



Animal &
Plant Health
Agency

Chemical Food Safety quarterly report **January to March 2022**

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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 January to March 2022

FSI No	Date	APHA VIC or contracted post mortem provider (ppp)	Species	Toxin (reported toxic agent)	Likely source
2022-001	26-01-2022	PPP	Sheep	Copper	Breed susceptibility and plane of nutrition
2022-002	31-01-2022	Starcross	Cattle	Lead	Geochemical
2022-003	01-02-2022	PPP	Cattle	Lead	Geochemical
2022-004	24-02-2022	Thirsk	Pigs	Bracken	Grazing previously unused paddocks
2022-005	21-03-22	PVS	Sheep	Kerosene	Leaking container

Key: Incidents in Wales highlighted in grey.

Highlights

Year (1st quarter)	Total FSIs (E & W)	Total FSIs Wales	Lead (E & W)	Total lead Wales	Botulism (E & W)	Total botulism Wales
2022	5	0	2	0	0	0
2021	5	0	1	0	1	0
2020	6	2	1	1	1	0
2019	9	1	2	1	2	0
2018	7	0	1	0	4	0

Due to the very high prices of diesel, red diesel, and kerosene, some farmers and rural communities are stock piling these fuels. In the incident described below the tup owner had filled various receptacles to stock-up before further price hikes. Unfortunately, one container with kerosene leaked, and it is likely the tup had access to, and drank, this leaked fuel. This acts as a reminder that people may be purchasing and storing red diesel and kerosene in different ways to normal, as it is in short supply in some areas and so it is important to consider how this is being done to prevent accidental livestock exposures.

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 0.48 μ mol/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 carcasses 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 μ mol/l: no restrictions required.
- Blood lead concentrations of 0.15 μ mol/l to 0.48 μ mol/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 $> 0.48 \mu\text{mol/l}$: 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 $>1.21 \mu\text{mol/l}$: 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

FSI 2022-002

A raised kidney lead concentration of 0.7 mg/kg wet weight was obtained at analysis following the postmortem of a seventeen-month-old dairy heifer replacement. Two heifers had been found dead on the same day from a group of 50. There were minimal postmortem findings. There was some evidence of chronic pneumonia but considered unlikely to be the cause of death. Rumen liquor pH was on the low side (pH 5.1). Metabolic disease was suspected as the cause of death (hypomagnesaemia and marginal acidosis) due to low mineral supplementation and poor forage whilst grazing fodder beet. This was the first time that the farm had outwintered heifers on fodder beet. It is suspected that the exposure of lead was associated with increased soil ingestion in an area not too far from the Mendips, an area renowned for high lead in soils. However, soil contamination of silage could not be ruled out. On the advice of APHA, management changes were implemented with better quality and increased silage being offered and mineral supplementation provided. There were no further deaths. The farmer agreed to a 16-week restriction of the group following which blood samples will be taken to assess whether there is evidence of ongoing subclinical exposure. The results of bloods will establish whether further risk management measures are required. The dairy heifers will not start to be milked for another six months and so there was no immediate risk to the food chain. Should there be casualty slaughters required during this time then food chain information would be presented with the recommendation that offal be discarded.

FSI 2022-003

Lead poisoning was suspected to be the cause of neurological signs and death of several cattle in a small herd of 30 suckler cows and calves. The first two cases presented together with neurological signs, chomping, twitching, hypersalivating and behaving abnormally. One was a yearling, the other a recently calved cow being brought in for TB testing. These were housed temporarily and treated with sodium calcium edetate and vitamin B1 and their clinical signs improved. Another cow was found dead in the field and there was evidence of disturbed ground and she had trampled through a fence and a fourth cow presented clinically with tachycardia twitching, convulsions, opisthotonos, hypersalivation prior to death. Bloods samples from the two housed cattle were analysed for lead concentrations with results confirming 3.51 and $3.21 \mu\text{mol Pb/l}$. Marginal magnesium concentrations were also confirmed. The mild nervous signs in three further clinical animals were treated with magnesium with some improvement. All cows were then bolused with magnesium. The farm is in an area known to have had occasional issues with geochemical lead and geochemical lead was suspected to be the source of lead in this outbreak. No other potential source of lead was identified. The farm manages the risks

from lead exposure as suckler calves are moved off the farm when 6-12 months old to a different farm for rearing and finishing over an 18 month period. The farmer agreed to a 16-week restriction of the group following which blood samples will be taken to assess whether there is evidence of ongoing subclinical exposure. The results of bloods will inform whether further risk management measures are required.

