

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOOD SAFETY AND INSPECTION SERVICE  
WASHINGTON, DC

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<b>FSIS PHIS DIRECTIVE</b>	6100.2	4/11/11
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**POST-MORTEM LIVESTOCK INSPECTION**

**CHAPTER I -- GENERAL**

**I. PURPOSE**

The purpose of this directive is to provide instructions to Inspection Program Personnel on how to inspect livestock after slaughter (post-mortem). In addition, this directive officially cancels the Meat and Poultry Inspection Manual Subparts 9A and 9B (post-mortem livestock section). Inspection program personnel (IPP) are no longer to use the Meat and Poultry Inspection Manual. This directive updates information from, and cancels, FSIS Directive 6200.1, Preparation and Submission of FSIS 6200 Form Series. Finally, this directive instructs Public Health Veterinarians (PHVs) on how to make dispositions for livestock post-mortem and how to document the findings. This directive provides documentation procedures under the Public Health Information System (PHIS).

*KEY POINTS:*

- *Inspecting livestock post-mortem.*
- *Making dispositions.*
- *Documenting post-mortem findings.*

**II. [RESERVED]**

**III. [RESERVED]**

**IV. REFERENCES**

Federal Meat Inspection Act (FMIA) 21 U.S.C. 604  
9 CFR 310, 311, 325 and 500.2

The PHIS User Guide is available via the FSIS Intranet on the PHIS page under Resources.

## **V. BACKGROUND**

IPP, under the Federal Meat Inspection Act (FMIA), examine and inspect carcasses post-mortem during the slaughter process. IPP inspecting carcasses in establishments determine whether carcasses are wholesome and not adulterated. The FMIA requires that FSIS IPP inspect the carcasses and parts of carcasses. Product that is wholesome and not adulterated, and passes for human consumption, may bear the mark of inspection as provided by 21 U.S.C. 604 and 9 CFR 310.1(a). Identification and inspection of the carcass includes the head, tail, tongue, thymus gland, and all viscera of each animal slaughtered (9 CFR 310.2(a)).

## **CHAPTER II -- POST-MORTEM INSPECTION**

### **I. RETAINING CERTAIN CARCASSES FOR VETERINARY DISPOSITION**

A. While performing post-mortem inspection, IPP are to retain livestock carcasses and their associated parts for veterinary disposition, when appropriate. IPP are to retain the following types of carcasses (and their associated parts) for veterinary disposition:

1. Carcasses of animals designates as U.S. Suspects at ante-mortem inspection;
2. Carcasses of cattle that contain lesions consistent with tuberculosis (TB);
3. Carcasses that display disease conditions or other signs that warrant residue testing; and
4. Carcasses that display signs of disease conditions at post-mortem examination that could reasonably result in condemnation or restriction (e.g., pass for cooking).

B. If on-line IPP are uncertain about a particular carcass, they are to retain it for veterinary disposition. PHVs are to correlate with IPP to ensure that they are consistently retaining appropriate carcasses for veterinary disposition.

### **II. CATTLE**

#### **A. Heads**

1. For Tongue-in head presentation, IPP are to:
  - a. Observe the head's surfaces and eyes;
  - b. Incise and observe the mandibular, parotid, medial, and lateral retropharyngeal lymph nodes;
  - c. Incise and observe the lateral and medial masticatory muscles (cheeks) after tongue "dropping"; and
  - d. Observe and palpate the tongue.
2. For Tongue-out – base-up head presentation, IPP are to:
  - a. Incise the lymph nodes attached to the tongue including the medial and lateral retropharyngeal and the mandibular lymph nodes;
  - b. Observe and palpate the tongue;
  - c. Observe the head's surfaces and eyes; and

- d. Incise and observe the parotid lymph nodes and the lateral and medial masticatory muscles (cheeks).
3. For Tongue-out – base-down head presentation, IPP are to:
  - a. Incise the lymph nodes attached to the tongue including the medial and lateral retropharyngeal and the mandibular lymph nodes;
  - b. Observe and palpate the tongue;
  - c. Observe the head's surfaces and eyes; and
  - d. Incise and observe the parotid lymph nodes and the medial and lateral masticatory muscles (cheeks).
4. IPP are to look for:
  - a. Inflammation, exudate, swelling, or masses that indicate disease (9 CFR 310.1(a));
  - b. Pathology or abnormal conditions in lymph nodes;
  - c. Cysts or yellow, green, white, or red lesions in muscles;
  - d. Parasites (e.g., cysticercosis, sarcocystosis) (9 CFR 311.21, 311.23, and 311.25);
  - e. Sanitary dressing defects (e.g., hair, hide, ear canals, lips or horns, ingesta, bruises); and
  - f. Identifiable specified risk materials (SRMs) (9 CFR 310.22) on edible portions of the product.
5. When IPP find heads showing signs of abnormalities or diseases that may affect the disposition of the carcass while performing post-mortem inspection, they are to:
  - a. Retain the head, viscera, and carcass for veterinary disposition if the disease or condition is generalized, or when IPP have questions regarding disease conditions, abnormalities, or the appropriate disposition of the head (9 CFR 310.3 and 500.2). IPP are to attach “retain” tags to carcasses and parts as soon as practical (9 CFR 310.4).
  - b. Condemn abnormal or diseased tissue and verify that the establishment trims the affected tissues if the disease or condition of the head is localized. If IPP have any doubt or question as to whether the disease or condition is localized, they are to retain the head, viscera, and carcass for veterinary disposition.

