Animal & Plant Health Agency

Asiantaeth Iechyd Anifeiliaid a Phlanhigion

Chemical Food Safety

QUARTERLY REPORT **NO. 51**

POTENTIAL FOOD SAFETY INCIDENTS JULY TO SEPTEMBER 2015

FSI No	Date	APHA Regional Lab or external post mortem provider	Species	Confirmed Toxin (suspected toxin)	Source
2015-033	03-07-15	Starcross	Avian	Lead	Lead shot
2015-034	03-07-15	Bury St Edmunds	Avian	Difenacoum	Rodenticide
2015-035	06-07-15	Thirsk	Cattle	Botulinum	Poultry litter
2015-036	07-07-15	Thirsk	Cattle	Lead	Geochemical
2015-037	20-07-15	Penrith	Cattle	Lead	Battery
2015-038	24-07-15	Bury St Edmunds	Cattle	Lead	Pig shelters
2015-039	04-08-15	External provider North	Cattle	Lead	Geochemical
2015-040	11-08-15	Starcross	Sheep	Copper	Total feed
2015-041 Wales	17-08-15	Carmarthen	Cattle	Bracken	Growing plant
2015-042	02-09-15	Bury St Edmunds	Avian	Lead	Lead shot
2015-043	02-09-15	Starcross	Sheep	Copper	Total feed
2015-044	10-09-15	Shrewsbury	Cattle	Lead	Battery
2015-045	10-09-15	Penrith	Cattle	Arsenic (Lead & cadmium)	? Geochemical
2015-046	23-09-15	Bury St Edmunds	Sheep	Nitroxynil	Overdose of flukicide
2015-047	21-09-15	Local authority	Cattle	Imizol	Medicine's record compliance failure
2015-048	29-09-15	Carmarthen	Sheep	Copper	Total feed

KEY: Incidents in Wales highlighted in grey.

HIGHLIGHTS

Lead incidents continue to occur this quarter whilst cattle are outdoors and grazing. Arsenic poisoning was one of the more unusual incidents and has involved a cross government response on trying to establish the exact source of arsenic. It seems that because there were also residues of cadmium and lead detected in cattle liver and kidney tissues that a geochemical source seems likely and the area involved was once mined for coal. The investigation is on-going.

Year (3rd quarter)	Total FSIs (E & W)	Total FSIs Wales	Lead (E & W)	Total lead Wales	Botulism (E & W)	Total botulinum Wales
2015	16	2	7	0	1	0
2014	16	2	9	2	2	0
2013	21	2	9	1	9	0
2012	19	3	12	2	5	0
2011	22	1	11	0	8	0

The table indicates that the number of incidents identified in England and Wales in this third quarter of 2015 appears consistent with 2014 but down a little from before this. However the variation appears to mostly depend on the number of botulism outbreaks reported which in turn is influenced by weather conditions and the timing of the arable harvest.

LEAD INCIDENTS

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

(ppm equates to mg/kg)

Most incidents arise from cases that are submitted to APHA following animal disease outbreaks. APHA receives clinical samples or carcases for investigation enabling confirmation of lead poisoning. However, occasionally as a result of laboratory testing, we come across high blood or tissue lead levels that, although not high enough to cause clinical signs of poisoning, are still important in terms of food residues and food safety.

Risk management measures of lead incidents involves:-

1) Removal of animals from the source of lead
2) The implementation of a sixteen week voluntary withdrawal
3) Further blood sampling for blood lead analysis. To be used as a biomarker of internal (carcase) lead residues.

Should the animals be close to or at finishing weight, the following parameters are then followed:-

- < 0.15 µmol/l; no further restrictions required.

- 0.15 µmol/l to 0.48 µmol/l; provide food chain information to the abattoir and ensure offal is discarded.
- > 0.48 µmol/l; provide food chain information to the abattoir and ensure offal is discarded and make an additional assessment risk assessment as to whether carcase meat requires testing prior to carcase release.
- >1.00 µmol/l; provide food chain information to the abattoir and ensure offal is discarded and carcase meat requires testing for lead residues prior to carcase release. Ideally a further withdrawal period should be observed.

