Identification and Removal of Lingual and Palatine Tonsils as SRMs in Beef Market Heads and Tongues

USDA-FSIS-OPPD
FSIS Policy on Beef Tonsils

- Beef tonsils are identified as “specified risk materials” (SRMs) in cattle of all ages per 9 CFR 310.22(a)(2).

- FSIS policy has focused on removal of palatine and lingual tonsils in beef and is outlined in Chapter II, Part V. of FSIS Directive 6100.4.
Beef Market Heads

- Beef Market Heads are typically sold as “whole” beef heads with tongue.

- Beef Market Heads can only be saved from cattle less than 30 months of age after removal of grossly identifiable (i.e. visible to the unaided eye) palatine and lingual tonsil tissue (SRM) within specified landmarks.
Beef Market Heads

Whole beef market heads *cannot* be saved from cattle *30 months and older* as the entire skull and associated non-meat components are considered SRM material per 9 CFR 310.22(a)(1).
FSIS Policy on Beef Palatine and Lingual Tonsils

- **Palatine and lingual tonsil** in the oropharynx are the designated tonsils (SRM) that must be removed during head boning including preparation of beef market heads and tongues. **Other tonsils need not be removed as SRM unless found to be unwholesome.**
FSIS Policy on Beef Pharyngeal and Tubal Tonsils

- Based on a lack of scientific evidence, the pharyngeal and tubal tonsils of the nasopharynx, are not considered SRM and need not be removed unless found to be unwholesome.
FSIS Verification Procedures for Removal of Tonsils in Beef Market Heads

- FSIS Inspection personnel should follow verification procedures outlined in FSIS Directive 6100.4 regarding SRM removal procedures in the plant’s HACCP, SSOP, or pre-requisite program procedures to remove the designated tonsil tissue (SRM) of concern from beef market heads and tongues.
Why the concern over Beef Market Heads?

1. Nationwide Data Analysis of SRM related NRs and a recent recall suggest not all specified tonsil tissue is being adequately removed from beef market heads and tongues.
Why the concern over Beef Market Heads?

2. Due to differences in processing of beef market heads compared to regular boning of beef heads, the verification of adequate removal of *palatine and lingual tonsil* from beef market heads requires more in-depth knowledge of head anatomy and location of tonsils.
FSIS Verification Procedures for Beef Tonsils

From FSIS Directive 6100.4:

1. Inspection program personnel are to verify that the establishment’s procedures for the removal, segregation, and disposition of tonsils [using] ... accepted head dressing procedures [that include] removal of [tonsils on] the tongue...
2. If an establishment harvests tongue for human food, inspection program personnel are to verify that the establishment’s harvesting procedure includes making a transverse cut, or effectively skinning caudal (just behind) to the last vallate papillae on the tongue, to ensure complete removal of lingual tonsils.
Objectives

- Review the basic anatomy of the beef head observed during head inspection.

- Identify location and gross appearances of bovine *palatine and lingual tonsils* on:
  1. Beef market head
  2. Beef tongues
Approach to Objectives

- Beef head inspection entails incision of the four (4) sets of lymph nodes and cheek muscles of the head.

- Occasionally, *tonsils* may be observed during *head inspection*; therefore, we will demonstrate tonsils in a manner familiar to FSIS inspectors.
Approach to Objectives (2)

This presentation will be accessible with other SRM guidance material on the FSIS PDD (Technical Service Center) website at:

Before locating and identifying the specified tonsils in a beef market head, it is beneficial to review the anatomical landmarks on the beef head observed during head inspection.
Review of Head Inspection
Anatomy (2)

- This presentation will identify the specified *palatine and lingual tonsils* (SRMs) as they may be exposed while performing head inspection using a *tongue-in head inspection procedure*. 
Here is the caudal view of a beef head seen during a tongue-in head presentation.
4 Major Head Lymph Nodes:

1. Parotid lymph nodes (Inn.)
2. Lateral retropharyngeal lymph nodes
3. Mandibular Inn.
4. Medial retropharyngeal Inn. (below #2; not shown; see slide #20)
Another view of three (3) of four (4) lymph nodes incised during head inspection.
Medial Retropharyngeal Lymph nodes.