6. When IPP find dressing defects (e.g., hair, hide, ear canals, lips, or horns), they are to verify that the defects are removed in a sanitary manner (9 CFR 310.18).

**NOTE:** If the establishment does not present heads, viscera, and carcasses that are free of dressing defects, then IPP are to verify that the establishment makes the product wholesome before passing the head, viscera, or carcass by stopping the line or else must condemn the product.

B. Viscera: When an establishment eviscerates carcasses into a viscera truck, IPP are to follow the sequence for “hindquarter inspection” to observe the eviscerated carcass, unless a rail inspector is performing rail inspection. If an establishment eviscerates carcasses onto a moving top table, IPP are to observe the eviscerated carcass.

1. Stomachs, Esophagus, and Spleen

- a. IPP are to:

- i. Observe the mesenteric lymph nodes and abdominal viscera;
- ii. Observe and palpate the rumino-reticular junction; and
- iii. Observe the esophagus and the spleen.

- b. IPP are to look for:

- i. Inflammation, exudate, swelling, or masses that indicate disease (CFR 310.1(a));
- ii. Pathology or abnormal conditions in lymph nodes;
- iii. Cysts or yellow, green, white, or red lesions in muscles of the esophagus;
- iv. Parasites (9 CFR 311.21, 311.23, and 311.25);
- v. Sanitary dressing defects (e.g., ingesta) (9 CFR 310.18); and
- vi. Identifiable SRMs (9 CFR 310.22) on edible portions of the product.

2. Pluck (heart and lungs)

- a. IPP are to:

- i. Incise and observe the lymph nodes associated with the lungs, including the mediastinal (posterior, middle, and anterior) and bronchial (right and left);

- ii. Observe and palpate the costal (pertaining to the ribs) surfaces (which appears curved) of the lungs ;
- iii. Observe the cut and inner surfaces, after incising the heart from base to apex or vice versa, through the interventricular septum; and
- iv. Turn the lungs over and observe the ventral (front) surfaces (which appears flat) and the heart's outer surface.

b. IPP are to look for:

- i. Inflammation, exudate, swelling, or masses that indicate disease (CFR 310.1(a));
- ii. Pathology or abnormal conditions in lymph nodes;
- iii. Cysts or yellow, green, white, or red lesions in muscles;
- iv. Parasites, cysticercosis, sarcocystosis (9 CFR 311.21, 311.23, and 311.25); and
- v. Sanitary dressing defects (e.g., ingesta).

### 3. Liver

a. IPP are to:

- i. Incise and observe the hepatic (portal) lymph nodes of the liver;
- ii. Open the bile duct in both directions and observe the contents for flukes;
- iii. Observe and palpate the liver's ventral surface; and
- iv. Turn the liver over, palpate the renal impression, and observe and palpate the parietal [dorsal (back)] surface.

b. IPP are to look for:

- i. Inflammation, exudate, swelling, or masses that indicate disease (CFR 310.1(a));
- ii. Pathology or abnormal conditions in lymph nodes;
- iii. Parasites, especially liver flukes (distoma) (9 CFR 311.21-311.25);
- iv. Sanitary dressing defects (e.g., ingesta);
- v. Carotenosis which is a yellow-orange discoloration of the liver;

- vi. Cirrhosis where the liver degenerates and is replaced by hard, tough fibrous connective tissue;
  - vii. Melanoma;
  - viii. Sawdust, which is a pinkish-white to yellow-gray necrotic lesion seen in the liver; and
  - ix. Telangiectasis where the liver has purple-red to bluish-black lesions.
4. When IPP find viscera showing signs of abnormalities or diseases while performing post-mortem inspection, they are to:
- a. Retain the viscera, head, and carcass for veterinary disposition if the disease or condition is generalized and affects the viscera, or when IPP have questions regarding disease conditions, abnormalities, or the appropriate disposition of carcasses or parts (9 CFR 310.3). IPP are to attach “retain” tags to carcasses and parts as soon as practical.
  - b. Verify that the establishment trims the affected tissues if the disease or condition of the viscera is localized. If *IPP* have any doubt or question as to whether the disease or condition is localized, they are to retain the viscera, head, and carcass for veterinary disposition.
5. When IPP find dressing defects (e.g., ingesta), they are to verify the removal of defects in a sanitary manner (9 CFR 310.18).

### C. Carcasses

1. Hindquarter Inspection – IPP use hindquarter inspection when the establishment combines viscera and carcass inspections. IPP are to:
- a. Observe the back of the skinned carcass during evisceration;
  - b. Palpate the superficial inguinal, or supramammary, and internal iliac lymph nodes;and
  - c. Observe the body cavities.
2. Forequarter Inspection – IPP use forequarter inspection to complete the carcass inspection started under hindquarter inspection. IPP are to:
- a. Observe the cut surfaces of muscles and bones, the diaphragm's pillars, and the peritoneum;
  - b. Observe and palpate the kidneys and the diaphragm; and

