

Chemical Food Safety

QUARTERLY REPORT

NO. 35

POTENTIAL FOOD SAFETY INCIDENTS JULY TO SEPTEMBER 2011

FSI No	Date	Regional Lab	Species	Confirmed Toxin (suspected toxin)	Source
2011-073	11-07-11	Preston	cattle	Lead	Batteries
2011-074	12-07-11	Winchester	Cattle	Lead	Battery
2011-075	12-07-11	Luddington	Cattle	Ipomoea batatas	Mouldy sweet potatoes
2011-076	12-07-11	Carmarthen	Sheep	Copper	
2011-077	25-07-11	Thirsk	Cattle	Lead	Oil
2011-078	02-08-11	Thirsk	Cattle	Botulinum	Poultry litter
2011-079	03-08-11	Sutton Bonington	Cattle	Botulinum	Poultry litter
2011-080	28-07-11	Winchester	Cattle	Ionophore	Pheasant feed
2011-081	03-08-11	Luddington	Cattle	Lead	Paint
2011-082	11-08-11	Thirsk	Cattle	Botulinum	Poultry litter
2011-083	19-08-11	Sutton Bonington	Cattle	Botulinum	Poultry litter
2011-084	19-08-11	Shrewsbury	Cattle	Lead	Battery
2011-085	30-08-11	Penrith	Cattle	Lead	Paint/putty
2011-086	13-09-11	Shrewsbury	Cattle	Botulinum	Poultry litter
2011-087	13-09-11	Shrewsbury	Cattle	Lead	Battery
2011-088	19-09-11	Thirsk	Pigs	Lead	Unknown
2011-089	15-09-11	Langford	Cattle	Lead	Lead flashing
2011-090	16-09-11	Luddington	Avian	Lead	Lead shot
2011-091	21-09-11	Shrewsbury	Cattle	Botulinum	Poultry litter
2011-092	30-09-11	Thirsk	Cattle	Lead hydrocarbons &	Used engine oil

2011-093	22-09-11	Thirsk	Cattle	Botulinum	Forage
2011-094	27-09-11	Shrewsbury	Cattle	Botulinum	Poultry litter
2011-095	26-09-11	Sutton Bonington	Cattle	Lead	Battery

HIGHLIGHTS

YEAR quarter / INCIDENTS	2010	2011
Lead	20	12
Botulism	1	8
Other	2	3

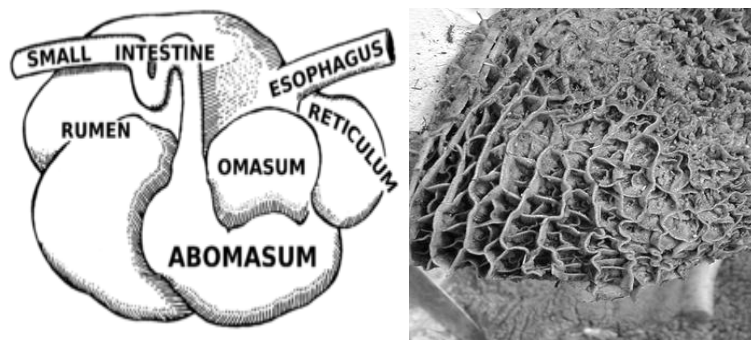
It is likely that a difference in weather conditions between 2010 and 2011 was the underlying factor influencing the number and type of incidents investigated this quarter. There was a distinct North-South divide in rainfall. Towards the south, the dry summer and early autumn conditions enabled farmers to harvest and plough relatively early and because poultry litter is often moved and used at this time, this is likely to have increased the number of botulism cases occurring. However it is worthy of note that the most devastating botulism incident was not associated with poultry litter use and probably occurred due to an ensiled carcass (see FSI 2011-093).

LEAD INCIDENTS

An incident is recorded where the kidney or liver lead concentrations exceed 0.5 parts per million (ppm) wet weight (WW), muscle lead concentration exceeds 0.1 ppm WW, milk lead concentration exceeds 0.02 ppm or blood lead concentration exceeds 0.48 µmol/l.