Notice they are located just below the muscle (sternothyro-hyoideus mm.) tissue.
Note the opening to **nasopharynx** as indicated by presence of **pharyngeal septum** (arrow) after incision of medial retropharyngeal Inn.
Beef Pharyngeal and Palatine Tonsils

- The *palatine* and *lingual tonsils* are the tonsils designated as the intended SRM to be removed and are accessible through the *oropharynx*. 
Relative Locations of Tonsils in the Beef Head

The figure eight (8) represents the location of tonsils relative to the nasopharynx (above) and oropharynx (below).
Relative Locations of Tonsils in the Beef Head

- **Palatine tonsils** are at the 4 and 8 o’clock positions of the oropharynx.
- **Lingual tonsils** are located at the base of the tongue.
Other tonsils including the pharyngeal and tubal tonsils can be found in the nasopharynx and need not be removed as SRM.
Size of Tonsils

- The size of beef tonsils vary from animal to animal depending on two (2) major factors:

1. age (younger >> larger tonsils) and
2. reactivity to antigenic stimulation (reactive >> larger tonsils).
Pharyngeal Tonsils

- **Pharyngeal tonsils** are mentioned here only for anatomical reference.
- **Pharyngeal tonsils**, located at the roof of the nasopharynx, tend to be larger and less inflamed (congested) than other tonsils.
- **Pharyngeal tonsils** have a soft folded appearance.
Here is the pharyngeal tonsil reflected downward after opening of the nasopharynx.

Note its soft folded appearance.
1. Nasopharynx
2. Medial retropharyngeal lymph node (incised)
3. Epiglottis
4. Edge of the soft palate or the palatopharyngeal arch
5. Pharyngeal tonsil
Palatine Tonsils

- Located adjacent to *soft palate* below the mucosal surface and the opening of *sinus of palatine tonsil*.

- Note: *Palatine tonsils* tend to be larger, more congested, and inflamed at post mortem. As the length of post mortem increases, these tonsils tend to be less congested.
Palatine tonsils

1. Palatine tonsil
2. Nasopharynx
3. Pharyngeal tonsil
4. Tongue
Note the *congested* appearance below the mucosal surface.

The arrow points to the *palatine tonsil* and congestion around it.
Note:
The probe is directed at the *palatine tonsil* (1) into the opening to the *sinus of the palatine tonsil* lateral to base of the tongue (4).

The *pharyngeal tonsil* (3) has sagged into the nasopharynx (2).
Palatine Sinus
Note: The opening to *sinus of the palatine tonsil* (arrows) is a useful landmark for locating the *palatine tonsil*. 
Lingual and Palatine tonsils

Note the following:

1. hard palate
2. vallate papillae
3. sinus of the palatine tonsil
4. lingual tonsils
Beef Tongue and Palatine Tonsils

- Depending on how the tongue is removed from the head, the *palatine tonsil* may be found attached to remnants of the beef tongue.
Palatine tonsil on tongue
Note: Lingual tonsil to be removed is located below the yellow cut line.
**Lingual Tonsils**

- Located at the base of the tongue
- *Lingual tonsils* are removed by removing the epithelium and underlining muscle to a sufficient depth (~>5mm) just caudal to the last *vallate papillae* by knife trimming or skinning.
Lingual Tonsils
Lingual Tonsils

- Can you identify the vallate papillae and location of lingual tonsils in this picture?
- Answer: See the next slide.
Beef tongues are adequately trimmed when the surface layers are removed to a sufficient depth (~>5mm) caudal to the last *vallate papillae*. 
Removal of *lingual tonsils* in a beef market head.
Removal of lingual tonsils in a beef market head.

Note: Less radical removal leaving more tongue meat is also acceptable.
Beef Market Head
sans
Lingual and Palatine Tonsils

- Removal of the *palatine and associated lingual tonsils* of a beef market head meet the requirements of 9 CFR 310.22 regarding removal of SRM tissue.
Here is a beef market head with all tonsil related SRM removed. The **arrow** points to the short cut tongue in situ.
A beef market head with all tonsil related SRM removed is eligible for the mark of inspection and can enter commerce.
Questions?

Please submit your tonsil or SRM questions to one of the following:

1. AskFSIS at [http://askfsis.custhelp.com](http://askfsis.custhelp.com)

OR

2. Contact the Policy Development Division (PDD) (formerly the TSC) at 1-800-233-3935.