

**ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD**

**Botulism in Sheep and Goats**

**Key Issue**

1. In the report on Botulism in Cattle (ACMSF, 2006), the Committee recommended that in the absence of other signs there should be no requirement to restrict meat or milk from healthy cattle from farms where there have been suspected cases of botulism. The FSA wishes to seek the Committee's advice on whether these recommendations can also be applied to meat and milk from healthy sheep and goats on farms where there have been suspected cases of botulism.

**Background**

2. Where outbreaks of botulism in sheep and goats are suspected, the Agency requests that the farmer agrees to voluntary restrictions on the movement of the flock or herd and on the entry of meat and milk from these animals into the food chain. These restrictions apply for 14 days from the onset of the last clinical case or 17 days from the removal of the suspected source of botulism and apply to both affected and healthy animals.
3. The Agency previously requested the same voluntary restrictions for herds of cattle from farms where cases of botulism had been suspected. However, in the report on Botulism in Cattle, the Committee recommended that there should be no requirement to restrict meat or milk from healthy cattle from herds where cases of confirmed or suspected botulism have occurred, but that meat and milk from clinically affected cattle should not enter the food chain due to concern that this may pose a risk to consumers. The recommendations on voluntary restrictions for healthy in-contact cattle were mainly based on the finding that the botulinum toxin types identified in animals (C and D) have rarely been associated with disease in humans. In addition, the report considered that there was little evidence to suggest that any human cases of botulism have occurred from meat and milk consumption and that there was a lack of clinical cases of botulism occurring in suckler calves in herds in which there were cows affected by botulism.
4. The report's recommendations on voluntary restrictions for botulism in cattle were endorsed by the ACMSF at their meeting on 28<sup>th</sup> September 2006 and were implemented by the Agency in conjunction with the Veterinary Laboratories Agency (VLA) and Defra in November/December 2006. An update on this was provided to the Committee in paper ACM/816.

5. An assessment of the risk to human health from the food chain associated with farms where there is suspected botulism in sheep or goats was considered to be beyond the scope of the report on Botulism in Cattle. The Agency has therefore continued to request voluntary restrictions for healthy sheep and goats from farms where cases of botulism are suspected. The Agency requests the Committee's advice on whether voluntary restrictions for meat and milk from outbreaks of suspected botulism involving sheep and goats can be relaxed.

### **Symptoms and diagnosis**

6. The main clinical signs of botulism in ruminants are progressive flaccid muscular paralysis leading to recumbency and death. The clinical signs are caused by neurotoxins produced by *Clostridium botulinum* which inhibit the transmission of nerve impulses at neuromuscular junctions.
7. Most cases of botulism in ruminants are identified on the basis of typical clinical signs and the exclusion of alternative diagnosis. However, following recommendations in the Committee's report on Botulism in Cattle (ACMSF, 2006), VLA commenced toxin testing and culturing of gut contents (VLA, personal communication).

### **Incidence**

8. Outbreaks of botulism in sheep have been reported in several countries, including America, South Africa and Australia (Bennetts & Hall, 1938; Trueman et al, 1992; Van der Lugt et al, 1995, Van der Lugt et al, 1996; Swift et al, 2000). Suspected botulism in goats has also been reported in South Africa (Van der Lugt et al, 1995). In the UK, outbreaks of suspected botulism in sheep and goats are rare, although the numbers affected can be large (see Table 1). No outbreaks of suspected botulism in sheep have been reported in Wales or Northern Ireland. The first reported outbreak of suspected botulism in sheep in England occurred in 1999 and since then a further ten outbreaks have been reported by VLA, mostly from the west of the country. Poultry litter was identified as a possible source in all of these outbreaks. In Scotland, one outbreak of suspected botulism in sheep occurred in January 2007.
9. No reports of suspected botulism have been found for goats in England, Wales or Northern Ireland. In Scotland, one suspected case of botulism in a goat was reported in January 2005 (SAC, 2005).
10. In the UK, outbreaks of suspected botulism in sheep and goats are much less common than outbreaks of suspected botulism in cattle (data for England and Wales is provided in Table 2). However, it is unclear whether the lower number of suspected outbreaks in sheep and the single case involving a goat is due to under-reporting.

**Table 1: Reported outbreaks/incidents of suspected botulism in sheep and goats in the UK.**

Species	Date	Location	Flock/herd size	No. animals affected <sup>a</sup>	No. animals dead <sup>a</sup>
Sheep	Oct 1999	Gloucestershire	140	28	28
Sheep	Jan 2002	Monmouthshire	130	22	19
Sheep	Oct 2004	Worcestershire	700	55	55
Goat	Jan 2005	Scotland	Not reported	1	1
Sheep	March 2005	Herefordshire	40	8	6
Sheep	Sept 2005	Gloucestershire	55	12	9
Sheep	Dec 2005	Lancashire	230	97	80
Sheep	March 2006	Gloucestershire	30	22	20
Sheep	June 2006	Cheshire	45 <sup>b</sup>	27	21
Sheep	July 2006	South Yorkshire	100 <sup>b</sup>	4	3
Sheep	Dec 2006	Herefordshire	217 <sup>b</sup>	38	22
Sheep	Jan 2007	Lancashire	50 <sup>b</sup>	20	6
Sheep	Jan 2007	South West Scotland	300 <sup>b</sup>	100	100

Compiled from data provided by the Veterinary Laboratories Agency (VLA), the Scottish Agricultural College (SAC) and the Department of Agriculture and Rural Development, Northern Ireland (DARDNI). Data for number of animals affected include numbers that died.  
<sup>a</sup>Figures may be based on interim investigation data. <sup>b</sup>These figures refer to the affected group size, which may be epidemiologically different from the flock size.

**Table 2: Comparison of the number of outbreaks of suspected botulism in cattle, sheep and goats reported in England and Wales (2000-2006).**

Year	Cattle	Sheep	Goats
2000	5	0	0
2001	3	0	0
2002	5	1	0
2003	20	0	0
2004	20	1	0
2005	15	4	0
2006	30	4	0

Data Provided by VLA

## Toxin types

11. Seven serotypes (A-G) of botulinum toxin are recognised, of which types A, B and E are most commonly associated with human disease (Cherinton, 1998). The main botulinum toxin types reported to affect sheep are C and D. In an investigation of two outbreaks botulism in sheep in South Africa, type C and type D toxins were detected in the feed and intestinal contents of sheep from the first outbreak and type D toxin was found in intestinal contents of sheep from the second (Van der Lugt et al, 1995). An outbreak associated with the feeding of poultry litter in South

Africa was attributed to toxin type C (Van der Lugt et al, 1996). Botulinum toxin type C was considered the most likely cause of an outbreak in sheep in the Mojave Desert (California, USA) in 1995 following the detection of this toxin type in haemolysed blood by mouse bioassay and immunological analysis (Swift et al, 2000). VLA has conducted toxin testing for three outbreaks of suspected botulism in sheep. Toxin type D was detected in a gut contents sample from one of the outbreaks, although toxin testing of gut contents for the other two outbreaks was negative (VLA, personal communication). Little information on the susceptibility of sheep and goats to toxin types A, B or E is available.

**Members are invited to:**

- Provide their views on the foodborne risk to human health linked to botulism or suspected botulism in sheep and goats.
- Consider whether there should continue to be a requirement to restrict milk or meat from healthy sheep and goats from farms where there have been suspected cases of botulism.

To enable a full discussion of the issues, the Committee may wish to reconvene the *ad hoc* group to consider this issue further.

**Secretariat  
March 2007**

## References

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