



Animal &  
Plant Health  
Agency

# Chemical Food Safety quarterly report **October to December 2020**

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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 2020

FSI No	Date	APHA VIC or contracted post mortem provider (ppp)	Species	Toxin (reported toxic agent)	Likely source
<b>2020-037</b>	12-10-20	Carmarthen	Cattle	Bracken	Grazing
<b>2020-038</b>	23-10-20	Thirsk	Cattle	Botulinum	Silage
<b>2020-039</b>	02-11-20	Starcross	Cattle	Lead	Waste (putty) in hedgerow
<b>2020-040</b>	16-11-20	Shrewsbury	Cattle	Ragwort	Grazing
<b>2020-041</b>	24-12-20	Penrith	Cattle	Botulinum	Silage clamp

**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
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
2016	9	2	3	0	2	0

# 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 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 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

### FSI 2020-039

APHA were copied into a private laboratory report with a blood lead concentration of 130.6 µg/dl (equivalent to 6.3 µmol/l) and sufficient to confirm a diagnosis of acute lead poisoning. The only affected animal was a yearling beef animal which initially showed neurological signs of ataxia, blindness and became recumbent. The animal was later euthanized. The yearling was one of a group of 15 and no clinical signs were seen in the rest of the group. The source of lead was identified as an ancient, unlabelled tin of what was assumed to be roofers putty lying in the hedgerow and accessible to the cattle. It has since been removed and an additional fence put across to prevent access to any potentially contaminated surrounding ground. APHA have discussed animal health and welfare and food safety issues with the farmer and he agreed, that after a 16 week withdrawal period, to arrange that a cohort of the group be blood sampled and tested for lead to establish whether there was a likelihood of subclinical exposure.

## 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 in cattle

### FSI 2020-038

APHA tentatively diagnosed suspected botulism in an 18-month-old dairy heifer following post mortem examination. This heifer had been found dead without premonitory signs. Laboratory findings were unremarkable and there were no inflammatory/infectious type changes on brain histopathology. A second heifer exhibited progressive weakness/paralysis of the hind legs, then became recumbent and had a flaccid tail and reduced anal tone. She was initially examined by the private vet but later died. The source

of botulism was considered to be silage. A new silage clamp had been recently opened and was being fed to just the replacement heifers. There was no history of using broiler litter as a fertilizer on the silage fields and so the cause was considered likely to be a single small ensiled carcase. Intestinal content is being examined for botulinum toxin and organism. Results will be reported. Initially it was thought that there were a 3 to 4 other cases in a small group of dry cows as the farm was experiencing metabolic issues in the dry cow group in which the clinical signs were similar. However these cows responded to treatment with calcium. Salmonella Dublin was also present in this group of dry cows causing some abortions. APHA gave advice to the farmer and his family on animal health and welfare. Advice on vaccination was also given. APHA advised that affected animals should not be presented to the food chain and should any recover that there is a further 17 day restriction following cessation of clinical signs.

### **FSI 2020-041**

A tentative diagnosis of botulism was made following the post mortem examination of a yearling, dairy heifer. The heifer was submitted for post mortem examination to aid investigation into an issue of acute onset recumbency and death. There were three deaths in a slightly older group of 50 heifers with all deaths occurring over a few days. All four affected heifers were either found dead, or became recumbent and died within 24 hours. No significant gross pathology was noted during two on farm post mortems or that conducted by the APHA. The source of botulism was considered to be associated with the opening up and feeding silage from a clamp. No carcase material was observed but a large proportion of the silage was found to have slipped creating extensive spoilage. Botulinum tests are in progress to try to obtain supporting evidence for the suspected diagnosis of botulism. Following dialogue between the owner and the private veterinary surgeon it was decided that the silage should be disposed of and alternative forage purchased,

## **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 and additional forage fed and that a two week withdrawal period is observed.

Other diagnoses of copper poisoning do get confirmed following post-mortem examination but often do not meet the incident trigger criteria as stated above.

