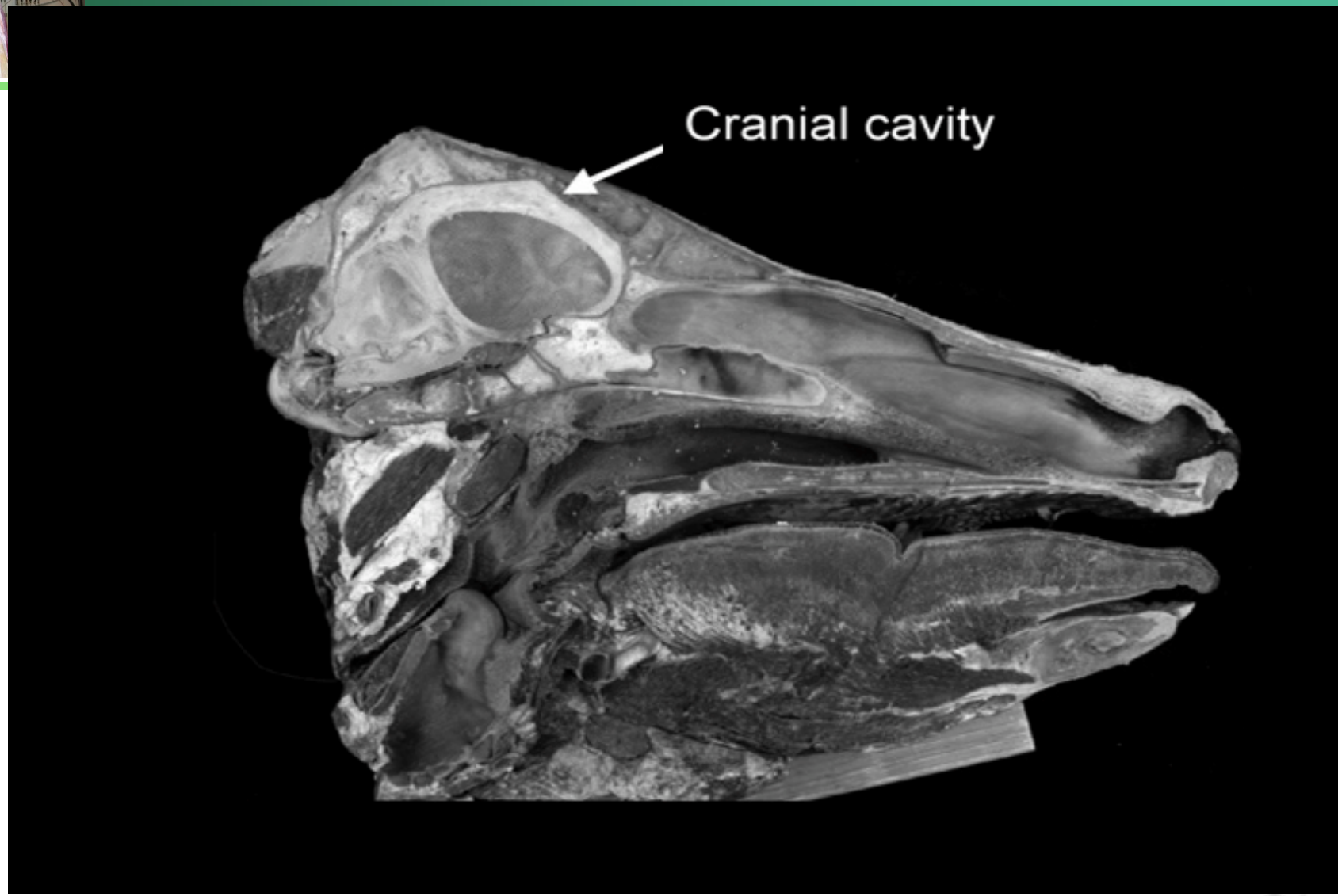
SRMs from the Head

- Skull
- Eyes
- Brain
- Trigeminal ganglia
- Tonsils


Skull


Eyes


Brain


Cranial cavity

Head

- Stun hole leakage

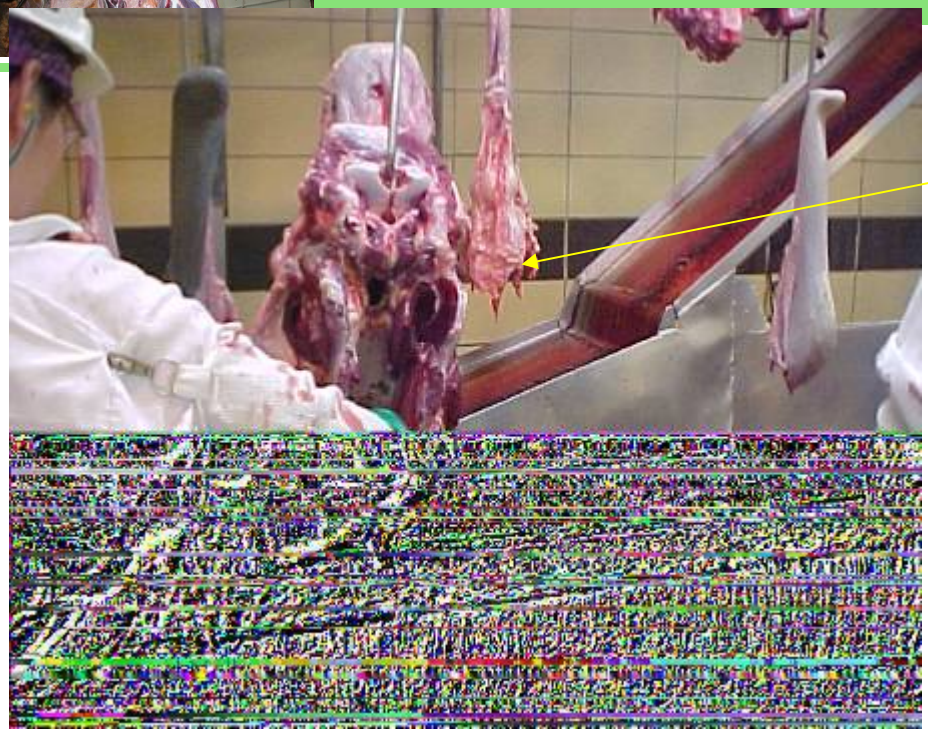
Knock Hole

Steam vacuuming of the knock hole, after hide removal and prior to head wash, prevents cross-contamination of visible brain material in the head wash.

Soaker pad is applied to knock hole to prevent cross-contamination during the head processing on head table.


2004

Head Processing



Head and cheek meat harvesting "on-the-chain." Effective for +30 aged heads when head table cannot be cleaned-sanitized between +30/<30 heads, or when SRM cross-contamination cannot be effectively addressed.

Head and cheek meat harvesting "on-the-table." Effective for head and cheek meat harvesting for <30 heads, and/or when head table can be effectively cleaned-sanitized between +30/<30 heads.

