Animal & Plant Health Agency

Asiantaeth Iechyd Anifeiliaid a Phlanhigion

# Chemical Food Safety

**QUARTERLY REPORT NO. 55**

## POTENTIAL FOOD SAFETY INCIDENTS JULY TO SEPTEMBER 2016

| FSI No | Date | APHA VIC or contracted post mortem provider (ppp) | Species | Confirmed Toxin (suspected toxin) | Source |
|---|---|---|---|---|---|
| **2016-022** | 06-07-16 | External ppp | Cattle | Lead | Paint |
| **2016-023** | 06-07-16 | Bury St Edmunds | Cattle | Lead | Battery |
| **2016-024** | 29-07-16 | Thirsk | Cattle | Hepatotoxin | ? algal toxins in water |
| **2016-025** | 01-08-16 | Thirsk | Avian | Lead | Geochemical or lead shot |
| **2016-026** | 08-08-16 | Thirsk | Sheep | Ionophore, fishmeal, antibiotic | Partridge feed |
| **2016-027** | 09-08-16 | Carmarthen | Cattle | Ionophore, fishmeal, anthelmintic | Pheasant feed |
| **2016-028** | 17-08-16 | Carmarthen | Cattle | Bracken | Grazing |
| **2016-029** | 19-08-16 | Bury | Avian | Lead | Environmental/waste |
| **2016-030** | 16-09-16 | Carmarthen | Cattle | Lead | Not established |
| **2016-031** | 27-09-16 | External private veterinary surgeon | Sheep | Diazinon | Oral administration of a sheep dip product |

**KEY:** Incidents in Wales highlighted in grey**.**

**HIGHLIGHTS**

Unusually there were two incidents which involved access of ruminants to game bird feed. Initially, in both incidents, it was considered that animal deaths might be related to ionophore toxicity; this suspicion was not confirmed in either incident. The clinical signs of ionophore toxicity in ruminants include sudden death, diarrhoea, respiratory signs and recumbency, and pathological findings include focal cardiomyopathy, skeletal muscle necrosis and pulmonary oedema.

However there were concurrent issues relating to the exposure of ruminants to fish meal and to a medicated feed not intended for that species. An information note was prepared for use in various media.

Two incidents in quick succession have highlighted risks to ruminants from gamebird feed. One incident involved medicated partridge feed being fed on moorland being co-grazed by sheep; the second involved medicated pheasant feed to which beef cows and calves had access. Unintended exposure to medicated feed is bad practice and unacceptable for many environmental and animal related reasons. These include:-

- *Clinical disease and death due to unregulated access to grain based feed. This could potentially cause grain overload and clostridial disease.*
- *Clinical disease and death due to unregulated access to feed medicated with lasalocid causing ionophore toxicity.*
- *Unintended exposure of ruminants to medications in feed which were not intended to be fed to ruminants. This requires a prolonged withdrawal period to be set and observed.*
- *Exposure of ruminants to gamebird feed which contains fish protein and as such breaches the Animal by-Products Regulations.*
- *Failure to follow guidance recommendations for the use of medicated feed including those associated with antimicrobial resistance.*

| Year (3rd quarter) | Total FSIs (E & W) | Total FSIs Wales | Lead (E & W) | Total lead Wales | Botulism (E & W) | Total botulinum Wales |
|---|---|---|---|---|---|---|
| 2016 | 10 | 3 | 5 | 1 | 0 | 0 |
| 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 |

Continuing the trend from the last quarter the table indicates that the total number of incidents in England identified this third quarter of 2016 is lower than previous years. Incident reports from Wales appear consistent over the last four years.

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.

**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 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.
- 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 into the food chain.
- >1.21 µmol/l: Clinical toxicity is likely. Ideally a further withdrawal period should be observed. If slaughter is essential then provide FCI to the abattoir ensuring offal is discarded and that carcase meat tested for lead residues prior to carcase release into the food chain.

**Lead incidents in cattle**

**FSI 2016-022**
Lead poisoning was confirmed as the cause of death of an eighteen-month old beef fattener store from an original group of 100 cattle consisting of 68 stores of varying ages and 32 in-calf heifers. A total of four similarly aged cattle died over a few days following short lived nervous signs which included blindness and ataxia. Deaths occurred over two days during a TB test. The kidney lead concentration from a dead fattener which was submitted to Aberystwyth for post mortem examination was 606.5 µmol/kg DM, equivalent to 28 mg/kg WM. Flakes of green paint were observed in the rumen at post mortem along with various other debris including rusty metal and rubber electrical wire casing. The source of lead was considered to be the paint. Exposure was thought to have occurred when some of the cattle escaped into a paint balling site where some old painted boards were present. The paint from the paint balls was no implicated. The cattle had access to this area for a few hours. The remaining group of cattle was placed under a voluntary 16 week restriction after which APHA advised that a cohort of cattle be blood sampled to establish whether any further risk management measures are required.

