Module 15
Equine Inspection

Objectives

With the aid of references, the trainee will be able to:

1. Describe any restrictions placed on the slaughter of equines in federally inspected official establishments.

2. Compare the differences in state laws that pertain to the sale of horsemeat for human consumption.

3. State the policy of the Food Safety Inspection Service on the custom-exempt slaughter of equine species.

4. Identify at least one unique feature of equine:

   a. Antemortem inspection
   b. Dressing procedures
   c. Head inspection
   d. Carcass inspection
   e. Branding

5. Given a list of pathological conditions, select those that would be most likely found during equine:

   a. Antemortem inspection
   b. Head inspection
   c. Viscera inspection
   d. Carcass inspection

6. Given pictures of a horse and beef liver, be able to identify each and give the primary anatomical difference that differentiates the two.

7. Given a list of equine organs or parts, be able to use the Manual to identify the ones that are routinely:

   a. Observed.
   b. Observed and palpated.
   c. Incised and observed.

Module 15
Equine Inspection (305)

Introduction

Products derived from equine slaughter (horses, mules, donkeys) are similar to the products derived from any livestock species; however the slaughter of equines or preparation of any of these products must be done in an establishment separate from any establishment that slaughters (or prepares products of) cattle, sheep, swine, or goats.

There is little equine product consumed in the United States. The principal domestic markets are on the east and west coasts. Some states have very stringent food laws regarding the sale of equine products. The primary markets are export markets in Europe (France, Belgium, and the Netherlands) and Asia (Japan). These markets are quite lucrative and product is often jet-freighted to its destination from major airports in the United States. In addition to usual requirements for export, some countries require that the carcasses be tested for trichinosis at slaughter.

A few countries require that antemortem inspection be performed by a veterinary medical officer for all product intended for export to that country. Our inspection system must comply in order to accommodate this requirement.

Antemortem pens for horses tend to be made of metal pipe or concrete because of the wood-gnawing habits of some horses. Antemortem inspection of horses is not performed from inside the pen because horses may startle easily, they are quick, they can kick with both front and hind feet, and they will bite if provoked. An elevated protected walkway therefore must be provided by the plant because of both inspector safety and meeting the need for visualizing upper areas on the horse's body. The equine is prone to develop severe abscesses (or fistulas) at the poll and the withers. These fistulas are often caused by *Brucella abortus*, the bacteria which causes brucellosis in cattle.

Antemortem inspection allows normal animals to go to slaughter and accounts for the dead and diseased. Among diseased animals, moribund animals, those with pyrexia, generalized illnesses and central nervous system (CNS) diseases must be examined by a veterinary medical officer. A CNS disease is one where there is a malfunction of the brain and/or spinal cord. Abnormal behavior such as stupor, changes in temperament, or changes in locomotion may be observed. A CNS disease in horses rarely seen in other species is tetanus. Signs observed may include generalized muscle stiffness, ears carried erectly, nostrils may be dilated, and the third eyelid prolapsed.

Prior to slaughter, the abdomen, legs and feet should be sprayed with water to control loose hair. Such spraying should not result in water dripping on exposed carcasses and/or parts during skinning.

Equines, like any other slaughter species must be slaughtered humanely. Captive bolt stunners and gunshot are the most commonly used methods for producing unconsciousness in slaughtered equines.

The bleeding rail and other carcass rails tend to be higher than in cattle plants to accommodate the generally longer length of horse carcasses. Rendering companies generally require plants to remove horseshoes before the hooves are sent to rendering.

The head is removed immediately after it is skinned and identified with a duplicate of the tag that is placed on the carcass. The oral and nasal cavities are then flushed and the outer surfaces are thoroughly washed. The head is then presented for inspection.

HEAD INSPECTION

1. Observe head's surfaces
2. Observe and palpate (incise when necessary) mandibular, pharyngeal and parotid lymph nodes, guttural pouches, and tongue.

The inspection of the head is similar to cattle except that incisions of muscle and lymph nodes are not routinely made. Guttural pouches in equines are not found in other slaughter species. They are normal sacculations of the eustachian tube. They are visible and palpable after the head has been severed from the neck and presented for inspection.

When infection is present in the guttural pouches, retain the head, carcass, and viscera for veterinary disposition. The membrane, which forms the guttural pouches, may be thickened and cloudy. The affected pouches may contain whitish-yellow pus and the regional lymph nodes may be enlarged, reddened and contain abscesses.