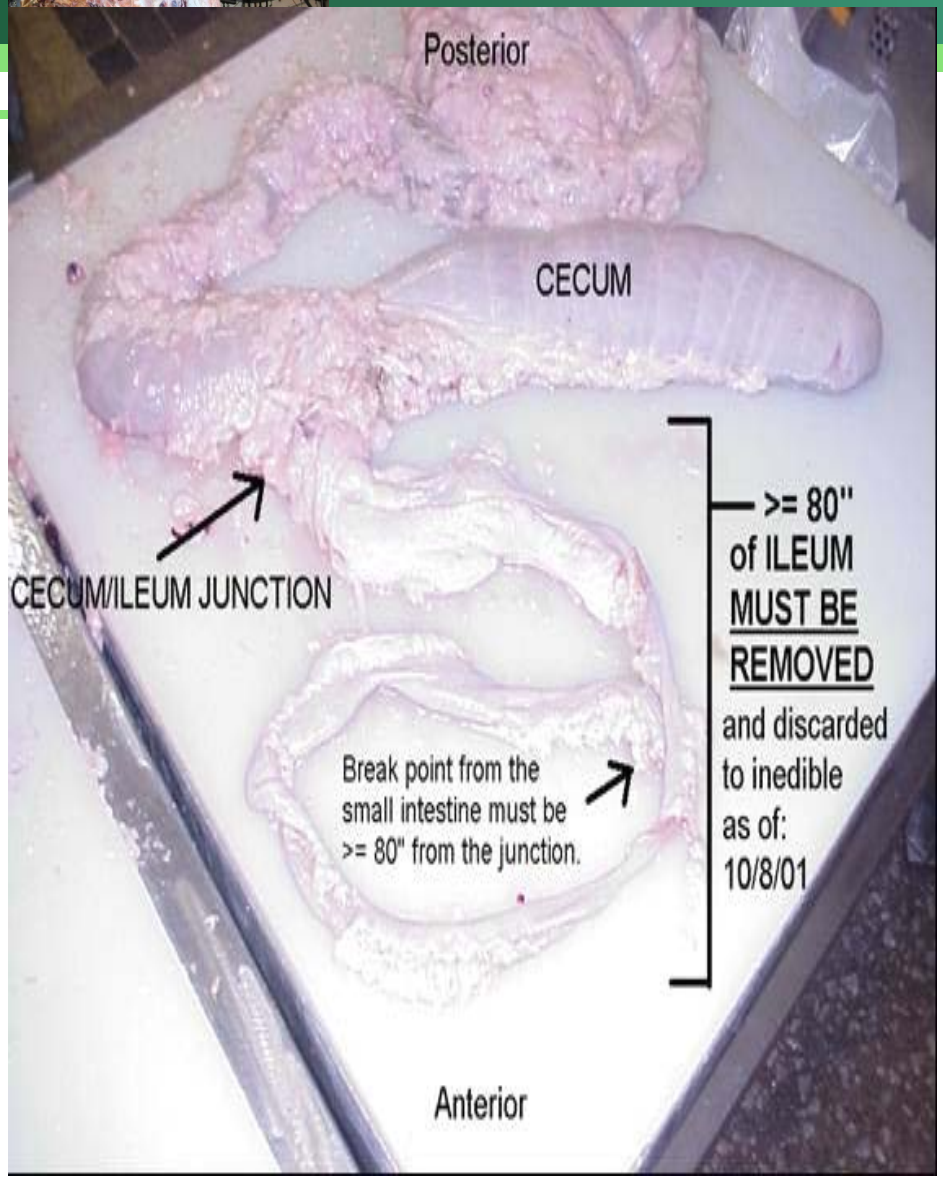
Inedible Rendering

- Brain, eyes, and skull are sent to inedible rendering

Tonsils

- After tonsil removal, some plant procedures include washing and sanitizing with 180°F water

Distal Ileum Removal



Spinal Cord Removal

Spinal cord is completely removed on the slaughter floor.

Bettcher vac cuts and vacuums material away from carcass, reducing the potential for cross-contamination.

Hand tool used to remove spinal cord missed by saw or vac.

Jarvis saw has a blade that runs down through the spinal channel.