Lead incidents in cattle

FSI 2015-036
Lead poisoning was diagnosed in three two- to three-month old suckler-calves from a group of eighty suckler-cows and calves. Two calves were found dead and one calf went blind and exhibited nervous signs. Post mortem examination of one calf was unremarkable except for the observation of a lot of sandy grit within the rumen and abomasum. The kidney lead concentration was analysed at 93.00 mg/kg WM. The source of lead was considered likely to be geochemical with exposure occurring after heavy rain. There is an old mine slag heap in the vicinity of where the cattle were grazing. Following the incident the group was immediately moved away from this contaminated grazing. The farmer has been reminded of his responsibility to protect the food chain. The affected area will be fenced off and not used as grazing. The farmer agreed to observe a voluntary sixteen week withdrawal on all cattle in the group after which APHA advised the farmer to blood sample a cohort of cows and calves to assess the extent of subclinical exposure and determine what further risk management might be required for the recovered calf and those which did not show clinical signs.

FSI 2015-037
Lead poisoning was diagnosed in a two-month old suckler-calf from a group of thirty-one suckler-cows and calves. Two calves died following nervous signs with excitability. A kidney lead concentration from one calf carcase was 543.0 µmol/kg DM, equivalent to 20.3 mg/kg WM. The source of lead was later found to be a discarded caravan battery. This was removed and disposed of safely. Top soil from around where the battery had been recovered was also removed and buried. The farmer has been reminded of his responsibility to protect the food chain. The farmer has agreed to observe a voluntary sixteen week withdrawal on all cattle in the group after which APHA advised the farmer to blood sample a cohort of cows and calves to assess the extent of subclinical exposure and determine what further risk management may be required. The cattle involved in this incident were part of a pedigree herd and most calves intended to be sold for breeding purposes with some heifers used as replacements.

FSI 2015-038
Lead poisoning was diagnosed in a five- to six-month old calf from a group of fourty calves from a calf rearing unit. In total twelve calves died either being found dead or following a short period of malaise with nervous signs. A blood lead concentration from one calf was 6.03 µmol/l. The source of lead was thought to be associated with several pig shelters that were in the field and which the calves had been chewing. Following removal of the pig shelters no further deaths occurred. The farmer was reminded of his responsibility to protect the food chain. The farmer agreed to observe a voluntary sixteen week withdrawal on all calves in the group after which he was advised to blood sample a cohort of calves to assess the extent of subclinical exposure and determine what further risk management may be required. Since the exact source of lead on the pig shelters remained undetermined it is still unclear as to whether material will reside in the rumen and reticulum of the calves for a long period. Only if and when

blood lead concentrations fall below 0.15 µmol/l will no further risk management measures be necessary.

FSI 2015-039
Lead poisoning was diagnosed in a group of twenty-five two-year old dairy heifer replacements which were soon to calve. Three heifers died and one was recovering following treatment with sodium calcium edetate. Two of the three heifers were found dead and the other two affected heifers initially presented with clinical nervous signs. Blood lead concentrations were 6.07 and 4.83µmol/l. The source of lead was thought to be geochemical as there is an area of exposed soil and stone which the heifers were seen to be eating. There are alleged to be historic lead workings in the vicinity and the farm had noted previous problems with lead poisoning associated with a geochemical point source in 1999 and in 2014. No other sources of lead were found in the field. The heifers were immediately removed from this field. The farmer was reminded of his responsibility to protect the food chain. Further fencing will be used to prevent further exposure occurring if the field is ever to be reused. The farmer agreed to observe a voluntary sixteen week withdrawal on the group and was advised that should any heifers calve within this period that their blood lead status be assessed prior to milk entering the bulk tank milk. Subsequently, the blood samples taken still indicated widespread exposure of this heifer group and so a decision was made to collect pooled milk from these freshly calved heifers and analyse this prior to any milk entering the bulk tank. This pooled analysis confirmed that heifer milk was still compliant and so following discussion with the dairy heifer milk was added to the bulk tank and bulk tank milk tested and found to be compliant. Although this group of heifers were not intended to enter the food chain for meat, were any to require casualty slaughter, food chain information should state that offal requires removal and in addition, for the recovered clinical case, that muscle meat could require testing prior to carcase release.

FSI 2015-044
Lead poisoning has been diagnosed in two six-month old beef calves/bullocks. There were no other cattle in the exposed group. One calf/bullock was found dead and the other presented with neurological signs and is now recovering. The blood lead concentration was 5.4µmol/l. The source of lead was a broken lead acid battery which has since been removed from the field and disposed of. The farmer was reminded of his duty to protect the food chain. The recovering affected calf/bullock will be blood sampled after a sixteen week restriction and the blood lead concentration will determine what further risk management advice is required.

