National Reference Laboratory for Feed Additives and Authorisations

End of Year Report
2023 - 2024

Report reference: CP-2024-01 (2)

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Date: 13 September 2024

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1. Introduction

Assimilated EU Regulation No. 1831/2003 on *additives for use in animal nutrition* describes 'feed additives' as substances, micro-organisms or preparations, other than feed material and premixtures, which are intentionally added to feed or water in order to perform, in particular, one or more of the following functions:

(a) favourably affect the characteristics of feed,

(b) favourably affect the characteristics of animal products,

(c) favourably affect the colour of ornamental fish and birds,

(d) satisfy the nutritional needs of animals,

(e) favourably affect the environmental consequences of animal production,

(f) favourably affect animal production, performance or welfare, particularly by affecting the gastro-intestinal flora or digestibility of feedingstuffs, or

(g) have a coccidiostatic or histomonostatic effect.

Feed additives should not:

(a) have an adverse effect on animal health, human health or the environment,

(b) be presented in a manner which may mislead the user,

(c) harm the consumer by impairing the distinctive features of animal products or mislead the consumer with regard to the distinctive features of animal products.

Antibiotics, other than coccidiostats or histomonostats, are not authorised as feed additives.

Depending on their functions and properties feed additives are allocated to one or more of the categories listed in Article 6 of assimilated Regulation (EC) No 1831/2003. The categories are:

(a) technological additives: any substance added to feed for a technological purpose;

(b) sensory additives: any substance, the addition of which to feed improves or changes the organoleptic properties of the feed, or the visual characteristics of the food derived from animals;

(c) nutritional additives;

(d) zootechnical additives: any additive used to affect favourably the performance of animals in good health or used to affect favourably the environment;
(e) coccidiostats and histomonostats.

LGC currently holds the role of National Reference Laboratory (NRL) for feed additives and authorisations for Great Britain. The tasks and objectives for the feed additive and authorisations NRL are as follows:

Part 1: NRL Core function
Objective 1. Secretariat services
Objective 2. Advice and representation within the UK and internationally
Objective 3. Production of standard operating procedures, codes of practice and guidance documents
Objective 4. Compliance assessment via audits and ring trials
Objective 5. Co-ordination within the UK of international initiatives
Objective 6. Communication of results and data use

Part 2: Feed Additive Regulated Product Authorisation
Objective 1. Infrastructure development
Objective 2. Maintenance of infrastructure
Objective 3. Core authorisation activities

This report provides an update for the National Reference Laboratory role for Feed Additives for the year April 2023 to March 2024.

2. Quality and staff competence

The Office of the Government Chemist at LGC, which hosts the feed additives and authorisations NRL role, has continued to maintain its quality systems to the requirements of ISO17025. Annual assessments carried out by UKAS, together with internal audits, help ensure that quality and accreditation is maintained. The annual UKAS assessment was carried out in June 2023. Seven non-conformances were

raised against the Office of the Government Chemist team. The findings, which mainly related to the updating of documents, have been actioned and closed.
An internal quality audit of the Office of the Government Chemist team was also carried out. The minor findings raised are being actioned.

Feed additives cover a very wide range of chemicals / materials / substances, and therefore experience and competency is needed in a wide range of techniques. To maintain and evidence the ongoing competency of staff, proficiency tests (PTs) are regularly participated in. It is generally acknowledged that the number of PTs directly relevant to the analysis of feed and feed additives is limited. As the techniques used to analyse feed and feed additives are predominantly the same as those used for the analysis of food, participation in food PTs is also carried out.

Table 1 gives examples of the analytes analysed in food PTs during 2023 and the techniques used. A similar range of PTs will be participated in during 2024.

Techniques	Example analyses
HPLC-UV	Vitamins
HPLC-FL	Aflatoxins
ICP-OES / ICP-MS	Trace elements / nutritional elements
LC-MSMS	Veterinary residues (Nitrofurans)
ELISA	Allergens
Gravimetric	Moisture, fat
General wet chemistry	Sulphur dioxide

Table 1: Examples of analytes and the relevant techniques for PTs participated in during 2023

It should be noted that while the costs of directly relevant feed rounds are attributed to the NRL role, the majority are funded either directly by LGC or through the Government Chemist programme. This enables the widest range of analytes / matrices to be covered in the most cost-effective way to each programme.

PT rounds available in 2023 / 2024 were reviewed and appropriate rounds chosen to cover a relevant range of analytes and techniques. PTs relevant to feed and feed additives that were participated in, together with the z-scores obtained are presented in Table 2.

Matrix	Analyte	Z-score
Dairy ration	Moisture	0.3
Dairy ration	Ash	0.7
Dairy ration	Total oil	-0.5
Dairy ration	Protein	-0.3
Dairy ration	Iron	0.1
Dairy ration	Magnesium	0.3
Dairy ration	Manganese	-0.1
Dairy ration	Selenium	0.4
Pig ration	Moisture	-0.7
Pig ration	Ash	0.8
Pig ration	Oil	-0.7
Pig ration	Protein	-0.3
Pig ration	Vitamin E	1.1
Pig ration	Zinc	1.8
Poultry feed	Coccidiostats - DNC (from Nicarbazin)	-0.2
Poultry feed	Chloramphenicol	0.0
Insect protein	Arsenic	0.4
Insect protein	Cadmium	0.2
Insect protein	Lead	0.0
Insect protein	Mercury	0.6
Insect protein	Nickel	1.6

Table 2: FAPAS feed PT rounds participated in during 2023

As examples of the z-scores obtained by LGC compared to those obtained by the other participants, Figures 1 and 2, taken directly from FAPAS Food Chem. Report 10187 show the z-scores obtained for manganese and magnesium in dairy ration. LGC is lab 32 in both.

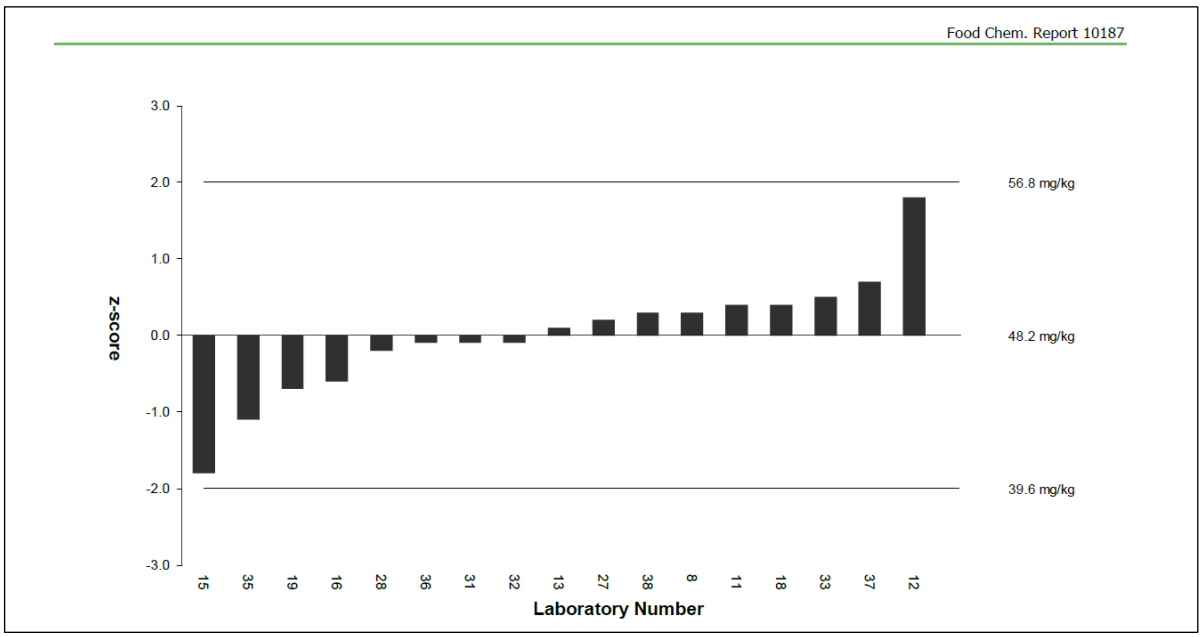


Figure 1: Manganese in dairy ration FAPAS PT – Z-scores for all participants (Chart taken directly from FAPAS (Fera Science Ltd) report Food Chem. Report 10187)

