Root?cause?analysis (RCA):?animal feeds and pet foods?

This page explains what animal feed and pet food are, and shares insights from Root Cause Analysis (RCA) investigations into feed safety incidents reported to the FSA. It highlights common hazards, root causes, and practical preventative measures to help feed businesses reduce the risk of future incidents.

What are ‘animal feed’ and ‘pet food’?

Animal feeds and pet foods are specially formulated to meet the nutritional needs of different species. Manufacturers offer a wide choice of complete, supplementary or specialist diet feeds. These can include dry or wet products made from plant-based or animal ingredients, and they can be?raw or cooked. Pet treats are also available, such as dried animal ears, biscuits and kibble.?

Preventing and responding to an incident

In the event of an incident occurring, (footnote 1) (including those that involve animal feeds and pet foods), the Food Standards Agency (FSA) and Food Standards Scotland (FSS) request root cause analysis, (RCA), be undertaken. This was provided to the FSA or FSS (depending on the location of the business) for trend analysis, to inform insights and identify emerging issues. These insights are also shared with wider interested stakeholders.

Insight to common root cause findings - animal feed incidents

These insights gained from RCA following incident occurrence deepens understanding of risks and highlights best?practice learning. These insights can support feed businesses to prevent incidents from occurring by following advice in the ‘key preventative measures’ and ‘next steps' sections of this page.

- reviewing food and feed safety management procedures, to ensure risks and learnings from previous incidents are managed within the existing Hazard Analysis Critical Control Plan, (HACCP) at the business
- using the insights to provide a baseline to support RCA investigations following incidents experienced by other feed businesses, by making use of the learnings from other feed businesses and their competent authorities

Recognised challenges for producers and distributors?

The production and distribution of animal feed, pet food, pet treats and former foods (footnote 2), present a wide range of challenges for businesses across the sector. Manufacturers must?comply with?all legislation (such as assimilated EU feed regulations and labelling obligations),?whilst meeting quality and safety standards for raw materials and the production process. At the same time, they face growing consumer expectations and increased competition within the

marketplace.??

Summary of feed types involved in incidents

Following incidents notified to the FSA over the last 5 years, the RCAs submitted?to the FSA? were identified within these product categories:

- pet food – 54%
- animal feed -?33%
- compound feed, feed additives and feed premixtures – make up the remaining 13% products

Summary of most commonly identified hazards

- pathogenic microorganisms were linked to 85% of the?RCAs received.
- salmonella spp. contamination was the most common pathogen, linked to 81% of reports anaerobic digestates were linked to 10% of reports
- other pathogens were linked to 4% of reports
- foreign bodies were linked to 4% of reports

Summary of root cause findings??

Between April 2021 and January 2026, the root causes identified can be attributed to the following categories:

- almost half of root causes (47%) were identified as 'material'?category, with 27% associated with ‘ingredient?cross-contamination’?and 19% relating to absent or inadequate ‘ingredient?hygiene controls’
- more than a tenth (13%) of RCAs?failed to?identify?a root cause and were categorised as? 'undetermined/inconclusive'
- the remaining 40% of causes were spread across 15 different RCA categories

The definition of ‘material’ as an RCA category is: Any component used in food production or preparation - including additives, ingredients, packaging, processing aids, or the food itself, and where the material contributed to, or resulted in, a failure or problem.

Interpretation of root cause analysis data?

Salmonella spp. are bacteria, (pathogenic micro-organisms), that typically live in the intestines of animals and humans. The bacteria are shed through poo. Salmonella is widely dispersed in the environment and can be spread during the slaughter and processing of meat and poultry. Other ingredients contained within pet food, (for example vegetables), can become contaminated through contact with animal faeces or residues of human faces. They can also be contaminated with non-potable water, or as a result of equipment handling or storage.?

There are no direct microbiological criteria outlined in regulations or raw pet food suppliers to?test for salmonella?spp. in the animal by-products (ABP),?that are used to produce raw pet food.

However, article 15, (2) of assimilated Regulation 178/2002 sets out legal requirements that feed must not be unsafe if the feed may have a negative impact on human or animal health then it is unsafe.

Common root causes in animal feed and pet food incidents?

RCA investigations often identify that incidents stem from failures in raw material sourcing, processing, or sanitation. Key areas of risk include:??

Microbial contamination of raw materials

- ingredient sourcing, particularly raw material sourcing, can introduce microbiological hazards?such as salmonella?spp
- the presence of salmonella?species in poultry and meat products upon delivery was often cited as the most?likely cause?of contamination in products, with the absence of testing reducing identification of its existence
- a lack of control of raw material cutting, preparation, transportation (with other products) and storage prior to receipt is routinely featured as potential root causes

Other raw material contamination:??

- Undesirable residues (for example, pesticides, metals or mycotoxins) can significantly reduce the quality of animal feeds and pet food. These residues may enter the feed through raw materials, manufacturing processes, or during storage and transport.?

Contaminants in manufacturing:?

- chemicals from use of cleaners and sanitisers - including from, included improper use, insufficient rinsing (from equipment surfaces) and poor storage causing product contamination
- metal contamination of equipment included damaged equipment, (for example knives, graters, grinders and so on) because of gradual wear and tear, including abrasion, corrosion, friction of equipment surfaces, where investigations identified release of metals into food products

Processing failures:?