# 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 2020-037

Bracken poisoning was confirmed by histology to have caused the death of a 4.5 year old bull which was grazing enclosed common land with 18 suckler cows and calves. The bull developed signs of malaise followed by a haemorrhagic diarrhoea. He did not respond to supportive treatment and died 5 days later. Post mortem examination showed that the bull died due to a haemorrhagic disease, with haemorrhages throughout the carcass and haemorrhage into the large intestine and considered to be consistent with bracken poisoning. Histopathology showed necrotising inflammation in the lung and a vasculitis, with a lack of neutrophil response. The lack of neutrophil response was assumed to be secondary to the notable suppression of the bone marrow, which particularly affected the megakaryocyte and granulocyte lineages. Differential diagnoses of Bovine Viral Diarrhoea and Malignant Catarrhal Fever were ruled out by laboratory testing. The private vet confirmed that there was bracken on the common land grazed by the cattle. APHA gave advice on animal health and welfare and also 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) and FSA risk assessment.

## FSI 2020-040

Ragwort toxicity was confirmed by histopathology to have contributed to the wasting and death of a 3-year-old bull at grass with two other suckler cows. The bull initially started to lose condition early on in October 2020. After two weeks it was examined by a private vet as it was anorexic, pyrexemic and had some blood visible in the nares. Despite treatment it died one week later and the carcass was submitted for post mortem examination. Gross examination revealed a severe hepatopathy with an enlarged, orange discoloured liver. At the time of death there was also abdominal haemorrhage, peritonitis, abomasal ulceration, haemorrhagic enteritis, excess sand in the abomasum and acorns in all four stomachs. The microscopic appearance of the liver was highly suggestive of pyrrolizidine alkaloid



toxicity, although some other toxic plants (eg lantana) and fungal toxins (eg aflatoxins) can produce similar changes. In addition to this, there was a mild renal tubular injury, which was considered to be a result of hypoxia (circulatory failure) and/or exposure to nephrotoxins (including acorns). The necrotising/ulcerative lesions in the abomasum were considered non-specific and likely to reflect an acute, terminal event. It was considered by the investigating officer and farmer that the source of ragwort was most likely to be associated with plant growth (and wilt) in the field rather than in conserved forage. APHA gave advice to the farmer on animal health and welfare and also food safety.

- Ragwort is one of many plants that contain pyrrolizidine alkaloids (Pa).
- Pa poisoning is probably the most common cause of plant poisoning in wildlife and livestock and can also affect humans.
- Many Pa containing plants are not palatable to livestock when growing and usually are only eaten when other feed is restricted or when incorporated into forage.
- Pas can cause hepatotoxicity and pulmonary toxicity and some Pas are carcinogens.
- Human poisoning and increased long-term cancer risk may arise from food (e.g. milk, honey) contamination as a result of food animal exposure to Pas.
- Risk to public health is reduced by dilution of Pa contaminated food materials, such as milk and honey, during marketing and processing.
- There may be higher risk scenarios associated with locally produced foods in areas heavily contaminated with plants such as ragwort.
- Better control of ragwort should be promoted and its spread prohibited.
- Stock should be prevented from having access to ragwort contaminated land and this land should not be used to produce forage.

## Other plant poisonings

Numerous cases of acorn and oak toxicity were reported in sheep. Typical post mortem findings might include the following:-

- Black tarry faeces around perineum.
- Rumen full of green herbage in green fluid with several partial acorns and remnants of acorns.
- Red/brown fluid in small intestine and severe haemorrhagic enteritis with dark blood and blood clots throughout the large intestine.
- Pale grey coloured disintegrating kidneys.
- High serum or ocular fluid urea concentrations.
- The kidney shows tubular changes consistent with nephrotoxic injury. These changes are not specific to any one toxin but we have seen a number of cases of oak toxicity this autumn and the identification of acorns in the stomachs supports the diagnosis.
- 2020 was reported to be a mast year with certain types of tree producing bumper crops of fruit and seeds. This was considered to be the case with oak.