

Annex A

Request

1. For the calendar year 2019 so far, how many DNA species tests carried out by local authorities on meat and fish products produced unsatisfactory results?
2. Please provide details of the unsatisfactory 2019 species tests including where available:
 - a) the product tested
 - b) the brand name of the product
 - c) the manufacturer of the product
 - d) the distributor of the product
 - e) the seller of the product
 - f) the name of the catering supplier or restaurant the product was obtained from
 - g) the species the product was labelled as being
 - h) the species (including plural) found by the testing
 - i) the quantities of the species that were found by the testing (ie. percentage of each species found) Please provide all results kept on your databases, and all sample results.
3. Please provide copies of any reports completed by your organisation (or on behalf of your organisation) in the calendar year 2019 so far, about unsatisfactory meat and fish test results found by local authorities as a result of DNA speciation testing.

Response

The FSA is unable to provide a full response to your request as it does not hold all the relevant information needed to fully determine how many DNA species tests carried out by local authorities on meat and fish products so far in 2019 produced unsatisfactory results.

The FSA holds only partial information in relation to your request.

To put this partial information into context, please note the following points.

- Food Standards Scotland (FSS) is responsible for food safety in Scotland so you would have to request any data on local authority sampling in Scotland from FSS.
- Day to day responsibility for enforcement of food standards law in food businesses, including the taking of samples, rests with local authorities across England, Wales and Northern Ireland.
- Food sampling is only one of a number of different approaches that local authorities take to assess compliance with food law - other approaches include, for example, checking traceability and inspecting food during inspections.
- Local authorities conduct the sampling, arrange for relevant testing and carry out enforcement activity where required.
- The number of samples taken will depend on a range of factors including the number and types of businesses, the results of past inspections and other types of intervention.

- Sampling is not conducted on a random or representative basis but, rather, is used as part of a targeted approach.
- The FSA collects sampling data on an annual basis through its [Local Authority Enforcement Monitoring System \(LAEMS\)](#) but this only provides information on the total number of samples local authorities take during the preceding financial year and does not provide details of what particular testing was undertaken or the results of that testing.
- Some, but not all, local authorities report sampling results using the FSA's United Kingdom Food Surveillance System (UKFSS) - use of the system is voluntary.

Local authority data reported on UKFSS relevant to your request

The data that we are able to provide is derived from samples on the UKFSS taken in 2019.

Please note the following additional points in relation to this data.

- Some local authority data may not, as yet, have been processed and reported through UKFSS.
- The data has not been verified with the reporting authorities to ensure its accuracy.
- Trace levels of unspecified meat or DNA at values of less than 1% are regarded as cross contamination – this is generally due to inadequate cleaning of processing lines - rather than deliberate inclusion.
- It is possible that levels of unspecified meat or DNA above 1% may also be due to cross contamination (due to inadequate cleaning) rather than deliberate inclusion.
- Local authorities are responsible for investigating unsatisfactory results and the FSA does not hold details of the outcomes so cannot say where deliberate inclusion has occurred.
- The names of the brand, manufacturer, distributor, seller and catering premises the unsatisfactory samples were obtained from are withheld under section 31 (law enforcement) and 43 (commercial interests) of the Act. Further details about the use of these exemptions have been provided at Annex C.

Details of the samples recorded on UKFSS as unsatisfactory to date in 2019 that have been submitted to an official control laboratory to be analysed for speciation are provided at Annex B. This includes two fish samples and 35 meat samples. Of the meat samples, 16 were found to contain trace levels of less than 1%, such that they are not considered to have been deliberately adulterated.

FSA reports

With reference to point 3 of your request, the FSA has not produced any reports to date in 2019 about unsatisfactory meat and fish test results found by local authorities as a result of DNA speciation testing nor has it commissioned any other organisation to produce such reports on its behalf.

