



Animal &
Plant Health
Agency

Chemical Food Safety quarterly report **January to March 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 January to March 2020

FSI No	Date	APHA VIC or contracted post mortem provider (ppp)	Species	Toxin (reported toxic agent)	Source
2020-001	07-01-20	FSA	Cattle	(Asbestos)	Landfill rubbish
2020-002	24-01-20	Bury St Edmunds	Pigs	Coal tar	Clay pigeons
2020-003	31-01-20	Carmarthen	Sheep	Copper	Total exposure from diet and supplements
2020-004	06-03-20	Carmarthen	Cattle	Lead	Not established
2020-005	13-02-20	Penrith	Cattle	Fungicide	Treated grain
2020-006	19-03-20	Shrewsbury	Cattle	Botulism	? Silage bale

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
2020	6	2	1	1	1	0
2019	9	1	2	1	2	0
2018	7	0	1	0	4	0
2017	6	0	3	0	0	0
2016	8	4	4	2	3	2

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:-

1. Removal of animals from the source of lead.
2. 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.
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 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 2020-004

A raised tissue lead concentrations was detected following post mortem of a neonatal calf which was born weak and was slow to suckle and stand. The liver lead concentration was 0.715 mg/kg WM. The suckler cow group consisted of 20 cows and several of the calves born were either stillborn or weak. In addition, one calf had been treated for neurological signs and two other calves for pneumonia, one of which was also scouring. Two calves were submitted for post mortem examination and laboratory testing carried out.

Pathology included:-

- Joint ill, pneumonia, congested meningeal vessels
- *Salmonella* Dublin isolated from joint (aerobic culture) and faeces (enrichment only) of calf 2
- *Mycoplasma bovis* detected from lung from calf 2 by DGGE
- Tissue lead: liver 0.715 mg/kg WM (calf 1); Liver 0.867 mg/kg WM and kidney 0.201 mg/kg WM (calf 2)

The raised liver lead concentrations were unexpected and although of no immediate food safety concern due to the age of the calves the source of lead required some exploration. A cohort of the cows were subsequently blood sampled to determine if they had been exposed to lead during pregnancy but the results were all below background. This confirmed that the cows were no longer exposed but it did not rule out the possibility that calves has been exposed to a source of lead in utero. No source of lead could be found in the environment. Animal health and welfare advice and public health advice was given in regard to the salmonella isolated.

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 18 days following recovery.

Botulism incidents in cattle

FSI 2020-006

An outbreak of suspected botulism in a group of 40 pregnant and calving beef suckler cows was reported by telephone. Four pregnant suckler cows from a group of 40 were affected with clinical signs of flaccid paralysis within a few days and two subsequently died. A post mortem examination was carried out by the private vet (PVS) and did not reveal significant pathology. Blood samples taken from a recumbent animal indicated normal Ca and Mg but a low phosphate concentration which was unresponsive to treatment. The cows were all fed similarly on round bale silage and bedded on straw. Only one group of cattle was affected suggesting it was a single point source (carcase) in one round bale of silage. The PVS reported that there is a game bird shoot on premises and that there was no link to broiler litter. APHA gave advice on animal health and welfare and discussed causes of botulism and prevention. APHA advised that affected cattle should not be presented to the food chain and should any recover that there is a further 18 day restriction following cessation of clinical signs.

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 $\mu\text{mol/kg DM}$, 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.

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

FSI 2020-003

Copper toxicity was diagnosed as the cause of death of an adult Texel pregnant ewe from a ewe flock of 350 mixed breed ewes. Two ewes died but only one death was investigated.

Copper boluses had been administered to the ewes three weeks prior to the deaths as there was a history of swayback on the farm. Post mortem revealed discoloured red urine, dark kidneys and an orange/brown friable liver parenchyma. The gross findings were considered consistent with chronic copper poisoning as a result of a haemolytic crisis and this was confirmed following analysis.

Test	Ref Range	Units	Analytical result
Copper (Kidney)(\pm)	0-787	$\mu\text{mol/kg DM}$	8000
Copper (Liver)(\pm)	314-7850	$\mu\text{mol/kg DM}$	34600 *

The liver copper concentration is equivalent to 639.3 mg/kg WM.

As breeding stock, the ewes were not intended to enter the food chain in the near future and so there was no immediate risk to the food chain. APHA advised the PVS and farmer to reassess the ongoing flock requirements for supplementary copper by monitoring their copper status prior to supplementing. Also to check the current concentrates being fed to ensure that the copper concentrations were suitable for pregnant ewes.

Other incidents

Landfill waste, coal tar and fungicide

FSI 2020-001

A member of the public raised concerns with APHA regarding a small group of sheep that were grazing in a field where there appeared to be a lot of dumped waste materials including possible asbestos roofing sheets. A preliminary investigation was carried out by APHA field veterinary officers to review the welfare situation of the flock and also assess whether there were likely to be food safety concerns. These issues were ruled out and the investigation passed over to the Local Authorities.

