

## USA Comments

### CHAPTER X . X .

## INFECTION WITH *TAENIA SOLIUM*

### Article X.X.1.

#### General provisions

*Taenia solium* is a cestode (tapeworm) that is endemic in major parts of Latin America, Asia and sub-Saharan Africa. The adult worm 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 feces of infected humans are ingested](#). The most severe form of the infection in humans by the larval stage is neurocysticercosis. 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 additional text is suggested to clarify that it is the shedding by human carriers, not pigs, which is responsible for cysticercosis in humans.

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

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 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, all pigs from the same origin should be disposed of in accordance with Article 4.12.6.;~~
- ii) ~~if the carcass of a pig has less than 20 cysticerci, all pigs from the same 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.~~

**Rationale:** re: Article X.X.3 Point 2 – post-slaughter testing should be the purview of the Codex Alimentarius Commission (CAC). Therefore, this section should mirror the Codex Committee on Food Hygiene guidelines with respect to *T. saginata*. Since *T. solium* is not endemic in every country of the world, requiring prescriptive slaughter testing, while appropriate to endemic countries, is not risk based, and is inappropriate for countries where the disease is not endemic. Furthermore, this section states that inspection should be done in accordance with Chapter 2.9.5 of the *Terrestrial Manual*. However the recommendations in the *Manual* are inconsistent with modern meat inspection methods where *T. solium* is not endemic. Chapter 2.9.5 requires incision and palpation of masseters and tongue muscles, as well as heart. Meat inspection guidelines for both the USA and EU do not support palpation or incision unless there is reason to suspect cysticercosis. Therefore the United States recommends deleting this section.

An optimal control programme should include detection and treatment of human 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.](#)

**Rationale:** Article 4 describes surveillance programs which are appropriate for this chapter, and refers to the use of slaughter data as part of a surveillance program. This section should be retained but not in conjunction with Article 3, Point 2. (See comment above)

*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 which have been subjected to post-mortem inspections for *T. solium* cysticerci with favourable results;or
  - b) has been processed to ensure the inactivation of the *T. solium* cysticerci in conformity 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 60°C; or
- 2) freezing to minus 10°C or below for at least ten days or any time/temperature equivalent.

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