Risk management of lead incidents usually involves the farmer observing a 16 week withdrawal on exposed stock, once exposure (externally and internally) to the source of lead has been fully removed, to allow lead residues to decline. If battery parts, metallic lead or a lot of soil is eaten small fragments which have high lead concentrations may become trapped within the mucosal folds of the reticulum or rumen and remain there for very long periods releasing low levels of lead. In these cases further blood monitoring beyond 16 weeks is usually required in order to determine what further risk management measures may be required at slaughter.

The diagram below shows the complex structure of the ruminant fore stomachs and the photograph shows the folds within the mucosa of the reticulum which can entrap particulate lead.



AHVLA advises that background blood lead concentrations should be expected to be < 0.2 µmol/l.

Lead source	Nos of cases where tissue lead exceeds regulatory limits	Actual poisoning cases*	Animal species
Battery	5	5	5 cattle
Paint	2	2	2 cattle
Other	5	2 cattle; 1 avian	3 cattle; 1 pig; 1 avian
Geochemical	0	0	

* Most incidents occur following animal disease outbreaks ie are actual poisoning incidents. However, occasionally as a result of laboratory testing, we come across high blood or tissue lead levels that are not high enough to cause clinical signs but which are still important in terms of food residues and food safety. These are also taken as incidents.

Lead incidents in cattle

FSI 2011-073

Lead toxicity was diagnosed in a group of 15 five to seven month old beef calves. Two calves presented with clinical signs which included hypersalivation and nervous disease. Both were treated with and responded to calcium edetate. A calf had been found dead one month earlier but the cause of death of this calf was not investigated. The blood lead concentrations of the two clinical cases were 9.36 & 2.91 $\mu\text{mol/l}$. Cattle were immediately moved out of the field. The source of lead was found to be two broken lead acid batteries. A cohort of the group was blood sampled and results indicated widespread exposure of the group to lead. The results were 3.45, 2.99, 1.39, 0.84, 1.69, 0.13, 1.91 and 0.29 $\mu\text{mol/l}$.

FSI 2011-074

Lead toxicity was diagnosed in a group of 40 suckler cows with young calves at foot grazing approximately 1000 acres of conservation heath land (ex Ministry of Defence land). Two cows were found dead over a week and one carcass was submitted for post mortem. A kidney lead concentration of 1549.0 $\mu\text{mol/kg DM}$ was obtained at analysis, equivalent to 76.0 mg/kg WM. Scant small metallic fragments were observed in the omasum & reticulum. The source of lead is expected to be a lead acid battery. The cattle have been moved and the farmer has said that he will not use the site again.

FSI 2011-077

Lead toxicity was diagnosed in a group of 15 fattening cattle. Two animals presented with clinical signs consistent with lead poisoning. Blood lead concentrations were 3.84 & 6.62 $\mu\text{mol/l}$. The source of lead was engine oil from a can left accessible to the cattle. This has since been removed from the field. The two affected cattle are recovering.

FSI 2011-081

Lead toxicity was diagnosed in a yearling beef store from a group of 20. The blood lead concentration was 3.17 $\mu\text{mol/l}$. The source of lead was suspected to be flaking paint from an old painted cattle crush to which the group had access. There was also a painted gate in the field. The cattle crush and gate have been removed. The affected heifer recovered.

FSI 2011-084

Lead toxicity was diagnosed in a dried off dairy cow (a cow which is close to calving and is no longer being milked), one of a group of 20. The cow was euthanased. The group was due to calve down at intervals when the milk would enter the food chain. The blood lead concentration of the clinical case was 5.20 $\mu\text{mol/l}$. The source of lead was a discarded cracked lead acid battery which was in the field and which has now been properly disposed of. AHVLA advised that the soil surrounding the battery is also removed. None of the rest of the group showed clinical signs of lead toxicity and blood lead concentrations obtained from a cohort were all below background level helping to support the fact that the rest of the group had not been exposed to the battery.