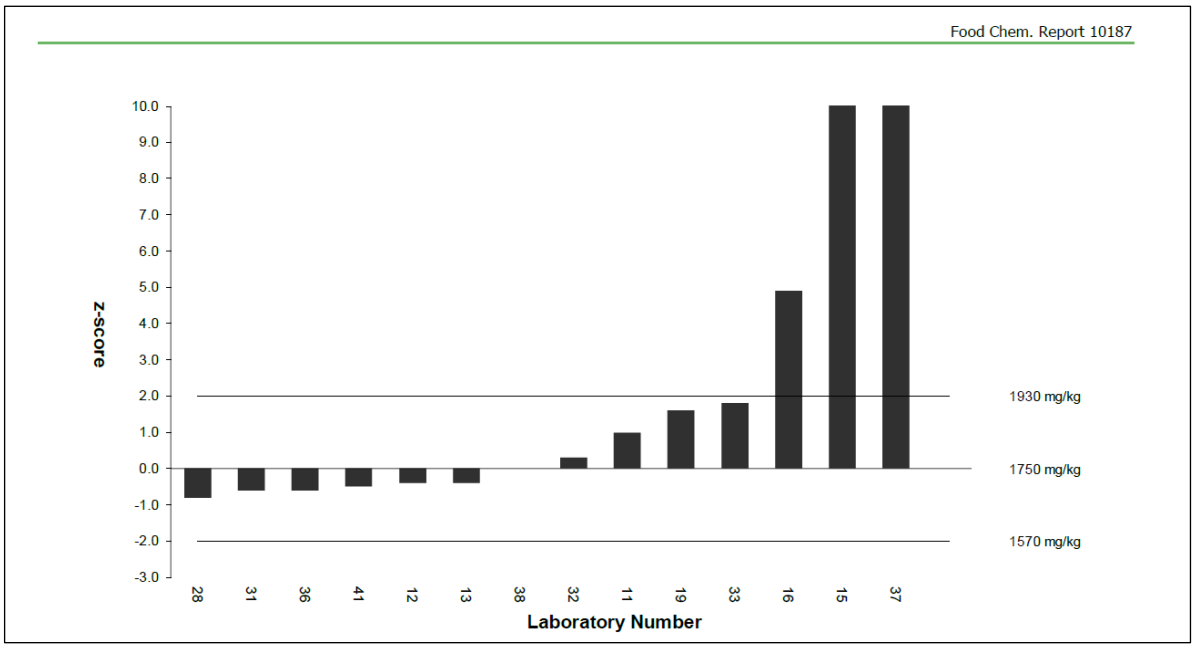


Figure 2: Magnesium in dairy ration FAPAS PT – Z-scores for all participants (Chart taken directly from FAPAS (Fera Science Ltd) report Food Chem. Report 10187)

Figure 3 shows the z-scores for all participants for 4,4'-dinitrocarbanilide (DNC) from the coccidiostat nicarbazin; LGC is lab number 18.

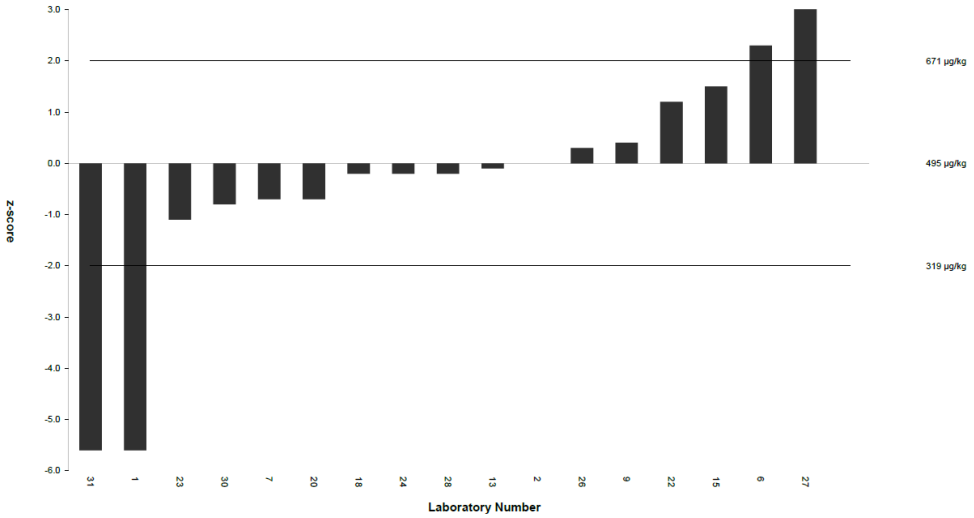


Figure 3: DNC from nicarbazin in poultry feed – Z-scores for all participants (Chart taken directly from FAPAS (Fera Science Ltd) report Food Chem. Report 02526)

Whilst the heavy metals, arsenic, cadmium, lead, etc. are not feed additives there appears to be an ongoing interest in using insects / insect protein as feed materials. It is therefore useful to be able to provide evidence of competency of the analysis of these types of matrices. Figure 4 is a copy of the graph from FAPAS Food Chem. Report 07505 showing the z-scores for all participants for cadmium in insect protein; LGC is lab number 11.

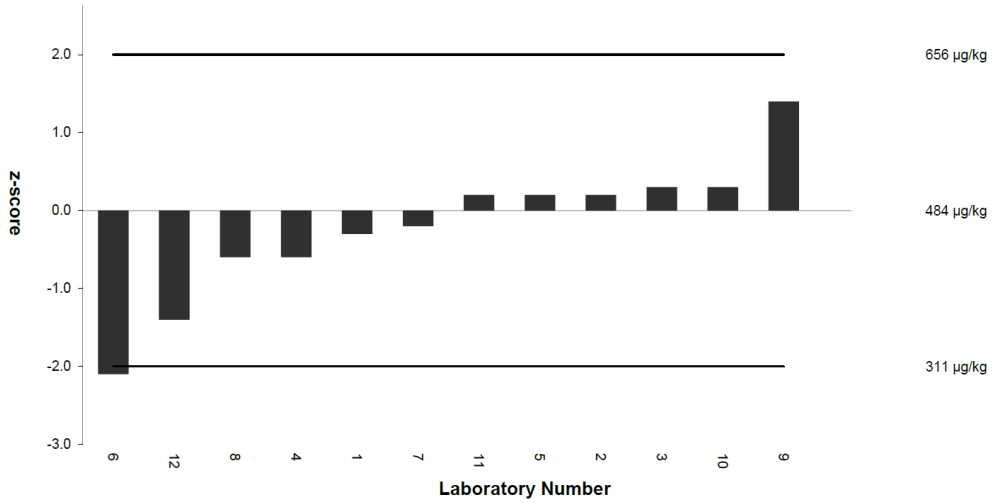


Figure 4: Cadmium in insect protein – Z-scores for all participants (Chart taken directly from FAPAS (Fera Science Ltd) report Food Chem. Report 07505)

Figures 5 and 6 show the z-scores for all participants for vitamin E and zinc in a FAPAS sample of pig ration. LGC is lab 20 in both.

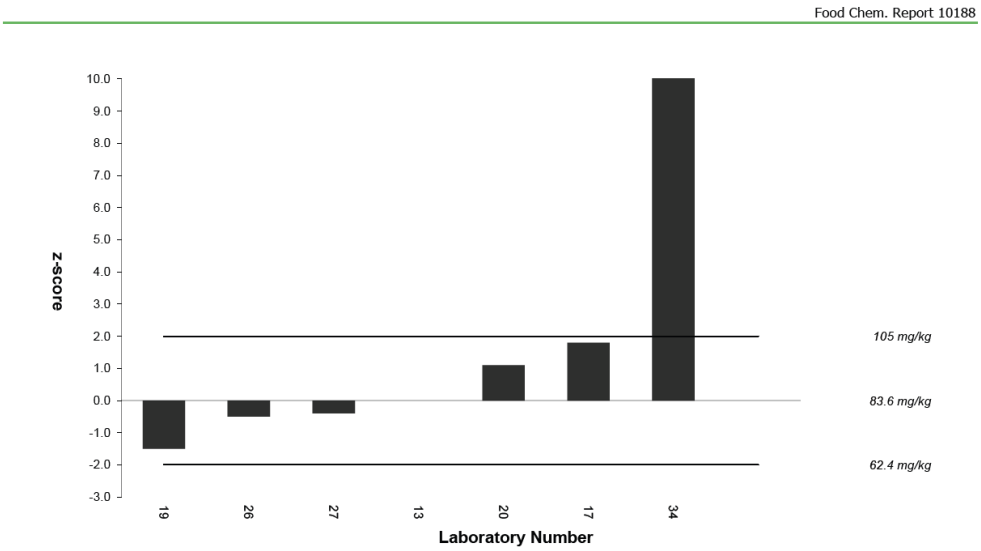


Figure 5: Vitamin E in pig ration – Z-scores for all participants (Chart taken directly from FAPAS (Fera Science Ltd) report Food Chem. Report 10188)

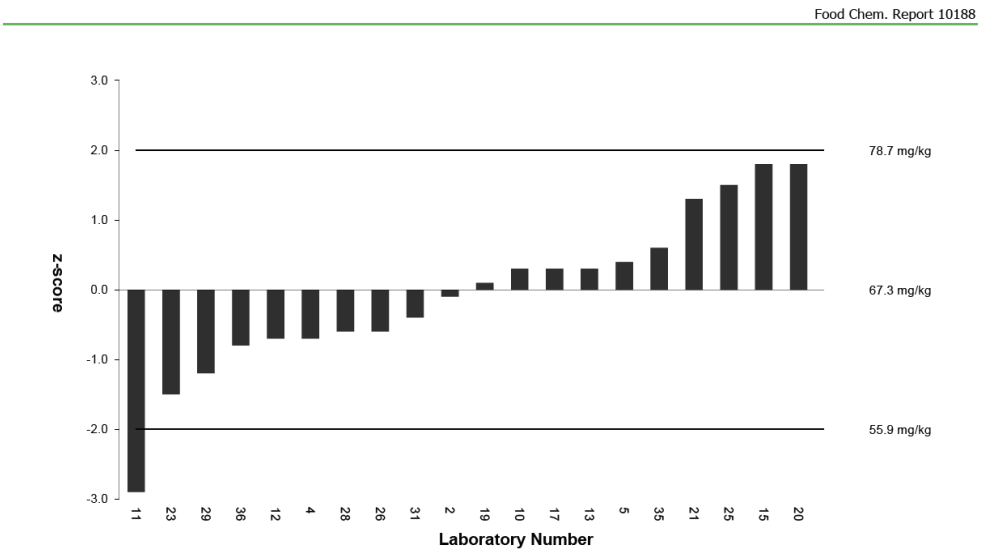


Figure 6: Zinc in pig ration – Z-scores for all participants (Chart taken directly from FAPAS (Fera Science Ltd) report Food Chem. Report 10188)

The following was stated in the FAPAS report regarding the results for vitamin E: ‘For vitamin E, only seven participants submitted a result. The median is considered the best measure of consensus for such a small number of data points and was

therefore set as the assigned value. However, the uncertainty of the median was high and for this reason the assigned value is given for information only'.