**FSI 2016-023**
Lead poisoning was diagnosed in a three to four-month old beef calf which presented with nervous signs and appeared blind. The blood lead concentration was 4.41µmol/l. A total of three calves died and two other calves presented with clinical nervous signs. The calves were part of a group of 57 comprising cows and calves. The source of lead was identified as a lead acid battery which had fallen off the back of a trailer during fencing work and cracked open. The group was immediately moved and the battery correctly disposed of and the surrounding top soil removed. APHA advised the farmer to place the rest of the group under a 16 week withdrawal after which a cohort of the

group (to include both cows and calves) which did not show clinical signs and the two recovered calves be blood tested for lead to establish whether further risk management measures are required.

**FSI 2016-030**
Lead poisoning was diagnosed in a four-month old suckler calf from a group of fifteen calves. The calf initially presented with nervous signs and later died. The carcase was submitted for post mortem. Lead poisoning was confirmed by kidney lead analysis with a lead concentration of 384 µmol/kg dry matter, equivalent to 20.9 mg/kg wet weight. The source of lead remains undetermined. To prevent further exposure cattle have been moved out of the field which they were grazing at the time. The farmer will continue to look for the source of lead. APHA advised the farmer to place the rest of the group under a 16 week withdrawal after which a cohort of the group (to include both cows and calves) should be blood tested for lead to establish whether further risk management measures are required.

**Lead incidents in birds**

**FSI 2016-025**
Lead poisoning was diagnosed in a dead goose on a small holding farm. The pooled tissue sample of brain and gizzard muscle (the usual tissues were not available to test) contained a lead concentration of 240.9 µmol/kg DM, equivalent to 9.19 mg/kg WM. The goose was one of three used to produce eggs for home consumption. The source of lead was uncertain but it was thought likely to be associated with environmental lead either from lead shot or from natural geochemical sources. APHA advised the owner not to eat or sell the eggs or slaughter the geese for meat unless they establish that the other birds had not been exposed. In addition, the following advice was given to the owner:-

- Try to locate the source of the lead and prevent exposure.
- If the source of lead is environmental and cannot be satisfactorily removed, the eggs from these geese, or any other birds on site, should not be collected for human consumption unless the eggs are proven to be safe to eat. Whole egg analysis for lead residue is recommended.
- If the source of lead is environmental and cannot be satisfactorily removed, the geese, or any other birds on site, should not be slaughtered for human consumption unless the carcase is proven to be safe to eat. To establish this, blood testing birds prior to slaughter is recommended with blood lead concentrations of <0.15µmol/l confirming normal background levels. Carcase meat testing could also be carried out but would not be economic.

**FSI 2016-029**
Exposure to lead was confirmed in a dead duck which was one of twenty ducks, kept as pets. Kidney tissue contained a lead concentration of 0.58 mg/kg WM. A blood sample taken from another duck was analysed for lead and found to contain 1.24µmol/l. The clinical history was that four ducks had presented with green diarrhoea over a two week period. Two of the ducks were examined post mortem by the private veterinary surgeon. Post mortem revealed egg peritonitis. The most likely cause of disease and death was considered to be duck viral enteritis. Ten geese on the premises appeared clinically unaffected. The source of lead was uncertain but several old car batteries and car parts were reported to have been buried in the ground by the previous occupants of the property. Eggs from the birds are eaten by householders but none sold or supplied to third parties. APHA advised the owner not to eat or sell the eggs or slaughter the ducks or geese for meat unless they established that the other birds were not exposed to lead. The following advice was given to the owner:-

- Try to locate all sources of the lead and prevent the birds from gaining access. Discard any old batteries at an official waste site.
- If the source of lead can be removed, birds should observe a 16 week withdrawal period to allow lead to be excreted.
- If the source of lead cannot be satisfactorily removed, the eggs from any birds on the premises should not be collected for human consumption unless the eggs are proven to be safe to eat. Whole egg analysis for lead residue is recommended.

- Birds on site should not be slaughtered for human consumption unless the carcase is proven to be safe to eat. To establish this, blood testing of the birds prior to slaughter is recommended with blood lead concentrations of <0.15µmol/l confirming normal background levels. Carcase meat testing could also be carried out but would not be economic.

**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.**

No incidents reported meeting these criteria.