FSI 2011-085

Lead toxicity was diagnosed as the cause of sudden death of 2 one-month old dairy cross bred calves in a group of 4. The 2 other calves were unaffected. The kidney lead concentrations were 2787 and 840 $\mu\text{mol/kg DM}$, equivalent to 111 & 39 mg/kg WW. The liver lead concentrations were 2872 & 154 $\mu\text{mol/kg DM}$, equivalent to 165 & 9.5 mg/kg WW. The source of lead was suspected to be paint or putty from building works that were taking place within the calf housing. AHVLA have advised that the calves are removed from the building until the work is completed and all potential sources of lead removed.

FSI 2011-087

Lead toxicity was diagnosed in an eight-week-old suckler calf. The calf presented blind and incoordinated and later died. The blood lead concentration was 9.59 $\mu\text{mol/l}$. Two other young calves had died over the previous month but these deaths were not investigated. The rest of the group of 30, comprising 6 suckler cows, their calves and 18 store cattle were unaffected. The source of lead was discovered to be an old broken lead acid battery.

FSI 2011-089

A raised kidney and liver lead concentration was detected following post mortem of a fifteen-month-old bullock which died of black leg caused by infection with *Clostridium chauvoei*. Four animals were found dead one morning in a group of 28 beef cattle ranging in age between 15 and 22 months. The kidney lead concentration was 45.4 $\mu\text{mol/kg DM}$, equivalent to 1.38 mg/kg WW and the liver lead concentration 22.2 $\mu\text{mol/kg DM}$, equivalent to 1.82 mg/kg WW. The source of lead was suspected to be lead flashing which had come loose from a building and which showed signs of having been mouthed by cattle. The group of cattle was moved and there were no further clinical problems. Blood samples were immediately taken from the rest of the group of 24 cattle and the results were all $<0.08 \mu\text{mol/l}$ confirming that they had not been exposed.

FSI 2011-092

Lead poisoning was diagnosed in a three month old beef suckler calf which died after a short clinical malaise from a suckler herd of 52 cattle comprising cows and calves. Two calves were affected and died. The second calf was submitted for post mortem. Gross and histological examination showed profound liver pathology consistent with exposure to hydrocarbons. The kidney lead analysis was 587 $\mu\text{mol/kg DM}$ equivalent to 29ppm WM. The source of lead was confirmed as a used oil filter which had been placed in a bucket which later filled with rain water and from which the calves drank.

FSI 2011-095

Lead poisoning was diagnosed in a three month old beef suckler calf which died after a short clinical malaise in a group of cattle comprising 20 cows and 18 calves. The kidney lead analysis was 2046 $\mu\text{mol/kg DM}$ equivalent to 528ppm WM. Two other calves showed typical clinical signs of nervous disease. Blood lead concentrations were 4.49 & 4.79 $\mu\text{mol/l}$ respectively. The source of lead was confirmed as a split car battery.

Lead incidents in pigs

FSI 2011-088

Raised liver lead concentrations were detected in 3 twenty-five week old finishing pigs. The pigs were presented for post mortem because of hind limb paresis. The liver lead concentrations were 21.9, 10.6 & 13.4 $\mu\text{mol/kg DM}$, equivalent to 1.17, 0.55 & 0.69 mg/kg. The cause of hind limb paresis is being investigated further but expected to be a nutritional imbalance. Lead toxicity was not the cause of the clinical signs observed. The pigs were housed on slats and on liquid feed (includes beetroot tops, potato mash and soya) with added minerals. The suspicion is that some of the clinical signs may have been due to calcium deficiency and there would appear to have been some response to subcutaneous treatment with calcium and also to additional calcium added to the food. The farm had also recently changed to a borehole water supply. The source of lead is uncertain. The supplementary calcium, borehole water and origin of the beetroot were investigated and ruled out as potential sources. Interestingly the kidney lead concentrations were unremarkable

which suggested that lead exposure was not current and had occurred much earlier in the pigs' lives, probably at the farm of origin. Further investigations are on going.