As in the inspection of other species, correlate with your supervisor regarding their standards for retaining carcasses so that you know which ones that you should retain and which that you should trim and pass on the line.

Melanoma is seen in horses and is particularly a problem in horses of certain colors. For that reason the plant is required to identify white and gray horses during slaughter so that an additional required inspection procedure may be completed. A melanoma is a neoplasm of skin pigment cells. In the head, this may appear as black nodules of tissue in the lymph nodes. The lymph nodes may also be blackened in another condition called melanosis. You don't need to be able to tell the difference between the two but always retain any equine product whenever blackened tissues are encountered.

As in other species you may encounter malignant lymphoma (lymphoma) on head inspection. These may be seen as growths about the eyes on antemortem, or as enlargements of the lymph nodes of the head. When this condition is encountered retain the carcass and parts for veterinary disposition.

Equines may be affected with epithelioma, just as is seen in cattle. Occasionally these are so small that they are not detected on antemortem inspection. When you encounter these on postmortem inspection always retain the carcass and viscera with the head for veterinary disposition.

Stains and lacerations of the horses' tongue may frequently be encountered. These are required to be trimmed.

As in the postmortem inspection of any species, whenever any abnormality is encountered check with your supervisor regarding what it is and what you should do with it.

Carcass skinning is similar to beef skinning, with the difference that the carcass of white and gray horses must be identified after the hide has been removed. This is because to shoulders of gray and white equines must be routinely dropped to expose the axillary (armpit) and subscapular (under the shoulder blade) spaces for inspection. It is in these areas that evidence of melanoma or melanosis is commonly seen. This procedure may be accomplished the day of slaughter or (at the request of the plant) the dropping may be accomplished the following day, after the carcass has chilled. If the latter is the case, the carcasses must be under FSIS control (U.S. Retained) until after the inspection is completed.

After the carcass has been skinned, the wither must be topped. The upper third of the spinous processes of thoracic vertebrae two through nine are removed and presented for inspection. This additional inspection procedure is required because inflammation and infection are occasionally encountered in the supraspinous bursa in the withers area. The incidence of brucellosis in these lesions is quite high; therefore unusual attention is required when any infection is determined. Humans can contract brucellosis. The plant must take great care to assure that the highest sanitary standards are maintained including sanitizing all implements used. To protect yourself, thoroughly wash hands, avoid sniffing the lesions for any odor, and pay the utmost of attention to personal hygiene (avoid placing your hands about your face). Always retain the carcass and parts for veterinary disposition when brucellosis is suspected.

At the viscera inspection station, unusual attention is required by the inspector because horses often have a full urinary bladder. At this point an inexperienced or careless eviscerator might be responsible for considerable urine contamination or product. Equines do not have a gall bladder so bile contamination is infrequent but still might occur when the bile duct of the liver is severed.

VISCERA INSPECTION

1. Observe and palpate lungs, bronchial and mediastinal lymph nodes (incise when abnormal).

2. Incise heart, from base to apex or vice versa, through interventricular septum, and observe cut, inner, and outer surfaces. *[See cattle alternative procedure Manual 11.1 (h) (2)]*

3. Observe and palpate spleen, liver (both surfaces), and portal lymph nodes.

4. Open bile duct (both directions) and observe its content.

5. Observe rest of the viscera and body cavities.

Topping of the withers must be accomplished before carcass splitting to avoid contamination of the carcass from a potentially infected supraspinous bursa and to allow inspection of the spinous processes. Carcass inspection must be done after carcass splitting and before washing. Depending upon facilities available, carcass inspection may be divided into *hindquarter, forequarter,* and *complete* inspection.

CARCASS INSPECTION

The first three steps are in addition to the basic twelve steps used for cattle inspection (fifteen steps total).

Observe (and incise when necessary):

1. Inner abdominal walls for encysted parasites.

2. Spinous processes of thoracic vertebrae, supraspinous bursa, and first two cervical vertebrae for fistulous conditions.

3. Axillary and subscapular spaces of white and gray horses for melanosis.

Hindquarter Inspection (used where viscera and carcass inspections are combined). *See Manual 11.1 (h) (3)(i).*

Forequarter Inspection (this completes carcass inspection started under *hindquarter inspection*). *See Manual 11.1 (h)(3)(ii).*

Complete Inspection (used in moving lines with separate carcass inspection stations). *See Manual 11.1 (h)(3)(iii).*

Kidneys may be inspected during viscera inspection or carcass inspection. The plant must be consistent in the manner that the kidneys are presented. Just as with any species the plant is responsible to remove the kidney capsule before inspection. The capsule on a normal healthy equine kidney is extremely difficult to remove. It is far more difficult to remove that any other species.

