Food Safety and Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Antemortem and Postmortem Inspection and Disposition

SHEEP & GOATS

PHV Refresher Course

Learning Objectives

- Describe the general procedures for antemortem and postmortem inspection of sheep and goats
- Name the diseases or conditions listed in the PHIS Animal Disposition Reporting (ADR) module which may be used to characterize PHV dispositions
- Cite the FSIS regulations which support the various antemortem and postmortem dispositions

Resources

The following FSIS documents will serve as your primary resources for performing and documenting dispositions:

Directives	Regulations	Other
6000.1	9 CFR Part 309	FSIS PHIS Page
6100.1	9 CFR Part 310	PHIS Help Button
6100.2	9 CFR Part 311	
6100.6		
6240.1		

Review of Antemortem Procedures

As with all livestock species, sheep and goats should be observed at rest and in motion.

Use your discretion to determine if animals presented for slaughter should also be observed from both sides…

This would be based on the age, sub-class, and history of disease conditions observed at the establishment.

Remember that establishments that slaughter primarily market classes of sheep (usually lambs) may implement voluntary segregation procedures during antemortem.

They must maintain and follow a written program—as part of the HACCP system or a prerequisite—for separating normal appearing animals from those exhibiting abnormalities.

IPP observe the normal animals at rest, and 5 to 10 percent of all presented animals in motion, and the PHV will perform antemortem examination on the abnormal animals…refer to FSIS Directive 6100.1, Section X for detailed procedures.

Sheep and goat carcasses are typically hung by their hindlimbs.

The establishment may use a single hook, provided they can adequately clean and trim the space between the shanks and support this presentation for dressing the carcass.

The carcasses are usually not split, and most establishments choose to leave the heads attached. The kidneys may remain attached to the carcass, provided they have been exposed from their capsules.

IPP should observe all surfaces and palpate the kidneys and lymph nodes (prescapular, cervical, inguinal, and popliteal).

The viscera of sheep and goats are presented on either a stationary or moving viscera tray. The pluck (heart, lungs, esophagus, trachea) are separated from the abdominal viscera. The liver may or may not remain attached to the other abdominal organs.

The establishment should make an incision in the common bile duct, because you will be squeezing the gall bladder to check for flukes. You will not need a knife for routine PM examination.

For full postmortem inspection procedures, refer to FSIS Directive 6100.2, Rev. 1, Chapters V and VI.

When inspectors on the line identify abnormal conditions, they are directed to apply blue U.S. Retained tags to carcasses, heads, and viscera and direct the establishment to "rail out" or otherwise set aside those items for PHV examination.

You will perform a thorough examination of the carcasses (including heads) and viscera and make a disposition based on your findings. Remember that the possible outcomes of postmortem disposition by the PHV are:

- Pass
- Pass with restriction
- Condemn

Description:

Septicemia occurs when a pathogen overwhelms the animal's immune system and enters the bloodstream.

At antemortem, the animal may appear sick and may be febrile; however, this is not always the case. Therefore, it is unlikely you would condemn an animal for septicemia at antemortem.

9 CFR 311.16 and **311.16(a)(2)**

Description:

Toxemia occurs when the endotoxin or exotoxin produced by a pathogen enters the circulation and causes diffuse toxic changes to tissues or body systems.

At antemortem, the animal may appear sick and may be febrile; however, this is not always the case. Therefore, it is unlikely you would condemn an animal for toxemia at antemortem.

9 CFR 311.16

Description:

Pyemia is an acute condition which occurs when a pyogenic organism enters the circulation and causes formation of diffuse abscesses throughout the body.

At antemortem, the animal may appear sick and may be febrile; however, this is not always the case. External abscesses may or may not be present. Therefore, it is unlikely you would condemn an animal for pyemia at antemortem.

Pyemia should not be diagnosed when multiple, localized, well-encapsulated (chronic) abscesses are found.