For interest, the number of labs participating in the pig ration PT was reviewed. As shown in Figure 7, there has been a general downward trend in the overall number of labs submitting results for this PT. As an example, a large proportion of the participants submit results for protein where as the number submitting results for vitamin E, and to a lesser extent zinc, is much smaller.

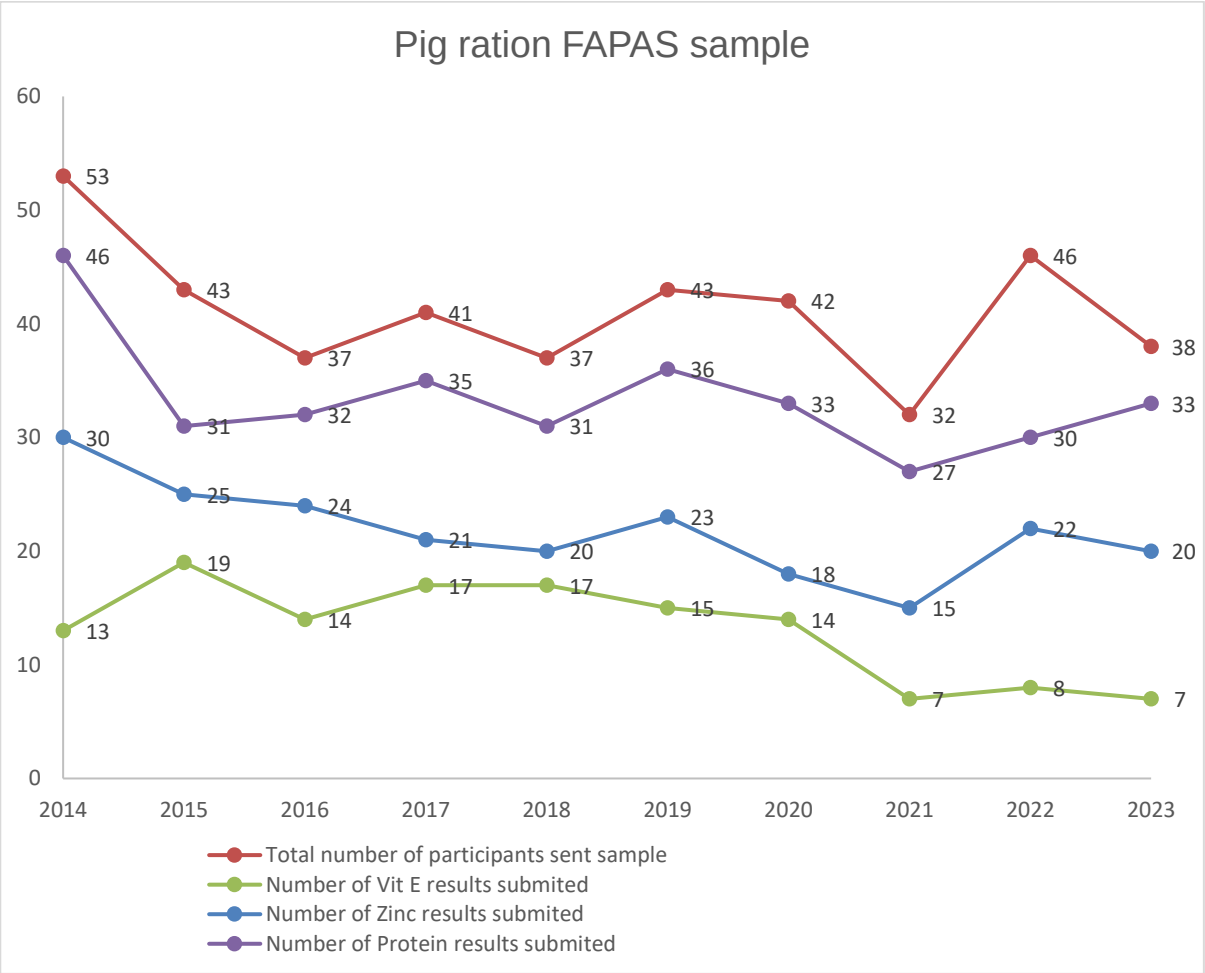


Figure 7: Total participation in FAPAS pig ration PT rounds

According to the FAPAS report, samples for the recent pig ration PT (10188) were sent to 38 laboratories, 36 of which submitted results for at least one analyte. Seven labs submitted results for vitamin E, 20 submitted results for zinc and 33 submitted results for each of protein and moisture. As a comparison, the total number of labs submitting results for other rounds LGC has recently participated in was 41

participants for mycotoxins in dog food, 83 participant for vitamins in baby food and 97 for sulphur dioxide in dried apricots.

3. Proficiency test review

A review of feed related PTs being organised in 2024 was carried out. A summary of the findings is presented in Annex 1.

4. Horizon scanning

The Rapid Alert System for Food and Feed (RASFF) is reviewed monthly to try and detect trends and help identify possible future issues. However, it should be noted that the notifications in RASFF are those made by EU member states and may not reflect the situation in the UK. The product categories reviewed are: feed additives, feed materials, feed premixtures, compound feed and pet food, together with the risk category of feed additives.

In the twelve months from April 2023 to March 2024 there were 301 RASFF notifications for the above categories. Together, salmonella and Enterobacteriaceae accounted for 118 (39 %) of the notifications. The next highest category was mould with 42 (14 %) notifications. These figures compare with 119 (50 %) and 6 (3 %) respectively for the year April 2022 to March 2023. Table 3 gives the reasons for all 301 notifications from April 2023 – March 2024.

Reason for notification	Number of RASFF notifications April 2023 - March 2024
Salmonella / Enterobacteriaceae / Bacteria	118
Mould	42
Pesticides	23
Mycotoxins (Aflatoxins, T2/HT2, Deoxynivalenol, Fumonisins)	19
Ragweed (Ambrosia spp.)	15
Lead / Arsenic /Zinc / Copper / Manganese / Selenium / Nickel	15
Dioxins	12
Ruminant DNA / protein	11
Metal particles / Metal / Plastic / Glass / Porcelain fragments	7
Unauthorised additive	7
Foreign bodies	4
Coccidiostats (Diclazuril / Lasalocid / Salinomycin / Narasin / Robenidin)	3
GMO	3
Cyanide	2
Datura seeds	2
Insects / insect larvae / pests	2
Rye ergot / Ergot (Claviceps purpurea)	2
Consumer complaint / Fraud	2
Missing / incorrect documents / Incorrect labelling	2
Colours (Ponceau 4R)	1
Glycerol triheptanoate (GTH)	1
Glycoalkaloids	1
Haemorrhagic gastroenteritis	1
Not stated	1
Processed animal protein / Products of animal origin / Fish particles	1
Technical grade chemicals	1
Unauthorised operator	1
Vitamin D3	1
Tuberculosis	1
Total	301

Table 3: RASFF notifications involving feed additives, feed materials, feed premixtures, compound feed and pet food in the 12 months from April 2023 to March 2024

During the 12 months reviewed there were 7 RASFF notifications relating to the presence of unauthorised feed additives, a decrease from 17 in the preceding 12 months. The unauthorised additive notifications were:

- Unauthorised feed additives/ feed materials in complementary feed for cats and dogs
- Unauthorised feed additives/ feed materials in complementary feed for cats and dogs
- Prohibited feed additive ethoxyquin (E324) in protein concentrate
- Presence of unauthorized additives in complementary feed for cats
- Unauthorized additive formaldehyde in complementary feed for ruminants
- Presence of an unauthorized feed additive for dogs (lanthanum carbonate)
- Non authorized feed additive (vit. K1) in pet food

No significant trends were identified from the RASFF notifications.

Table 4 shows a comparison of the RASFF notifications for the feed categories listed above reported in 2022 compared to those reported in 2023. While there were significantly more notifications for mycotoxins, pesticides and dioxins, no trends were seen in the matrix type or specific analyte. The increase in notifications for 'mould' in 2023 was mainly due to sunflower products from Ukraine and wheat bran pellets from Angola.

Reason for notification	**2022**	**2023**
Salmonella / Enterobacteriaceae / Bacteria / Microbiological	115	121
Unauthorised additive	15	6
Arsenic / Cadmium / Copper / Lead / Manganese / Mercury / Nickel / Selenium / Zinc	14	22
Mycotoxins (Aflatoxins, T2/HT2)	11	24
Ragweed (Ambrosia spp.)	8	11
Ruminant DNA / protein	8	7
Pesticide	7	17
Metal particles / Metal / Plastic / Glass / Porcelain fragments	6	6

Ethylene oxide	6	1
Mould	5	42
Dioxins	4	12
Rye ergot / Ergot (Claviceps purpurea)	3	4
Cyanide	3	2
Foreign bodies	3	2
Coccidiostats (Diclazuril / Lasalocid / Salinomycin / Narasin / Robenidin)	2	3
GMO	2	2
Not stated	2	2
Fluorine	2	
Paraquat	1	1
Processed animal protein / Products of animal origin / Fish particles	1	1
Vitamin D3	1	1
Antibiotic residues	1	
Chlorpropham	1	
Clostridium	1	
Dodder seeds (Cuscuta spp.)	1	
Furazolidone	1	
Glyphosate	1	
Incorrect quality	1	
Insufficient checks	1	
Ivermectin	1	
Matrine, Amitraz and Pyrrolizidine Alkaloids	1	
Nitrite	1	
Sulfadimidine	1	
Insects / insect larvae / pests		2
Datura seeds		2
Colours (Ponceau 4R)		1
Consumer complaint		1
Fraud		1
Glycerol triheptanoate (GTH)		1
Glycoalkaloids		1
Haemorrhagic gastroenteritis		1
Incorrect labelling		1
Tuberculosis		1
Unauthorised operator		1
Urea		1
Total	231	301

Table 4: Comparison of feed related RASFF notifications in 2022 to 2023

Table 5 shows a comparison of the number of RASFF notifications for ‘unauthorised additives’ in 2022 compared to 2023. As can be seen, there were significantly fewer notifications in 2023 (6) compared to 2022 (15).

