Opinion of the Scientific Committee on Veterinary Measures relating to public health - Detection of *Trichinella spiralis* in horse meat -22 June 1998

Terms of reference:

The Scientific Committee on Veterinary Measures relating to Public Health was asked to provide an opinion concerning a modification of the methods approved by council directive 77/96/EEC for the detection of *Trichinella* larvae in horse meat.

1. Background

The detection of *Trichinella spiralis* infection in pigs as a preventive measure to protect the consumer for trichinellosis has been regulated by law in most European countries since the end of the nineteenth century. Although microscopical examination of pieces of meat obtained from so-called predilection sites for *T. spiralis* has been the reference method for several decades ("trichinoscopy"), artificial digestion methods were introduced in the 1960's to enable larger numbers of pigs to be examined. These methods were considered to be at least as protective for human health as the classical trichinoscopy (1, 2).

Various artificial digestion methods were introduced in the 1970's and 1980's to shorten the procedures to 30 minutes; these include the use of a Stomacher, magnetic stirrer and Trichomatic equipment (see annexes of Directive 77/96/EEC). In all of these digestion methods, which are based upon so-called "pooled samples" of meat from a certain number of pigs (mostly 100 times 1 gram, representing 100 pigs), there are descriptions of how to act in case of a positive finding in the pooled sample. The positive finding may originate from one or more pigs examined. Therefore all pigs from the suspected pool of samples require re-examination. Normally for logistic reasons re-examination is carried out with pools of 20 grams from each of 5 pigs. If a positive pooled sample is identified again, the animals involved are re-examined at individual level again to identify the positive carcass and consequently the positive farm of origin.

Large outbreaks of trichinellosis have occurred in France and Italy in the past decades because of the consumption of infected horse meat. Although horses normally do not eat meat, incidentally they may become infected because of infected rodent cadavers in feed. In experimental infection of horses it was shown that they consume without hesitation *Trichinella* infected mice (5). Horses, in fact, have become a major source of infection with *Trichinella* in man in Europe, both in terms of number of epidemics as well as in number of patients involved (6).

A similar approach is followed for the detection of *T. spiralis* in horse meat (Directives 77/96/EEC and amended by 94/59 EEC). The only differences with pork are the quantities:

- the original amount per individual horse in the pooled sample digestion is 5 grams

- the requested amount of pre-dilection site muscle at re-examination is also 20 grams.

In both pork and horse meat the original screening procedure is designated to identify infected meat which can induce clinical trichinellosis in man. The amount of predilection site muscle sampled is based on tradition as well as experimental infection of pigs (1, 2). However, sampling of pieces of meat assumes that the distribution of the parasite is equal in the muscular system (3). Besides the fact that predilection sites exist, the assumed equal distribution in lightly infected animals will naturally lead to unavoidable difficulties in the confirmation of such light infections at re-examination. Therefore for re-examination larger amounts of muscle have to be examined to improve the chance of also finding the lightly infected animals.

International experiments where muscle samples were distributed of animals with low and moderate *Trichinella* infections have shown that the parasite is not equally distributed in the musculature (4). The reason why animals are re-examined after an initial positive finding in a pooled sample digestion seems obvious: trace the carcass to condemn or freeze, trace the farm of origin to take measures. In practice it may be expected that a lightly infected carcass is

accidentally the reason for a positive result in the pooled sample digestion. Re-examination may theoretically not lead to confirmation because of unequal and rare *Trichinella* larvae distribution in the carcass. Basically there are two pathways to continue the decision tree":

a. Examination of a larger amount of predilection muscle has not shown a *Trichinella* infection: release the carcass.

b. Increase the amount of tissue per individual carcass until the infected animal is identified. The measures at farm level are the reasoning of intensified examination.

2. Scientific considerations

2.1 Introduction

In a French request it was asked to consider that a larger amount of meat be re-examined after an initial positive result in a routine pooled sample digestion at the abattoir. A case was described in which a pooled sample digestion examination of horse meat samples was found positive for *Trichinella* larvae. However, the EU-prescribed re-examination procedure did not unravel the identity of the individual carcass responsible for the positive finding. The prescribed 20 grams of predilection muscle (tongue) were apparently not enough to identify the lightly infected horse. This seems to agree with the theory dealt with under section 1. However, a certain number of the carcasses were re-examined later at the Central Veterinary Reference Laboratory in Maisons-Alfort, where much higher quantities of muscle were examined. Re-examination of 100 grams of meat did reveal the infected horse.

The French proposal is to enlarge the amount of predilection muscle for re-examination in a pooled sample digestion method, to increase the chances of identifying *Trichinella* infected carcasses. This question was discussed with experts in the field of trichinellosis:

- Prof. F. van Knapen. Head of the Department of the Science of Food of Animal Origin, Faculty of Veterinary Medicine, Utrecht, The Netherlands.
- Dr. E. Pozio. Head of the Reference Laboratory for Trichinellosis on behalf of the International Commission for Trichinellosis (ICT) in Rome, Italy.
- Dr. E. Soule. Head of the Parasitology Unit of the CNEVA/Laboratoire Central Recherches Vétérinaire in Maisons-Alfort, France.

2.2 Discussion

The priority of the European directives in meat inspection lies in the protection of human health rather than the epidemiology of infectious diseases. If in a pooled sample digestion method *Trichinella* larvae are found, it is necessary to identify the infected carcass(es). Therefore re-examination rules are included in the directive. When this re-examination is carried out according to the directive and no infection can be demonstrated, there is no reason to fear for public health consequences (see section 1). However, it may be necessary to identify the lightly infected carcass to take measures at farm level. Therefore it is justified to increase the amount of meat to be examined in order to identify the infected, individual carcasses.

An actual amount of meat over 20 grams does not contribute to improved, direct public health guarantees. This leaves the responsible authorities in a particular situation to unravel potential infected individual carcass with public health consequences, or to enable further measures at farm level by identifying even a lightly infected carcass.

3. Conclusions

To identify individual carcasses infected with *Trichinella* larvae after an initial positive pooled sample digestion method, it is necessary to re-examine individual carcasses. In lightly infected animals it is required to re-examine larger amounts of predilection side muscle than the original 5 grams.

The French proposal to increase the amount of meat for re-examination is justified in terms of answering

epidemiological questions. In the existing Directive (77/96//EEC) the 20 gram sample prescribed is sufficient to safeguard public health in this respect. However for epidemiological reasons it may be necessary to increase the amount of meat.

References

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