9 CFR 311.16 and 311.16(a)(2)

First, note that all 3 are of public health significance—consumption of meat from these animals **could result in an adverse health event for a consumer!**

- Septicemia is the most general of these conditions and is used as the disposition when (a) the underlying condition cannot be identified and (b) the signs do not make toxemia or pyemia ideal diagnoses
- Toxemia is defensible when there is evidence that a toxin-producing organism may be involved (typically associated with such conditions as mastitis, metritis, or gangrenous wounds)
- Pyemia is diagnosed when the abscessation is in the acute, diffuse phase and the underlying cause of pyogenesis cannot be identified

Description:

FSIS takes a "zero tolerance" approach to contamination of carcasses and edible viscera by feces, milk, and ingesta, as these can all be sources of pathogens. Bile, urine, dirt, rust, and other foreign material can also adulterate product and render it unwholesome.

In most cases, contamination may be trimmed. However, when gross contamination occurs making trimming impossible or impracticable, this may be a public health concern, and the entire carcass and viscera may need to be condemned.

9 CFR 310.18(a)

Description:

Abscesses are walled-off accumulations of purulent material of many different etiologies. They may or may not be visible externally during antemortem inspection, but when they are visible, the PHV will determine if affected animals should be sent to slaughter as U.S. Suspects.

The PHV should characterize abscesses by extent and distribution, viscosity of the purulent material, and the nature of the walls or capsules around them.

9 CFR 311.14 and 311.16

Description:

Granulomas should be approached in a similar manner to abscesses, and many of your differentials will be the same. However, keep in mind they may have different etiologies and appearances.

Granulomas can be roughly described as clustered accumulations or purulent or caseous material separated by septa (which may or may not be easy to discern).

As with abscesses, granulomas may or may not be visible externally at antemortem.

9 CFR 311.14

(9 CFR 311.2)

"Acti"

Description:

This section refers to numerous conditions ending in "-itis". There are some general rules and considerations for disposition of these conditions:

- Acute, generalized inflammatory conditions may progress to septicemia, toxemia, or pyemia (systemic changes) and be of public health significance
- Acute inflammatory conditions warrant residue testing by the PHV
- Chronic inflammatory conditions may be resolving and no longer be of public health significance
- Most will not result in antemortem condemnation **unless** the animal is pyrexic or severely debilitated

When the inflammatory condition can be identified, and the signs are generalized, condemn for the appropriate condition:

- Pneumonia
- Pleuritis
- Pericarditis (including traumatic pericarditis)
- Peritonitis
- Gastroenteritis
- Nephritis/Pyelitis (or may condemn for Uremia, if pronounced)
- Arthritis
- Mastitis
- Metritis

FSIS Directive 10,800.3

FSIS Directives 10,800.1 thru 4

Description:

Caseous lymphadenitis is a bacterial infection of sheep and goats caused by the bacterium *Corynebacterium pseudotuberculosis*. It is typically found in older animals, though it can affect the young as well.

Affected animals will develop enlarged lymph nodes containing a generally caseous exudate. At antemortem, you may note loss of body condition, fever, and debilitation, along with visible swelling of superficial lymph nodes. Animals may cough if mediastinal and tracheobronchial lymph nodes are affected.

9 CFR 311.18

9 CFR 311.18

9 CFR 311.18

Description:

While there are no neoplasms *specifically* attributed to sheep and goats, you may encounter various types of sarcomas, carcinomas, melanomas, lymphoma, nerve sheath tumors, adrenal gland tumors, and other neoplastic conditions—particularly in mature animals.

When tumors or other abnormal tissue are presented, the PHV is able to send pathology samples—the lesion, along with adjacent tissue and local lymph nodes—to the FSIS Eastern Laboratory for histopathology that they can use to assist them when making the gross disposition.

9 CFR 311.11

9 CFR 311.11(b)

Description:

Sheep and goats may be affected by a number of parasitic organisms. Most are not considered zoonotic. Therefore, their effect on the carcasses and viscera of those animals will be considered to be not of public health significance, but rather a matter of wholesomeness.

On the next slides, we will discuss the organisms most commonly encountered during inspected slaughter. Note that parasites are not typically discovered at antemortem, and therefore dispositions would not apply.

Refer to FSIS Directive 6100.6, Rev. 1, Chapter II, Part I. E. for special postmortem examination procedures and regulatory dispositions when Cysticercosis is discovered.

Refer to FSIS Directive 6100.6, Rev. 1, Chapter II, Part III for special postmortem examination procedures and regulatory dispositions when Sarcocystosis is discovered. View the life cycle here.