Annex B – Unsatisfactory samples held on UKFSS

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
Fish Samples							
41004411700	04/01/2019	2 YELLOWFIN SOLE FILLETS WITH PEA, CHORIZO & MINT BUTTER	Section 31 and 43	Section 31 and 43	N/A	Section 31 and 43	<p>Sequencing of the Cytochrome B and 16s genes showed 100% homology with <i>Lepidopsetta polyxystra</i> (Northern rock sole) rather than the named species Yellowfin sole (<i>Limanda aspera</i>).</p> <p>I am therefore of the opinion the sample was not of the nature demanded, contrary to the requirements of Section 14 of the Food Safety Act 1990.</p>
80900520288	03/01/2019	5 X BATTERED WHITING	Section 31 and 43	Section 31 and 43	N/A	Section 31 and 43	<p>The sample was described as "Battered Whiting". The results of testing showed that the fish component of the sample consisted of Haddock; <i>Melanogrammus aeglefinus</i> and not whiting as declared.</p> <p>I am therefore of the opinion the sample was not whiting and was therefore not of the nature demanded, contrary to the requirements of Section 13 of The Food Safety (Northern Ireland) Order 1991.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
Meat samples unsatisfactory due to cross contamination							
22600860408	22/01/2019	Lean Minced Beef	n/a	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present. The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Beef (major part) Pork (very diminutive part)</p> <p>Therefore, the sample consists of beef with a very small amount of pork also detectable.</p> <p>In my opinion, the presence of less than 1% of pork DNA in the sample is unlikely to be due to deliberate substitution and Food Standards Agency advice is that values below 1% should be regarded as adventitious contamination and should be followed up to find out whether there is an underlying production problem.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
22600860522	06/03/2019	Pork sausages 78% meat	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Pork (major part) Beef (very diminutive part)</p> <p>Therefore the meat portion of the sample consists of pork with a very small amount of beef also detectable.</p> <p>The Products Containing Meat etc (England) Regulations 2014 require the meat portion of a food described as pork sausage to consist entirely of pork.</p> <p>In my opinion, the presence of less than 1% of beef DNA in the sample is unlikely to be due to deliberate substitution and Food Standards Agency advice is that values below 1% should be regarded as adventitious contamination and should be followed up to find out whether there is an underlying production problem.</p>
43700214539	23/05/2019	Lean beef mince	n/a	N/A	N/A	Section 31 and 43	<p>DNA of cow and sheep was detected in the sample. Sheep DNA was detected at or around the limit of detection of the test at 0.1%. At this level it is likely that it was present in the sample due to poor practice rather than deliberate adulteration.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
55102630004	22/02/2019	BEEF MINCE	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Beef (major part)</p> <p>Sheep (very diminutive part).</p> <p>The major species detected was consistent with that declared.</p> <p>In my opinion the presence of less than 1% of Sheep DNA in the sample is unlikely to be due to deliberate substitution and is likely to be due to adventitious cross-contamination. It is recommended that the cause of this cross-contamination is investigated and corrective action instigated in line with Food Standards Agency advice.</p>			

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
554HQ2057000 2824	15/01/2019	WELSH DICED BEEF	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Beef (major part)</p> <p>Sheep (very diminutive part).</p> <p>The major species is consistent with that declared.</p> <p>In my opinion the presence of less than 1% of Sheep DNA in the sample is unlikely to be due to deliberate substitution and is likely to be due to adventitious cross-contamination. It is recommended that the cause of this cross-contamination is investigated and corrective action instigated in line with Food Standards Agency advice.</p>			

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
554HQ2057000 2826	15/01/2019	MINCED LAMB	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Sheep (major part) Beef (very diminutive part).</p> <p>The major species is consistent with that declared.</p> <p>In my opinion the presence of less than 1% of Beef DNA in the sample is unlikely to be due to deliberate substitution and is likely to be due to adventitious cross-contamination. It is recommended that the cause of this cross-contamination is investigated and corrective action instigated in line with Food Standards Agency advice.</p>			

