

Cat-Borne Diseases and Agriculture



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Cats have a significant impact on agriculture in Tasmania. As a host to a number of diseases which impact on livestock, management of the interactions between cats and agriculture is a key component of cat management in Tasmania. Two significant diseases that cats spread to livestock include toxoplasmosis and sarcocystosis (sarco).

Toxoplasmosis can cause miscarriage and defects in offspring in sheep, goats and pigs, while sarco creates cysts in the muscle tissue of sheep. Sarco cysts look like grains of rice and make contaminated meat unsuitable for sale.

Cats spread toxoplasmosis and sarco directly to livestock through oocysts or eggs in their faeces. Livestock can contract the diseases if they feed on pasture, hay or grain or drink water contaminated with cat faeces. While toxoplasmosis and sarco are more common in stray and feral cats, all cats can contract the diseases, especially if they roam and eat prey or scavenge. The greatest impacts on livestock tend to occur on properties that border rural townships, where the numbers of feral and stray cats are greatest.

Toxoplasmosis

Toxoplasmosis is a disease caused by the parasite *Toxoplasma gondii*. *T. gondii* is a common parasite of warm-blooded animals, however cats are the only definitive host (i.e. the parasite is only able to mature and sexually reproduce in the cat's small intestine). Toxoplasmosis can adversely impact on livestock, wildlife and humans. In addition to being transmitted by eggs in cat faeces, it can also be transmitted by eating raw or undercooked flesh of infected animals, and to offspring via the placenta.

Cats can be infected with the disease if they are allowed to hunt and eat prey, like rodents, carrying cysts of the parasite in their muscle tissue. Young kittens can become quite sick from toxoplasmosis, but older cats generally do not show any symptoms. Once infected, cats shed millions of eggs in their faeces for 2-3 weeks. The cat then develops an immune response and stops shedding eggs.

In Tasmania's cool moist environment, the eggs can survive in the soil for up to 18 months. Consequently, one cat can potentially impact many sheep. Most warm-blooded animals are suitable as intermediate hosts and allow the parasite to survive until it can complete its life cycle in a cat's system.

Step 3 Mammals and birds can be infected through exposure to cat faeces, feed or water that has been contaminated by cat faeces or by eating the flesh of another animal that contains the parasite encysted in its muscle tissue. *T. gondii* eggs are resistant and can survive for up to 18 months in the environment.

Step 2 Parasite development occurs in the cat's intestine and faecal shedding of eggs starts 1-3 weeks after infection and persists for about two weeks. Eggs contaminate pasture and stock feed.

Step 1 Non-immune cats become infected by ingesting *T. gondii* eggs or cysts contained in the tissue of infected intermediate hosts (e.g. infected marsupials, rodents or birds).

Step 4 Eggs eaten by sheep (or other animals) replicate and become encysted in tissue. Tissue cysts are invisible to the human eye.

Step 5 Cats continue the cycle when they feed on the carcass of an infected intermediate host. Kittens can be infected in-utero or when they feed from their mother.

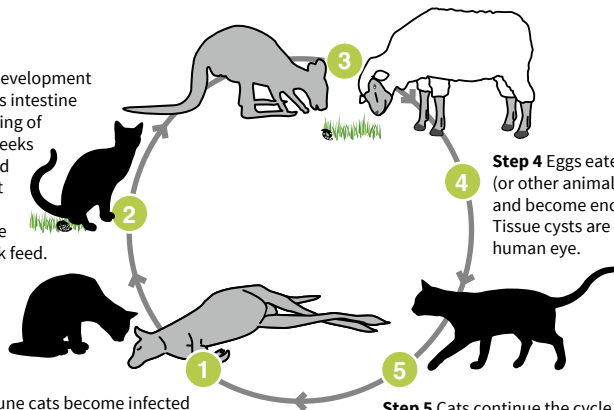


Figure 1: Lifecycle of toxoplasmosis

Source: Australian Wool Innovation and Sheep Connect Tasmania

Toxoplasmosis is common in livestock and substantial impact occurs when the infection happens during pregnancy, because it can cause miscarriage, stillbirths and mortality of newborns. In Tasmania, miscarriages caused by toxoplasmosis are particularly common in sheep. When a pregnant ewe becomes infected with *T.gondii* it may cause foetal resorption, often followed by permanent infertility ('barren' ewe), miscarriage or neonatal deaths. This is particularly a problem for maiden ewes that have not developed any immunity to toxoplasmosis. Generally, after animals have been exposed to *T.gondii* once, immunity occurs and protects animals throughout their life.

In one study, 84% of feral cats trapped in Tasmania were found to have had toxoplasmosis.¹ This is among the highest rates recorded in Australia, and significantly higher than most other countries.

An unpublished Department of Primary Industries, Parks, Water and Environment assessment (2015) of the costs imposed by *T. gondii* in Tasmania, estimated annual economic losses of approximately \$1.7 million.

Toxoplasmosis impacts to human health and wildlife

T. gondii can infect humans – with the potential to cause miscarriage in pregnant women, foetal abnormalities and illness in immune compromised people.

Pregnant women and immune compromised people should avoid contact with cat faeces and wear gloves when handling any material that could be contaminated with *T.gondii* eggs.

Take care when handling raw or undercooked meat. Cook all meat well to kill any *T.gondii* eggs.

Toxoplasmosis is fatal to a number of Australian herbivorous marsupials including bandicoots, pademelons, wombats, possums, wallabies, and birds. See our *Cat-borne disease: the impacts of toxoplasmosis on wildlife and human health* factsheet for more information at www.tassiecat.com.