Unauthorised additives	2022	2023
CBD	5	1
Not stated	1	3
Ethoxyquin	1	1
Astaxanthin	1	
Boric acid	1	
CBD and L-theanine	1	
Cobalt carbonate, cobalt carbonate hydroxide monohydrate	1	
E100 (curcumin), E150a (caramel)	1	
Inositol	1	
Sodium acetate	1	
Vitamin D2	1	
Formaldehyde		1
Total	15	6

Table 5: Comparison of unauthorised feed additive RASFF notifications in 2022 compared to 2023

5. Standardisation activities

Members of CEN TC 327 WG3 'Feed additives and drugs” were invited to a meeting on the use of ISO 23418 for the identification of probiotics. The virtual meeting, held on 31 May 2023, was an open meeting inviting experts from ISO TC 34/SC 9/WG 11 “Food and Feed Cultures”, CEN TC 327/WG 3 “Feed Additives and Drugs”, International Dairy Federation (IDF) Standing Committee on Harmonization of Microbiological Methods, IDF Standing Committee on Analytical Methods for Dairy Micro-organisms and International Probiotic Association.

At the start of the meeting it was reiterated that ISO 23418:2022, Microbiology of the food chain — Whole genome sequencing (WGS) for typing and genomic characterization of bacteria — General requirements and guidance, was not developed for the identification of probiotics, however, WGS is an important tool for probiotic strain characterisation (e.g. absence of antibiotic resistance, virulence factors etc.), as well as unequivocal species identification.

Whilst WGS has been widely used for pathogen source tracking as well as antimicrobial resistance (AMR) surveillance, there are important differences between pathogen and probiotic detection and identification. There are 2 issues which need to be addressed before WGS can be used for probiotic strain identification:

1) Genomic database to estimate the genome variability

For the major foodborne pathogens WGS interpretation is performed in the context of 50K to 500K genomes to estimate the species variability. To use WGS for probiotic identification a substantial database of good quality genomes is needed to estimate the genome variability.

2) Defining what is considered the “same strain”?

The importance of considering both phenotypic as well as genomic differences was highlighted during the meeting.

There was no consensus on whether whole genome sequencing was the best or a suitable approach for identification of probiotic strains. Kirstin Gray attended the meeting.

6. Meetings

Meetings have been held quarterly with the FSA and FSS to discuss activities carried out under the NRL role and any issues that have arisen.
A catch-up meeting with the FSA, including the Feed Delivery Team, was held on 9th June. The NRL provided an update on the review of assimilated EU Regulation 152/2009 and the applicability of including performance characteristics rather specific method details was briefly discussed. The FSA Feed Delivery Team provided an update on the 2023/23 programme and issues and challenges with formal sampling methods were discussed.
Searches are carried out periodically for any meetings, either in the UK or internationally, applicable to feed additives. The searches highlighted the 8th International Feed Conference “Present and Future Challenges”, Feed2023, held in Milan on 9-10th October 2023; more information on the conference is provided in section 13 of this report.

7. NRL network meeting

At the request of the OLs the annual meeting was planned for April 2024 as due to time pressures it is difficult to attend meetings towards the end of the financial year. The meeting has been pushed back to avoid the FSA Food and Feed Laboratory Workshop being held in April 2024.

8. OL Advice, training and support

Issues with the method for the determination of vitamin A had been raised previously and investigated with regards to reported issues with poor recoveries and variation in replicate results. The method for the determination of vitamin A is described in Annex IV, Methods of analysis to control the level of authorised additives in feed, of assimilated EU Regulation 152/2009. The scope of the method is stated as 'This method makes it possible to determine the level of vitamin A (retinol) in feed and premixtures. Vitamin A includes all-trans-retinyl alcohol and its cis-isomers which are determined by this method. The content of vitamin A is expressed in International Units (IU) per kg. The limit of quantification is 2 000 IU vitamin A / kg'. The principle is as follows: the sample is hydrolysed with ethanolic potassium hydroxide solution and the vitamin A is extracted into light petroleum. The solvent is removed by evaporation and the residue is dissolved in methanol. The content of vitamin A is determined by reversed phase high performance liquid chromatography (RP-HPLC) using a UV or a fluorescence detector.
Investigations into the analysis of vitamin A are ongoing and have included the preparation of an in-house QC material to enable comparisons of different procedures and methods to be made.

9. Official Laboratory capability

The annual OL survey was drafted and sent to all UK OLs. The survey, organised under the Government Chemist programme, included questions regarding training, support or method development that NRLs could provide. Responses to the survey have been collated and a summary report is in preparation. Relevant parts, for example training needs, will be forwarded to the appropriate NRLs for information.

To help provide an assessment of overall OL capability, a review of the OLs accreditation status was carried out. The accreditation scope for each laboratory is published on the UKAS website and each scope was looked at for methods and analyses accredited for in feed matrices; a summary is provided in Annex 3. Moisture, nitrogen / protein, oil, vitamins A and E and a range of elements appear to be the standard analyses accredited by the majority of OLs in animal feeding stuffs. A number of the OLs (Kent Scientific Services, Lancashire County Scientific Services, Aberdeen Scientific Services, Tayside Scientific Services and Minton, Treharne and Davies Limited) also hold generic / flexible scopes for the development of methods of analysis for analytes including additives, colourings, preservatives and contaminants in animal feeding stuffs using a variety of techniques such as HPLC, AAS, ICP-OES, ELISA, UV/Visible spectrophotometry, microscopy and classical wet chemistry techniques. It is also worth noting that Kent Scientific Services not only holds accreditation for chemical tests in animal feeding stuffs, the scope of their accreditation also covers related opinions and interpretations.

10. Reporting

Monthly activity logs and quarterly reports have been completed and the annual report describing activities carried out in the last year submitted and a copy placed on the NRL webpage.

11. Legislation updates

Under the Government Chemist programme regular reviews of legislation relating to feed and food are carried out. A summary of GB and EU feed additives authorisations and renewals published between during the year April 2023 – March 2024 is provided in Annex 3.

12. Enquiries and advice

A request was received from the FSA for help clarifying the wording in a EU feed additive report (azurine cross-linked wheat arabinoxylan substrate). The text was reviewed and an opinion on the text provided.

13. Feed 2023 International conference

Feed 2023, the 8th International Feed Conference was held as a hybrid event, physically at Università degli Studi di Milano, Italy, and virtually, on 9 and 10 October 2023. Kirstin Gray attended virtually. The conference was held over one and a half days and the presentations' titles were as follows:

- Optimised Nutrient Recovery Through Animal Nutrition
- Doing it better with less: the main drive for innovation in the feed mill
- Processed former foodstuff in livestock diet can enhance performance and improve environmental impacts: an insight in poultry application
- The inclusion of salty and sugary Former Food Products in the feed of growing-finishing pigs does not impair diet digestibility
- Combined inclusion of former foodstuff and wet distiller grain in dairy cow diets to reduce the environmental impact of cheese production.
- Bioconversion of Agro-Industrial Residues to Volatile Fatty Acids (VFAs): A Sustainable Approach for Ruminant Feed Supplementation
- Microplastics interact with the ruminal microbiome ex vivo
- Determination of microplastics additives in feed containing former food
- From Farm to Fork: Innovative feed additives and reducing emissions from livestock
- Total phenolic content and antioxidant capacity of hemp co-products after green extraction and ex vivo digestion simulation
- Ascophyllum nodosum and Lithothamnium calcareum as functional feed additives alternatives to antibiotics in F4+ Escherichia coli challenged piglets
- Efficacy of a spore-forming bacteria (Bacillus coagulans) on the health of weaning Holstein Friesian female calves
- Yeast mixture benefits gut health of post-weaning piglets
- Evaluation of phenolic profile and antioxidant activity of cocoa (Theobroma cacao L.) by-products to explore their potential as animal feed additives

- Soil nematode C. elegans infection model for screening of novel plant-based antimicrobials as feed additives
- Measures against Antimicrobial Resistance: methods of analysis for 24 antimicrobial active substances in feed at cross-contamination level to support EU legislation enforcement
- Determination of aminoglycoside antibiotics in feed at cross-contamination levels for enforcing EU legislation
- New Approach Methodologies for mechanistic toxicology-based feed safety assessments
- ConTrans: A Tool to Estimate Feed-to-Food Contaminant Transfer in Farm Animals
- Quality assurance and control of methods to examine visually recognizable substances in feed and food
- Ranking of chemical hazards for risk-based monitoring of farmed fish, feed and feed materials
- Supplementing broiler diet with a new generation emulsifier: effects on performances, nutrient absorption, and cost optimization.
- NIR portable instruments. Development of a cloud-based application with a handheld spectrometer: Pocket Feed Lab
- Assessment of the Accuracy of Near-Infrared Spectroscopy (NIRS) Technology for Determining the Proximate Composition and Amino Acid Content of Commercial Soybean Meal Samples
- Spectra library-based proteomics for feed forensics in a circular economy
- Insect meal in feed: use of NIRS techniques to support the detection of authorized and unauthorized insect species
- Defining a common cut-off of real-time PCR methods in a network of laboratories for the detection of processed animal proteins
- The emerging mycotoxin enniatin B causes adverse health effects in Atlantic salmon farmed on plant-based feeds, while beauvericin does not.