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
554HQ2057000 2835	23/01/2019	DICED WELSH LAMB	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Sheep (major part)</p> <p>Beef (very diminutive part).</p> <p>The major species is consistent with that declared.</p> <p>In my opinion the presence of less than 1% of Beef DNA in the sample is unlikely to be due to deliberate substitution and is likely to be due to adventitious cross-contamination. It is recommended that the cause of this cross-contamination is investigated and corrective action instigated in line with Food Standards Agency advice.</p>			

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
55900260269	24/01/2019	PORK MINCE	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Pork (major part)</p> <p>Sheep (very diminutive part).</p> <p>The major species detected is consistent with that declared.</p> <p>In my opinion the presence of less than 1% of Sheep DNA in the sample is unlikely to be due to deliberate substitution and is likely to be due to adventitious cross-contamination. It is recommended that the cause of this cross-contamination is investigated and corrective action instigated in line with Food Standards Agency advice.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
55900260278	31/01/2019	DICED STEAK (BEEF)	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Beef (major part)</p> <p>Sheep (very diminutive part).</p> <p>The major species detected is consistent with that declared.</p> <p>In my opinion the presence of less than 1% of Sheep DNA in the sample is unlikely to be due to deliberate substitution and is likely to be due to adventitious cross-contamination. It is recommended that the cause of this cross-contamination is investigated and corrective action instigated in line with Food Standards Agency advice.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
56300500027	31/01/2019	WELSH DICED LAMB (MINCED)	N/A	N/A	Section 31 and 43	Section 31 and 43	<p>All of the submitted minced meat matrix was homogenised together in order to form the sample for analysis for DNA testing for six species (equine/ovine/porcine/bovine/gallus/meleagris). Genetic material consistent with ovine (sheep) and bovine (beef) was found by analysis. Quantified DNA analysis estimate of the amounts by determining the normalised ratio of the target species DNA copy number to the total copy numbers (bovine, ovine, porcine, gallus, meleagris and horse equine). The copy number ratio of the bovine and all species indicates that as a best estimate based on the DNA extraction variability between different types of tissues, the level of bovine is a trace less than 1% of the meat component.</p> <p>I am of the opinion that the sample is predominantly sheep, with a trace level of beef consistent with cross contamination. The most likelihood is that it has arisen from use of the same machinery for products of the two species without proper cleaning.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
57100090419	23/01/2019	BEEF MINCE	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Beef (major part)</p> <p>Sheep (very diminutive part).</p> <p>The major species detected is consistent with that declared.</p> <p>In my opinion the presence of less than 1% of Sheep DNA in the sample is unlikely to be due to deliberate substitution and is likely to be due to adventitious cross-contamination. It is recommended that the cause of this cross-contamination is investigated and corrective action instigated in line with Food Standards Agency advice.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571267	23/01/2019	PORK, HONEY AND MUSTARD SAUSAGES	Section 31 and 43	Section 31 and 43	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays specific for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of animal DNA present. Using the detected signals, all species DNA amounts present in the sample are calculated as relative values (%), related to the total amount of determined DNA, and are given in semi-quantitative ranges:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%). (Detected but below the reporting limit of the method)</p> <p>The following species were detected in the sample:</p> <p>Pig (major part); Sheep (very diminutive part); Beef (very diminutive part).</p> <p>Values less than 1% may be regarded as adventitious contamination and should be subject to further investigation to establish if the presence of the material is a consequence of on-going production methods. The amounts of the other meats are below the 1% value and are insufficient to be regarded as adverse.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571273	23/01/2019	STEAK SAUSAGES	Section 31 and 43	Section 31 and 43	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays specific for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of animal DNA present. Using the detected signals, all species DNA amounts present in the sample are calculated as relative values (%), related to the total amount of determined DNA, and are given in semi-quantitative ranges:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%). (Detected but below the reporting limit of the method)</p> <p>The following species were detected in the sample:</p> <p>Beef (major part); Sheep (very diminutive part); Pig (very diminutive part).</p> <p>Values less than 1% may be regarded as adventitious contamination and should be subject to further investigation to establish if the presence of the material is a consequence of on-going production methods. The amounts of the other meats are below the 1% value and are insufficient to be regarded as adverse.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571624	20/02/2019	LOW FAT BEEF BURGERS	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays specific for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of animal DNA present. Using the detected signals, all species DNA amounts present in the sample are calculated as relative values (%), related to the total amount of determined DNA, and are given in semi-quantitative ranges:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%). (Detected but below the reporting limit of the method)</p> <p>The following species were detected in the sample:</p> <p>Beef (major part)</p> <p>Pig (very diminutive part)</p> <p>Values less than 1% may be regarded as adventitious contamination and should be subject to further investigation to establish if the presence of the material is a consequence of on-going production methods. The amount of the other meat is below the 1% value and is insufficient to be regarded as adverse.