Lead incidents in birds

FSI 2015-033
A raised kidney lead concentration was identified in a two-month old goose being reared for the Christmas market. The goose was one of a group of thirty. No others were showing clinical signs. The kidney lead concentration was 19.4 µmol/kg DM, equivalent to 0.8 mg/kg WM. The goose initially presented with weakness in one leg which progressed to both legs and drooping wings. (It is possible that exposure to lead is contributing to the severity of clinical signs). The source of lead was suspected to be lead shot on the ground of the arboretum where the birds were first placed and kept for two weeks. Several shot gun cartridges were found in this area. The geese have since been moved and are now ranging on sheep pastures during the day and are housed at night in a calf shed. APHA advised that additional calcium is made available. The farmer was reminded of his responsibility to protect the food chain. The farmer agreed to observe a voluntary sixteen week withdrawal on the remaining geese in the group after which he has been advised to blood sample a small cohort to assess the extent of subclinical lead exposure and determine what further risk management may be needed.

FSI 2015-042

A raised blood lead concentration was detected in a laying hen from a small holding with ten hens. The blood lead concentration was 0.64µmol/l. The hen had initially presented with nervous signs but recovered without receiving any treatment. It was therefore uncertain as to whether the raised blood lead level was coincidental and not the cause of the clinical signs. Two other birds were also reported to have recently died and Marek's disease was suspected in one of these hens. The source of lead was considered to be associated with lead shot gun pellets in the environment that the hens were ranging in. APHA, via the private veterinary surgeon, has given advice to the owner about lead toxicity, predisposing factors and food safety. The hens will be removed from the source of lead and further hens' blood tested to establish whether this was a one off or representative of the flock. Dietary calcium will be increased to help to prevent further absorption of lead. The owner was reminded of her duty to protect the food chain. She was advised not to eat or sell any eggs until the lead concentrations of the eggs was established to be acceptable.

BOTULISM INCIDENTS

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

FSI	Nos. Affected	Species	Type & age	Source of exposure
2015-035	Four different holdings affected	Cattle	Adults and growing beef and grown dairy heifers	Indirect exposure to broiler litter

FSI 2015-035

An outbreak of suspected botulism was diagnosed on several farms. Farms 1,2 and 3 were in close proximity to a broiler unit and farm 4 received some of the poultry litter from the same broiler unit . The litter was stored, waiting to be spread onto arable land, on adjacent fields, to where the affected groups of cattle were grazing. Only low numbers of cattle from each of the farms involved were affected. Affected cattle presented with typical clinical signs and flaccid paralysis and were euthanased. Intestinal content was positive for *Clostridium botulinum* organism on both the affected bullock from farm 2 and the cow from farm 3. The bulling heifer from farm 1 was not tested although post mortem examination was unremarkable and no differential diagnoses were considered likely. Farm 4 had had previous cases of botulism on the farm and on this premises the adult cows are vaccinated against botulism but the young stock not. More comprehensive vaccination will now be undertaken. The farmers have been reminded of their responsibility to protect the food chain. APHA have given advice about the risks of spreading broiler litter and also advised that no clinically affected cattle should enter the food chain and that there should be imposed a restriction of eighteen days following cessation of clinical signs prior to cattle being presented for sale or slaughter. No broiler carcases were detected in the litter and so there was no breach of the Animal by product Regulations.

COPPER POISONING

FSA/APHA incident trigger is when the liver copper concentration exceeds 500 mg/kg WM.

Especially in sheep, chronic copper poisoning can also occur when liver concentrations of copper are well below this incident trigger value. The same food safety advice is still provided. The APHA normal reference range for liver copper

concentrations in sheep is 300 to 8000 µmol/kg DM, equivalent to approximately 5 to 125 mg/kg WM.

