Animal &
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Agency

Chemical Food Safety quarterly report

October to December 2021

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APHA is an Executive Agency of the Department for Environment, Food and Rural Affairs and also works on behalf of the Scottish Government, Welsh Government and Food Standards Agency to safeguard animal and plant health for the benefit of people, the environment and the economy.

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Potential food safety incidents October to December 2021

FSI No	Date	APHA VIC or contracted post mortem provider (ppp)	Species	Toxin (reported toxic agent)	Likely source
2021-035	29-10-21	PPP	Cattle	Botulism	Not established. Metabolic disease confirmed
2021-036	26-10-21	Lasswade	Avian	(Suspected poisoning of unknown origin)	Not established. Avian Influenza confirmed
2021-037	09-11-21	Shrewsbury	Sheep	Copper	Bolus use in lambs
2021-038	13-12-21	Carmarthen	Cattle	Bracken	Grazing upland

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

Highlights

Year (4th quarter)	Total FSIs (E & W)	Total FSIs Wales	Lead (E & W)	Total lead Wales	Botulism (E & W)	Total botulism Wales
2021	4	1	0	0	1	0
2020	5	1	1	0	2	0
2019	5	0	1	0	2	0
2018	11	0	3	0	5	0
2017	17	2	5	0	8	1

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, bulk 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:

- Removal of animals from the source of lead.

- The implementation of a sixteen-week voluntary withdrawal from slaughter; 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.

- 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 or producing milk for dairy products, the following risk management guidance parameters should be considered:

- Bulk tank milk requires monitoring if there is evidence of exposure of milking cows to lead. The lead concentration of bulk tank milk must remain below 20 parts per billion. If there is initially uncertainty at the start of an incident then bulk tank milk must be held to allow for testing or milk discarded.

- Blood lead concentrations of < 0.15 µmol/l: no restrictions required.

- Blood lead concentrations of 0.15 µmol/l to 0.48 µmol/l: provide food chain information (FCI) to the abattoir and ensure offal is discarded. Bulk tank milk is likely to remain compliant.

- Blood lead concentrations of > 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.

- Blood lead concentrations of >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 is tested for lead residues prior to carcase release into the food chain.

Lead incidents in cattle

None recorded

Botulism

An incident is usually recorded when more than one animal is affected with clinical signs deemed typical of botulism and with no other explanatory diagnosis following veterinary investigation.

Most incidents arise from cases that are submitted to APHA and post mortem providers for post mortem examination following animal disease outbreaks. Some botulism cases are notified verbally especially when there is an obvious association with the use of broiler litter.

Risk management measures to protect the food chain during botulism incidents is as follows:

- Clinically affected animals should not be presented for slaughter into the food chain and neither should produce from clinically affected animals be used. Recovered clinical cases should not be presented into the food chain for 17 days following recovery.

Botulism incidents

FSI 2021-035

Botulism was considered a differential diagnosis in a dairy herd being fed silage of questionable quality with areas of visible mould. Two recently calved cows presented with lateral recumbency and flaccid paralysis with an inability to swallow and a protruding flaccid tongue. The second affected cow was submitted for postmortem examination following euthanasia. Gross postmortem findings were inconclusive with no conclusive pathology. Metabolic disease due to energy deficit and reduced feed intakes was considered likely and biochemistry confirmed a low serum calcium at 0.64 mmol/l (reference 2-3 mmol/l) and raised GLDH liver enzymes at 173 U/l (reference <25 U/l). However botulism could not be ruled out and intestinal content was tested for botulinum toxins. No toxins or organism were detected, thereby providing no supporting evidence of an outbreak of botulism. APHA provided advice on food safety and on nutritional aspects of silage quality and feed intake. It seems most likely that the clinical signs shown were related to poor nutrition.

Copper incidents

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 approximately 300 to 8000 µmol/kg dry matter (DM), equivalent to approximately 5 to 125 mg/kg WM. Advice given is that copper supplementation is withdrawn from sheep where possible, additional forage fed and that a two week withdrawal period is observed.