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571755	20/02/2019	SAUSAGE ROLLS	Section 31 and 43	Section 31 and 43	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays specific for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of animal DNA present. Using the detected signals, all species DNA amounts present in the sample are calculated as relative values (%), related to the total amount of determined DNA, and are given in semi-quantitative ranges:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%). (Detected but below the reporting limit of the method)</p> <p>The following species were detected in the sample:</p> <p>Beef (major part); pork (very diminutive part); sheep (very diminutive part).</p> <p>Values less than 1% may be regarded as adventitious contamination and should be subject to further investigation to establish if the presence of the material is a consequence of on-going production methods. The amount of the other meats are below the 1% value and are insufficient to be regarded as adverse.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571760	20/02/2019	CHICKEN BURGER	Section 31 and 43	Section 31 and 43	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays specific for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of animal DNA present. Using the detected signals, all species DNA amounts present in the sample are calculated as relative values (%), related to the total amount of determined DNA, and are given in semi-quantitative ranges:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%). (Detected but below the reporting limit of the method)</p> <p>The following species were detected in the burger portion of the sample:</p> <p>Chicken (major part); pork (very diminutive part); sheep (very diminutive part).</p> <p>Values less than 1% may be regarded as adventitious contamination and should be subject to further investigation to establish if the presence of the material is a consequence of on-going production methods. The amount of the other meat is below the 1% value and are insufficient to be regarded as adverse.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
Meat samples unsatisfactory due to levels of unspecified meat or DNA above 1%							
19301540101	15/04/2019	LAMB MINCE	Section 31 and 43	N/A	Section 31 and 43	Section 31 and 43	<p>The sample was described as 'Lamb Mince'. DNA of cow and sheep was detected in the sample. It was estimated that approximately 13% of the DNA present was of cow origin which was indicative of the presence of beef.</p> <p>I am of the opinion that the food was falsely described.</p>
21800024475	18/02/2019	LAMB TIKKA AND CURRY SAUCE NO PEANUT	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the meat from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>us scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The major DNA component detected was beef but a very diminutive proportion of sheep DNA was also detected.</p> <p>In my opinion, the meat in a sample described as 'lamb tikka and curry sauce' should consist solely of sheep meat. Consequently, I am of the opinion that the sample was not of the substance demanded.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
21800024494	20/02/2019	LAMB PASANDA NO PEANUT	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the meat from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>Beef was the only species detected in the sample.</p> <p>In my opinion, the meat present in a sample described as 'lamb pasanda' should consist solely of sheep meat. Consequently, I am of the opinion that the sample was not of the nature demanded.</p>
42700340184	27/02/2019	COOKED KEBAB MEAT	n/a	N/A	N/A	Section 31 and 43	<p>The ingredients list declared the presence of mutton 40% and beef, 40% but no other species.</p> <p>The presence of significant amount of chicken was detected in the sample, but was not declared in the ingredients list, contrary to the requirements of Regulation 1169/2011 on food information for consumers.</p> <p>I am therefore of the opinion the food was not of the substance demanded, contrary to the requirements of Section 14 of the Food Safety Act 1990.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
43700214494	14/05/2019	Pork Sausage (thin)	n/a	N/A	N/A	Section 31 and 43	DNA of cow and pig was detected in the sample. It was estimated that approximately 9% of the DNA present was of cow origin which was indicative of the presence of beef. I would expect a product described as 'Pork Sausage' to be derived only from pig unless otherwise qualified. Consequently, I am of the opinion that the food was not of the nature demanded by the purchaser.
43700214504	16/05/2019	Thin pork sausage	n/a	N/A	N/A	Section 31 and 43	DNA of cow, pig and sheep was detected in the sample. It was estimated that approximately 15% of the DNA present was of cow origin which was indicative of the presence of beef. Sheep DNA was detected at or around the limit of detection of the test at 0.1%. At this level it is likely that it was present in the sample due to poor practice rather than deliberate adulteration. I would expect a product described as 'Pork Sausage' to be derived only from pig unless otherwise qualified. Consequently, I am of the opinion that the food was not of the nature demanded by the purchaser.
43700214571	04/06/2019	Thin Pork Sausage	n/a	N/A	N/A	Section 31 and 43	DNA of cow and pig was detected in the sample. It was estimated that approximately 48% of the DNA present was of cow origin which was indicative of the presence of beef. I would expect a product described as 'Pork Sausage' to be derived only from pig unless otherwise qualified. Consequently, I am of the opinion that the food was not of the nature demanded by the purchaser.
43700214584	04/06/2019	Pork Sausage	n/a	N/A	N/A	Section 31 and 43	DNA of cow and pig was detected in the sample. It was estimated that approximately 20% of the DNA present was of cow origin which was indicative of the presence of beef. I would expect a product described as 'Pork Sausage' to be derived only from pig unless otherwise qualified. Consequently, I am of the opinion that the food was not of the nature demanded by the purchaser.

