POTENTIAL FOOD SAFETY INCIDENTS APRIL TO JUNE 2016

<table>
<thead>
<tr>
<th>FSI No</th>
<th>Date</th>
<th>APHA VIC or post mortem provider</th>
<th>Species</th>
<th>Confirmed Toxin (suspected toxin)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-009</td>
<td>19-04-16</td>
<td>Carmarthen</td>
<td>Cattle</td>
<td>Lead</td>
<td>Mortar</td>
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<tr>
<td>2016-010</td>
<td>19-04-16</td>
<td>External provider</td>
<td>Sheep</td>
<td>Lead</td>
<td>Geochemical</td>
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<tr>
<td>2016-011</td>
<td>10-05-16</td>
<td>Shrewsbury</td>
<td>Cattle</td>
<td>Lead</td>
<td>Not established</td>
</tr>
<tr>
<td>2016-012</td>
<td>12-05-16</td>
<td>External provider/Bury St Edmunds</td>
<td>Cattle</td>
<td>Lead</td>
<td>Batteries</td>
</tr>
<tr>
<td>2016-013</td>
<td>26-05-16</td>
<td>Penrith</td>
<td>Cattle</td>
<td>Lead</td>
<td>Battery</td>
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<tr>
<td>2016-014</td>
<td>03-06-16</td>
<td>Penrith</td>
<td>Cattle</td>
<td>Lead</td>
<td>Bonfire site</td>
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<td>2016-015</td>
<td>10-06-16</td>
<td>Bury St Edmunds</td>
<td>Pigs</td>
<td>Coal tar</td>
<td>Clay pigeons</td>
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<tr>
<td>2016-016</td>
<td>10-06-16</td>
<td>Starcross</td>
<td>Cattle</td>
<td>Lead</td>
<td>Paint</td>
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<tr>
<td>2016-017</td>
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<td>Carmarthen</td>
<td>Cattle</td>
<td>Lead</td>
<td>Battery</td>
</tr>
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<td>2016-018</td>
<td>17-06-16</td>
<td>Shrewsbury</td>
<td>Cattle</td>
<td>Lead</td>
<td>Geochemical</td>
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<td>2016-019</td>
<td>22-06-16</td>
<td>External provider</td>
<td>Cattle</td>
<td>Lead</td>
<td>Metallic</td>
</tr>
<tr>
<td>2016-020</td>
<td>22-06-16</td>
<td>External provider/Penrith</td>
<td>Cattle</td>
<td>Lead</td>
<td>Metallic</td>
</tr>
<tr>
<td>2016-021</td>
<td>28-06-16</td>
<td>Penrith</td>
<td>Cattle</td>
<td>Lead</td>
<td>Building materials</td>
</tr>
</tbody>
</table>

KEY: Incidents in Wales highlighted in grey.

HIGHLIGHTS

Lead poisoning dominated the incidents during this quarter which is not unusual and tends to occur when livestock are turned out to graze. Sources of lead appeared equally divided between point sources such as lead acid batteries and dumped waste materials and geochemical exposure enhanced by the previous wet winter and flooding.
The table indicates that the total number of incidents identified in this second quarter of 2016 is approximately 50% lower than the previous four years. Incident reports from Wales seem to be more consistent over the last four years. It is encouraging that some reports continue to be received from external post mortem providers and other private veterinary surgeons; however awareness needs to be maintained and improved. APHA have been invited to give presentations in this area at the British Cattle Veterinary Association and also at the London Vet Show. Please get in touch with a member of the Chemical Food Safety Team (contact details below) if you think we could contribute to any future education programmes.

Part of the down-turn in England can be attributed to the fact that there were no botulism incidents recorded. Botulism incidents generally occur when broiler poultry litter is stacked and spread on agricultural land as a fertiliser. The timing of when this occurs reflects the time of harvest, the climate which in turn influences vehicular access to fields, grass growth and the exact time that stock are turned out. Decreased incident numbers could also reflect a rise in general awareness of the risks of botulism associated with broiler litter and possibly also industry changes in disposal methods eg the increasing use of broiler litter in anaerobic digesters.

**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 0.1 ppm WM, milk lead concentration exceeds 0.02 ppm or blood lead concentration exceeds 0.48 µmol/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 for lead incidents involve:-

1) Removal of animals from the source of lead;
2) The implementation of a sixteen week voluntary withdrawal; Should emergency slaughter of any of the clinically unaffected cattle in the exposed group be required during the restriction period then the animal should be accompanied by food chain information stating that offal should be discarded.
3) Further blood sampling for blood lead analysis. This is 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 (FCI) to the abattoir and ensure offal is discarded.

