



# Cysticercus bovis infection in fattened cattle from several farms in the same locality in England

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Reports of significant levels of *Cysticercus bovis* infection in fattened cattle from several farms in the same locality prompted an investigation into potential sources of the parasite.

*Cysticercus bovis* is the intermediate (larval) stage of *Taenia saginata*, the human beef tapeworm. Cattle become infected with bovine cysticercosis by ingesting materials contaminated with tapeworm eggs originating from human faeces. Humans, the definitive host, become infected via consumption of raw or undercooked beef. In people, the adult tapeworm ranges from 5m to 15m in length and whilst infection may occasionally be associated with diarrhoea or abdominal pain, it is usually asymptomatic and is mainly objectionable on aesthetic grounds. The lifecycle of bovine cysticercosis is shown in Fig. 1.

## PUBLIC HEALTH MEASURES

Bovine cysticercosis is of economic significance to the beef industry due to the costs of meat inspection and public health control. Infected carcasses may be condemned or downgraded, or must be subjected to cold storage at temperatures not exceeding -7°C for up to three weeks to ensure the metacestode stage of the parasite is killed, rendering the carcass safe for human consumption.

## THE OUTBREAK

In August 2013, a private veterinary surgeon consulted APHA for assistance in the investigation of high levels of *C. bovis* infection in batches of cattle submitted for slaughter from a single beef producer client. The abattoir reported that between 70-80% of animals were infected. In November following this outbreak, APHA was made aware of a further four farms in the locality where significant levels of *C. bovis* infection in fattened cattle were also reported by the same abattoir. The level of infections in some farms was again extremely high; in one batch of 20 animals, 14 were shown to have heavy infections. This resulted in significant disruption and economic loss to both the slaughterhouse, in the requirement to cold store the carcasses, and also to the farmer

whose end carcass price was much reduced (60% of the anticipated finished price), well below the initial outlay required to purchase store cattle.

## EPIDEMIOLOGICAL INVESTIGATIONS

Epidemiological investigations considered many potential sources of infection, including livestock source, feed, bedding, recent flooding in the area and staff sanitary conditions of the affected farms.

One line of enquiry focused on oil seed rape straw which had been harvested from land to which human sewage had been applied two years earlier, but this practice had not been replicated on the other four farms.

## COMMON LINK IDENTIFIED

A second line of enquiry revealed that the first farm had sourced feed potatoes from a local merchant. The potatoes were part of a batch imported from continental Europe originally destined for the human food processing chain, but they had been rejected by the



Fig 3: Cysticerci in muscle tissue

manufacturer reportedly after unknown persons had been found in the transport trailer.

Although the definitive source of contamination with human faeces was not identified, the investigation identified that a common link between all five farms was the feeding of potatoes from the same potato merchant.

## CONTROL MEASURES

Advice was given on reducing the ongoing exposure of cattle to potential sources of infection, with particular recommendations based on eliminating environmentally persistent eggs in feed passageways and shared feeder equipment between farms.

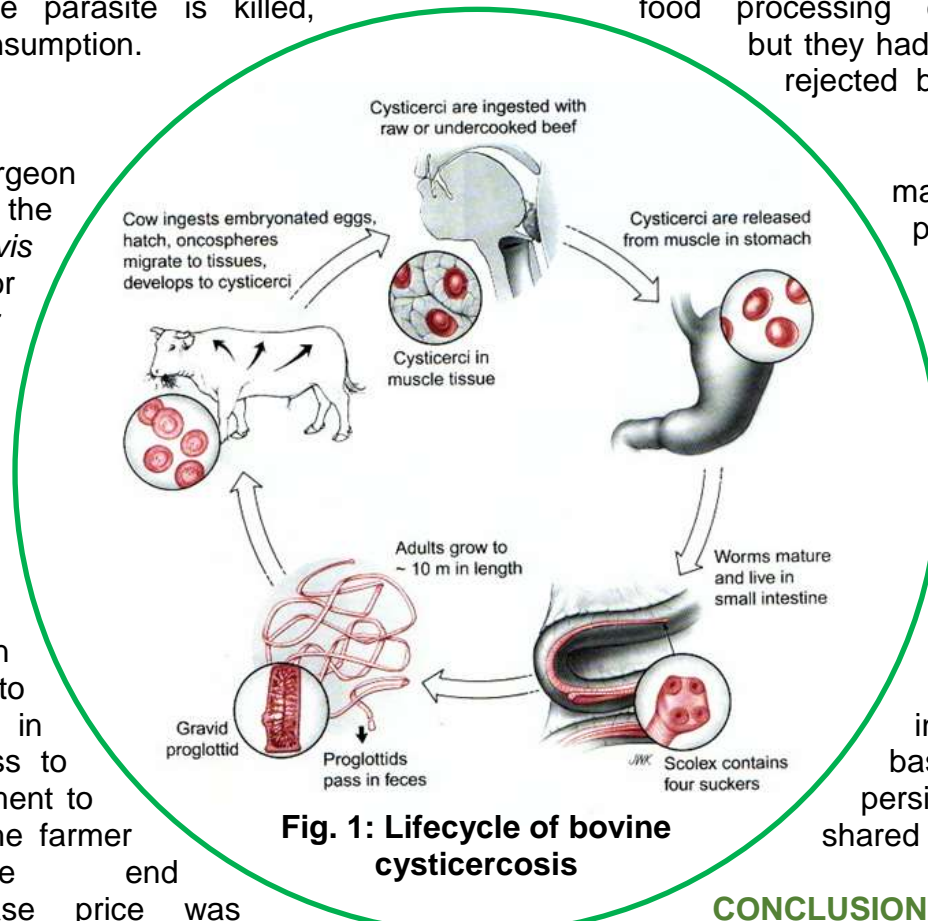


Fig. 1: Lifecycle of bovine cysticercosis

## CONCLUSION

This incident highlights the importance of animal feed security in the protection of public health, and the value of cross-department co-operation in identifying and controlling such outbreaks of zoonotic disease.



Fig. 2: Beef cattle

The cattle reared by the five farms were typically batch reared store cattle purchased from different sources and reared indoors over a four month period. Occasional cattle were homebred.



Fig 4: Contaminated potatoes and feeder equipment were identified as a possible source of the outbreak

## ACKNOWLEDGEMENTS

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Fig 1: Lifecycle of bovine cysticercosis reproduced courtesy of 'This Week in Parasitism' drawn by © Dickson Despommier