FSI 2015-040
Copper poisoning was diagnosed in a group of seventy adult Texel-cross breeding ewes and rams. Nineteen adult sheep died over the last two months with five post mortems carried out by the private veterinary surgeon. Carcases were observed to be jaundiced consistent with copper toxicity. The liver copper concentration from a ram was 45993 µmol/kg DM, equivalent to 699 mg/kg WM; the liver copper concentration from a ewe was 28443 µmol/kg DM, equivalent to 441 mg/kg WM. Ewes and rams were fed 18% premium ewe nuts until the end of May 2015. Lambs were on a separate creep feed. All the adult sheep were in very good condition suggesting that overfeeding may have had a role in the aetiology of the condition. The withdrawal of hard feed in June may have also resulted in fat mobilisation from liver predisposing to chronic copper poisoning. APHA gave the farmer advice about copper toxicity and its predisposing factors. The ewes and rams were not intended for slaughter at the current time. The farmer agreed to maintain a lower plane of nutrition in this group to allow liver copper concentrations to decline. The adult sheep had effectively already undergone a two month withdrawal period following cessation of ewe nut concentrates. None of the lambs were affected. The farmer has been reminded of his duty to protect the food chain. The farmer is a butcher by trade with the lambs slaughtered and sold as home reared lamb at the farmer's shop.

FSI 2015-043
Copper poisoning was diagnosed in one ram from a group of three eighteen-month old pedigree rams. The affected ram died soon after returning from a sale at which it failed to sell. The liver copper concentration from the ram was 32681 µmol/kg DM, equivalent to 507 mg/kg WM. The rams involved were intended for breeding and were on a high plane of nutrition with concentrates. It is suspected that this predisposed the rams to copper loading in the liver and then that the stress of the journey to the sale precipitated chronic copper poisoning and a haemolytic crisis. The concentrate ration per se was not suspected to be at fault. APHA gave the farmer advice about copper toxicity and predisposing factors. The other two rams were not intended for slaughter at the current time. The farmer agreed to maintain a lower plane of nutrition to allow liver copper concentrations to decline. None of the other sheep on the farm were affected. The farmer was reminded of his duty to protect the food chain.

FSI 2015-048
Copper poisoning was diagnosed in an eighteen-month old ram intended for breeding. The ram died following a malaise with inappetance and lethargy lasting three days. The other rams in the group appear unaffected. The ram was one of a group of four that had been on the show circuit all summer. The group were housed and on a high plane of nutrition. The liver copper concentration was 591 mg /kg WM and the kidney concentration 18 mg/kg WM. APHA gave advice to the farmer and PVS on copper poisoning in sheep and warned that stress might potentially precipitate copper poisoning in the other rams if they too were copper loaded. APHA advised that the plane of nutrition to the other three rams is reduced and that they observe a minimum of a two week withdrawal period to allow liver copper concentrations to reduce. Also, although the rams were not intended for the food chain if they were sold in the next few months that they should be sold with food chain information ensuring that liver is removed and discarded.

OTHER INCIDENTS

FSI 2015-034
Suspected rodenticide poisoning was confirmed by post mortem examination of two birds. Some small blue grains were observed in the crop of one bird. There were also multiple

haemorrhages and an overt abdominal haemorrhage in one bird carcase. The birds were submitted as part of a wildlife investigation as part of the project that monitors the misuse or abuse of agrochemicals, by Natural England. The history was that seventeen chickens had died over the last few months since February 2015. The chickens were free ranging and had also roamed onto land owned by neighbouring farmers. The latter were thought to keep old-fashioned rat boxes outside their property using split grain difenacoum 0.005% and 0.001% denatonium benzoate. Natural England investigated the incident and toxicological analyses were carried out at Fera, York. The eggs are eaten by the family and close friends but the bird carcases are not eaten at any time. The owners were advised not to consume or sell the eggs or meat from the birds. They have been told that further advice will be provided once the investigation has been progressed and analyses completed.