Lead incidents in poultry

FSI 2011-090

A visit was carried out to establish the likely risks posed to the food chain and duck health and welfare by a clay pigeon shoot close to a duck rearing establishment and duck shoot. The enterprise comprises 1200 nineteen-week old ducks in three groups of approximately 400 birds, each with its own pond. Clinical disease was occurring in approximately 3-5% ducks from one pond. Ducks presented with weight loss and were off their legs and at post mortem numerous lead shots were observed in the gizzards. Analysis was undertaken on a typical case and the liver lead concentration was 2382 µmol/kg DM, equivalent to 112ppm WM and kidney lead 970 µmol/kg DM equivalent to 52ppm WM. The clay pigeon shoot is sited approximately 150m away from the affected pond. The clay pigeon shoot was set up this summer to be used twice a week during the closed season. It was estimated that approximately 12kg lead shot had been used. In addition to the duck shoots, 3000 pheasants are also reared and released in the woods surrounding the ponds. Further monitoring was carried out on healthy ducks and pheasants and muscle meat and the majority of offal tested was found to be acceptable in terms of lead residues. AHVLA advised that ducks reared at the affected pond would not be suitable to shoot for human consumption. Longer term, AHVLA advised that birds are not reared in the vicinity of the clay pigeon shoot. We also advised that the maize being grown as ground cover be ploughed back and not harvested as it would be contaminated with lead shot. Lead shot becomes trapped within the cobs and leaf structure.

BOTULISM INCIDENTS

In botulism incidents produce from cattle and sheep showing clinical signs should not enter the food chain.

FSI	Nos. Affected	Species	Type & age	Direct/indirect exposure
2011-078	5/27	Cattle	Beef fatteners	Indirect
2011-079	6/45	Cattle	Beef fatteners	Direct
2011-082	4/30	Cattle	Beef heifers	Probably indirect
2011-083	4/110	Cattle	Dairy cows	Probably indirect
2011-086	9/139	Cattle	Beef fatteners	Direct
2011-091	10/19	Cattle	Dairy heifers	Indirect
2011-093	90/360	Cattle	Dairy cows	Direct
2011-094	4/13	Cattle	Beef fatteners	Direct

FSI 2011-078

A diagnosis of suspected botulism was made in a group of 27 beef fatteners. In total 5 beasts, ranging in age from 10 months to 20 months, were affected. The source of botulism was suspected to be associated with broiler litter spread onto neighbouring fields. Broiler carcasses were seen in the litter and Trading Standards were contacted due to the breach in the Animal By Products regulations.

FSI 2011-079

A diagnosis of suspected botulism was reached in a group of 45 fifteen to eighteen month old beef fatteners. In total 6 animals were affected. Two died, two recumbent animals were euthanased, and two recovered. The source of botulism was suspected to be associated with broiler litter moved into the grazing field prior to moving it onto arable land. All clinical cases occurred 3 days after the litter was placed.

FSI 2011-082

A diagnosis of suspected botulism was made in a group of 30 cows and calves. In total 4 animals were affected with typical clinical signs of ataxia, recumbency, dyspnoea and death. The carcass of a 19-month old fattening heifer was submitted for post mortem examination. The exact source of botulism was uncertain. The carcasses of 5 brown hens were found in the cattle field. There was a small back yard flock of 30 birds adjacent to the field which is suspected to be where the brown hen carcasses originated from. There was also a 40,000 bird broiler unit within 300 metres and poultry litter from these houses had recently been spread on nearby arable land. The cattle were moved and there were no further cases.

FSI 2011-083

A diagnosis of suspected botulism was made in a group of 110 high yielding milking dairy cows. Over a three day period 4 animals were affected with typical clinical signs of ataxia and recumbency and 2 deaths. There is a broiler unit on site which was cleaned out and the litter stacked adjacent to the cattle housing. The litter was immediately moved and disposed of.

FSI 2011-086

A diagnosis of suspected botulism was made in a group of 139 beef cattle ranging in age from 5 to 19 months. Most were Friesian bullocks of 5 to 6 months of age. Nine cattle were affected, with typical clinical signs, over a period of 10 days. Four died. The cause of botulism was suspected to be linked to 70 tons of broiler litter spread onto 40 acres of grass land, including the field that the cattle were moved onto, the day before the first case occurred. Cattle were moved off the poultry litter treated fields.

