Introduction

In Hungary, Trichinella spp. are widespread in susceptible wild animals (Széll et al., 2008, 2012; Tolnai et al., 2014). Humans acquire Trichinella infection by consuming raw or undercooked meat from pigs, horses, wild boars and other game animals. According to the Commission Implementing Regulation (EU) 2015/1375, carcasses of domestic pigs, horses, wild boar and other farmed and wild animal species intended for human consumption in the EU market, should be systematically tested for Trichinella spp. larvae. One of the major duties of the national reference laboratories for parasites is to organize proficiency tests (PTs) for official Trichinella laboratories, as described in the Commission Regulation (EC) No. 882/2004 of the European Parliament and the Council. The aim of the present study was to evaluate the results of PTs of the digestion method carried out by the Hungarian Trichinella laboratories between 2011 and 2016.

Materials and methods

From 2011 to 2013, only Trichinella laboratories with high sample numbers (n = 10–39) were involved in the PTs. From 2014 to 2016, all laboratories (n = 105–116) participated. Larvae were obtained by artificial digestion of 3–6-month-old mice infected with Trichinella spiralis. The artificial digestion was done using a modified version of the magnetic stirrer protocol (37°C for 30 min). The required number of larvae was counted under a stereo-microscope using a watch glass, and transferred to an hollow made in the centre of each meat ball by rinsing the watch glass with 200 µl of PBS. The watch glass was then examined under a stereo-microscope, to ensure that no larvae remained on it. Each meat ball was stored in a plastic container labeled with a numeric code. Laboratories received a panel of samples (n = 3–5) consisting in 100g of minced pork meat spiked with 3–5 Trichinella larvae. One or two negative controls were also included in the panels. PT panels were packed in a polystyrene box, which contained ice packs to maintain a temperature of 4–10°C during transportation. All laboratories that participated at the PT, used the magnetic stirrer method and examined the samples within 72 hours. According to the current EU legislation, the result of the artificial digestion method has to be expressed qualitatively. Therefore, the PT was considered passed if the laboratory correctly identified the positive samples. A false positive result was not accepted. After evaluation, the individual PT report for laboratory performance and the final PT report with the results of all participating laboratories have been prepared.

Until 2014, the National Reference Laboratory for Parasites (NRLP) provided the description of critical points, reference materials and validation samples, requested corrective actions, organized laboratory trainings and repeated PTs and prepared training and test materials on trichinellosis according to guidelines of International Commission on Trichinellosis (2012).

Results and discussion

For 2014, still only 49% of the laboratories was able to find at least one 3-5 larva per sample and to pass the PTs in Hungary. (Fig. 1). In 2014, all recommendations of International Commission on Trichinellosis were implemented in Hungary, which resulted in a marked improvement of the performance of the laboratories. For 2015 and 2016, 83% and 85% of laboratories were able to pass the PT for the first time (Fig. 1). These figures are similar to that seen in the PTs organized by the European Union Reference Laboratory for Parasites for the NRLPs from 2007 to 2009 (Marucci et al., 2016). The major obstacles of further performance increase are the continuous personnel fluctuation in these laboratories. Human trichinellosis had been documented only in connection with the consumption of backyard pigs and game animals, which escaped veterinary controls in Hungary (Széll et al., 2012). Therefore, it can be assumed that Trichinella meat inspection in Hungary is performed on a satisfactory level to protect consumers.

Fig. 1. Number of laboratories passed the PTs from 2014 to 2016.

References