FSI 2015-045

Arsenic poisoning was diagnosed in a group of six to eight-year old suckler-cows grazing an area of moorland on the North Pennine Moors. The cows formed part of a small suckler-herd of thirty-five animals comprising cows and calves. The source of contamination was suspected to be associated with the installation of wind turbines in the vicinity possibly due to soil disturbance and exposure to a geochemical point source associated with the region having previously being mined. Five adult cows died over a four week period with the first three cows being found dead one morning. Three further animals were found recumbent the following morning and one died the same day, one two weeks later and the third recovered. There have been no recent cases. The cows presented with ataxia followed by recumbency and there were tremors. There was no response to treatment with calcium and magnesium. Post mortem signs included congested lungs and one cow had pneumonia. The abomasal mucosa was oedematous and intestinal content watery. Histopathology confirmed a moderate multifocal tubular nephropathy and a mild hepatocellular vacuolar change, moderate chronic fibrosing portal hepatitis and multifocal perivascular haemorrhages in the superficial cortex of the brain. The kidney arsenic concentration from one cow was 1182µmol/kg DM, equivalent to 12.9 mg/kg WM and the liver arsenic concentration from the other cow was 242µmol/kg DM, equivalent to 4.7 mg/kg WM. These concentrations, along with the clinical history, pathology and histopathology were deemed sufficient to suspect acute arsenic toxicity. Tissues from the two cows analysed also had raised lead and cadmium concentrations consistent with undesirable residues and supporting a geochemical exposure but not considered to be of clinical significance; kidney cadmium 117 µmol/kg DM, equivalent to approximately 3.3 mg/kg WM; liver lead 16.8 µmol/kg DM, equivalent to 0.9 mg/kg WM. The farmer was reminded of his duty to protect the food chain. The farmer was advised to observe an indefinite voluntary restriction whilst the investigation takes place. APHA comment that since arsenic is excreted, providing that all cattle are removed from the source of arsenic then levels should fully subside after a withdrawal period of approximately twelve weeks. To account for the lead and cadmium residues, any adult (>2 years) breeding cows slaughtered in the future should be accompanied by food chain information and an offal ban. Calves should be blood sampled for lead to assess whether they have been exposed and subsequent risk management determined on the basis of blood results.

FSI 2015-046

Fifty five-month old ewe lambs were overdosed with approximately four times the recommended dose of Trodax 34% (Merial Animal Health; active ingredient nitroxynil) and this was administered intramuscularly and not subcutaneously as recommended in the data sheet. Four lambs died and four others became lethargic. Post mortem examination confirmed pulmonary oedema and muscle necrosis at the site of injection. The lambs were not intended for the food chain as they are ewe lamb replacements. The usual withdrawal period for the veterinary drug is forty-nine days for meat. Risk management advice followed discussions with both the FSA and the Veterinary Medicines Directorate. The farmer and PVS were

advised that under the circumstances of misuse a withdrawal period of one year should be observed.

FSI 2015-047
This potential food safety incident, (which was eventually shown to be due to mistaken identity), was triggered following a medicine's record compliance check and involved a cow having been sent for slaughter before the end of a stated withdrawal period. The animal had been treated by injection of the product Imizol (MSD Animal Health; active ingredient imidocarb 85 mg/ml as imidocarb dipropionate 121.15 mg/ml) having been diagnosed with 'Red water fever' a disease caused by *Babesia divergens*, a blood borne protozoa. The correct withdrawal period for this product is 213 days. A full investigation was carried out during which the abattoir confirmed that the wrong animal identification had been recorded, a mistake put down to human error. The treated animal had not been slaughtered and was still present on the farm.

PLANT-RELATED INCIDENTS
In general, except for ragwort and bracken fern, plant toxicity incidents are not considered to pose a significant risk to the food chain.

FSI 2105-041
Bracken fern poisoning was diagnosed in a group of twenty-six fifteen-month old beef and dairy heifer replacements. The group was turned out onto a boggy field in early July 2015 which contained gorse, bracken, rushes and plenty of lush wet grass. After two weeks in this area three animals died. The group was moved and treated for worms and fluke but a further three animals died in the second week of August. Post mortem examination confirmed subcutaneous oedema, failure of blood to clot and multiple haemorrhages throughout the carcase. Three further affected animals were blood sampled and haematology confirmed low platelet counts and low white blood cell counts consistent with exposure to bracken. APHA gave the farmer advice on bracken fern poisoning and also pointed out the risk management recommendations to ensure food safety.

- Bracken contains some genotoxic or possibly genotoxic substances including ptaquiloside, kaempferol and shikimic acid. Ptaquiloside from bracken ingested by food producing animals (eg dairy cows) can transfer into muscle and offal and be passed into milk that might be consumed by humans.
- The level of human exposure to these substances should be kept as low as is reasonably practicable.
- Available data on ptaquiloside residues suggests a withdrawal period of at least 4 days for milk and 15 days for edible tissues.
- Reference: COT statement on the risk to consumers of eating foods derived from animals that have eaten bracken (2008).

From the animal health perspective, it is possible for animals to graze in fields containing bracken if they don't eat it. However certain conditions seem to be associated with an increased likelihood of bracken ingestion. These include a lack of grass and, if the pasture is too lush and wet, a lack of ingested fibre. The latter was thought to be the main risk factor in this incident.

Yew poisoning
Three cows died after eating yew cuttings dumped in a Conwy farmer's field.
http://www.bbc.co.uk/news/uk-wales-north-west-wales-33664279