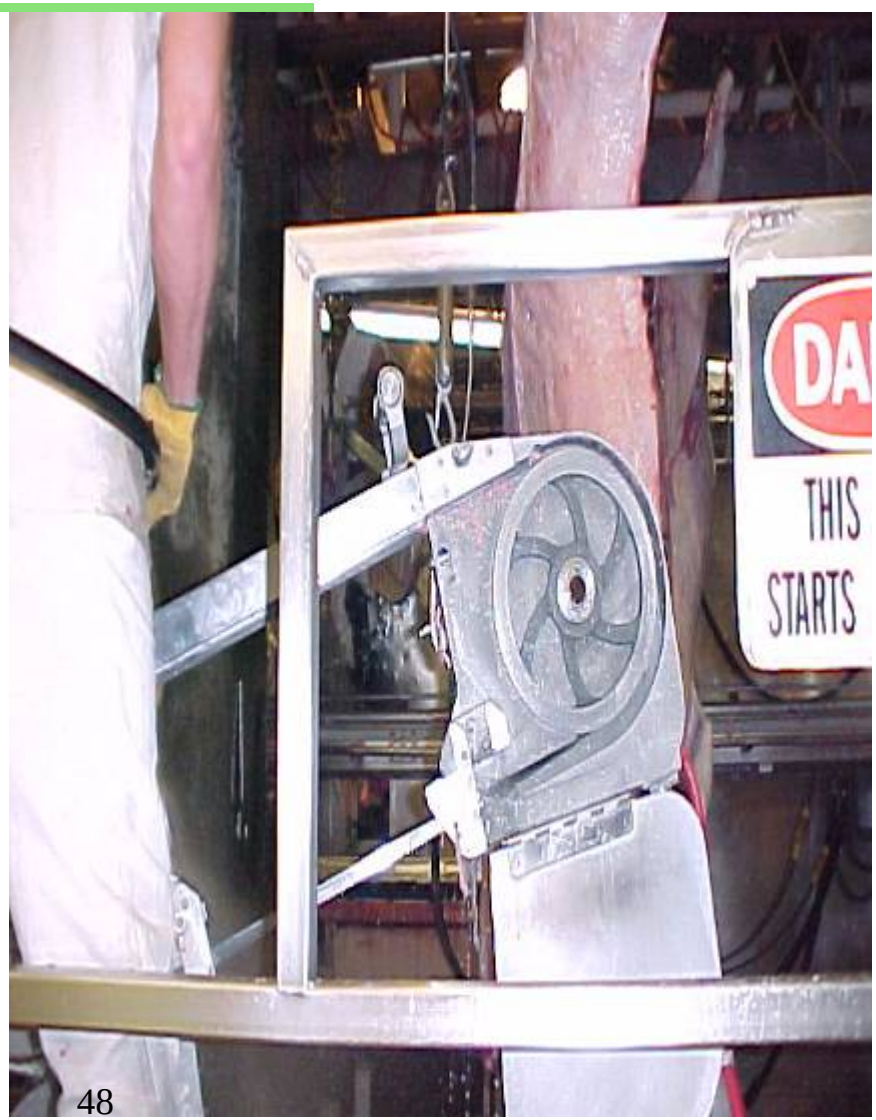
Bettcher

Spinal Cord Removal

SRM Removal - Processing

In some establishments, equipment used to split the vertebral column on animals identified as +30 months of age are cleaned free of organic material and sanitized with 180°F water or alkaline sanitizer before proceeding to the next “<30” carcass.

