Animal &
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Agency

Chemical Food Safety quarterly report

April to June 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.

Contents

Potential food safety incidents April to June 2020

FSI No	Date	APHA VIC or contracted post mortem provider (ppp)	Species	Toxin (reported toxic agent)	Source
2020-007	24-04-20	PVS	Cattle	Ragwort	Wilted plant on grazing
2020-008	27-04-20	Penrith	Cattle	Lead	Not established
2020-009	13-05-20	Shrewsbury	Sheep	Lead	Silts post flooding
2020-010	14-05-20	Shrewsbury	Cattle	Botulism	Broiler litter
2020-011	19-05-20	Thirsk	Cattle	Lead	Paint
2020-012	18-05-20	Shrewsbury	Cattle	Lead	Waste site
2020-013	18-05-20	Carmarthen	Cattle	Lead	Battery
2020-014	20-05-20	Carmarthen	Cattle	Lead	Battery
2020-015	11-06-20	Thirsk	Sheep	Botulism	Boiler litter
2020-016	01-06-20	FSA Wales	Cattle and sheep	(external query)	Potential exposure to animal by-products
2020-017	12-06-20	PPP	Cattle	Lead	? Lead shot
2020-018	19-06-20	Carmarthen	Cattle	Lead	Battery
2020-019	23-06-20	Starcross	Cattle	Lead	Battery
2020-020	22-06-20	Carmarthen	Cattle	Lead	Batteries
2020-021	29-06-20	Starcross	Cattle	Lead	Not established on MOD land

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

Highlights

Year (2nd quarter)	Total FSIs (E & W)	Total FSIs Wales	Lead (E & W)	Total lead Wales	Botulism (E & W)	Total botulism Wales
2020	15	7	11	5	2	1
2019	21	4	9	1	6	1
2018	15	0	8	0	1	0
2017	15	3	9	1	4	2
2016	13	4	12	4	0	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 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

FSI 2020-008

A raised tissue lead concentration was detected following post mortem of a four-month-old calf which presented blind and then died. Post mortem revealed petechial haemorrhages in the thymus but no other obviously pathology. The kidney lead concentration was 4.62 mg/kg wet weight. Hypomagnesaemia was considered a potential differential diagnosis as magnesium absorption efficiency in calves fed milk falls from 87% at 2–3 weeks of age to 32% at 7–8 week of age predisposing to hypomagnesaemia tetany in 2- to 4-month old calves**.** The clinical history was that three suckler calves had been turned out onto a rested field two weeks prior to the onset of the incident. The field has previously been used in October 2019. The other two calves appeared unaffected and were subsequently moved. No source of lead was found. APHA gave the farmer advice on where to look for potential sources of lead and advised that the two other calves be blood tested following a 16 weeks period to assess their blood lead concentrations and determine what further risk management measures might be required.

FSI 2020-011

Lead poisoning was suspected to be the cause of one death and clinical signs in two 2-4 week old calves. The calves were part of an indoor group with 30 suckler cows and

approximately 20 calves. The first case occurred a month earlier. A calf showed mild neurological signs and became blind. It was only when more calves were affected that the cause was investigated. Blood lead concentrations were 0.37 and 2.96 µmol/l. The source of lead was confirmed to be an old wooden partition which divided the two halves of the shed. This had flaking paint with a lead concentration of 34,200 mg/kg. It has since been removed. The private veterinarian investigated and opted to euthanize the two affected calves and blood sampled four other animals to help to establish whether there was subclinical exposure. The following results were obtained:

- an unaffected 8 week-old calf – 0.08µmolPb/l
- an unaffected cow 0.04 µmolPb/l
- the unaffected mothers of the two affected calves; 0.09 and 0.2µmolPb/l

APHA recommended a withdrawal period of 16 weeks is observed for the potentially exposed group. Given the fact that all affected calves were euthanized and most of the other blood lead concentrations were at or well below background levels further blood testing was not deemed to be needed.