<table>
<thead>
<tr>
<th>Year (2nd quarter)</th>
<th>Total FSIs (E &amp; W)</th>
<th>Total FSIs Wales</th>
<th>Lead (E &amp; W)</th>
<th>Total lead Wales</th>
<th>Botulism (E &amp; W)</th>
<th>Total botulinum Wales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>13</td>
<td>4</td>
<td>12</td>
<td>4</td>
<td>0</td>
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<tr>
<td>2015</td>
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<td>5</td>
<td>17</td>
<td>3</td>
<td>4</td>
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<td>2014</td>
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<td>4</td>
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<td>3</td>
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<td>5</td>
<td>15</td>
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<tr>
<td>2012</td>
<td>27</td>
<td>11</td>
<td>22</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Milk will be permitted to enter the bulk tank provided the blood lead concentration is less than 0.48 µmol/l. However if there are high numbers of cattle in this category then a risk assessment should be carried out first and bulk tank milk may need to be monitored.

> 0.48 µmol/l: provide food chain information to the abattoir, ensure offal is discarded and make an additional risk assessment as to whether carcase meat requires testing prior to carcase release.

> 1.21 µmol/l: Clinical toxicity is likely. Ideally a further withdrawal period should be observed. Provide food chain information to the abattoir, ensure offal is discarded and carcase meat requires testing for lead residues prior to carcase release.

### Lead incidents in cattle

**FSI 2016-009**

Lead poisoning was diagnosed in a three-week old calf from a group of four beef suckler cows and calves. The kidney lead concentration was 1611 µmol/kg DM, equivalent to 73.2 mg/kg WM. The source of lead was mortar present in the building that the cattle were in. The lead exposed group of cattle were moved and placed under a voluntary sixteen-week restriction after which the remaining seven cows and calves will be blood sampled to establish what further risk management measures might be required.

**FSI 2016-011**

A raised kidney lead concentration was detected in a two-month old calf from a group of eighteen beef suckler cows, each with calves, kept at grass. The kidney lead concentration was 17.1 µmol/kg DM, equivalent to 0.62 mg/kg WM. The cause of death was not established despite a post mortem being carried out. Neither was the source of lead determined despite the farmer searching the field on several occasions. The farmer reported that here was an old creep feeder with painted legs that was purchased in the 1990’s but there was no evidence that the calves had been chewing the legs and the paint was intact. APHA considered that the source might be geochemical as a result of the heavy rain over the winter, however this farm is in general not considered to be in a geochemical lead area. The group of thirty-five cattle was placed under a voluntary sixteen-week restriction after which a cohort of cows and calves will be blood sampled to establish what further risk management measures are required. No cattle are due to be moved off the farm until October 2016.

**FSI 2016-012**

Lead poisoning was diagnosed in an approximately three-month old calf which was seen to be blind and died the following day. The kidney lead concentration was 495 µmol/kg DM, equivalent to 26 mg/kg WM. Three other young calves, aged between six weeks and three months, also died without clinical signs being observed over a two month period but these deaths were not investigated. The calves were part of a group of suckler cows and calves. There was no reported ill health in the suckler cows. The source of lead was thought to be associated with three old lead acid batteries which were situated under the bottom barrier of the cattle crush within an area of the yard solely used for handling cattle. Two batteries were intact and one was damaged with the plates exposed. The time of exposure was thought likely to have occurred when the cattle were tuberculosis tested and run through the crush. The suckler cows and calves were congregated for the test over a lunch break and left unsupervised for several hours with access to the crush and it is likely that this additional standing time allowed the calves’ access to the broken battery. Some fat cattle were also run through this yard at the TB test. However this was quick and supervised and there was no evidence of exposure to lead in this group with no signs of ill health and no deaths. APHA advised the farmer to place the suckler cows and calves (total of approximately 200) under a sixteen-week withdrawal after which a cohort of cows and calves will be blood tested for lead to establish whether further risk management measures are required. The batteries have since been correctly disposed of with a copy of the disposal note copied to APHA.

**FSI 2016-013**

Lead poisoning was diagnosed in a two-month old calf which was seen to be listless and blind and died twelve hours later. The kidney lead concentration was 3092 µmol/kg DM, equivalent to 142
mg/kg WM. One other young calf died the previous day. The calves were part of a group of forty-two others (21 suckler cows, 19 calves and 2 bullocks). There was no ill health in the rest of the group. The source of lead was confirmed to be a lead acid battery. The battery was removed and disposed of. APHA advised the farmer to place the rest of the group under a sixteen-week withdrawal after which a cohort of cows, calves and bullocks will be blood tested for lead to establish whether further risk management measures are required.