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
43700214641	12/06/2019	Pork Sausages	n/a	N/A	N/A	Section 31 and 43	DNA of cow and pig was detected in the sample. It was estimated that approximately 10% of the DNA present was of cow origin which was indicative of the presence of beef. I would expect a product described as 'Pork Sausage' to be derived only from pig unless otherwise qualified. Consequently, I am of the opinion that the food was not of the nature demanded by the purchaser.
43700214658	12/06/2019	pork sausage	n/a	N/A	N/A	Section 31 and 43	DNA of cow and pig was detected in the sample. It was estimated that approximately 3% of the DNA present was of cow origin which was indicative of the presence of beef. I would expect a product described as 'Pork Sausage' to be derived only from pig unless otherwise qualified. Consequently, I am of the opinion that the food was not of the nature demanded by the purchaser.

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
55900260272	05/02/2019	PORK SAUSAGEMEA T	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present. The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows: Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample: Pork (major part) Beef (minor part).</p> <p>The sample was described as Pork sausage meat. The major species was Pork which is consistent with that declared. However the sample also contained a minor part of Beef (5 to 30%).</p> <p>Based on the results of the analysis the sample was misdescribed as I am of the opinion that a food described as Pork sausage meat should consist solely of Pork.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
55900260275	05/02/2019	LAMB MINCE FREE FLOW	Section 31 and 43	N/A	Section 31 and 43	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present. The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Sheep (major part) Beef (diminutive part).</p> <p>The major species detected is consistent with that declared.</p> <p>The level of beef in the sample, although possibly due to adventitious cross-contamination, is higher than what would be expected when using good practice and warrants investigation into handling and cross-contamination.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
567HQ22880004778	04/02/2019	LAMB TIKKA MASSALA	Section 31 and 43	n/a	N/A	Section 31 and 43	<p>Analysis of DNA extracted from the meat showed it to consist of chicken and not lamb. The sample was therefore not of the substance demanded, contrary to the requirements of Section 14 of the Food Safety Act 1990.</p> <p>The following scale is used to indicate the proportion of DNA in the total DNA measured.</p> <p>Major part (60-100%), Medium part (30-60%), Minor parts (5-30%), Diminutive part (1-5%), Very diminutive parts (<1%) (detected but below the reporting limit of the method)</p> <p>Not detected</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571236	22/01/2019	PORK AND APPLE BURGERS	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays specific for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of animal DNA present. Using the detected signals, all species DNA amounts present in the sample are calculated as relative values (%), related to the total amount of determined DNA, and are given in semi-quantitative ranges:</p> <p>Major part (60-100%), Medium part (30-60%), Minor parts (5-30%), Diminutive part (1-5%), Very diminutive parts (<1%) (Detected but below the reporting limit of the method),</p> <p>The following species were detected in the sample:</p> <p>Pork (major part); Beef (diminutive part).</p> <p>The only species of meat declared in the name of the food was pork. The Food Standards Agency advise that values above 1% be regarded as deliberate addition and values below as adventitious contamination, therefore the presence of beef in the sample described only as pork is not satisfactory.