- c. Observe the pleura, neck, and carcass exterior.
3. Complete Carcass Inspection – IPP use complete carcass inspection when establishments use moving lines with separate carcass inspection stations. IPP are to:
  - a. Palpate the superficial inguinal, or supramammary, and internal iliac lymph nodes;
  - b. Observe the lumbar region;
  - c. Observe and palpate the kidneys;
  - d. Observe the cut surfaces of muscles and bones, the diaphragm's pillars, and the peritoneum;
  - e. Observe and palpate the diaphragm; and
  - f. Observe the pleura, cut surfaces of muscles, bones, neck, and the carcass exterior.
4. IPP are to observe all ox tails: Ox tails may be presented: (1) attached to the carcass before removing the tail at the rail inspection, (2) if previously removed, pinned to the carcass, at the rail inspection, (3) with the viscera on the viscera table, or (4) other means such as a moving tail chain. IPP are to look for:
  - a. Inflammation, exudate, swelling, or masses that indicate disease (CFR 310.1(a));
  - b. Pathology or abnormal conditions in lymph nodes;
  - c. Cysts or yellow, green, white, or red lesions in muscles;
  - d. Parasites (9 CFR 311.21, 311.23, and 311.25);
  - e. Sanitary dressing defects (e.g., fecal material, urine, ingesta, bile, dirt, hair, milk, and foreign matter) (9 CFR 310.18); and
  - f. Identifiable SRMs (9 CFR 310.22) on edible portions of the product.
5. When IPP find carcasses showing signs of abnormalities or diseases while performing post-mortem inspection, they are to:
  - a. Retain the head, viscera, and carcass for veterinary disposition if the disease or condition is generalized and affects the majority of the carcass, or when IPP have questions regarding disease conditions, abnormalities, or the appropriate disposition of carcasses or parts (9 CFR 310.3). IPP will attach “retain tags” to carcasses and parts as soon as practical.

- b. Condemn abnormal or diseased tissue and verify that the establishment trims the affected tissues, if the disease or condition of the carcass is localized. If IPP have any doubt or question as to whether the disease or condition is localized, they are to retain the head, viscera, and carcass for veterinary disposition.
6. When IPP find dressing defects (e.g., fecal material, urine, ingesta, bile, dirt, hair, and foreign matter), they are to verify that the defects are removed in a sanitary manner (9 CFR 310.18).

### **III. CALVES**

#### Skinned Carcasses

##### A. Heads

1. IPP are to:
  - a. Observe the head's surfaces; and
  - b. Incise and observe the medial retropharyngeal lymph nodes (both left and right).
2. IPP are to follow Chapter II, I., A. 4., 5., and 6. for what to look for and the actions to take when inspecting the heads of calves post-mortem.

##### B. Viscera

1. IPP are to:
  - a. Observe and palpate the bronchial and mediastinal lymph nodes of the lungs, the costal (pertaining to the ribs) surfaces of the lungs (which appear curved), and the heart;
  - b. Turn the lungs over and observe the ventral (front) surfaces (which appear flat);
  - c. Observe the spleen;
  - d. Observe and palpate the dorsal surface of the liver;
  - e. Turn the liver over, observe the ventral surface, and palpate the portal lymph nodes; and
  - f. Observe the stomach and intestines.
2. IPP are to follow Chapter II, I., B. 1b., 2.b., 3.b., 4., and 5. for what to look for and the actions to take when inspecting the viscera of calves post-mortem.

## C. Carcasses

1. IPP are to:
  - a. Observe the outer and cut surfaces of the carcass;
  - b. Lift the forelegs and observe the neck and shoulders;
  - c. Observe the body cavities; and
  - d. Observe and palpate the internal iliac lymph nodes and kidneys.
2. IPP are to follow Chapter II, I., C. 4., 5., and 6. for what to look for and the actions to take when inspecting the carcasses of calves post-mortem.

## D. Hide-On Carcasses

1. IPP are to:
  - a. Observe the hide; and
  - b. Palpate the back.

**NOTE:** After carcasses are cold-skinned in the cooler, IPP are to examine the carcasses for injection lesions, foreign bodies, parasites, bruises, or other pathology not detectable with the hide still on the carcass.

2. IPP are to look for contamination or parasitic conditions (e.g., grubs and other abnormalities).
3. IPP are to follow Chapter II, I., C. 4., 5., and 6. for what to look for and the actions to take when inspecting the carcasses of calves post-mortem.

## E. Large Calves

IPP perform inspection of large calves as described for cattle and are to follow Chapter II, I., A. 4., 5., and 6.; B. 1.b., 2.b., 3.b., 4., and 5.; C. 4., 5., and 6. for what to look for and the actions to take when inspecting calves post-mortem.

## IV. LAMBS

### A. Viscera

1. The following procedures pertain to lamb carcasses only.
2. A young sheep or lamb (ovine) carcass meets the following criteria: written documentation that the ovine is less than 14 months of age or the presence of a break joint (epiphysis) of the distal metacarpal bone of either foreleg.

3. IPP are to:

- a. Observe the abdominal viscera, esophagus, mesenteric lymph nodes, and omental fat;
- b. Observe the bile duct and contents and express the gall bladder;
- c. Observe and palpate the liver (both sides) and the costal (pertaining to the ribs) surfaces of the lungs (which appear curved);

**NOTE:** Finding tapeworms in the bile duct may indicate an infestation of tapeworms in the pancreatic gland. The establishment presents the liver with the bile duct incised.

- d. Palpate the bronchial and mediastinal lymph nodes;
  - e. Observe the ventral surfaces of the lungs;
  - f. Observe and palpate the heart; and
  - g. Examine the pancreatic glands for wholesomeness if the establishment saves the gland for edible purposes.
1. IPP are to follow Chapter II, I., B. 1b., 2.b., 3.b., 4., and 5. for what to look for and the actions to take when inspecting the viscera of lambs post-mortem, except for SRMs for BSE, since BSE is not an issue.