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 postmortem 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

No cases

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 $\mu\text{mol/kg}$ 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 2022-001

A very high liver copper concentration consistent with copper toxicity was confirmed in two ewes from a commercial flock of 220 which included ewes, store lambs and finishing lambs. There had been four deaths in total, with two ewe carcasses investigated. One ram

died in December 2021 after a 24-hour malaise and this death was not investigated. In January a Beltex ewe and a store lamb died in similar circumstances. An on farm postmortem of the ewe identified a yellow liver raising the possibility of copper toxicity. Liver was sent for analysis and the copper concentration analysed to be 33,700µmol/kg DM (722mg/kg FT). A second Beltex ewe died a few days later and this was submitted to APHA for postmortem examination. The liver copper concentration was 17,600µmol/kg DM (319mg/kg FT), also confirming a very high exposure to copper. The Beltex ewes were bought onto the farm at the end of the summer 2021 and had been housed since and due to lamb in March 2022. They were being fed a concentrate ration which was sold as a copper free course mix for sheep and hay. There was no evidence of an error in composition. The ewes received an oral dose of minerals with copper at tupping and 3 treatments of closantel, a flukicide. The finishing and finished lambs were also fed the concentrate and remained unaffected. APHA concluded that there was likely no one source of contamination and that copper toxicity likely arose as a result of the earlier supplementation, the plane of nutrition and housed status in a copper sensitive breed.

Other incidents

FSI 2022-005

APHA was notified of a case of kerosene poisoning causing the death of an adult ram. The ram was the only sheep in the field. Whilst not of direct food safety concern on this occasion the cause of the incident was considered of interest, presenting a potential new and emerging hazard. The tup was on his own in a field and presented with non-specific malaise. Bluebell poisoning was initially suspected. He died overnight. On postmortem examination the rumen contained large amounts of an oily yellow substance with a strong smell of kerosene. There was also some lung pathology in the form of cranio-ventral purple consolidation and oedema. There was a large amount of tracheal froth. On further investigation it turned out that in the field where the tup had been, there was an Intermediate Bulk Containers (IBC), used for the safe transportation and storage of liquids, fluids and chemicals, containing heating oil. The farmer had used the cap for another IBC he was using to fill up with red diesel due to its in short supply. The kerosene was therefore able to leak out of this IBC and was ingested by the ram. APHA put out an endemic disease alert and included it as a news item in an edition of the Digest report that is circulated internally and to those working for AHPA under contract.

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 2022-004

Bracken poisoning was suspected from histopathology to have caused the death of a 4-month-old fattening pig. The carcase was submitted for postmortem examination. The pig was one of a group of 5 kept in a paddock with access to bracken. There were 15 pigs in total. The owner was a first time small scale pig keeper, receiving piglets at weaning, for rearing and finishing. The 1st case (unconfirmed) is thought to have occurred in November 2021. This 4-to-5-month-old pig presented with acute ataxia and recumbency and was

euthanised. The 2nd case (also unconfirmed) occurred in a 6-month-old pig in January 2022. The clinical signs were less severe and occurred over 10 days prior to death. This was the 3rd case with the pig initially presenting as lethargic and inappetent prior to death. At postmortem the lungs were seen to be congested and oedematous, with profuse volumes of fluid in the thoracic cavity. Histopathology demonstrated a severe, multifocal, chronic, polyphasic, lymphohistiocytic myocardial necrosis, consistent with bracken poisoning. 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 amount 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

Bluebell toxicity

Bluebell toxicity was suspected in a group of 13 adult ewes turned out into a new paddock for 8 hours. The following day they all developed anorexia, lethargy and diarrhoea with one aborting. One ewe died overnight and at gross findings were suggestive of a toxæmia. The private vet confirmed the presence of numerous bluebell plants against the wire fencing with evidence of the leaves being chewed back. All parts of the bluebell plant contain toxic glycosides that are poisonous to humans, dogs, horses and ruminants. If any part of the plant is eaten, it can cause serious gastrointestinal signs, and if consumed in large quantities, may be fatal. Bluebell sap is also believed to cause dermatitis and skin irritation and the bulbs have been mistaken for spring onions or garlic. All varieties of bluebells contain glycosides, and therefore all varieties are poisonous.