FSI 2020-012

Lead poisoning was confirmed as the cause of death of one of five dead cattle from a group of 50 yearling replacement heifers, part of a suckler herd. The kidney lead concentration was 35.30 mg/kg WM. The heifers were on a rotational grazing system where paddocks are rotated every two days. They were moved onto a rough bank covered with gorse and bracken and it transpired that the area had been used as a rubbish dump by a previous tenant. Within 24 hours one heifer was found dead and two others were found in a ditch having gone through the electric fencing. On initial examination of the live animals there was apparent blindness. The cattle were euthanized and submitted for post mortem examination. The farmer has now fenced off this area so that the cattle are unable to access to it. The farmer agreed to observe a 16 week voluntary restriction after which a cohort of cattle will be blood tested to ascertain ongoing exposure levels. The results of blood testing will determine the ongoing risk management measure that are required.

None of the cattle are intended to be entering the food chain in the near future as they are intended for breeding cattle.

FSI 2020-013

Lead poisoning was confirmed as the cause of death of two 18-month-old beef steers that were in a group of 5 steers along with 23 heifers. The steer carcases were submitted for post mortem examination. One of the other steers presented with clinical nervous signs. All the heifers remained unaffected. The kidney lead concentrations were 75.5 and 27.6 mg/kg WM and a blood lead concentration analysed at 6.86 µmol/l, confirming lead exposure and poisoning. The five steers went on to new grazing away from the home farm two weeks prior to the first death; the 23 heifers were added to the group the day before

the first death. The animals were immediately removed from the field and housed back at the main farm. It was reported that was an old tractor in the field, some plastic waste materials and an area of blackened ground which might have been bonfire ash. The whole area is being carefully inspected and suspected sources of lead removed. The farmer agreed to observe a 16 week voluntary restriction after which a cohort of cattle will be blood tested to ascertain ongoing exposure levels. The cohort will include the steers and some of the heifers. The results of blood testing will determine the ongoing risk management measure that are required.

FSI 2020-014

Lead poisoning was confirmed following post mortem examination of a milking dairy cow. The kidney lead concentration was 115.0 mg/kg WM. At the time of the incident the whole herd (230) cows were grazing a 2.5 acre paddock. The history was as follows:-

One cow went off her food on the 16th May. By the 17th May, one cow was displaying neurological signs and was examined by the vet. Over the course of 2-3 days, a further 7 cows developed anorexia and neurological signs. On the 19th May, a cow was submitted to for post-mortem examination. APHA were alerted to the incident on 20th May and FSA immediately notified. APHA advised the farmer to notify his Dairy, if he had not already done so, and to approach the NML to assist with undertaking bulk tank milk testing for lead. The 8 cows that displayed neurological signs were ultimately euthanized or died. The last one died on the 23rd May. Since then there have been no further cases and no cows are showing signs of any illness.

A broken battery was identified by the farmer on the 23rd May as the source of lead which was safely disposed of and the surrounding area cleaned up.

The bulk tank milk and traced produced was tested for lead and found to be compliant with negligible concentrations of lead detected thereby enabling release into the wider food chain. Regarding meat production the herd was placed on a voluntary 16-week withdrawal so that no culls should be presented to the food chain without prior blood testing.

FSI 2020-017

A raised tissue lead concentration, high enough to cause subclinical toxicity, was confirmed in a 3.5 month old suckler calf from a suckler herd consisting of 44 cows, 11 calves and 15 yearling steers. The kidney lead concentration was 120mg/kg WM. Two calves died following acute respiratory signs. One carcase was submitted for post mortem examination and gross findings confirmed that pneumonia was the likely cause of death with heavy growths of *Pasteurella multocida* cultured. Bovine coronavirus was also detected by PCR. Most of the other younger cattle also showed signs of respiratory disease with pyrexia and coughing and the majority responded to treatment.

The area that the group were grazing at the time of the outbreak had access to woodland and other rough areas. It was considered that the source of lead came from these areas.