B. Carcasses-Heads

1. IPP are to:

- a. Observe the outer surfaces of the carcass;
- b. Observe the pelvic, abdominal, and thoracic body cavities;
- c. Observe the spleen and kidneys; and
- d. Observe the neck, shoulders, and head.

2. IPP are to follow Chapter II, I., A. 4., 5., and 6. and C. 4., 5., and 6. for what to look for when inspecting lamb heads-carcasses post-mortem, except for SRMs for BSE, since BSE is not an issue.

3. IPP are to selectively palpate observed abnormalities and retain for veterinary disposition carcasses with abnormalities requiring incisions to make disposition determinations.

## V. SHEEP AND GOATS

### A. Viscera

#### 1. IPP are to:

- a. Observe the abdominal viscera, esophagus, mesenteric lymph nodes, and omental fat;
- b. Express the gall bladder and observe the cut bile duct and expressed content for tapeworms;
- c. Observe and palpate the liver (both sides);
- d. Observe and palpate the costal (pertaining to the ribs) surfaces of the lungs (which appear curved);
- e. Palpate the bronchial and mediastinal lymph nodes;
- f. Observe the ventral surfaces of the lungs;
- g. Observe and palpate the heart; and
- h. Examine the pancreatic glands for wholesomeness if the establishment saves them for edible purposes.

**NOTE:** The establishment should present the liver with the bile duct incised.

2. IPP are to follow Chapter II, I., B. 1b., 2.b., 3.b., 4., and 5. for what to look for and the actions to take when inspecting the viscera of sheep and goats post-mortem, except for SRMs for BSE, since BSE is not an issue.

### B. Carcasses-Heads

#### 1. IPP are to:

- a. Observe the outer surfaces of the carcass and the body cavities (pelvic, abdominal, and thoracic) and the spleen;
- b. Observe and palpate the kidneys;
- c. Observe and palpate the prefemoral, superficial inguinal or supramammary, and popliteal lymph nodes;
- d. Palpate the back and sides of the carcass;
- e. Palpate the prescapular lymph nodes and shoulders; and

- f. Lift the forelegs and observe the neck, shoulders, and head.
2. IPP are to follow Chapter II, I., A. 4., 5., and 6. and C. 4., 5., and 6. for what to look for when inspecting sheep and goats heads-carcasses post-mortem, except for SRMs for BSE, since BSE is not an issue.

### **C. Incising Lymph Nodes**

IPP are to incise the body lymph nodes whenever palpation is inadequate to determine the absence of abscesses indicating caseous lymphadenitis and are to leave the incised nodes attached to the carcass for final inspection.

## **VI. SWINE**

### **A. Heads**

1. IPP are to:
  - a. Observe the head and cut surfaces;
  - b. Incise and observe the mandibular lymph nodes; and
  - c. Observe the carcass when required.
2. IPP are to follow Chapter II, I., A. 4., 5., and 6. for what to look for and the actions to take when inspecting the heads of swine post-mortem, except for SRMs for BSE, since BSE is not an issue.

### **B. Viscera**

1. IPP are to:
  - a. Observe the eviscerated carcass, viscera, and parietal (top) surface of the spleen;
  - b. Observe and palpate the mesenteric lymph nodes;
  - c. Palpate the portal lymph nodes;
  - d. Observe the dorsal surfaces of the lungs and the mediastinal lymph nodes;
  - e. The bronchial lymph nodes; then,
  - f. Turn the lungs over and observe the ventral surfaces of the lungs;
  - g. Observe the heart and dorsal surface of the liver; and

h. Turn the liver over and observe the ventral surface.

**NOTE:** IPP are to observe the nongravid uteri and ovaries when saved for edible use.

2. IPP are to follow Chapter II, I., B. 1b., 2.b., 3.b., 4., and 5. for what to look for and the actions to take when inspecting the viscera of swine post-mortem, except for SRMs for BSE, since BSE is not an issue.

### C. Carcasses

1. IPP are to:
  - a. Observe the back of the carcass by looking in a mirror, or when a mirror is not present, by turning the carcass to observe the back of the carcass;  
and
  - b. Observe the front parts and inside of the carcass; then grasp, turn, and observe both sides of the kidneys.
2. IPP are to follow Chapter II, I., C. 4., 5., and 6. for what to look for when inspecting swine carcasses post-mortem, except for SRMs for BSE, since BSE is not an issue.

## **CHAPTER III -- MAKING DISPOSITIONS POST-MORTEM**

### **I. GENERAL**

A. PHVs play a critical role in ensuring that the public health is protected by appropriately identifying and addressing livestock affected with disease conditions and ensuring that there is an appropriate disposition of affected carcasses and parts. PHVs are to conduct a thorough and complete post-mortem examination of carcasses or parts that are held for their final examination. In making dispositions, the PHV should use a consistent, systematic approach for evaluating the carcass. For example, if a PHV starts the examination with the carcass, follows with the viscera, and ends with the head, then he or she should use this same method every time.

B. PHVs may seek diagnostic assistance from the pathology laboratory. PHVs are to consider the laboratory's report within the context of ante-mortem and post-mortem findings. For residues, PHVs are to make final dispositions based on the regulations (9 CFR 311.39) and whether a tissue is 1) in compliance either as residue not detected or positive but non-violative; or 2) noncompliant as residue detected at a violative level. For information on foreign animal diseases, PHVs are to refer to FSIS Directive 6000.1, Responsibilities Related to Foreign Animal Diseases (FADs) And Reportable Diseases.