14. NRL Forward Workplan

In 2024/25 the NRL core activities, e.g. horizon scanning, PT participation and dissemination of relevant information and advice as required, will continue.

The systems and processes drafted for the evaluation of feed additive authorisation applicants and receipt and storage of reference samples will be maintained and dossiers will be evaluated as required.

15. NRL website

Information about LGC's NRL roles are found on our website at: https://www.lgcgroup.com/what-we-do/national-laboratory-and-government-roles/national-laboratory-roles/national-reference-laboratories/. Additional webpages are to be added and will provide information on the authorisation process, guidance for submission of reference samples and standards relating to authorisation applications and a database of additives newly authorised for use in GB together with information on methods of analysis for control.

16. Feed Additive Authorisation

Feed additives are regulated products and as such require authorisation before use. Following Great Britain's exit from the EU, all new feed additives need to be authorised by the Competent Authority (FSA/FSS) before use in GB. Feed additives that are currently approved for use in the EU can continue to be used in GB but an application for authorisation renewal is required to be submitted at least one-year prior to expiry, however, it should be noted that this procedure is currently under review.

Under part 2 of the NRL contract, feed additive regulated product authorisation, the NRL is responsible for:

- the reception, preparation, storage and maintenance of reference samples and reference standards where applicable;
- evaluating the data provided by the applicant for authorisation to place the feed additive on the market, for the purpose of testing and evaluation or validation of the method for detection;

- submitting a full evaluation report to the FSA Risk team for each application within 3 months from the date of receipt of a valid application and payment of fee. This period can be extended for complex applications or where supplementary information is requested.

As the NRL will be responsible for storage of any feed additive reference samples and standards received, suitable storage facilities with accurate temperature monitoring are required. During the year a new temperature monitoring system, an upgrade to the current system, was installed. The new system enables the temperature of storage areas for feed additive reference samples and standards (rooms, fridges and freezers) to be monitored remotely and alarm notifications sent if abnormal temperatures are recorded.
Numerous meetings were held with the FSA throughout the year to discuss the feed authorisation procedure, LGC/FSA webpages, reference sample storage and access and reference to standard methods.

Meetings were also held with the FSA to discuss the potential for LGC to triage authorisation applications, together with the associated processes and contractual issues. As a result, 10 applications were sent to LGC to triage. The triage involved determining whether a full scientific evaluation of the analytical methods proposed by the applicants was required.

The 10 feed additives that underwent triage were:

- Sodium bisulphate
- Cobalt(II) carbonate
- *Saccharomyces cerevisiae* Y1242
- Patent Blue V
- Niacin
- Niacinamide
- *Lentilactobacillus buchneri* DSM19455
- *Bacillus velezensis* PB6
- Clinoptilolite
- Folic acid

During the triage of the above feed additive applications it was determined that a set of criteria was required to differentiate between the need for a triage only for a renewal application and a renewal evaluation being required. The following four questions which were proposed to the FSA as potential criteria:

- Has the method proposed by the applicant been previously approved?
- Is the concentration of the active ingredient in the additive the same as in the original authorisation?
- Is the proposed maximum content of the additive the same as in the original authorisation?
- Is the matrix the same as in the original authorisation?

If during the triage it was determined that the answer to all 4 questions was 'Yes', a full evaluation would not be required. If the answer to any of the questions was 'No', a renewal evaluation would be required to review, for example, the LOD, etc. At the time of writing this report feedback from the FSA is awaited on their requirement for the triage of applications going forward.

Annex 1: Feed Proficiency Tests

A search of the European PT Information System (EPTIS) database was carried out to see which proficiency tests (PTs) are available in areas relevant to the National Reference Laboratory for Feed Additives role. The EPTIS database (www.eptis.bam.de) is a joint publication of a worldwide consortium of organisations with all members being involved in PT and playing a prominent role in national or international quality infrastructures. The overall coordinator of EPTIS is the Federal Institute for Materials Research and Testing (BAM) in Germany and, currently, the EPTIS database lists around 5,000 PT schemes from around 40 countries worldwide.

The screen shot below (Figure 1) shows an example of the output of a search of the EPTIS database using the following terms (4 January 2024) (First results based on date 'last changed'.):

- 'Feed additive'
- Accredited

The results of the search were not particularly useful as words such as 'additional' were also picked up resulting in 143 hits, the majority of which were unrelated to feed or feed additives, for example legionella in water, food factory hygiene and blood gases.

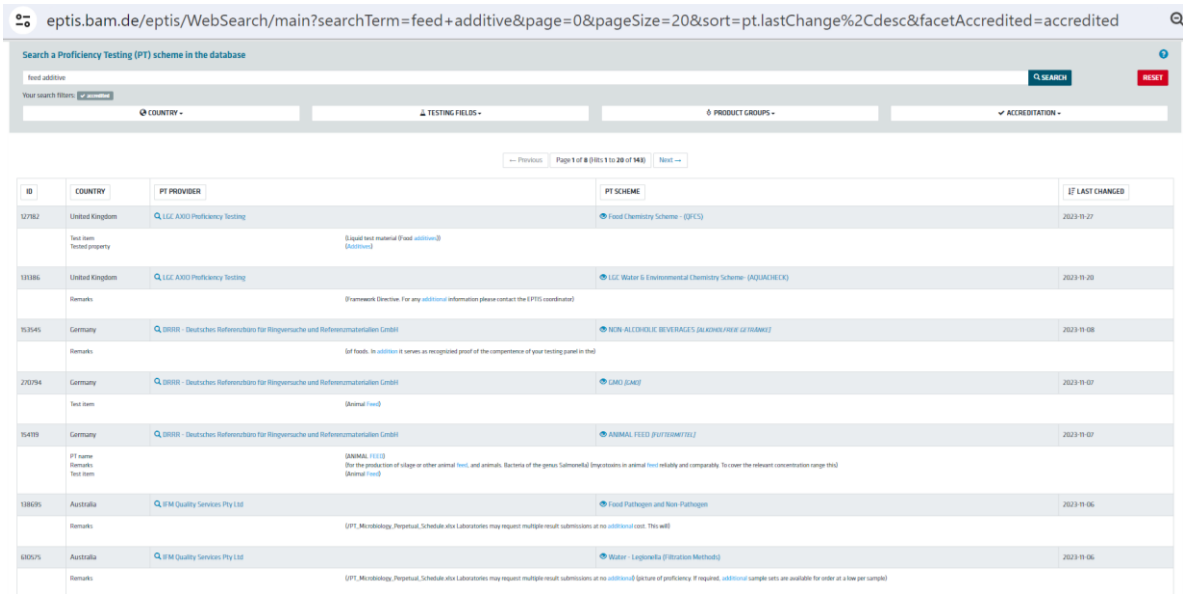


Figure 1: Result of search on EPTIS database using 'Accredited' and the search term 'Feed additive'

Another search was carried out using the search term ‘Feed’ and the filter ‘Accredited’ (Figure 2).