The areas was difficult to search for a source and no obvious course was found. These areas are therefore being fenced off. Lead shot from cartridges was considered a possibly source of lead and this source would be consistent with a lead level unlikely to cause acute lead toxicity and sudden death. The farmer agreed to observe a 16-week voluntary restriction after which a cohort of cattle of all ages will be blood tested to ascertain ongoing exposure levels. The results of blood testing will determine the ongoing risk management measure that are required.

FSI 2020-018

Lead poisoning was confirmed in one 15-month-old animal which presented with signs of blindness and drooling and was successfully treated with Sodium calcium edetate. The blood lead concentration was 5.31µmol/l. This occurred after the group of 34 cattle were placed in a 5-acre field (silage aftermath) for two days. The cattle were immediately removed from the field and the other cattle remained healthy with no clinical signs of lead poisoning. Two batteries (possibly tractor batteries) were found in some woodland in the field, one of which had a broken case and the plates of the battery were exposed. These batteries have since been removed and safely disposed of. The farmer agreed to place the group under a 16-week restriction and toward the end of this period to blood test the recovered clinical case and 7 others to determine if there is evidence of a wider subclinical exposure. APHA will use the results to decide on whether further blood testing of the group is necessary and to determine the future risk management required.

FSI 2020-019

Lead poisoning was confirmed in two yearling beef cattle from a group of 67. The blood lead concentrations of those sampled were 4.35 and 1.21 µmol/l respectively. A total of three animals were considered to be affected over a 24 hour period, two with neurological signs and one found dead. Livestock were immediately moved to a different field and clinically affected cattle moved back to the home farm. A broken car battery was later discovered to be the source of lead. This has since be removed and safely disposed of. The farmer agreed to place the group under a 16-week restriction and towards the end of this period to blood test the recovered clinical cases and a cohort of others to determine if there is any evidence of a wider subclinical exposure to lead. APHA will use the results to decide on whether further blood testing of the whole group is necessary and to determine the future risk management required. During this restriction period should any of the unaffected animals require casualty slaughter then food chain information should be presented to the abattoir and offal removed and discarded.

FSI 2020-020

Lead poisoning was confirmed in two 2.5-month-old beef calves that were found dead a week apart and both submitted for post mortem examination (PME) during early June . The kidney lead concentrations of those sampled were 142 and 114 mg/kg wet weight respectively. A total of 3 calves died from a group of 28 comprised of 14 calves and 14 cows. The first death occurred on 29/05/20 after the cattle had been in a rented field for a

month. This death was not investigated. On 1st June the group were moved out of the rented field to a neighbouring field (separated by thick hedge and stream). On 2nd June another calf was found dead. This calf was submitted for PME. The group were moved again on 5th June and vaccinated against the clostridial disease, Blackleg. On 8th June a further calf death occurred. This was also submitted for PME. At the move on 5th June, an additional 10 cows, their calves and a bull were added to original group of 14 cows and their calves. There were no further deaths or clinical signs observed. The PVS and farmer found two old batteries near to water trough in first (rented) field that appeared to have been licked and chewed. There was also other rubbish found in the field. The batteries were considered likely to be the source of lead poisoning in all cases. No other lead source was found. The farmer agreed to place 25 cows and calves from the original group under a 16 week restriction and towards the end of this period to blood test a cohort of cows and calves to determine if there is any evidence of a wider subclinical exposure to lead. APHA will use the results to decide on whether further blood testing of the whole group is necessary and to determine the future risk management required.

FSI 2020-021

Lead poisoning was confirmed as the most likely cause of death of a five-year-old beef suckler cow from a group of 270 which were grazing on Ministry of Defence (MOD) ranges. The blood lead concentration was 3.28µmol/l. This cow was the only animal affected. She showed acute nervous signs and then died. The exact source of lead was undetermined but it is considered that there could be old batteries or foreign materials present in the rougher areas of the grassland. At post mortem examination there were haemorrhagic contents in the distal intestines and haemorrhages on endocardium of the heart indicating circulatory collapse. The brain also looked congested. Other differential diagnoses were ruled out. The farmer agreed to place the group under a 16-week restriction and towards the end of this period to blood test a cohort of others to determine if there is any evidence of a wider subclinical exposure to lead. APHA will use the results to decide on whether further blood testing of the whole group is necessary and to determine the future risk management required.