### **II. REGULATORY ACTIONS**

A. When PHVs find diseases and abnormalities, they are to:

1. Examine all livestock carcasses showing abnormalities that inspection program personnel retain at post-mortem (9 CFR 310.3); and
2. Examine and inspect all "U.S. Suspect" animals identified on ante-mortem inspection.

### **III. CORRELATING WITH THE TEAM**

A. PHVs are to, during work unit meetings, meet with the inspection team as necessary to review pathology and regulatory requirements for addressing each condition (e.g., show, explain, discuss, and answer questions). PHVs may utilize "The Entry Training for the PHV" modules on Post-Mortem Inspection and Multi-Species Dispositions for correlating.

[http://www.fsis.usda.gov/FSIS\\_Employees/Public\\_Health\\_Veterinarian/index.asp](http://www.fsis.usda.gov/FSIS_Employees/Public_Health_Veterinarian/index.asp).

B. The following are specific disease conditions and the procedures PHVs are to follow to make carcass and parts dispositions. This section provides disposition information for livestock conditions taken from the discontinued Manual. PHVs may find other post-mortem disposition information in the "Entry Training for the PHV", Multi-Species Disposition and Post-mortem Inspection modules at the link below. PHVs are to use and follow the directions in this directive for dispositions.

[http://www.fsis.usda.gov/FSIS\\_Employees/Public\\_Health\\_Veterinarian/index.asp](http://www.fsis.usda.gov/FSIS_Employees/Public_Health_Veterinarian/index.asp).

## IV. CYSTICERCOSIS

A. Recognizing Cysticercosis: Cysticercosis is a condition caused by the presence of the larval form of the beef tapeworm, *Taenia saginata*, in the carcass tissues. Beef, pork, or sheep carcasses affected with cysticercosis will contain live, dead, or degenerated cysts in the heart, tongue, esophagus, or muscles. The live cyst will appear as a vesicle or small bladder (balloon) filled with fluid. In most cases, the cyst will be dead and degenerated to some extent and will appear as small foci (small localized bodily infection) of fibrotic (hard, thick) tissue that may or may not be calcified and gritty in texture. In addition to these lesions, the associated muscle tissue may be watery or discolored.

**NOTE:** IPP will find information regarding shipment and control of products containing cysticercosis under 9 CFR 325.7.

### B. Steps PHVs Follow for Beef Carcasses Retained for Cysticercosis

1. When a beef carcass is retained for cysticercosis, PHVs are to:
  - a. Incise thoroughly the lateral and medial masticatory (cheek) muscles, heart, diaphragm, and its pillars. The peritoneum is removed before incising the diaphragm;
  - b. Observe and palpate the tongue. If cysts are suspected in the muscular part, the tongue is thoroughly incised and observed; and
  - c. Examine the esophagus and all exposed muscular surfaces.
2. When cysts in a carcass are in two or more of the above sites (Chapter III, III. B.1.), PHVs are to:
  - a. Make one transverse cut in each shoulder (2-3 inches) above the olecranon's point. This cut is to extend to the humerus and expose the triceps brachii;
  - b. Make one cut in each round to expose musculature in cross section; and
  - c. Observe the cut surfaces for cysticercosis lesions.

### C. Steps IPP Follow for Beef Carcasses Infected with Cysticercosis

1. The presence of even one cyst, whether viable or not, indicates beef cysticercosis. When IPP find one beef carcass to contain a cyst, the following procedure is to be performed on all carcasses that the establishment receives from the same producer. IPP are to verify that the establishment addresses all potentially affected product.

2. IPP are to:

- a. Make multiple incisions of the interventricular septum of the heart and the external and internal masticatory (cheek) muscles;
- b. Observe closely the esophagus and cut surfaces of muscles exposed during the dressing operation; and
- c. Incise, as above, hearts and cheeks from carcasses that passed inspection before the finding of the infected carcass, and identified as part of the potentially affected production.

D. Disposition of Beef Carcasses with Cysticercosis: A carcass is extensively infested if PHVs find lesions in at least two of the usual inspection sites and two of the additional exposed sites.

1. The usual inspection sites are:

- a. Heart;
- b. Diaphragm and its pillars;
- c. Cheeks;
- d. Esophagus;
- e. Tongue; and
- f. Muscles exposed during normal dressing operations.

2. The additional exposed sites are:

- a. An incision made into each round exposing the musculature in cross section; and
- b. A transverse incision made into each forelimb commencing 2-3 inches above the joint of the olecranon and extending to the humerus exposing the triceps brachii.

3. PHVs are to:

- a. Condemn the carcass and its parts when lesions of cysticercosis are present, and the musculature is edematous or discolored; or if the infestation is extensive (9 CFR 311.23(a));
- b. Send samples to the FSIS laboratory in Athens, Georgia, to confirm the diagnosis, if necessary;
- c. Notify the Veterinarian-in-Charge, APHIS, Veterinary Services, of the State of the animal's origin, using VS Form 2-11;

- d. Notify the health department of the State of the animal's origin;
- e. Pass for refrigeration, or pass for heating after removal and condemnation of affected parts, any carcass with an infestation that is less than extensive and that does not show edema or discoloration in the musculature;
- f. Verify that the establishment:
  - i. Holds carcasses for 10 days at not higher than 15° F;
  - ii. Holds boned meat for 20 days at not higher than 15° F; or
  - iii. Heats product to an internal temperature throughout of at least 140° F.
- g. Verify that the establishment handles edible offal in the same manner as the rest of the carcass. If edible product has lesions of cysticercosis, PHVs are to verify that the offal is condemned (9 CFR 311.23(b)); and
- h. Identify all products appropriately by "retain" tags. PHVs are to verify removal of "retain" tags only after the product has met the processing restrictions.