Carcass Split Saw Must Be Kept Clean



SRM Removal and Control—Carcass Disassembly

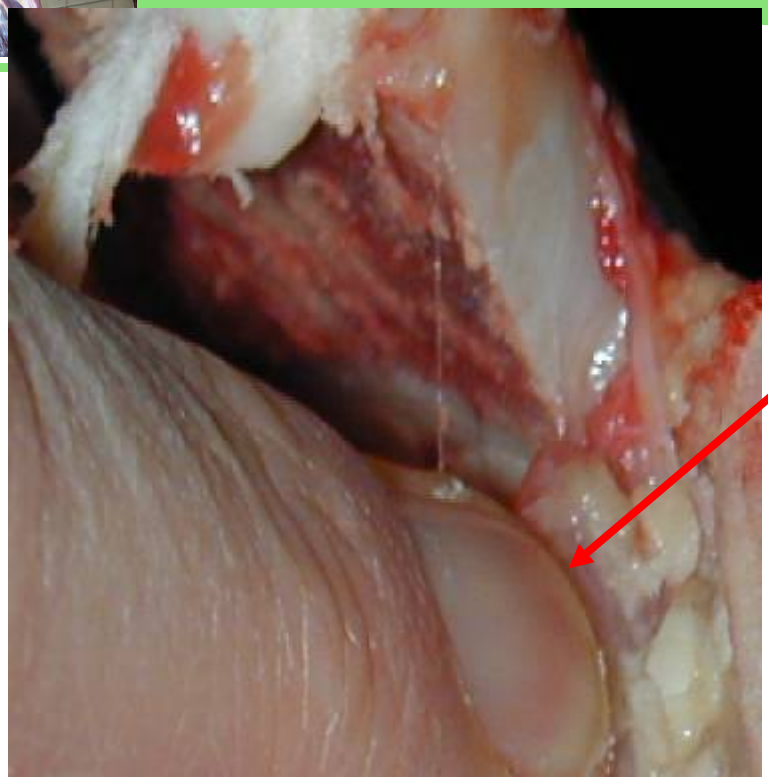
Removal of vertebral column (DRG)

Washing/sanitizing of affected equipment after +30 month old

Vertebral Bone

All +30 vertebral bones are removed and disposed of to inedible rendering.

Dorsal Root Ganglia



- Removal can be difficult.
- In the cervical and thoracic region, DRGs are “buried” in the meat.

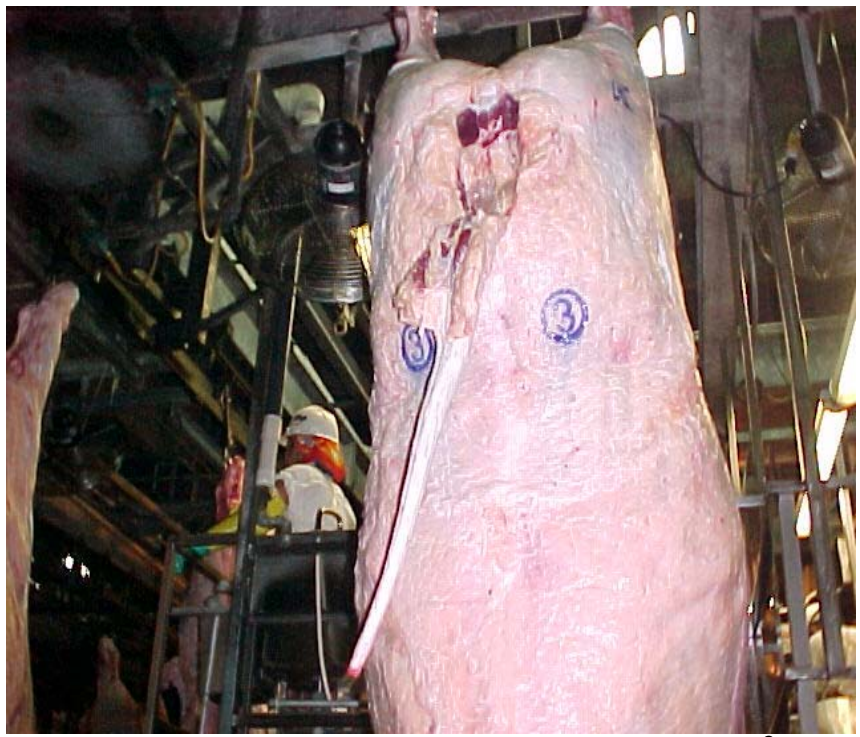
Vertebrae boning and lean harvesting practices for +30 carcasses should avoid deep gouging into the crevice at the base of the finger bones to minimize DRG exposure in lean trimmings or muscles.

Dorsal Root Ganglia *(con't)*

Segregation of Cattle

> 30 Month Carcass Identification

Forequarter *(Circle 3 stamp)* **Hindquarter**



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+30 Carcass Identification

Ribbon applied to foreshank

Marking of spinal column with purple ink

Question?