Lead incidents in sheep

FSI 2020-009

A raised tissue lead concentration was detected following post mortem of an adult breeding ewe which presented with nervous signs and died. The liver lead concentration was 0.8 mg/kg WM. In total 12 of a group of 260 were affected and died. Post mortem examination of two affected ewes confirmed a diagnosis of listeriosis. The lead detected in the liver was consistent with a residue due to above background exposure to lead. Blood lead concentrations were analysed in two of the other affected ewes prior to death and blood lead concentration of 0.12 and 0.14 µmol/l detected. These results suggested that the liver residue was unlikely to be due to a current exposure to lead. The source of lead was considered to be due to the fact that the ewes had been placed on post flooded

ground. Once the flood had subsided a fine silt could be seen. It is likely that the river flood water contained geochemical lead in the silt. The silt and exposed areas of mud in the post flooded field were suspected to have predisposed the ewes to listeriosis. The flock were moved and no further clinical cases occurred. APHA recommended a withdrawal period of 16 weeks was observed but since the blood lead concentrations were below background APHA have not requested further blood sampling. The ewes are breeding ewes and not intended for the food chain in the near future.

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 2020-010

APHA investigated an outbreak of suspected botulism in a group of thirty 13 to 15-month old beef cattle. One animal was found dead and one found recumbent with typical signs. Botulism was suspected by the PVS and the PVS subsequently euthanized the bullock. The remainder were moved out of the field. The source was considered most likely to be due to broiler litter in the next door field which was partly spread and partly in a heap**.** Recent dry, windy weather had disturbed the heap. No broiler carcases were seen. The farmer will discuss the incident with the neighbour so that he is also aware of the risk associated with broiler litter. He will not reuse the field until the poultry litter has been ploughed in and the risk of using the grazing field has reduced. APHA gave advice on animal health and welfare and discussed causes of botulism and prevention. The owner will consider the use of vaccination for future cattle that may use the land.

Botulism incidents in sheep

FSI 2020-015

APHA investigated an outbreak of suspected botulism in a group of 50 to 60 ewes and lambs. Five sheep were found dead and approximately five others showed signs of weakness and ataxia and flaccid paralysis. Two dead ewes were submitted to investigate the cause of death. Gross post mortem findings were unremarkable. Laboratory testing for differential diagnoses using clinical chemistry, bacteriology and histology were unrewarding. The source of botulism was suspected to be broiler litter which had been spread on the field where the group are grazing a few weeks before. Since there was a feasible source, no testing for botulinum toxin was carried out.

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 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.

None reported

Other incidents

FSI 2020-016

APHA were informed that a group of cattle and sheep had access to a stack of poultry litter and broken eggs. There was no illness reported or detected in the livestock. The enquiry was taken forward as a breach of animal by-products regulations.

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 2020-007

Ragwort toxicity was tentatively diagnosed from liver histopathology following post mortem of a bull that died following a period of ill thrift and wasting. The pathology in the liver indicated a severe and prolonged hepatotoxic insult. Pyrollizidine alkaloid containing plants, such as ragwort, were considered the leading differential but at the advanced stage of disease it was difficult to pinpoint the exact cause. The farmer considered exposure was likely as there was ragwort in the field that the bull had frequented in the late autumn which would have been dying back. The bull was in a group of 10 cattle and at this time one other animal was considered possibly affected. APHA gave advice on animal health and welfare and discussed nutrition and prevention.

APHA also gave the following advice:

- 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.

Laurel poisoning

One two-year-old ewe was submitted for post mortem following a period of recumbency and death. The ewe was part of a group of 15 ewes that had all lambed recently. Gross examination suggested the ewe to be septicaemic/toxaemic with increased prominence of subcutaneous blood vessels. Multiple leaf fragments were found in the rumen which were identified as laurel leaves. It was uncertain why the exposure occurred.