The kidney may be inflamed and/or infected (nephritis) just as in other species. Similarly other disease abnormalities such as pneumonia, septicemia, pyemia (abscesses), peritonitis, pleuritis, arthritis, neoplasia, and emaciation might be encountered. Again it is quite important that you correlate closely with your supervisor regarding at what stage of some of these conditions that you are supposed to retain carcass, viscera, and head for veterinary disposition.

Parasite infestation is common in horses and may cause poor performance, poor appearance, colic and other diseases. Adult parasites often live in the gastrointestinal tract where they derive nourishment and produce offspring (generally eggs). These eggs pass out in to feces. Eggs are transmitted to the next host by being ingested with feed. The egg develops into a larvae which migrate through the new host tissues (liver, lungs, kidneys, muscle, blood vessels, etc.) before they arrive back in the GI tract, and so the cycle (life cycle) repeats itself. When these larvae migrate through tissues they may produce inflammatory reactions, small hemorrhages, pneumonia, etc.

Horses are particularly prone to parasitism and it is said that wherever there are horses, there are parasites. The first step of the inspection procedure is to "observe the inner abdominal walls for encysted parasites." These encysted parasites are larval stages of parasites and the encystment is an inflammatory reaction by the horses' body against the parasite. These inflammatory reactions can be seen as nodules in the equine stomach, the cecum, the colon, and in fat along the abdominal wall. The affected organs are condemned and the lesions along the abdominal wall (as referred to in the steps of inspection above) require trimming.

After the carcass has passed inspection, it is trimmed and washed. The high glycogen levels in horse muscle give it a strong adhesive quality. A paper tag such as a "U.S. Retained tag", or any paper tag left on the muscle tissue for a matter of hours, will frequently have to be cut off because the paper has actually glued itself to the muscle and you can't remove the tag without tearing the tag and leaving part of it on the muscle. Therefore, contamination such as loose hair, etc., can be very difficult to remove by washing, especially after some drying.

The carcass is branded with a *"U.S. Insp and Passed"* brand before being placed in the cooler. Horses and ponies are branded with a horsemeat brand; Mules, donkeys, etc. are branded with an equine brand. Horses and other equines are the only species for which FSIS allows the use of green ink for the inspection brand.

The word *Horsemeat* can be used on the label to identify product obtained only from horses and/or ponies, not other equines for which the word *Equine Meat* would be appropriate.

The forequarters are usually boned and boxed whereas the hindquarters are usually wrapped and exported as quarters. This hindquarter is a little unusual in that the loin and part of the rib cage is included with it. When viewed from the side the quarter looks like the handle and barrel of a pistol and in fact it is referred to as a *pistola* by the industry. France prefers pistolas from heavy horses while in other parts of Europe, pistolas from lean horses are preferred.

Module 15
Equine Inspection Supplement

1. Use part 303 of the Regulations to answer the following question.

You are assigned to a federal establishment that slaughters some livestock as *custom-exempt*. An owner brings a shetland pony to the plant to be slaughtered, cut, and wrapped for him to take home for his family to eat. Circle the letter that best describes the action you should take.

a. Prohibit the slaughter of the pony but allow the cutting and wrapping.

b. Prohibit the cutting and wrapping but allow the slaughter.

c. Take no action because *custom-exempt* slaughter is outside your jurisdiction.

2. Place an "X" in the space provided to indicate which conditions may be detected while performing equine antemortem inspection.

___ Caseous lymphadenitis

___ Dead

___ Cirrhosis

___ Lameness

___ Foot injuries

___ EM

___ Tetanus

___ Pneumonia

___ Moribund

___ Pyrexia

___ Cysticercosis

___ Fistulous withers

___ CNS disorders

3. Place an "O", "O-P", or "I-P" in the space provided to indicate the inspection technique routinely used on that equine organ or part.

O = Observe

O-P = Observe

I-O = Incise and Observe

Use the Manual for reference.

HEAD INSPECTION

____ Head surfaces

____ Mandibular lymph nodes

____ Retropharyngeal (pharyngeal)

____ Parotid lymph nodes

____ Guttural pouch

____ Tongue

VISCERA INSPECTION

____ Lungs

____ Mediastinal lymph nodes

____ Heart

____ Tracheobronchial (bronchial) Lymph nodes

____ Liver

____ Portal lymph nodes

____ Spleen

____ Hepatic bile duct

CARCASS INSPECTION

____ Body cavities

____ Inner abdominal walls

____ Supraspinous bursa

____ Spinous processes of thoracic vertebrae

____ First two cervical vertebrae

____ Axillary spaces.

____ Subscapular space

4. Place an "x" in the space provided to indicate which conditions may be detected while performing equine head inspection.

