Sheep Livers Condemned Due to *Ascaris suum*

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Figure 1: Immature adults of Ascaris suum.

IN MAY 2010, AN ONTARIO SHEEP FLOCK EXPERIENCED LIVER CONDEMNATIONS DUE TO THE SWINE PARASITE, *ASCARIS SUUM (A. SUUM)*. Lambs were sent to a processing plant, where routine inspection revealed that the livers, specifically the bile ducts, were heavily infested with numerous live nematodes. The nematodes were found in the livers of two of the 20 lambs sent to the abattoir by the producer. Identification of *A. suum* was confirmed at the Animal Health Laboratory (AHL) and the Ontario Veterinary College (OVC), University of Guelph, by parasite morphology. This was a novel condition for both the producer and the processor.

Currently the flock size of the operation is approximately 40 ewes, with an average of 80 to 90 lambs marketed per year to both direct slaughter and to sales yards. The flock is housed in a renovated swine facility that was previously a farrow-to-wean operation that used injectable ivermectin in sows prior to farrowing. The producer took advantage of the national Cull Breeding Swine Program and is now using his former dry sow and breeding areas to house ewes, lambs and rams during lambing in the winter and early spring. The flock is grazed during the summer and early fall. The flooring is concrete with straw bedding added. Pens are separated by metal gating. The barn was cleaned and disinfected prior to housing the sheep. The lambs are fed a creep ration while nursing their mothers and some are sent directly to slaughter without weaning, while others are weaned, dewormed and sent to slaughter later depending on the current market conditions and their size. The ewes are dewormed twice annually with ivermectin. This year the lamb crop has shown no clinical evidence of parasitism, nor any other diseases such as pneumonia or scours. In 2009, some of the lambs showed respiratory disease, several were unthrifty and gastrointestinal parasites were a significant problem.

A. suum is the large roundworm of swine and is the most common gastrointestinal parasite of pigs. It is more common in growing pigs than in mature pigs. Infective *A. suum* eggs will hatch in a number of animal species including ruminants. Once ingested by sheep or cattle, larvae migrate through the intestinal wall, reach the portal vein and are transported to the liver. From the liver, larvae enter the hepatic venous system and are transported to the lungs. Larvae do not usually migrate beyond the lungs in foreign hosts and are generally unable to develop to mature adults in the intestine. However, immature adults have occasionally been found in the small intestines and bile ducts of sheep (Figure 1), as in this case. During migration, the larvae can damage the liver and lungs. In the liver, migration can cause hemorrhage and fibrosis that appears as white spots ("milk spots") on the surface of the liver and leads to condemnation of the liver at slaughter. In the lungs, the larvae may cause hemorrhage and/or a parasitic pneumonia. In sheep and cattle exposed to contaminated environments and grazing areas, reported clinical signs include acute dyspnea, tachypnea and coughing as the larvae migrate through the lungs. In general, the condition is most commonly seen during the warm summer months but tends to disappear during the fall, winter and spring when temperatures are too low to allow for the eggs to develop to the infective larval stage.

Over the past two years, Ontario has seen an increase in the number of swine operations being converted to sheep operations. *A. suum* eggs are thick-shelled and very hardy in the environment. They are resistant to disinfectants and different types of weather. They can survive in cool, moist surroundings for up to 5 years. Thus, sheep can be exposed to these eggs in such facilities and develop problems. It is unclear as to how common this problem is in Ontario sheep flocks. However, it is a very rare diagnosis at slaughter.

Routine treatment of sheep with anthelmintics for *A. suum* is not justified due to the life span of the eggs and the unknown time(s) of exposure. However, *A. suum* should be considered as a differential diagnosis if sheep (particularly lambs) are diagnosed with pneumonia and they are unresponsive to antibiotic treatment, particularly if the sheep have been moved into former swine housing within the past 5 years. Treatment options at that time could include ivermectin or fenbendazole. Hygiene practises prior to moving sheep into swine housing may help to lesson the risk of infection. All bedding and manure should be removed. Steam cleaning of walls, floors and feed troughs will limit the risk of infection; eggs are destroyed by temperatures greater than 60°C. Sheep producers should be made aware that if they are moving animals into a barn that previously housed swine, *A. suum* infection could result in health issues and liver condemnations. **OSN**

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