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571652	20/02/2019	PORK AND APPLE MEATBALLS	Section 31 and 43	Section 31 and 43	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Pork (major part); beef (minor part); chicken (diminutive part)</p> <p>The Food Standards Agency advice is that values above 1% be regarded as deliberate addition.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571656	20/02/2019	PORK SAUSAGES	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Pork (major part); beef (diminutive part); sheep (very diminutive part).</p> <p>The Products Containing Meat etc. Regulations (Northern Ireland) 2014 require pork sausages to contain meat from pigs only. The Food Standards Agency advice is that values above 1% be regarded as deliberate addition and values below as adventitious contamination, therefore the presence of beef in the sample is not satisfactory.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
80200571660	20/02/2019	BEEF SAUSAGES	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present.</p> <p>The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Beef (major part); pig (minor part); sheep (very diminutive part).</p> <p>The Food Standards Agency advice is that values above 1% be regarded as deliberate addition and values below as adventitious contamination.</p> <p>The major species detected was consistent with the name of the food. The amount of pig meat found was above the 1% value, but is permitted in beef sausages provided the minimum beef content has been met and is therefore not regarded as adverse, but has implications for the name of the food since the proportions of this meat may be sufficient to characterise the food.</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
81601340117	22/02/2019	MINCED STEAK	Section 31 and 43	Section 31 and 43	N/A	Section 31 and 43	<p>The sample consisted of minced meat described as "Minced Steak".</p> <p>Analysis of DNA extracted from the meat showed it to consist of beef with a significant amount of pork also present.</p> <p>Food Standards Agency Northern Ireland advice is that values above 1% be regarded as deliberate addition and values below as adventitious contamination. The sample contained an excess of beef and was therefore not of the substance demanded, contrary to the requirements of Article 13 of the Food Safety (Northern Ireland) Order 1991.</p> <p>The following scale is used to indicate the proportion of DNA in the total DNA measured.</p> <p>Major part (60-100%), Medium part (30-60%), Minor parts (5-30%), Diminutive part (1-5%), Very diminutive parts (<1%) (detected but below the reporting limit of the method)</p> <p>Not detected</p>

UKFSS reference number	Sample date	Product tested	Brand name	Manufacturer	Distributor	Seller, caterer or restaurant sample obtained from	Analyst comments
866HQINET010 8170	21/02/2019	BEEF BURGERS	N/A	N/A	N/A	Section 31 and 43	<p>DNA was extracted from the sample. Seven real-time PCR assays for <i>Bos taurus</i> (Beef), <i>Sus scrofa</i> (Pork), <i>Ovis aries</i> (Sheep), <i>Capra hircus</i> (Goat), <i>Equus caballus</i> (Horse), <i>Gallus gallus</i> (Chicken) and <i>Meleagris gallopavo</i> (Turkey) were then applied to detect and measure the amount of those animal species present. The measurement is semi-quantitative, and estimates from the detected signals the amount of DNA present for all tested species and each individual species in bands as follows:</p> <p>Major part (60 - 100%), Medium part (30 - 60%), Minor part (5 - 30%), Diminutive part (1 - 5%), Very diminutive part (<1%).</p> <p>The following species were detected in the sample:</p> <p>Beef (major part) Pork (diminutive part) Sheep (very diminutive part)</p> <p>In my opinion, the presence of less than 1% sheep DNA in the sample is unlikely to be due to deliberate substitution.</p>