¹ Fancourt, B. & Jackson, R. 2014. Regional seroprevalence of *Toxoplasma gondii* antibodies in feral and stray cats (*Felis catus*) from Tasmania. *Australian Journal of Zoology* 62, 272–283.

Sarcocystosis

Sarcocystis (sarco) is a type of parasite that requires two hosts to complete its life cycle. There are many species of sarco, but the kind that impacts the sheep industry in Tasmania uses the cat as its definitive host. The life cycle of the parasite relies on the faecal-oral transmission from the cat to the sheep, and then back to the cat, via consumption of the developed cysts within the sheep. The sarco species that are specific to cats cannot be transmitted to humans via either route.

Cysts created by sarco in the muscle tissue of sheep look like grains of rice and make contaminated meat unsuitable for sale.

Cats are infected when they eat meat that contains the parasite. The parasite then produces large quantities of eggs that are expelled in the cat's faeces, with millions of eggs spread over many months. Once a sheep eats the eggs off pasture or feed, the cysts appear in the muscle after 35 days and are clearly visible 10 – 14 months later. Due to the slow growing nature of the parasite, the cysts are typically seen in sheep greater than one year of age. While sheep exhibit no clinical signs of sarco, meat with cysts will be condemned.

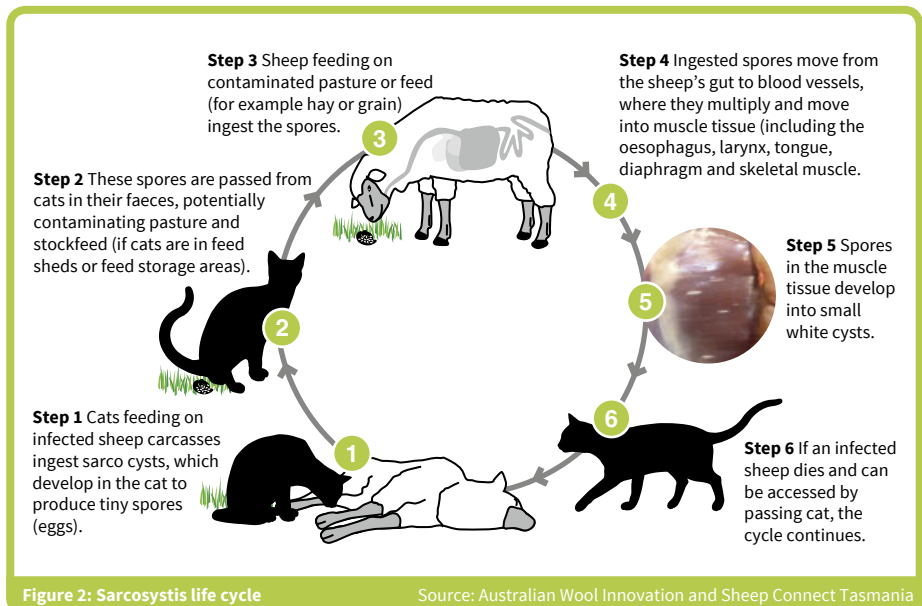


Figure 2: Sarcosystis life cycle

Source: Australian Wool Innovation and Sheep Connect Tasmania

Livestock that are infected with sarco are typically identified at the abattoir. In moderate to light infestations, contaminated muscle tissue is trimmed, while in heavy infestations an entire carcase may be condemned.

Sheep processors in Tasmania are seeing a significant increase in the number of carcasses coming through with sarco. In one instance, 140 carcasses carrying a heavy infestation of cysts in the muscle tissue were condemned from a total of 350 carcasses – a loss of 40%.²

Cats are not made sick by sarco and unlike toxoplasmosis, cats do not develop immunity to the parasite, so they can be reinfected many times in their lifetime, resulting in the repeated spread of eggs.

² Australian Wool Innovation and Sheep Connect (Fact Sheet no. 9). Sarcosystis.
https://sheepconnecttasmania.files.wordpress.com/2013/04/sc-factsheet-no9-sarcocystis_lr.pdf



Farm management for toxoplasmosis and sarco

There are no drenches or vaccinations available for toxoplasmosis or sarco in Australia. The best management options currently available to farmers to help manage the spread of these parasites include:

- ✓ Disposing of livestock carcasses by immediate deep burial or burning.
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- ✓ Keeping livestock feed secure from access by cats.
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- ✓ Controlling rodent (a key intermediate host for toxo) and cat populations, particularly around stock feed sources.
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- ✓ Not feeding domestic cats uncooked sheep meat or offal. Freezing meat does not kill sarco.
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- ✓ Making sure any cats kept on a property are desexed and ideally contained.
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Cats that are desexed are less likely to roam and thus contract and spread the parasites. Desexing also reduces the total numbers of cats that could potentially contract and spread the parasites. Contained cats are less likely to eat prey or scavenge and thus contract and spread the parasites.

Because cats are territorial, it is safer to have a stable population of mature, desexed and immune (in the case of toxoplasmosis) cats around the house and farm sheds rather than a succession of young, possibly 'infectious' (excreting sarco and toxoplasmosis eggs) feral cats that are periodically 'cleaned out' of the area.

Under Tasmanian cat management legislation, livestock primary producers and people working on their behalf can protect livestock on their land by trapping and humanely destroying or returning cats to their owners. It is important to be aware that cats from neighbouring territories may invade areas where a cat population has been reduced. Long term control is therefore required. It is best to coordinate with neighbours to reduce stray and feral cat populations across a large local area, and to ensure domestic cats are not impacted.



For more info visit:
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Credits:

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