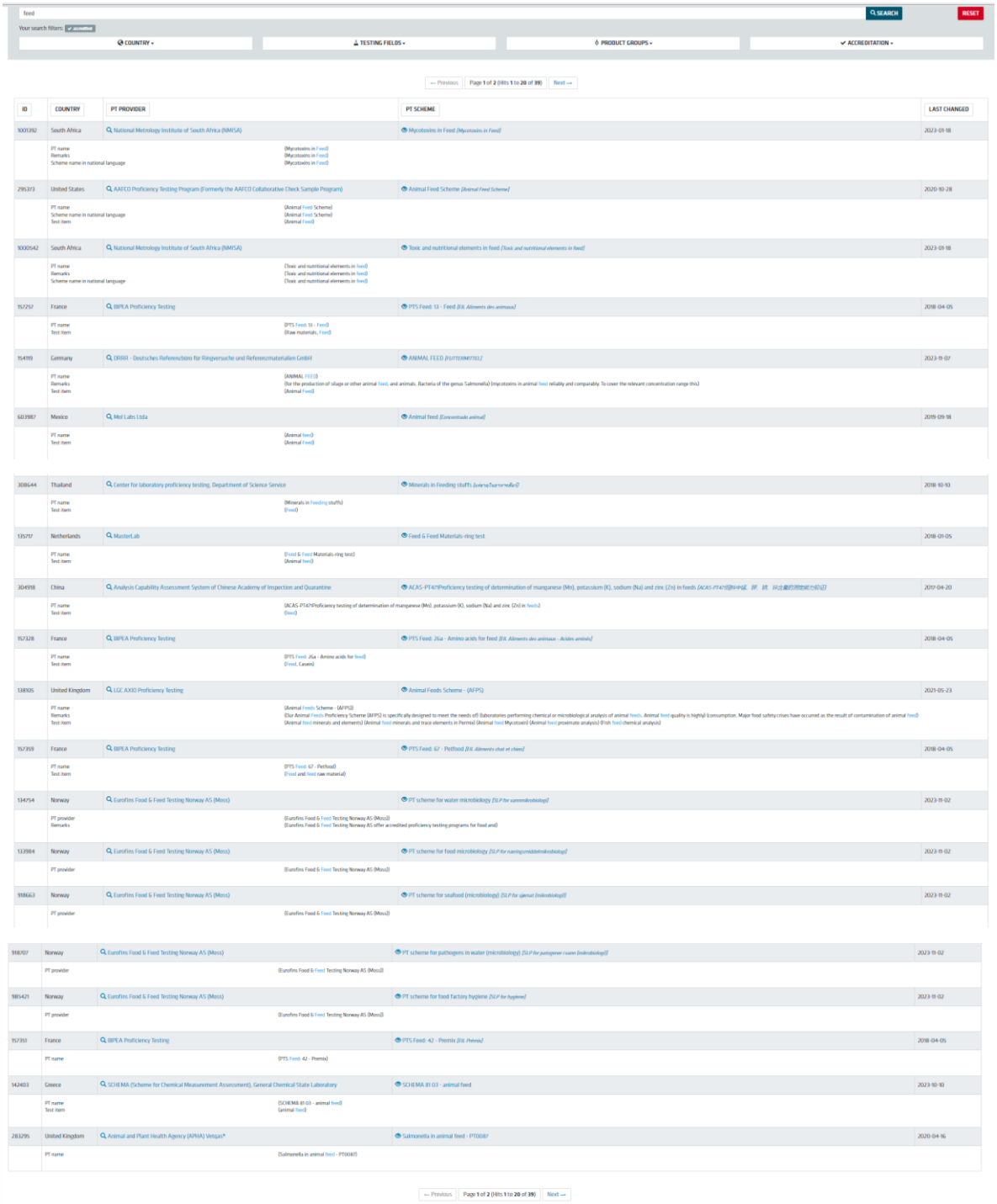
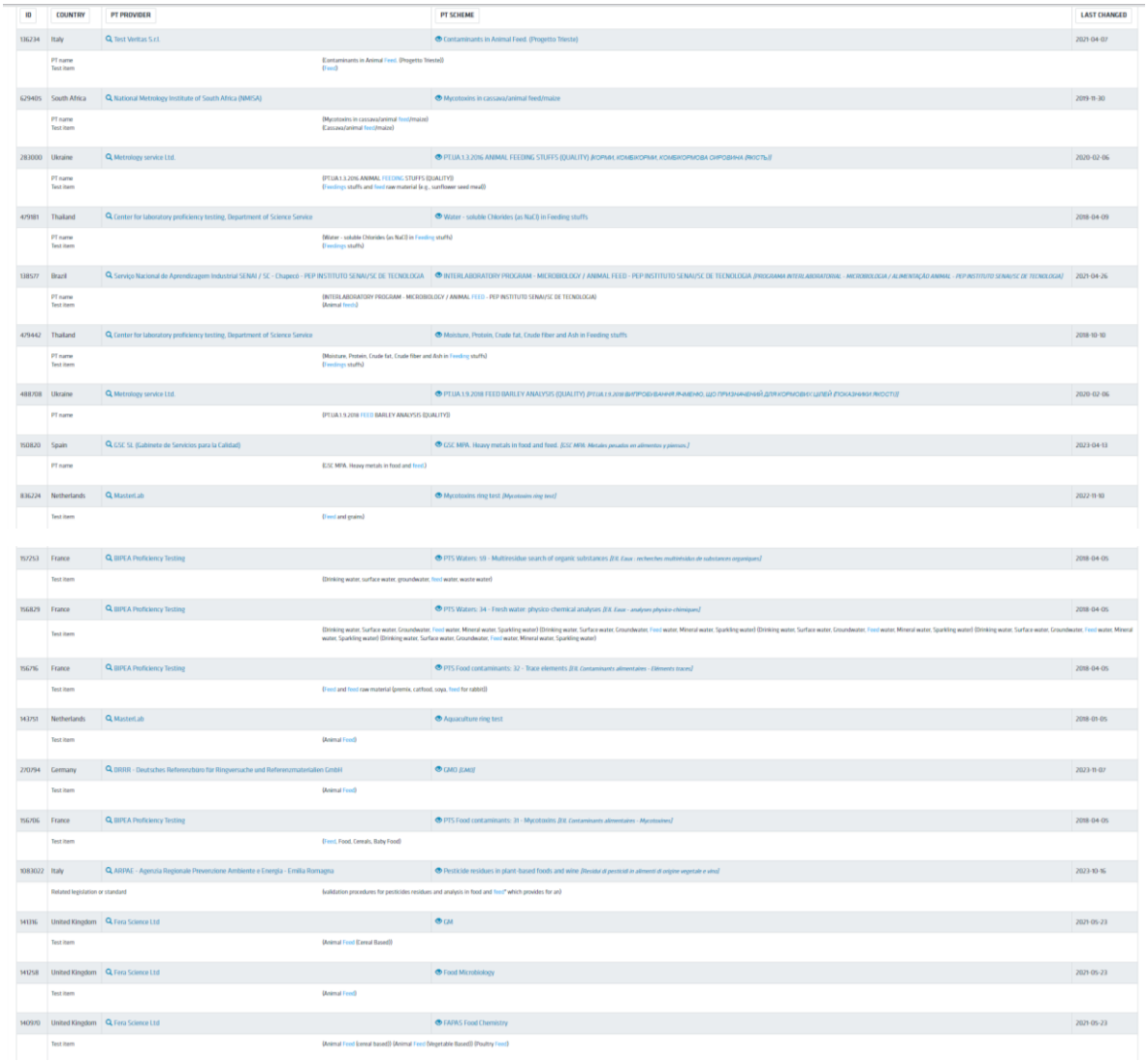


Figure 2: Result of search on EPTIS database using ‘Accredited’ and the search term ‘Feed’



ID	COUNTRY	PT PROVIDER	PT SCHEME	LAST CHANGED
136734	Italy	Test Veritas S.r.l.	Contaminants in Animal Feed. (Progetto Trieste)	2021-04-07
	PT name Test item	(Contaminants in Animal Feed. (Progetto Trieste)) (Feed)		
629405	South Africa	National Metrology Institute of South Africa (NMISA)	Mycotoxins in cassava/animal feed/maize	2019-11-30
	PT name Test item	(Mycotoxins in cassava/animal feed/maize) (Cassava/animal feed/maize)		
283000	Ukraine	Metrology service Ltd.	PT UA.1.3.2016 ANIMAL FEEDING STUFFS (QUALITY) (КОРМИ, КОМБІКОРМИ, КОМБІКОРМОВА СИРОВИНА, ЯКІСТЬ)	2020-02-06
	PT name Test item	(PT UA.1.3.2016 ANIMAL FEEDING STUFFS (QUALITY)) (Feedings stuffs and feed raw material (e.g., sunflower seed meal))		
479181	Thailand	Center for laboratory proficiency testing, Department of Science Service	Water - soluble Chlorides (as NaCl) in Feeding stuffs	2018-04-09
	PT name Test item	(Water - soluble Chlorides (as NaCl) in Feeding stuffs) (Feedings stuffs)		
138577	Brazil	Serviço Nacional de Aprendizagem Industrial SENAI / SC - Chapecó - PEP INSTITUTO SENAI/SC DE TECNOLOGIA	INTERLABORATORY PROGRAM - MICROBIOLOGY / ANIMAL FEED - PEP INSTITUTO SENAI/SC DE TECNOLOGIA (PROGRAMA INTERLABORATORIAL - MICROBIOLOGIA / ALIMENTAÇÃO ANIMAL - PEP INSTITUTO SENAI/SC DE TECNOLOGIA)	2021-04-26
	PT name Test item	(INTERLABORATORY PROGRAM - MICROBIOLOGY / ANIMAL FEED - PEP INSTITUTO SENAI/SC DE TECNOLOGIA) (Animal feeds)		
479442	Thailand	Center for laboratory proficiency testing, Department of Science Service	Moisture, Protein, Crude Fat, Crude fiber and Ash in Feeding stuffs	2018-10-10
	PT name Test item	(Moisture, Protein, Crude fat, Crude fiber and Ash in Feeding stuffs) (Feedings stuffs)		
488708	Ukraine	Metrology service Ltd.	PT UA.1.9.2018 FEED (BARLEY ANALYSIS (QUALITY) (РТ UA.1.9.2018 ВИПРОБУВАННЯ ЯЧМЕНЮ, ЩО ПРИЗНАЧЕНИЙ ДЛЯ КОРМОВИХ ЦІЛЕЙ (ЯКІСНІ ПОКАЗНИКИ ЯКОСТІ))	2020-02-06
	PT name	(PT UA.1.9.2018 FEED (BARLEY ANALYSIS (QUALITY))		
150820	Spain	GSC SL (Gabinete de Servicios para la Calidad)	GSC MPA. Heavy metals in food and feed. (GSC MPA. Metales pesados en alimentos y piensos.)	2023-04-13
	PT name	(GSC MPA. Heavy metals in food and feed.)		
836224	Netherlands	MasterLab	Mycotoxins ring test (Mycotoxins ring test)	2022-11-10
	Test item	(Feed and grains)		
157253	France	BIPEA Proficiency Testing	PTS Waters: 59 - Multiresidue search of organic substances (EIL Eaux - recherches multirésidus de substances organiques)	2018-04-05
	Test item	(Drinking water, surface water, groundwater, feed water, waste water)		
156829	France	BIPEA Proficiency Testing	PTS Waters: 34 - Fresh water: physico-chemical analyses (EIL Eaux - analyses physico-chimiques)	2018-04-05
	Test item	(Drinking water, Surface water, Groundwater, Feed water, Mineral water, Sparkling water) (Drinking water, Surface water, Groundwater, Feed water, Mineral water, Sparkling water) (Drinking water, Surface water, Groundwater, Feed water, Mineral water, Sparkling water) (Drinking water, Surface water, Groundwater, Feed water, Mineral water, Sparkling water)		
156716	France	BIPEA Proficiency Testing	PTS Food contaminants: 32 - Trace elements (EIL Contaminants alimentaires - Eléments traces)	2018-04-05
	Test item	(Feed and feed raw material (premix, cattfood, soya, feed for rabbit))		
143751	Netherlands	MasterLab	Aquaculture ring test	2018-01-05
	Test item	(Animal Feed)		
270794	Germany	DRRR - Deutsches Referenzbüro für Ringversuche und Referenzmaterialien GmbH	GMO (GMO)	2023-11-07
	Test item	(Animal Feed)		
156706	France	BIPEA Proficiency Testing	PTS Food contaminants: 31 - Mycotoxins (EIL Contaminants alimentaires - Mycotoxines)	2018-04-05
	Test item	(Feed, Food, Cereals, Baby Food)		
1083022	Italy	ARPAE - Agenzia Regionale Prevenzione Ambiente e Energia - Emilia Romagna	Pesticide residues in plant-based foods and wine (Residui di pesticidi in alimenti di origine vegetale e vino)	2023-10-16
	Related legislation or standard	(validation procedures for pesticides residues and analysis in food and feed" which provides for an)		
141316	United Kingdom	Fera Science Ltd	GM	2021-05-23
	Test item	(Animal Feed (Cereal Based))		
141258	United Kingdom	Fera Science Ltd	Food Microbiology	2021-05-23
	Test item	(Animal Feed)		
140970	United Kingdom	Fera Science Ltd	FAPAS Food Chemistry	2021-05-23
	Test item	(Animal Feed (cereal based)) (Animal Feed (Vegetable Based)) (Poultry Feed)		