#### E. Steps PHVs Follow for Swine Affected with Cysticercosis (Tapeworm Cysts)

1. When IPP retain swine carcasses for cysticercosis on post-mortem inspection, PHVs are to:
  - a. Examine the cheeks, heart, and esophagus by sight and numerous incisions;
  - b. Make several deep longitudinal incisions into the tongue;
  - c. Remove the peritoneum from the diaphragm and examine the muscles of the diaphragm by numerous incisions; and
  - d. Carefully examine the cut surfaces of muscles exposed during regular dressing procedures (ventral muscles of the ham).
2. If, after performing the inspections as described in Chapter III, III. E. 1. a-d above, PHVs find:
  - a. Only the initial lesions, they are to make the disposition based on these findings;
  - b. Any additional lesions, they are to:

- i. Make incisions parallel to cuts as described in Chapter III, III. E. 1.d.; and
- ii. Remove the peritoneum from the abdominal muscles in the flank and paralumbar regions. Examine visually and then make several incisions to aid in the examination.

3. If PHVs find:

- a. No additional lesions on findings through Chapter III, III. E. 2.b., they are to make the disposition based on these findings; or
- b. Additional lesions, they are to make deep, bold incisions into the heavily-muscled primal parts to determine if various parts of the musculature expose one or more cysts on most of the cut surfaces.

4. PHVs are to:

- a. Confirm the diagnosis of swine cysticercosis (*Cysticercus cellulosae*) or cases resembling such disease by sending samples to the Pathology Group of the FSIS Eastern Laboratory – Athens, Georgia. PHVs are to retain swine carcasses pending diagnostic results from the laboratory; and
- b. Follow the directions in FSIS Directive 6000.1, Revision 1, Responsibilities Related to Foreign Animal Diseases (FADs) and Conditions, for reporting diseases.

F. Disposition of Swine Carcasses with Cysticercosis: PHVs are to:

1. Condemn the carcass when porcine cysticercosis infestation is excessive (when the lesions are too extensive to be removed by trimming the carcass);
2. Pass for cooking, any swine carcass affected with *Cysticercus cellulosae* that is less than excessively affected;
3. Verify that the carcass is cooked at 170° F for 30 minutes after removal and condemnation of all affected areas; and
4. Verify removal of “retain” tags only after the product has met the processing restrictions in 9 CFR 311.24.

G. When *Cysticercus ovis* Affects Sheep Carcasses, PHVs Are To Perform the Following Procedures

1. When IPP detect cysticercosis in sheep carcasses during routine post-mortem inspection procedures, PHVs are to:
  - a. Re-examine the heart and esophagus by sight and palpation;

- b. Palpate the muscles of the diaphragm; and
  - c. Examine carefully the cut surface of muscles exposed during regular dressing procedures (ventral muscles of the neck and brisket and medial muscles of the leg).
2. If PHVs find:
- a. Only the initial lesions, as described in Chapter III, III. G. 1., they are to make the disposition based on these findings;
  - b. Additional lesions, they are to:
    - i. Make incisions parallel to the cuts as described in Chapter III, III. G. 1.c.; and
    - ii. Remove the peritoneum from the abdominal muscles in the flank and paralumbar regions. PHVs are to examine visually and then make several incisions to aid in the examination;
  - c. No additional lesions, they are to make the disposition based on the findings as described in Chapter III, III. G. 2.b.; or
  - d. Additional lesions, they are to make deep bold incisions into the heavily-muscled primal parts to determine if various parts of the musculature expose one or more cysts on most of the cut surfaces.

H. Disposition of Sheep Carcasses Affected with *Cysticercus ovis*: PHVs are to:

- 1. Condemn the carcass if complete removal of the infection is impractical because of the extent of the infection;
- 2. Pass the carcass for heating to an internal temperature of 140° F after trimming and condemning affected tissue where:
  - a. There are more than five cysts in the tissues, excluding the heart; and
  - b. Removing the parasites from the affected tissue is practical; and
- 3. Pass the carcass for human food after trimming and condemning affected tissues when PHVs find five or fewer cysts in the tissues, excluding the heart (9 CFR 311.25).

**V. EOSINOPHILIC MYOSITIS (EM)**

A. Recognizing EM: The most common lesions of EM are the irregularly distributed yellowish-green, yellowish-white, and red spindle-shaped lesions found in the heart and tongue. Less common lesions are the large, well-defined, bright green to greenish-gray areas found in the more active muscles (e.g., round, shoulder, esophagus, heart, and

brisket). Inspection program personnel may not notice the lesions until the carcass is broken into primal parts. PHVs will most readily detect EM in warm carcasses. Chilling causes muscle to contract and reduces the size and visibility of lesions present. In most cases, EM affects the more active muscles first and affects them more severely than other muscles.