**OTHER INCIDENTS**

**FSI 2016-024**
Malaise, anorexia, haemorrhage and a biochemistry profile indicative of acute hepatopathy was diagnosed in a single dry dairy cow triggering an investigation into the likely cause of liver disease and the source of potential toxic agents. The field was at the site of a former quarry. The hepatotoxic source was eventually suspected to be related to the animal accidentally gaining access to stagnant surface water with exposure to algal toxins considered the most likely; a suspicion supported by several concurrent algal toxin environmental alerts at the time. There was no evidence of lead exposure. APHA advised the farmer to place the cow and the rest of the group under a 28 day withdrawal and to fence off stagnant water. There was some other debris seen at the site but nothing considered significantly hazardous. The farmer was advised to clear up the site and to prevent the cattle from gaining access to any debris.

**FSI 2016-026**
Four sheep, from a group of 70, died on communal moorland grazing over a week. Post mortem examination could not be carried out as the carcases were all extremely autolysed. The cause of death was thought to be related to sheep exposure to medicated partridge feed, that although in covered feeders could still be eaten by the sheep. The partridge feed had been placed on the communal grazing by the game keeper of a partridge shoot. The feed was medicated with lasalocid sodium (Avatec) and chlortetracycline (Aurofac). The differential diagnoses of death relating to ingestion of this feed was considered likely to be due to any of the three scenarios listed:- lasalocid toxicity, grain overload or clostridial enterotoxaemia. Grain overload is the most probable differential diagnosis. The farmer was advised that once the sheep were removed off the moor and away from the medicated partridge feed, a 28 day withdrawal period should be observed to allow chemical residues to deplete. The likely presence of fish meal in the feed triggered an APHA sampling visit under the National Feed Audit to check for proteins of animal origin and breached animal by-product regulations. Advice was given to the owner of the shoot and to the game keeper.

**FSI 2016-027**
One suckler calf died and seven others clinically affected from a group of thirty cows and 25 calves, with calves aged one to four-months. The clinical signs were diarrhoea, pyrexia and respiratory signs. The cause of disease and death was thought to be related to medicated pheasant feed being fed from fields close to a wood and to which the cattle had access. The feed was medicated with lasalocid sodium 120mg and flubendazole 60 mg/kg and also contained fish meal. The main differential diagnosis of the clinical signs was considered to be lasalocid toxicity. The medicated feed (approx. 200kg over an uncertain time period) was placed on fields next to woods on an area to which the cattle had access. The pheasants were part of an 80,000 gamebird shoot on an estate. Following the incident the cattle were prevented access to the feed. The farmer was advised that the group of cattle should observe a 28 day withdrawal period following removal from the medicated pheasant feed to allow chemical residues to deplete.

**FSI 2016-031**
The Veterinary Medicines Residue team at APHA were alerted to an incident where Osmond Gold Fleece Dip 60% w/w diazinon had accidently been orally administered to 20 sheep on a small holding. The product was administered mistakenly instead of an oral worming product. Only one sheep showed clinical nervous signs but recovered. The withdrawal period for the product when correctly used as a sheep dip is 49 days. The small holder sought advice since they wanted to send three sheep for slaughter into the food chain. The incident was reported to the Veterinary Medicines Directorate. After oral administration Diazinon is rapidly metabolized and excreted and since 62 days had elapsed since the sheep were dosed there were considered to be no food safety issues. It is worth noting that most sheep would ingest a small amount of product during the process of dipping when they are fully submerged and also be able to lick it off the fleece post dipping.

## 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 2016-028**
Confirmed exposure to bracken and a histopathological diagnosis of bracken fern poisoning was reached in a group of twenty-five beef fattening cattle. The cattle, all dairy-cross calves, were aged approximately eight months and were potentially exposed to bracken for three months over the summer with five deaths occurring at the end of or shortly after this period. The farmer reported that bracken was present on the grazing land but that the pasture was very lush. APHA experience is that this sometimes predisposes cattle to eat bracken as it serves as a form of roughage. Two carcases were submitted for post mortem examination and multiple hemorrhages were observed. At the time of post mortem, four other calves were reported to be lethargic with blood present at the anus and/or the nose.
The following advice was given which is based on current FSA recommendations following the publication of the COT statement on the risk to consumers of eating foods derived from animals that have eaten bracken (2008) [(1)] :-

- Bracken is sometimes eaten by food-producing animals.
- 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:
1) https://cot.food.gov.uk/sites/default/files/cot/cotstatementbracken200805.pdf

**Chemical Food Safety Team**
Jo Payne
Tel. 01509 672332
jo.payne@apha.gsi.gov.uk

Aidan Dryden
Tel. 01905 763355
aidan.dryden@apha.gsi.gov.uk

Arthur Otter
Tel. 01743 47621
arthur.otter@apha.gsi.gov.uk