Figure 2 continued: Result of search on EPTIS database using ‘Accredited’ and the search term ‘Feed’

The above search was further refined by the inclusion of a filter for ‘United Kingdom’.

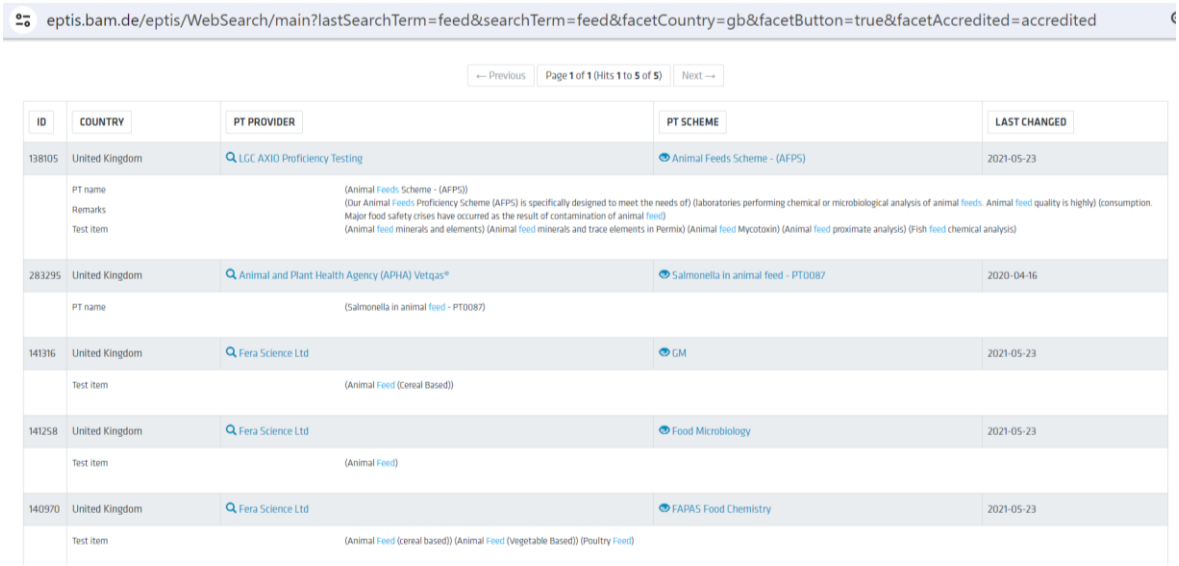


Figure 3: Result of search on EPTIS database using ‘Accredited’, ‘’United Kingdom’ and the search term ‘Feed’

Apart from the Animal and Plant Health Agency (APHA) which has organised salmonella in feed PTs, the only UK suppliers of feed related PT schemes are Fera Science Ltd (FAPAS) and LGC AXIO Proficiency Testing. A search was carried out on both companies’ websites for feed PTs, the results are shown below.

Fera Science Ltd (FAPAS)

Product Code	Item Code	Start Date	Matrix	Analytes		
Proficiency Test						
Veterinary Medicines in Animal Feed Proficiency Test						
FCVD40-AFE1	02547	20/03/2024	Animal Feed	antibiotics	£306.00	+
Coccidiostats & Chloramphenicol in Poultry Feed Proficiency Test						
FCVD8-AFE15	02571	27/09/2024	Poultry Feed	coccidiostats & chloramphenicol (contaminant levels)	£315.00	+
Coccidiostats & Chloramphenicol in Poultry Feed Blank Proficiency Test						
BLVD30-AFE23	02571b	27/09/2024	Blank Poultry Feed	BLANK for coccidiostats & chloramphenicol (BLVD30)	£98.00	+
Veterinary Medicines in Animal Feed Proficiency Test						
FCVD40-AFE1	02592	19/03/2025	Animal Feed	antibiotics	£315.00	+
Veterinary Medicines in Animal Feed Blank Material						
BLPM1-AFE4	02592b	19/03/2025	Blank Animal Feed	BLANK (BLPM1)	£98.00	+
Aflatoxins in Animal Feed (Cereal Based) Proficiency Test						
FCMM4-AFE2	04509	04/04/2024	Animal Feed (Cereal Based)	aflatoxins B & G &/or total & OTA	£320.00	+
FCMM4-AFE2	04528	30/09/2024	Animal Feed (Cereal Based)	aflatoxins B & G &/or total & OTA	£320.00	+
Mycotoxins in Animal Feed (Cereal Based) Proficiency Test						
FCMM5-AFE2	04533	20/11/2024	Animal Feed (Cereal Based)	contamination of matrix with two or more from the following list: aflatoxin B1, OTA, ZON, DON, FB1 & FB2 & total fumonisins (as a sum of FB1 & FB2)	£415.00	+
Heavy Metals in Animal Feed (Plant Origin) Proficiency Test						
FCCM45-AFE23	07521	07/03/2024	Animal Feed (Plant Origin)	selection of metals at high levels	£237.00	+
Heavy Metals in Animal Feed (Cereal Based) Proficiency Test						
FCCM46-AFE2	07555	21/11/2024	Animal Feed (Cereal Based)	selection of metals at natural/low levels	£244.00	+
Heavy Metals in Animal Feed (Plant Origin) Proficiency Test						
FCCM45-AFE23	07568	10/03/2025	Animal Feed (Plant Origin)	selection of metals at high levels	£244.00	+

Pesticide Residues (multi-residues) in Animal Feed (Cereal Based) Proficiency Test

FCPM2-AFE2	09176	10/10/2024	Animal Feed (Cereal Based)	pesticide residues (multi-residue)	£243.00	+

Pesticide Residues (multi-residues) in Animal Feed (Cereal Based) Blank Proficiency Test

BLPM2-AFE21	09176b	10/10/2024	Blank Animal Feed (Cereal Based)	BLANK for pesticide residues (multi-residue) (BLPM2)	£77.00	+

Nutritional Components in Premix Proficiency Test

FCNE1-AFE17	10192	25/01/2024	Premix	selection of nutritional elements	£240.00	+

Nutritional Components in Dairy Ration Proficiency Test

FCNC1-AFE7	10193	01/03/2024	Dairy Ration	selection of nutritional components	£433.00	+

Nutritional Components in Pig Ration Proficiency Test

FCNC1-AFE14	10194	03/07/2024	Pig Ration	selection of nutritional components	£285.00	+

Nutritional Components in Soybean Meal Proficiency Test

FCNC1-AFE20	10195	26/09/2024	Soybean meal	selection of nutritional components	£254.00	+

Nutritional Components in Poultry Ration Proficiency Test

FCNC1-AFE16	10197	05/12/2024	Poultry Ration	selection of nutritional components	£433.00	+

Nutritional Components in Premix Proficiency Test

FCNE1-AFE17	10198	24/01/2025	Premix	selection of nutritional elements	£254.00	+

Nutritional Components in Dairy Ration Proficiency Test

FCNC1-AFE7	10199	03/03/2025	Dairy Ration	selection of nutritional components	£433.00	+

Mycotoxins in Animal Feed Proficiency Test

FCMF11-AFE1	22218	19/01/2024	Animal Feed	Deoxynivalenol (DON),Deoxynivalenol 3-glucoside (DON-3-Glc) & 3-Acetyldeoxynivalenol (3-Ac-DON)	£304.00	+

Mycotoxins in Animal Feed (Cereal Based) Proficiency Test

FCMF2-AFE2	22229	25/09/2024	Animal Feed (Cereal Based)	deoxynivalenol (DON), zearalenone (ZON), T-2 & HT-2 toxins & as a sum of T-2 & HT-2 toxins	£353.00	+

Mycotoxins in Animal Feed Proficiency Test

FCMF11-AFE1	22234	17/01/2025	Animal Feed	Deoxynivalenol (DON),Deoxynivalenol 3-glucoside (DON-3-Glc) & 3-Acetyldeoxynivalenol (3-Ac-DON)	£313.00	+