FSI 2011-091

A diagnosis of suspected botulism was made in a group of 19 dairy heifer replacements ranging in age from 20 to 24 months. Ten cattle were affected, with typical clinical signs. All either died or were euthanased. The cause of botulism was suspected to be linked to broiler litter, from broiler houses on the same farm, which was spread onto stubble fields in early September and was due to be ploughed into arable land later in the autumn. The remaining heifers were vaccinated and moved away from the poultry litter treated fields.

FSI 2011-093

A diagnosis of suspected botulism has made in a 400 cow dairy herd. The affected cattle were from the high yielding group. The milking heifers and dry cow groups were unaffected. This was a devastating incident and in total over 100 cattle were affected and euthanased, with typical clinical signs, over a 10 day period. 3 carcasses were submitted for post mortem examination. Due to the distribution of clinical cases the cause of botulism was suspected to be linked to a carcass in the grass silage clamp. The silage face was changed and remediated as a precaution. The whole herd were vaccinated at the onset of the incident as a precautionary measure since the source of botulism could not be confirmed.

FSI 2011-094

A diagnosis of suspected botulism was reached in a group of thirteen dairy bred bullocks ranging in age between six and fourteen months. Four animals were affected. The source was suspected to be broiler litter which was purchased and spread onto grazing land 2-3 weeks before the cattle group were moved onto the land.

COPPER TOXICITY INCIDENTS

FSA/AHVLA incident trigger is when the liver copper concentration exceeds 500 mg/kg WW

FSI 2011-076

Copper toxicity was diagnosed in 300 breeding Lleyn ewes. One carcass was examined on farm by the private vet. A liver copper concentration of 35413.0 $\mu\text{mol/kg DM}$ was obtained at analysis, equivalent to 595 mg/kg WM. There was no obvious single high source of copper used. Severe concurrent liver fluke may have affected copper biliary excretory mechanisms. Ewes were treated

for liver fluke. Since the fluke treatment had a 56 day withdrawal period no further restrictions were required.

OTHER INCIDENTS

Mouldy sweet potatoes FSI 2011-075

Ipomoea batatas toxicity associated with feeding mouldy sweet potatoes was diagnosed following post mortem in a group of 20 suckler cattle of mixed ages. All cattle on the unit were fed mixed fruit and vegetable waste as a supplementary feed but only the one affected group of cattle received sweet potatoes. The remaining sweet potatoes were ploughed into arable land. A voluntary 28 day standstill was agreed on all cattle in the affected group.

Lasalocid sodium FSI 2011-080

A milking herd of 110 dairy cows gained access to and consumed 75kg of medicated pheasant feed. The feed contained a premix of Lasalocid sodium at an inclusion rate of 120mg/kg. It was not possible to establish how much any individual cow consumed. The dairy company was contacted and considered that a seven day withdrawal be applied to the milk. This would address the issues of ingestion of an unlicensed product by the cows. It was also considered that it would be appropriate that none of the cows be presented for slaughter for 28 days.

PLANT RELATED INCIDENTS

Ragwort toxicity

Ragwort toxicity was diagnosed by histopathology following post mortem of a beef fattener. There were 6 deaths in a group of 40 following clinical signs of wasting and scour. The history was that following a neighbour's complaint about high levels of ragwort the farmer had cut the ragwort but left it on his fields. The cattle then ate the dried ragwort since dry ragwort is palatable whereas growing ragwort is not. Ragwort contains high levels of pyrrolizidine alkaloids which are hepatotoxic.

Likely hemlock toxicity causing congenital limb defects in piglets

A gilt (an immature sow) from a smallholding farrowed 13 piglets, six of which had multiple severe congenital limb contracture/arthrogryposis and were euthanased. The seven others were less severely affected. This gilt was kept in an uncultivated field during pregnancy. A field walk confirmed the presence of hemlock (*Conium maculatum*). This grows in damp places and open woodlands throughout Britain. The stems are smooth with characteristic purple- red blotches and the fleshy white tap root resembles a parsnip. AHVLA has previously recorded hemlock poisoning in pigs in the Langford area (Barlow, 2006, Pig Journal, volume 57, 254-258). The control of hemlock is by cutting or digging up and disposing of the plants safely; alternatively a glyphosate-based herbicide can be used.

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