B. Steps PHVs Follow for Carcasses with EM: When IPP find EM on post-mortem inspection, PHVs are to:

1. Thoroughly incise and observe the lateral and medial masticatory muscles and the heart;
2. Observe and palpate the esophagus;
3. Make several deep longitudinal incisions into the tongue;
4. Thoroughly incise and observe the diaphragm and pillars after removal of the peritoneum; and
5. Observe the cut surfaces of muscles exposed during dressing operations (ventral muscles of the neck, the brisket, and the medial muscles of round).
6. Make several parallel incisions to all such cut surfaces when lesions are in any of the locations as described in Chapter III, IV. B. 5.;
7. Incise thoroughly and observe abdominal muscles in the flank and paralumbar region; and
8. Slash freely and examine closely the affected primal parts exposed during the above procedures if PHVs find any lesions in those areas.

C. Disposition of Carcasses Affected with EM: PHVs are to:

1. Condemn affected parts when localized lesions are present and only certain parts are affected (head, tongue, heart, esophagus, diaphragm, and pillars);
2. Follow the disposition requirements in the regulations when carcass muscles other than the diaphragm and pillars are affected;
3. Condemn the carcass if lesions in the musculature of the carcass are extensive and impractical to remove; and
4. Pass the carcass for comminuted cooked product when lesions are slight, or the establishment personnel cannot remove the lesions easily and completely. This outcome may occur if the lesions are slight or of such character as to be insignificant from a standpoint of wholesomeness. PHVs are to pass the carcass or parts for use in the manufacture of comminuted cooked product after removal and condemnation of the visibly affected portions (9 CFR 311.35).

**NOTE:** A carcass condemned for EM is eligible for shipment for animal food (pet food) if: (1) the Front-line Supervisor (FLS) grants permission, and (2) the establishment adequately identifies, slashes freely, and denatures (9 CFR 325.11 and 325.13(a)(2)) all parts of the carcass in an inedible area under FSIS supervision.

## **VI. SARCOCYSTOSIS**

A. Recognizing Sarcocystosis: Specific protozoans not considered pathogenic for humans in the United States cause Sarcocystosis. Sarcocystosis appears most frequently in older sheep. IPP may detect the lesions in the esophagus first. Lesions are white, semi-oval, cigar-shaped, or rice grain-shaped lesions. IPP may also detect lesions in the diaphragm, skin muscles, internal abdominal (stomach) muscles, or intracostal (muscles between the ribs) muscles. PHVs may find the lesions in the skeletal muscles, after incision and observation of primal parts.

### **B. Steps PHVs Follow for Carcasses with Sarcocystosis**

1. When IPP detect sarcocystosis during routine post-mortem inspection procedures, PHVs are to re-examine the esophagus, superficial and cut surfaces of the muscles, diaphragm, and the internal abdominal and intercostal muscles.
2. If PHVs find lesions in locations other than the esophagus, they are to incise the muscles of the shoulder, round, and back to expose the deep muscle tissues.
3. PHVs are to condemn the carcass if the lesions are impractical to remove (9 CFR 311.35).

**NOTE:** A carcass condemned for sarcocystosis is eligible for shipment for animal food (pet food) by the establishment when: (1) the FLS grants permission, and (2) under FSIS supervision, the establishment identifies, slashes freely, and denatures (9 CFR 325.11 and 325.13(a)(2)) all parts of the carcass in an inedible area.

## **VII. EPITHELIOMA OF THE EYE**

A. Recognizing Epithelioma of the Eye: Epithelioma is a neoplastic (cancerous) lesion involving the eye and surrounding tissues. Metastasis (disease spreads to different parts of the body) may occur to the lymph nodes and lungs. Infection, suppuration (the formation of pus), and necrosis (death or rotting of tissues) of the tissues around the eye may also occur.

B. Disposition of Epithelioma of the Eye: Absence of an eye or associated structure in mature cattle may indicate prior surgical removal of epithelioma. PHVs are to:

1. Condemn the head of such carcasses; and
2. Condemn the head, viscera, and carcass if they find metastatic lesions, cachexia or evidence of absorption or secondary changes, or involvement of the osseous (bony) structures of the head with extensive infection, suppuration, and necrosis (9 CFR 311.12).

## **VIII. MELANOSIS**

A. Recognizing Melanosis: Melanin is a normal black pigment of the body. Melanosis is excessive melanin deposits or deposits in abnormal locations.

B. Disposition of Carcasses with Melanosis: PHVs are to:

1. Condemn carcasses with generalized pigmentary deposits of melanin (9 CFR 311.13);
2. Condemn affected carcasses, organs, or parts when the establishment cannot remove melanin completely; when its removal is impractical; or, when it makes a carcass, organ, or part unfit for people to eat;
3. Remove melanin deposits when they extend into spinal nerve sheaths and meat; however, slight melanin deposits in spinal meninges are insignificant;
4. Remove only tumorous or smeary uniform melanin deposits over or in circumscribed skin areas of swine; and
5. Record melanin deposits under pigmentary conditions on FSIS Form 6200-14, except record melanin deposits under carcinoma when they are associated with malignant tumor formation.

## **IX. XANTHOSIS**

A. Recognizing Xanthosis: Xanthosis is the deposition of excessive quantities of cellular waste pigments. The condition is usually seen in older cattle and those suffering from a chronic wasting disease. PHVs will only find Xanthosis during post-mortem inspection. Xanthosis more commonly affects the musculature of the heart and head. Affected muscle has dark brown or coffee-colored discoloration of otherwise normal tissue.

B. Disposition of Carcasses with Xanthosis: PHVs are to:

1. Condemn carcasses with generalized pigmentary deposits; or
2. Pass for food carcasses with less than generalized distribution of pigmentary deposits after condemnation and removal of the affected areas (9 CFR 311.13).

