USA RECOMMENDED CHANGES SHOWN IN BLUE FONT

CHAPTER X.X.

INFECTION WITH TAENIA SOLIUM

Article X.X.1.

General provisions

Infection with Taenia solium is a zoonotic parasitic infection of pigs. *Taenia solium* is a cestode (tapeworm) that is endemic in large areas major parts of Latin America, Asia and sub-Saharan Africa. The adult worm cestode occurs in the small intestine of humans (definitive host) causing taeniosis. The larval stage (cysticercus) occurs in striated muscles, subcutaneous tissues and central nervous system of pigs (intermediate hosts), causing cysticercosis. Other suids and dogs can be infected but are not epidemiologically significant. Humans may also harbour the larval stage when eggs shed in faeces of infected humans are ingested. The most severe form of the infection by the larval stage in humans is neurocysticercosis which can cause neurologic signs including seizures (epilepsy) and sometimes death. Cysticercosis, although normally clinically inapparent in pigs, is associated with significant economic losses due to carcass condemnation and decreased value of pigs, and causes a major disease burden in humans, especially epilepsy.

Rationale: The United States suggests the recommended wording (noted in blue font). The original wording implies that neurocysticercosis will always cause seizures or death. These are the worst case scenarios, and are only a percentage of the clinical presentation of neurocysticercosis. Neurocysticercosis can develop in the brain or spinal cord. Presentations other than seizures and death include no symptoms at all, headaches, confusion, and balance deficits.

A few references:

United States Centers for Disease Control: Parasites -Cysticercosis
http://www.cdc.gov/parasites/cysticercosis/disease.html


For the purposes of the Terrestrial Code, infection with *T. solium* is defined as a zoonotic parasitic infection of pigs.

In humans, taeniosis occurs following ingestion of pig meat containing viable cysticerci and can be prevented by avoiding consumption of raw or undercooked contaminated pig meat. In humans, cysticercosis occurs following ingestion of *T. solium* eggs and can be prevented by avoiding exposure to *T. solium* eggs through detection and treatment of human tapeworm carriers, community health education, appropriate sanitation, personal hygiene, and good food hygiene. Collaboration between the Veterinary
Authority and the public health authority is an essential component in preventing and controlling T. solium transmission.

In pigs, cysticercosis occurs by ingestion of T. solium eggs from faeces or environments contaminated with faeces from humans harbouring adult T. solium.

The aim of this chapter is to reduce the risk of infection with T. solium of humans and pigs and to minimise the international spread of T. solium. The chapter provides recommendations for prevention, control, and surveillance of infection with T. solium in pigs.

This chapter should be read in conjunction with the Codex Alimentarius Code of Hygienic Practice for Meat (CAC/RCP 58-2005).

When authorising the import or transit of the commodities covered in this chapter, with the exception of those listed in Article X.X.2. Veterinary Authorities should apply the recommendations in this chapter.

Standards for diagnostic tests are described in the Terrestrial Manual.

Article X.X.2.

Safe commodities

When authorising import or transit of the following commodities of pigs, Veterinary Authorities should not require any T. solium related conditions regardless of the status of the animal population of the exporting country or zone:

1) processed fat;
2) casings;
3) semi-processed skins which have been submitted to the usual chemical and mechanical processes in use in the tanning industry;
4) bristles, hooves and bones;
5) embryos, oocytes and semen.

Article X.X.3.

Measures to prevent and control infection with T. solium

The Veterinary Authority or other Competent Authorities and the public health authority should carry out community awareness and education programmes on the risk factors associated with transmission of T. solium emphasising the role of pigs and humans.

The Veterinary Authority or other Competent Authorities should promote also implement the following measures:

1. Prevention of infection in pigs

   Transmission of T. solium eggs from humans to pigs can be avoided by preventing:

   a) preventing the exposure of pigs to environments contaminated with human faeces;
   b) preventing the deliberate use of human faeces as pig feed or the use of pigs as a means of human faeces disposal;
   c) preventing the use of untreated sewage effluent to irrigate or fertilise land to be used by pigs for forage and food crops;
d) providing adequate and implementing the use of toilet and sanitation facilities for people in pig rearing establishments; the involvement of human tapeworm carriers in pig rearing.

**Rationale:** Suggested changes shown in blue font. The provision of these facilities is not effective in preventing pig infection unless they are actually used. Human nature/behavior and previous outbreak scenarios have indicated that convenience is often a factor that plays a role in animal infection as a result of human defecation in animal feed areas, etc.

2. Control of infection in pigs

   a) The **Veterinary Authority** should ensure that all slaughtered pigs are subjected to post-mortem meat inspection in accordance with Chapter 6.2., and with reference to Chapter 2.9.5. of the Terrestrial Manual.

   b) When cysticerci are detected during post-mortem meat inspection:

      i) if the carcass of a pig has 20 or more cysticerci, that carcass and its viscera, as well as all pigs from the same establishment of origin should be disposed of in accordance with Article 4.12.6.;

      ii) if the carcass of a pig has less fewer than 20 cysticerci, all pigs from the same establishment of origin should be treated in accordance with Article X.X.6. or disposed of in accordance with Article 4.12.6.;

      iii) an investigation should be carried out by the **Veterinary Authority** and the public health authority to identify the possible source of the infection in order to target an intervention;
iv) post-mortem examination of pigs for slaughter from known infected establishments should be intensified until sufficient evidence has been obtained indicating the infection has been eliminated from the establishment.

**Rationale:** Suggested phrase in blue font is recommended because there should be some measure by which the veterinary authority determines that an establishment has eliminated the infection.

An optimal control programme should include detection and treatment of human tapeworm carriers.

**Article X.X.4.**

**Surveillance for infection with T. solium in pigs**

Communication procedures on the occurrence of *T. solium* should be established between the Veterinary Authority and public health authorities.

The Veterinary Authority should use information from public health authorities and other sources on human cases of taeniosis or cysticercosis in the initial design and any subsequent modification of surveillance programmes.

Surveillance can be conducted by:

1) meat inspection at slaughterhouses/abattoirs;
2) tongue inspection of live pigs at markets;
3) other diagnostic tests on live pigs.

The data collected should be used for investigations and for the design or amendment of control programmes as described in Article X.X.3.

Animal identification and animal traceability systems should be implemented in accordance with the provisions of Chapters 4.1. and 4.2.

**Article X.X.5.**

**Recommendations for the importation of meat and meat products of pigs**

Veterinary Authorities of importing countries should require the presentation of an international veterinary certificate attesting that the entire consignment of meat or meat products:

1) has been produced in accordance with the Codex Code of Hygienic Practice for Meat (CAC/RCP 58-2005);

AND

2) comes from pigs which have been slaughtered in an approved slaughterhouse/abattoir;

AND

3) either
   a) comes from pigs born and raised in a country, zone or compartment demonstrated to be free from *T. solium* in accordance with Article 1.4.6.;

or
b) comes from pigs which have been subjected to post-mortem inspections for *T. solium* cysticerci with favourable results;

or

cb) has been processed to ensure the inactivation of the *T. solium* cysticerci in accordance with one of the procedures referred to in Article X.X.6.

**Article X.X.6.**

**Procedures for the inactivation of *T. solium* cysticerci in meat of pigs**

For the inactivation of *T. solium* cysticerci one of the following procedures should be used:

1) heat treatment to a core temperature of at least **80°C**; or

2) freezing to minus 10°C or **less** below for at least ten days or any time **and** temperature equivalent.

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