FSIS Directive 6000.1

Info sheet here

here

hydatid cysts (*Echinococcus*)

Flukes

FSIS Directive 6100.6 9 CFR 311.25(b).

hydatid cysts (*Echinococcus*)

Flukes

Click on the headings in bold for regulatory citations

Central Nervous System Disorder
Rabies
Tetanus
Moribund or **Dead**

Icterus

Pigmentary Conditions

Non-ambulatory Injuries

Residues

Skin Conditions

Vesicular Diseases

Misc. Degen. And Dropsical Conditions

Regulatory citations here, here, and here

See slide 93

See slide 94

CONDEMN

PASS FOR COOKING

9 CFR 311.25(b)

The following quiz questions are for practice and review only

When performing antemortem inspection at an establishment that slaughters market lambs, where the establishment follows a written **voluntary segregation** program, you must observe 100% of the animals presented for slaughter both at rest *and* in motion:

7 True

7 False

Check

Central nervous system signs, vesicles or ulcers, mucosal discharge, tubercles, or large granulomatous cysts in the liver and lungs are all examples of potentially _____conditions [choose the *best* response]:

7 parasitic

7 viral

7 reportable

Check

Which of the following is true of postmortem inspection in sheep and goat slaughter establishments? [select all that apply]

- 7 The common bile duct must be incised by establishment employees
- 7 Carcasses may be presented with heads and kidneys attached
- 7 The PHV is to perform expanded postmortem examination procedures when Cysticercosis is suspected
- 7 Carcasses must be split prior to inspection
- 7 IPP should palpate the prescapular, popliteal, inguinal, and cervical lymph nodes
- 7 IPP will need a knife to perform routine postmortem inspection

☐ Check

Diseases and conditions of public health significance are those which affect the wholesomeness of the product, but are unlikely to cause adverse health effects in the consumer:

7 True

7 False

Check

Carcasses with multiple chronic, well-encapsulated abscesses, but without lymphadenopathy or other degenerative changes should have what disposition? [select the *best* response]

7 Pass after trimming, provided removal of all lesions is practicable

7 Pass for cooking after performing directed residue sampling

7 Condemn carcass and viscera for **pyemia**

☐ Check

At the postmortem rail, you are examining a sheep carcass exhibiting severely hyperemic and edematous intestines; enlarged and hemorrhagic mesenteric, thoracic, and cervical lymph nodes; and petechial hemorrhages throughout the gut, kidneys, lungs, and some of the muscle tissue. Your disposition should be _____: [select the *best* response]

7 Pass after trimming of affected tissues

7 Condemn for **Septicemia**

7 Condemn for **Gastroenteritis**

☐ Check

Considering the case of gastroenteritis on the previous slide:

You *should* perform in-plant residue (KIS) testing on the condemned carcass:

7 True 7 False

Check

Postmortem dispositions for caseous lymphadenitis should be based on what factors? [select all that apply]

- 7 Capsule thickness of affected lymph nodes
- 7 Viscosity of the purulent exudate
- 7 Degree and extent of lesions
- 7 Nutritional status of the animal
- 7 Age of the animal

☐ Check

Which of the follow parasites of sheep and goats are generally **not** considered a human health concern? [select all that apply]

- 7 Sarcosporidiosis (Sarcocystis)
- 7 *Echinococcus granulosus*
- 7 *Cysticercus (Taenia) ovis*
- 7 *Fasciola hepatica*

☐ Check

Which of the following is a condition under which sheep or goat carcasses should be condemned for neoplasia? [select all that apply]

- 7 The primary tumor exhibits central liquefactive necrosis
- 7 Histopathology confirms carcinoma
- 7 Evidence of metastasis
- 7 Size or nature of the neoplasm has caused a generalized effect in the animal
- 7 Histopathology confirms malignant lymphoma

☐ Check

Slide	Score/ Total
Slide 100: Untitled True/False Question	0/1
Slide 101: Untitled Multiple Choice	0/1
Slide 102: Untitled Multiple Choice	0/4
Slide 103: Untitled True/False Question	0/1
Slide 104: Untitled Multiple Choice	0/1
Slide 105: Untitled Multiple Choice	0/1
Slide 106: Untitled True/False Question	0/1
Slide 107: Untitled Multiple Choice	0/2
Slide 108: Untitled Multiple Choice	0/1
Slide 109: Untitled Multiple Choice	0/3
Total Score	**0/12**

Show solutions Retry