## **X. CAROTENOSIS**

A. Recognizing Carotenosis: Carotenoid pigments enter the body with food. Therefore, they are classified with the exogenous pigments. When carotenoid pigments are deposited in the fat tissues and liver to the extent they become grossly visible, the resulting discoloration of tissues is carotenosis. To determine carotenosis, place a white paper towel or napkin on the cut surface of the liver. A bronze-orange stain

indicates carotenoid pigment. Deposition of carotenoid pigments in the fatty tissue does not affect carcass disposition.

B. Disposition of Carcasses with Carotenosis: IPP are to condemn livers with carotenosis (9 CFR 311.13).

## **XI. ICTERUS**

A. Recognizing Icterus: If, for any reason, the amount of bilirubin (waste product that results from the breakdown of hemoglobin molecules from worn out red blood cells) increases in the blood and therefore in the tissues, a yellowish pigmentation of the tissues arises that is called icterus or jaundice. Look for icterus where the tissues are normally very white or pale, such as (1) the sclera (white part) of the eye, (2) tendons, (3) pleura (lining of the chest cavity), (4) peritoneum (lining of the abdominal cavity), (5) omentum (tissue that extends from the stomach to the adjacent organs in the abdominal cavity), (6) cut surface of abdominal wall fat, (7) joint surfaces, or (8) mesentery (fold of tissue attaching small intestines to the body wall). Fat may be yellow from diet, breed, and age changes that are essentially normal. Yellow fat is normal in some animals.

B. Disposition of Carcasses Showing Signs of Icterus: PHVs are to:

1. Defer final disposition of carcasses with a slight yellow discoloration and no visible pathological changes in the organs until the establishment has the opportunity to chill the carcasses; then
  - a. PHVs are to re-examine the carcasses preferably under natural light or a good quality light of at least 50 footcandles and make a disposition; and
  - b. Pass the carcass for food if the discoloration disappears, and there are no other conditions warranting a different disposition.
2. Condemn carcasses showing any degree of icterus including either:
  - a. A parenchymatous degeneration of organs, as the result of infection or intoxication; or
  - b. Showing pronounced yellow or greenish yellow discoloration without evidence of infection or intoxication (9 CFR 311.19).

## **XII. NEUROFIBROMA (NERVE SHEATH TUMOR)**

A. Recognizing Neurofibroma: Neurofibroma is a neoplasia of nerve sheath cells most often seen in cattle. Neurofibromas are found along any nerve trunk of the carcass but are most often found in the intercostals (between the ribs) and paravertebral spaces [beside the spinal (back) bones], heart, brachial plexus (network of nerves located between the shoulder and neck), and celiac plexus (network of nerves located behind the stomach and below the diaphragm). They may be seen as multiple nodular enlargements along any nerve. Neurofibromas are generally regarded as benign but may metastasize to regional lymph nodes. Neurofibromas are often seen in multiple

sites because of multicentric origin of neoplasms. The tumors may be firm or soft and often have gelatinous centers and appear as shiny, glistening, white-to-gray, lobulated, firm nodular growths on or within the nerve.

B. Disposition of Carcasses with Neurofibroma: PHVs are to:

1. Examine the brachial and celiac plexus for lesions when inspection program personnel find neurofibromas when performing post-mortem inspection;
2. Condemn an individual organ or part of a carcass affected with a neoplasm; and
3. Condemn the entire carcass if there is evidence of metastasis, or that the general condition of the animal has been adversely affected by the size, position, or nature of the neoplasm (9 CFR 311.11).

### **XIII. ARTHRITIS**

A. Disposition of Carcasses with Arthritis: PHVs are to:

1. Condemn joints affected with arthritis;
2. Verify removal of lymph nodes corresponding with affected joints;
3. Verify that the establishment does not open joint capsules until after they remove affected joints; and
4. Condemn the carcass if systemic involvement is present (9 CFR 311.7).

### **XIV. OTHER DISEASE CONDITIONS**

A. Slight Abscesses in Cattle and Swine: When PHVs find slight abscesses in cattle and swine heads, they are to:

1. Pass the head for food after removal of the lymph node when a small, well-encapsulated abscess is in a cervical lymph node; and
2. Verify removal of all affected lymph nodes, including mandibular and adjacent lymph nodes, when heads with slight abscesses are passed for food (9 CFR 311.14).

B. Chronic Lesions: If PHVs observe chronic lesions that do not create a generalized condition in the carcass when conducting post-mortem dispositions, they are to verify complete removal of all chronic lesions, including adhesions (9 CFR 311.14).

## CHAPTER IV -- DOCUMENTING POST- MORTEM INSPECTION FOR LIVESTOCK

### I. DOCUMENT RESULTS OF POST-MORTEM INSPECTION

A. PHVs are to enter the post-mortem inspection results in the appropriate fields in PHIS. Refer to the PHIS User Guide.

### II. COMPLETING THE CERTIFICATE OF ANTE-MORTEM OR POST-MORTEM DISPOSITION OF TAGGED ANIMALS, FSIS FORM 6000-13

A. PHVs are to generate and print Form 6000-13 within PHIS and present it to establishment management. Refer to the PHIS User Guide.

Refer questions regarding this directive to the Policy Development Division through askFSIS at <http://askfsis.custhelp.com> or by telephone at 1-800-233-3935.



Assistant Administrator  
Office of Policy and Program Development