FSI 2016-014

Lead poisoning was diagnosed in a three-month old calf which was found dead. The liver lead concentration was 148 µmol/kg DM, equivalent to 7.5 mg/kg WM. One other calf also died three days earlier and a third presented with clinical nervous signs which improved after treatment with vitamin B12 and magnesium. The calves were part of a group of eleven made up of six adult cows, four calves and a bull. The group was moved and there were no further cases. The source of lead was suspected to be lead rich soil and ash within an old bonfire site within the field that the cattle were grazing. The site will be remediated and cattle access to the site prevented. APHA advised the farmer to place the rest of the group under a sixteen-week withdrawal after which the rest of the group should be blood tested for lead to establish whether further risk management measures are required.

FSI 2016-016

Lead poisoning was diagnosed in a four-month old calf which was found dead. The kidney lead concentration was 588 µmol/kg DM, equivalent to 27.1 mg/kg WM. One other calf died three days earlier. The calves were part of a group of sixty-nine cattle; forty adult cows and twenty-nine calves. The group was moved and there were no further cases. The source of lead was suspected to be flaking paint on parts of the field shelter. There was good evidence that the calves had congregated in this area and licked at the paint. The cattle were immediately removed from the area and the field shelter will be remediated prior to cattle moving back. Analysis of the paint confirmed that this was the source. APHA advised the farmer to place the rest of the group under a sixteen-week withdrawal after which the rest of the group should be blood tested for lead to establish whether further risk management measures are required.

FSI 2016-017

Lead poisoning was confirmed as the cause of death of a two-month old calf from a group of fifteen beef suckler cows each with calves that were kept at grass. The blood lead concentration of a live clinically affected calf was 4.45 µmol/l. One other calf had been found dead five days prior to this but the cause of death was not investigated. A further death occurred after the diagnosis was made but before a source of lead was discovered and this calf was submitted for post mortem examination. The source of lead was later confirmed as a lead acid battery which had been used to power an electric fence. This has since been removed and disposed of. The group of twenty-seven cattle have been placed under a voluntary sixteen-week restriction after which a cohort of cows and calves will be blood sampled to establish what further risk management measures are required.

FSI 2016-018

Lead poisoning was confirmed as the cause of death of a yearling beef fattener calf from a group of twenty. The blood lead concentration of a clinically affected calf was 4.09 µmol/l. All cases occurred over a twelve day period after which the group were moved off the field. The first clinical case was found dead and not examined. Two further cases then occurred with cattle presenting with clinical nervous signs prior to death 24 hours later. The fourth case also presented with clinical nervous signs and was euthanized. The source of lead was considered likely to be geochemical as the area is a former lead mining area. Wet weather caused an underground stream to erupt in the field exposing soil and silt. The group of cattle was placed under a voluntary sixteen-week restriction after which a cohort of cattle will be blood sampled to establish what further risk management measures are required. No cattle in this group are due to be moved off the holding before the autumn. In the autumn they are intended to be sold to another farm for finishing.

FSI 2016-019

Lead poisoning has been diagnosed in two twelve-month old beef fattener cattle. Both initially presented with clinical nervous signs and one died. The blood lead concentrations were 7.73 and
1.41 μmol/l. The cattle were part of a group of twenty-nine cattle aged between twelve and eighteen months. The group was moved and there were no further cases. The source of lead was considered to be lead fittings on a telegraph pole in the field. There was evidence that the cattle had congregated in this area and that the fittings had been chewed and broken. Access to the telegraph pole has since been prevented. There was no evidence of any other possible source of lead. APHA advised the farmer to place the rest of the group under a sixteen-week withdrawal after which a cohort of the group which did not show clinical signs and the recovered animal should be blood tested for lead to establish whether further risk management measures are required. The farmer intends to eventually sell the animals from this group for finishing elsewhere.

**FSI 2016-020**

Lead poisoning was diagnosed in a two-month old beef calf which was found dead. This was the second affected calf; the first calf presented with malaise and was blind. The dead calf was submitted for post mortem examination. The kidney lead concentration was 1278 μmol/kg DM, equivalent to 54 mg/kg WM. The cattle were part of a group of twenty-five cattle comprising twelve cows, twelve calves and one bull. None of the adult cattle were affected. The group was moved and there were no further cases. The source of lead was found to be lead flashing from roofing material which had been left in the field. The material was moved and safely disposed of. APHA advised the farmer to place the rest of the group under a sixteen-week withdrawal after which a cohort of the group which did not show clinical signs and the recovered animal should be blood tested for lead to establish whether further risk management measures are required.