- Can you list three SRMs and describe where each is located?

FSIS Regulations and Future Issues

9 CFR Parts 309, 310, and 318

Prohibition of the Use of Specified Risk Materials for Human Food and Requirements for the Disposition of Non-Ambulatory Disabled Cattle; Prohibition of the Use of Certain Stunning Devices Used to Immobilize Cattle During Slaughter; Rule

Provisions Contained in the Rule

Prohibition of the Use of Certain Stunning Devices Used to Immobilize Cattle During Slaughter—This section of the final rule prohibits the use of captive bolt stunning devices that deliberately inject air into the cranial cavity of cattle. FSIS finalized this section, **without amendment**, in the final rule.

Provisions Contained in the Rule *(con't)*

Prohibition of the Use of Specified Risk Materials (SRM) for Human Food and Requirements for the Disposition of Non-Ambulatory Cattle—FSIS affirmed the provisions in the SRM interim final rule, with the following amendments:

1. FSIS clarified in the regulation that non-ambulatory disabled cattle offered for slaughter must be condemned; however, FSIS inspection personnel will determine on a case-by-case basis the disposition of cattle that become non-ambulatory *after* they have passed antemortem inspection.

Consistent with current policy.

2. FSIS clarified in the regulation that veal calves that are unable to rise from a recumbent position because they are tired or cold may be set apart and held for treatment.

Consistent with current policy.

3. FSIS clarified in the regulation that it will exclude from the definition of SRMs, materials from cattle originating from countries that can demonstrate that their BSE risk status can reasonably be expected to provide the same level of protection from human exposure to the BSE agent as prohibiting SRMs for use as human food does in the U.S.

Must work with Office of International Affairs to demonstrate a country's risk status for BSE provides a level of protection equal to the U.S.'s against BSE.

4. FSIS requires the removal of the spinal cord from cattle 30 months of age or older at the establishment where the animal is slaughtered.

New requirement.

5. FSIS clarified in the regulation that an establishment's procedure for removing SRMs must address potential contamination of edible materials with SRMs before, during, and after entry into the official establishment.

FSIS is relying on the establishment's food safety systems to prevent this potential cross-contamination from occurring.

6. FSIS included the requirements in the regulations for the sanitation of equipment used to cut through SRMs.

Addresses sanitation of equipment in establishments slaughtering mixed ages of animals.

Sanitation Requirements

- Establishments that do not segregate the carcasses and parts from cattle 30 months of age or older from younger cattle during processing operations must
  - use dedicated equipment to cut through SRMs

    or
  - clean and sanitize the equipment prior to use on cattle to be designated as younger than 30 months.

Sanitation Requirements *(con't)*

- Establishments using dedicated equipment to cut through SRMs, and establishments that segregate animals may continue to conduct routine operational sanitation procedures between carcasses.

7. FSIS specified the conditions under which slaughter establishments may ship carcasses or parts of carcasses that contain vertebral columns from cattle 30 months of age or older to another federally inspected facility for further processing.

Shipping Requirements

- Processors must
  - obtain documentation from their suppliers to demonstrate that carcasses or parts are from cattle that were younger than 30 months at the time of slaughter

    or
  - handle all carcasses and parts as if from cattle 30 months or older.

Shipping Requirements *(con't)*

Slaughter establishments may ship beef carcasses or parts that contain vertebral column from cattle 30 months of age or older for further processing if the slaughter establishment

- Maintains control in transit
- Provides documentation showing age
- Maintains records identifying the official establishments that received the carcass
- Maintains records verifying the receiving establishment removed the SRMs

Training DVD

- FSIS has a DVD on how to identify, remove, and dispose of SRMs. This is a new training and guidance tool for small and very small establishments and custom slaughter facilities.
- The DVD is the result of a cooperative agreement between FSIS and the New York State Department of Agriculture and Markets. Copies of the DVD are available upon request through the FSIS SIPO office.