



***Echinococcus multilocularis*: probability of introduction to mainland Norway and risk to human health**

Background

Echinococcus multilocularis (EM) is a small tapeworm parasite that resides in the intestine of carnivores (e.g. foxes, dogs) that eat rodents. Adult tapeworms produce eggs that are released in the faeces of the carnivores and may be ingested by rodents that act as intermediate hosts. In the intermediate hosts the larval form of the tapeworm produces cysts, predominantly in the liver, but the cysts proliferate and may invade the surrounding tissues. If the rodent is eaten by a susceptible final host, the adult tapeworms develop in the intestine and the lifecycle is completed.

EM is of public health significance as humans may act as accidental intermediate hosts if they ingest eggs, either through contaminated foods or water, or from contact with infected final hosts (dogs, foxes) or their faeces. In untreated patients the disease is fatal (10 year survival rate of 29 %), and in treated patients the 10 year survival rate is 80 %. The treatment is expensive, and may also require liver transplantation.

EM is widely distributed over the northern hemisphere, including in Europe, with many areas considered endemic. However, in Norway, the only known occurrence has been in Svalbard, in which introduction of the intermediate host (sibling vole) resulted in the lifecycle establishing between arctic foxes and this vole species in 1999; as recently as 2010, mainland Fennoscandinavia (Finland, Sweden, and Norway) were considered free of this parasite.

However, EM was found in three red foxes shot in south-east Sweden (Lanneröd, Uddevalla, Västra Götalands län two and one in Södermanland). This is relatively close to the Norwegian border.

In the light of these recent findings in Sweden, the Norwegian Scientific Committee for Food Safety (Vitenskapskomiteen; VKM), Panel of Biological Hazards (Faggruppe hygiene og smittestoffer) took the initiative to undertake a risk assessment regarding the introduction of EM to mainland Norway and its significance to human health.

Terms of reference

The Panel has decided on the following terms of reference:

1. To assess the probability? of introduction of EM to mainland Norway via movement of dogs (and cats)

- a. From Sweden (pets, that have/have not undergone the antihelminthic treatment prior to entry);
 - b. Svalbard
 - c. Other endemic countries
2. To assess the probability of introduction of EM to mainland Norway via movement of wildlife:
 - a. infected rodents from Sweden;
 - b. infected foxes and other wild canids from Sweden;
 - c. infected rodents from Denmark or other European countries where EM is established
 - d. infected foxes from Denmark or other European countries where EM is established?
3. To assess the probability of detection under current monitoring conditions if EM is introduced into mainland Norway:
4. To assess the risk of EM becoming endemic
5. To assess the risk for human health
6. To assess the effectiveness and efficiency of applicable disease control options