FSI 2021-037

Copper toxicity was diagnosed in two 7 to 8-month old lambs from a group of 500. On the same day one was found dead and one found recumbent and euthanised. The two lamb carcases were submitted for postmortem examination. A total of four lambs had died in the preceding month but the cause of death in these was not investigated. When the average lamb weight in the group was assessed to be approximately 20kg the lambs had received a rumen bolus with copper and anthelmintic treatment prior to being turned out onto a stubble aftermath for three weeks. Examination of the two carcases confirmed that the lambs had been in poor condition weighing 20 and 26 kg and there was evidence of diarrhoea and reactive mesenteric lymph nodes consistent with previous endoparasitism. Mucous membranes were jaundiced in one carcase which also had dark kidneys and a pale soft liver. Tissue copper concentrations were as follows:-

Test	Ref Range	Units	1	2
Copper (Kidney)	0-787	µmol/kg DM	1650	1100
Copper (Liver)	314-7850	µmol/kg DM	29600	39200

29600 and 39200 µmol/kg DM are approximately equivalent to 474 and 627 mg/kg WM. It seemed likely that the combination of receiving copper at too light a weight and ill-thrift with fat mobilization from the liver precipitated the haemolytic crisis associated with copper toxicity. Heavier finished lambs (at around 40kg) in the group remained healthy. APHA provided advice on animal health and welfare and food safety reminding the farmer that the stress of gathering and transportation could also trigger a haemolytic crisis in susceptible lambs and carcase rejection due to jaundice at slaughter.

Other incidents

FSI 2021-036

APHA were notified by a private veterinary surgeon (PVS) that pheasants on an estate were suspected by the estate owner and game keeper to have been maliciously poisoned. The PVS carried out some postmortems of dead birds submitting tissues to APHA for laboratory testing. The birds were reported to be in good body condition and displaying no clinical signs but over approximately 72 hours they started dying. The keeper found 30 dead birds in a small area one morning out of 10,000 birds released. The only significant finding on PM are blood clots in the abdomen which appear to be due to liver

haemorrhage. They also all had congested lungs with some further blood clots near the heart. APHA advised the PVS and estate owner as to how to best investigate the suspicion of malicious poisoning and it was reported to the police. Investigation continued via the Wildlife Incident Investigation Scheme (WIIS). The gamekeeper and estate managers agreed not to let meat into the food chain until investigation were completed. As part of the WIIS investigation birds are tested for avian influenza (AI). The results were positive for AI H5NI confirming AI as the most likely cause of death.

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 2021-038

Bracken poisoning was suspected from histopathology to have caused the death of a seven-month-old beef suckler which died and the carcase submitted for post mortem examination. The group of 24 were grazing upland over the summer months with access to bracken until October when they were brought to lower ground closer to farm. The group had been housed for 3 weeks prior to this animal's death. Five other deaths occurred over the summer of which one was investigated with black leg (clostridium chauvoei) diagnosed. The calf group were therefore vaccinated. This calf initially showed malaise, diarrhoea with mucosal casts, mild increased respiratory rate and slight epistaxis prior to death. At postmortem haemorrhages were observed throughout the carcass and necrotic ulceration of the gastrointestinal tract. The liver was enlarged and orange/ bronze in colour and the carcass jaundiced. The blood appeared watery suggestive of anaemia. Histopathology demonstrated a necrotising bacterial infection of the intestine, with systemic spread of bacteria. Bone marrow showed marked suppression of all cell lines. Bone marrow suppression was considered to be the primary pathology and in this age of calf Bracken Fern toxicity was the principal differential. APHA gave advice on animal health and welfare and also gave advice on the current food safety guidance regarding withdrawal periods.

- 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 be passed into milk that might be consumed by humans. No information is available on the mount of ptaquiloside and other possibly genotoxic substances that may be left as residues in other animal-derived foods.
- The level of human exposure to these substances should be kept as low as is reasonably practicable.
- Available data suggests a withdrawal period of at least 4 days for ptaquiloside in milk.
- Further studies are required to be able to specify a withdrawal period prior to slaughter for human consumption of meat and offal.
- Until this is known, a withdrawal period of 15 days should be observed prior to slaughter for human consumption of meat and offal.

Reference: COT statement on the risk to consumers of eating foods derived from animals that have eaten bracken (2008).

Other plant poisonings

Other plant poisoning cases investigated included:-

Euonymus species toxicity was diagnosed as the likely cause of 4 ewe deaths. Affected ewes initially presented with incoordination and tremors. Sprigs were observed in rumen contents. A carcase was not received for full postmortem examination.