FSI 2020-002

Coal tar/pitch toxicity was confirmed to be the cause of hepatopathy and increased mortality in three different pens of 8 to 10-week-old pigs, each comprising 200 pigs. The affected pens were situated at one end of a new site. Deaths started to occur just over one week after moving to this site and mortality in these pens was running at between 5 to 12.5%. The other pig pens, comprising a total of 2,300 pigs, had a mortality on 0.3%. Post mortem of fresh carcasses revealed liver pathology consistent with either vitamin E deficiency or chemical toxicity and the former was ruled out by laboratory testing. APHA arranged to visit the site since no toxic cause was initially identified. The provenance of the site was established as a former military airport and on which a clay-pigeon shooting range

was later run from a concrete base at one edge of the field. Cattle had previously been kept on the field grazing for about 12 years with no issues of ill health reported. At the visit pitch fragments, consistent with broken up clay-pigeons, were located in the soil of the affected pens. The rooting behaviour of the pigs had exposed these previously buried fragments and clays and were confirmed as the cause of the hepatopathy. Arrangements were made by the farmer to move the 600 exposed pigs to a different part of the field well away from the old shooting range. APHA advised the farmer and vet that following coal tar exposure pigs should not enter the food chain for at least 28 days following exposure. Fortunately, in this incident, the batch of pigs were approximately 15 weeks away from slaughter age and with the move away from the contaminated site this would ensure that the food chain is protected. Pigs would continue to be monitored and any further increases in mortality explored.

FSI 2020-005

APHA were alerted by telephone that a small group of two-year old in-calf dairy heifer replacements had broken into a building where there was a 250kg bag of fungicide-treated oat seed waiting to be drilled. The oat seed was treated with Redigo Pro, containing two fungicides prothioconazole and tebuconazole. There was evidence that the bag has been disturbed and oat seed trampled but it was considered that not much had been ingested. The heifers had access to this area for < 30 minutes. APHA advised that if clinical signs were to be observed it was likely that these would be attributable to rumen acidosis due to the consumption of oats and that signs of toxicity to prothioconazole and tebuconazole were unlikely due to the low exposure dose even in a worst case scenario. The risk of residues was discussed, however neither chemicals accumulate and both would be excreted.

Immediately after the potential exposure the group of heifers appeared bright and healthy and no clinical signs were seen during the next few days. APHA gave preliminary advice that if any heifers calved down within the week following the withdrawal of potential exposure then a 7 day milk withhold be observed. The above advice being based on the standard cascade of a 7 day milk withdrawal period from point of exposure and a meat withdrawal period of 28 days.

The farmer secured all barriers to ensure that the cattle could not break out again.

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.

Laurel

A Texel gimmer was submitted for post mortem to investigate cause of death. It was part of a group of 20 gimmers that were being kept separately from the rest of the flock. The

group escaped from the fields where they were being kept, and were subsequently found in the garden of a disused house a short distance away (the farmer assumed someone opened the gate to this house in order to get the sheep off the road). The group were collected the same day and taken back to the farm. As they were being off loaded the farmer noticed that some were teeth grinding with excess salivation and kicking at their abdomens. The clinical signs progressed in some, culminating in ataxia, recumbency and death. A total of nine were affected, with four dying. At post mortem the gimmer was observed to be well conditioned (59kg) and the carcass mild to moderately autolysed and the lungs markedly red in colour. The rumen contained a large number of leaf fragments, identified as cherry laurel. Ingestion results in the formation of hydrocyanic acid and the release of cyanide into the blood stream binds with iron in cellular cytochrome oxidase thereby blocking cellular respiration and preventing the release of oxygen. Carcasses might appear cherry red if examined early due to supersaturation of erythrocytes with oxyhaemoglobin and have a smell of bitter almonds.

Yew

A PVS reported that eight lambs from a small flock of lambs had died as a result of yew poisoning. Exposure was confirmed at post mortem as their rumens were full of yew needles. It was considered that clippings had been dumped in the field. Yew contains Taxine alkaloids which are a mixture of cardiotoxins that can induce fatal conductive disturbances with direct action on cardiac myocyte ion channels.

Garden hedge plant clippings

A total of three ewes, from a group of 30 at grass, died over three days with one appearing to recover. The paddocks consist of permanent pasture with hedges and were situated either side of a drive up to a house where there are a variety of plants including privet and cotoneaster. The first case occurred on 3rd February when one ewe was seen standing away from the group grinding its teeth, uncoordinated, with its ears down. It was given oral glucose and appeared to recover the next day. The following day a similar case was seen with the ewe being disorientated, grinding its teeth and in abdominal pain. It died one hour later. The third and fourth case showed similar clinical signs. Both subsequently died with the carcass of the fourth submitted for post mortem. A variety of plant leaves were adhered to the wool including conifer, holly and other oval-shaped leaves. Some unidentifiable oval leaves were present in the rumen. The history and finding of plant material in the rumen, alongside no other forthcoming differential diagnosis, was considered sufficient evidence to confirm plant poisoning.