____ Infection
____ Pyrexia
____ Bruises
____ Sawdust
____ Caseous lymphadenitis
____ Lacerations
____ Malignant melanoma
____ Hair contamination
____ Telangiectasis
____ Degeneration
____ Abscess
____ Distoma

5. Place an "X" in the space provided to indicate which conditions may be detected while performing equine viscera inspection.

____ Melanosis
____ Brucellosis
____ Degeneration
____ Abscesses
____ Sarcocystosis
____ Parasitic lesions
____ Kidney worms
____ Malignant melanoma
____ Sexual odor
____ Tumors
____ Erysipelas
____ Pneumonia
____ Caseous lymphadenitis

6. Place an "X" in the space provided to indicate which conditions may be detected while performing equine carcass inspection

____ Fat necrosis
____ Bruises
____ Skin conditions
____ Tumors
____ Kidney worms
____ Degeneration
____ Erysipelas
____ Fistulous withers
____ Cholera
____ Caseous lymphadenitis
____ Malignant melanoma
____ Abscess
____ Rabies

7. Your supervisor brings the two livers shown in figure 1 and figure 2 on the next page to you and says that one is a horse liver and the other is a beef liver. Which one is which? Complete the statements below.

a. Figure 1 is a _____ liver.

b. Figure 2 is a _____ liver.

c. The structure in figure 2 with the number 23 on it is a _____.

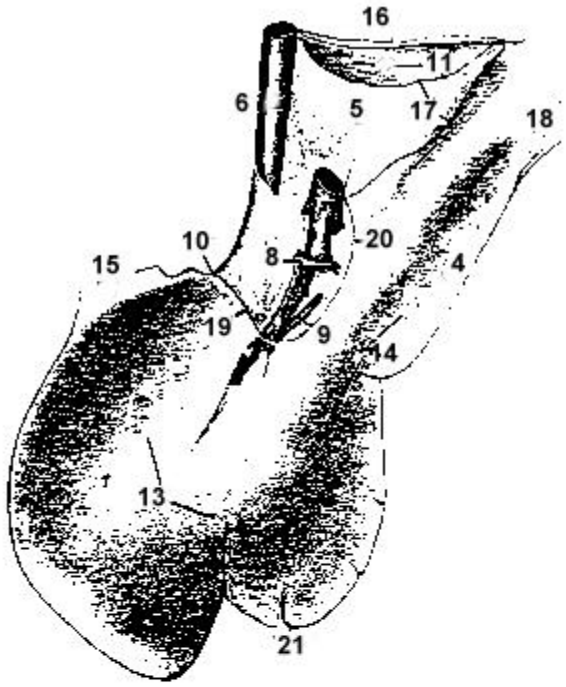

Figure 1

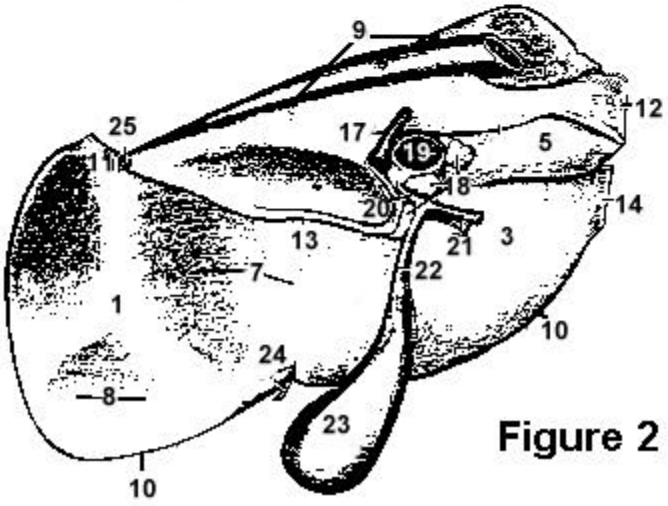

Figure 2

EQUINE ANATOMICAL TERMS

The following drawing will help you to identify equine anatomy.

A. Guttural pouch

B. Muzzle (lips)

C. Subscapular space

D. Carpus (knee)

E. Poll

F. Withers

G. Stifle (knee)

H. Hock