- improper temperatures, pressures, times, fluctuating moisture levels in the system (often caused by condensation forming on surfaces) or handling during manufacturing may leave pathogens in products - these are commonly identified as causal factors
- absent or infrequent cleaning, disinfection or washing procedures (for both materials and equipment) were also identified as potential causes in many cases

Packaging/storage issues:?

- environmental contamination, such as pest infestation or improper storage conditions

Key preventative measures:?

A summary of commonly reported corrective actions and corresponding preventative measures? identified is provided. Applying these to your own feed safety management business and HACCP based controls will support your businesses to prevent incidents.

- review animal feed and pet food safety management systems to ensure all relevant activities that might cause a production risk?to have?been?identified?
- make sure microbiological sampling and testing plans are adequate and sufficient (manufacturer and/or supplier) to help minimise the risks of contamination?
- make sure regular chemical analyses of materials are undertaken to detect unwanted substances and help ensure the provision of safe feed in the desired quality??

- make sure chemical use is in accordance with manufacturer's instructions, and that it is suitable to remove the hazards it is expected to eliminate. Ensure there is not over dilution which weakens its effectiveness. If chemical dilutions are strengthened with the intention of improving control, ensure this is not done in a way which may cause chemical residues
- strengthen equipment and storage area cleaning protocols to reduce cross-contamination risks or the likelihood of incident recurrence?
- make sure appropriate drainage?is in place that prevents standing water to reduce the risk of feedstuff contamination
- verify the authenticity and purity of raw materials, for example the use of lower-quality animal by-products or adulterated/undeclared?Genetically Modified Organisms (GMOs)? containing plant-based ingredients like grains and dried herbs
- make sure products meet labelling and compositional requirements and contain? appropriate handling?instructions
- make sure commercial specifications clearly set out requirements for your business to be informed in case a safety or non-compliance issue is identified by your supplier. This should include details on the action being taken to ensure further supplies are not affected
- refresh staff training to highlight the procedures to prevent cross-contamination, confirm your best practices procedures associated with hygiene controls
- refresh training and make sure you keep a record of the training for audit purposes following any changes to procedures and processes. This is a HACCP pre-requisite, and you are therefore required to produce this in an inspection, if asked. Training records are also important to help you demonstrate your due diligence defence
- make sure HACCP based procedures identify all product and environmental hazards. Where there is a failure to identify the hazards, there's a missed opportunity to then manage and eliminate the hazard
- make sure there is clarity and understanding on the legislative requirements where 'direct' microbiological criteria are not set out in legislation
- food initially intended for the human food chain, for example former foods, meat intended originally intended for the human food chain, that is later 'downgraded,' (for example unsold meat where its use-by date has expired) must be safe for use as animal feed, pet food, or raw pet food, (in the case of raw meat for pets). It is an offence to place on the market feed that may have an adverse effect on human or animal health
- where legislation does not provide upper thresholds, make sure there are risk-based critical limits established, and that there is clear understanding what the triggers for action are when a critical limit is unacceptable
- following a food safety incident, ensure relevant responsible staff undertake a Root Cause Analysis (RCA) exercise

Common RCA process errors

Avoid and look out for these commonly identified errors:

- many RCAs initially consider the receipt of contaminated ingredients from suppliers as the primary cause, the root causes may be difficult to?establish, but the source is not a root cause
- the presence of bacteria in the product brought to your business may be a source of contamination, but this is not the root cause. You should instead consider instead, why your business did not detect the contamination coming into your business and whether controls at your supplier are working. You should also consider why the controls at the supplier did not detect the presence of the contamination
- not investigating the incident, on the basis the incident occurrence is within a 'threshold of tolerance' for the business
- poor feed and food safety culture, for example the view that, 'salmonella is widely in the environment', and 'there is therefore no need or benefit in spending time and effort to investigate the incident'

Next steps

Feed business operators are advised to:

- review their HACCP based procedures, being informed by RCA findings from earlier reported incidents. This will reduce the likelihood of a similar incident occurring at other feed businesses
- check existing feed safety management systems against these insights, with a view to make use of learnings identified by other feed businesses who have experienced incidents
- make sure procedures are in place to 'immediately inform the competent authorities' if your business 'considers or has reason to believe that a feed which it placed on the market may not satisfy the feed safety requirements,' as set out in Article 20, 3, of assimilated EU Regulation No 178/2002
- all staff view a short introduction to Root Cause Analysis (8 minute video)
- staff who lead investigations and management of feed safety management systems undertake Root Cause Analysis training
- build conducting RCA into your feed safety management systems as part of your investigation tool kit and ensure your control procedures include completing an RCA for in the event of an incident in the future. An RCA form is available
- Local authorities and FSA veterinarians are requested to provide this to the FSA/FSS on completion, following an incident

1. Incidents are notified to the competent authorities, (local authorities or FSA official veterinarians in FSA approved establishments). The competent authorities are then required to notify the FSA where they categorise the incidents either potentially 'serious' or 'widespread' issue. Widespread is defined and may be limited as across two or more local authority areas.

2. Former foods are foodstuffs that were manufactured for human consumption in full compliance with EU food law but are no longer intended for human consumption due to various reasons. These include manufacturing or packaging defects, logistical issues, or problems that prevent them from reaching the human consumption market. However, they retain a significant nutritional value for animal feed purposes. Former foods can be processed into animal feed ingredients, contributing to a more sustainable animal feed and circular economy.