**FSI 2016-021**

Lead poisoning was diagnosed in a two-year old dairy heifer replacement which presented with nervous signs and appeared blind. The blood lead concentration was 6.79μmol/l. The heifer was part of a group of twenty dairy replacement heifers. The source of lead was identified as building material around the edges of the field and to which the heifers had access. The heifers were immediately moved and the material disposed of. APHA advised the farmer to place the rest of the group under a sixteen-week withdrawal after which a cohort of the group which did not show clinical signs and the recovered animal should be blood tested for lead to establish whether further risk management measures are required. As dairy replacements, the heifers are not intended to be slaughtered into the food chain and were in early pregnancy and not close to milk production.

**Lead incidents in sheep**

**FSI 2016-010**

Lead poisoning was diagnosed in a one-month old Dartmoor lamb. This was the third lamb to be affected with similar clinical signs including abdominal pain, diarrhoea, malaise, anaemia and ataxia. In addition, two lambs were born with brachygnathia (pug like) and nervous signs and died soon after birth. The lambs were part of a flock of ewes with 159 lambs. The blood lead concentration of the lamb submitted for post mortem was 4.99 μmol/l. Marked renal pathology was also noted consistent with lead poisoning. The source of lead was considered most likely to be geochemical with soil ingestion by lambs being the route of exposure. There were apparently a lot of molehills in the field that they were grazing and lambs were seen to play around the mole hills and nibble at the soil. APHA advised that efforts were made to reduce soil exposure to the sheep, ideally in the first instance by moving them to better pastures. Field management such as flattening molehills, mole control programmes and reseeding bare patches help to ensure a good sward of grass is present thereby reducing soil ingestion. Alternatively consideration could be given to keep the field for hay making only; hay is less likely to be contaminated with soil than silage. APHA advised the farmer to place the flock under a sixteen-week withdrawal after which a cohort of ewes and lambs should be blood tested for lead to establish what further risk management measures are required.

**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 cattle and sheep is 300 to 8000 µmol/kg DM, equivalent to approximately 5 to 125 mg/kg WM.

There was one reported case of copper poisoning in a twelve-month old beef fattening bullock. The liver copper concentration was 20993 µmol/kg DM (reference range 300-8000 µmol/kg DM), equivalent to 397 mg/kg WM. The kidney copper concentration was 1355 µmol/kg DM (reference range 125-650 µmol/kg DM), equivalent to 17 mg/kg; thus confirming copper toxicity. The animal was a dairy-cross beef finisher on high level of concentrates. APHA advised the farmer to review cattle nutrition especially with regard to the total level of copper being fed. Further monitoring of liver copper concentrations was also advised to help to establish the extent of the problem.

OTHER INCIDENTS

FSI 2016-015
Coal tar pitch poisoning associated with eating historic shooting clay pigeons was diagnosed in a group of seven-week old replacement gilts. Two gilts were found dead having appeared previously to be well from a group of forty. Two to three weeks earlier two other gilts died from another similar group but these deaths were not investigated. The groups investigated were part of a large weaner-producer unit. Carcases of two gilts were submitted for post mortem examination. Findings included a consistent hepatopathy with liver rupture and haemorrhage. The histopathology was consistent with either vitamin E deficiency or toxicity such as coal tar pitch poisoning or a combination of both. The private vet reported that the pigs were exposed to fragments of shooting clays in their environment. The site had historically been used for clay pigeon shooting. Ingestion of old shooting clays is known to be able to cause the clinical signs observed due to their coal tar pitch content; modern clays do not contain pitch. APHA advised the private veterinary surgeon and farmer to remove the pigs from the source of poisoning and to instigate some further monitoring of the pigs to assess their vitamin E status. In this incident the gilts were not intended to be presented to the food chain for at least the next two years. APHA advised the farmer to place any potentially exposed pigs under a twenty-eight day withdrawal following removal from the source of clay pigeons.

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.

Exposure to Elder (Sambucus nigra)
A diagnosis of Clostridium perfringens type D enterotoxaemia was reached following post mortem examination of a goat carcase. The submitted goat was one of a group of three animals mostly housed for management reasons and occasionally let out to grazing. The carcase submitted was from an animal that had developed smooth green diarrhoea two days prior to submission with a short terminal malaise and drop in appetite. One other goat in this group, a heavily pregnant nanny goat, also developed diarrhoea. The only recent management change was that elder tree clippings were fed to the group 24 hours prior to the onset of diarrhoea. It is possible that this change in diet caused the diarrhoea and precipitated the growth of Clostridium perfringens type D and since the goats were not vaccinated against clostridial disease, they succumbed to enterotoxaemia.