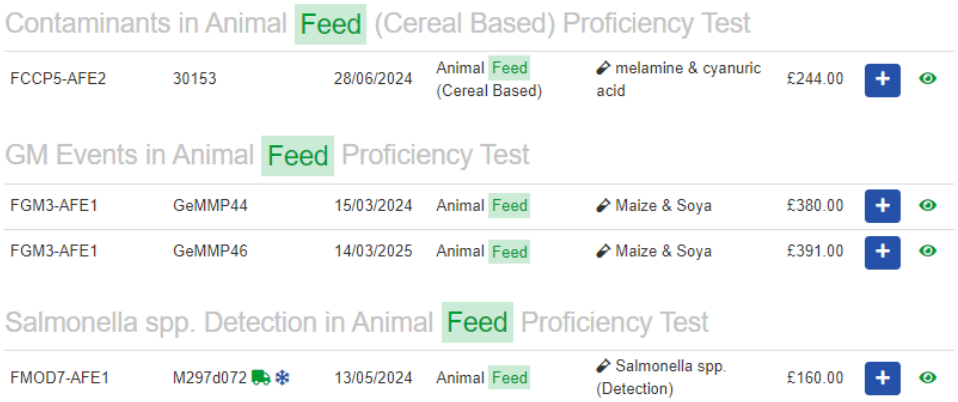


Figure 4: FAPAS feed related PT

Analytes included in the various rounds include:

Nutritional analysis

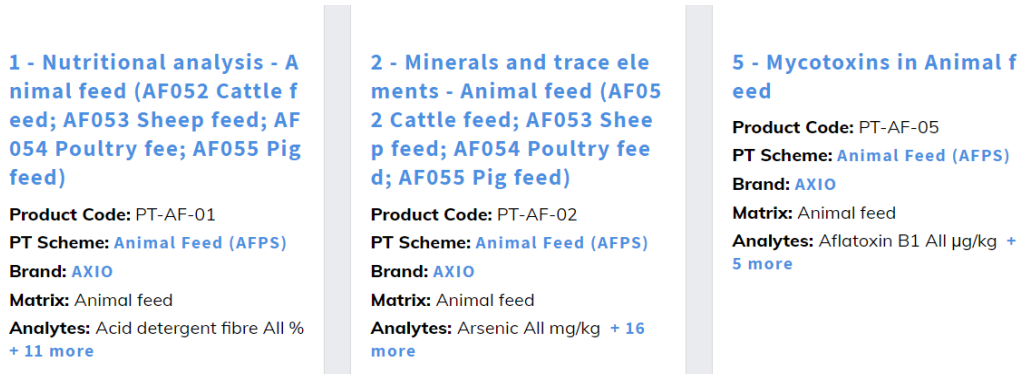
Moisture	Ash	Total oil
Protein	Fibre	Vitamin E

Minerals and trace elements

Calcium	Magnesium	Manganese
Phosphorus	Sodium	Zinc
Selenium	Iron	

LGC AXIO Proficiency Testing

Animal feed scheme (AFPS) – Chemistry



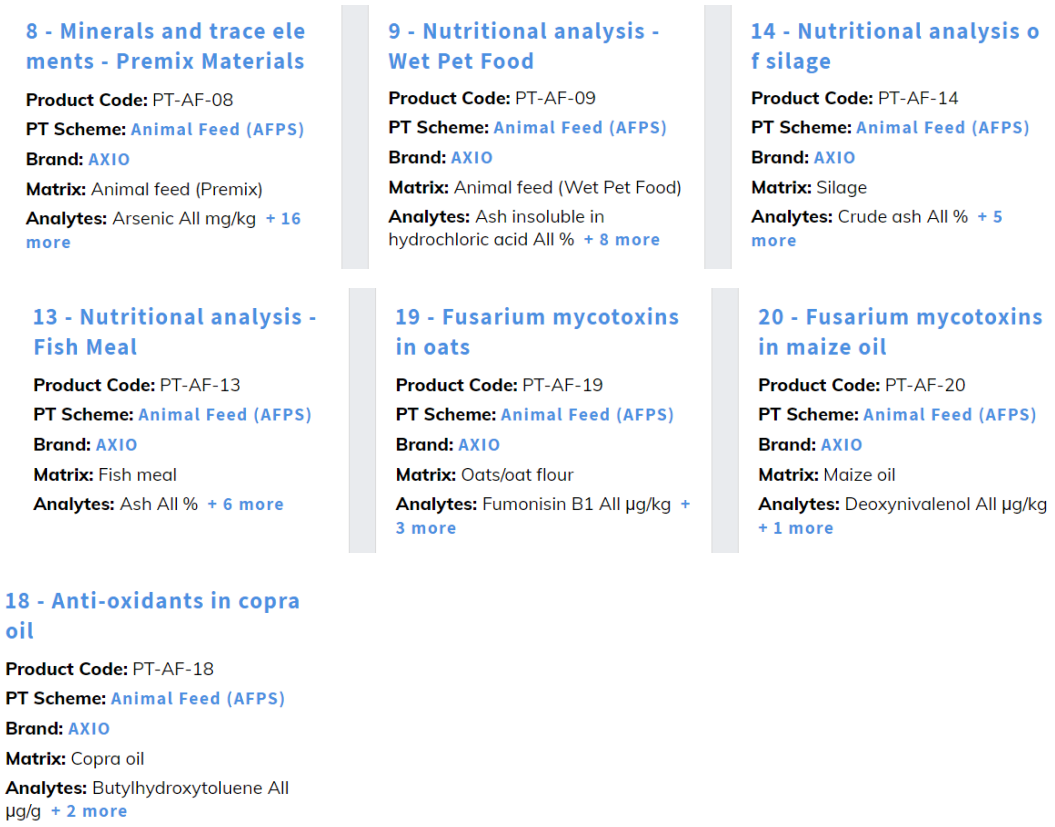


Figure 5: LGC AXIO feed related PT

Analytes included in the various rounds include:

<u>Nutritional analysis</u>

Acid detergent fibre	Acid insoluble ash	Crude ash
Crude fat	Crude fibre	Crude protein
Moisture	Neutral detergent fibre	Pepsin protein
Starch	Sugars	pH

<u>Minerals and trace elements</u>

Arsenic	Cadmium	Calcium
Chloride	Chromium	Cobalt
Copper	Iron	Lead
Magnesium	Manganese	Mercury
Phosphorus	Potassium	Selenium
Sodium	Zinc	

As can be seen from the above lists, there are a number of feed PTs offered by both Fera Science Ltd (FAPAS) and LGC AXIO Proficiency Testing, however there are only a very limited number that are relevant to feed additives. PTs with analytes relevant to feed additives in a feed matrix include:

- Calcium (FAPAS and LGC AXIO PT)
- Manganese (FAPAS and LGC AXIO PT)
- Selenium (FAPAS and LGC AXIO PT)
- Iron (FAPAS and LGC AXIO PT)
- Zinc (FAPAS and LGC AXIO PT)
- Cobalt (LGC AXIO PT)
- Copper (LGC AXIO PT)
- Coccidiostats (FAPAS)
- Vitamin E (FAPAS)

A search of the EPTIS database for proficiency tests related to feed came back with rounds from the following companies worldwide:

- Serviço Nacional de Aprendizagem Industrial SENAI, Brazil
- Analysis Capability Assessment System of Chinese Academy of Inspection and Quarantine, China
- BIPEA Proficiency Testing, France
- DRRR Deutsches Referenzbüro für Ringversuche und Referenzmaterialien GmbH, Germany
- SCHEMA (Scheme for Chemical Measurement Assessment), General Chemical State Laboratory, Greece
- ARPAE Agenzia Regionale Prevenzione Ambiente e Energia - Emilia Romagna, Italy
- Test Veritas S.r.l., Italy
- Mol Labs Ltda, Mexico
- MasterLab, Netherlands
- Eurofins Food & Feed Testing Norway AS (Moss), Norway
- National Metrology Institute of South Africa (NMISA), South Africa
- GSC SL (Gabinete de Servicios para la Calidad), Spain

- Centre for laboratory proficiency testing, Department of Science Service, Thailand
- Metrology service Ltd., Ukraine
- Animal and Plant Health Agency (APHA) Vetqas®, UK
- Fera Science Ltd, UK
- LGC AXIO Proficiency Testing, UK
- AAFCO Proficiency Testing Program, United States

Although PT rounds from all of the above companies were listed when a search for 'feed' was carried out on the EPTIS database, a large number of the entries had not been updated for over at least 2 years, and many of the companies were not currently offering rounds.

The only companies that had updated the EPTIS database in 2023 were:

- DRRR Deutsches Referenzbüro für Ringversuche und Referenzmaterialien GmbH, Germany – Schemes covering GMO, Salmonella and mycotoxins
- Eurofins Food & Feed Testing Norway AS (Moss), Norway – Microbiology schemes
- ARPAE Agenzia Regionale Prevenzione Ambiente e Energia - Emilia Romagna, Italy – Pesticide scheme
- SCHEMA (Scheme for Chemical Measurement Assessment), General Chemical State Laboratory, Greece – Animal feed scheme for the following analytes: Moisture, ash, oil, protein, fibre, iron, copper, manganese, zinc, calcium, potassium, sodium, potassium and magnesium
- GSC SL (Gabinete de Servicios para la Calidad), Spain – Scheme for heavy metals
- National Metrology Institute of South Africa (NMISA), South Africa – Schemes for mycotoxins and toxic and nutritional elements.

Although there are numerous companies worldwide that are flagged on the EPTIS database as organising PTs relating to feed, when they are reviewed it becomes apparent that many of the entries are out of date and have not been updated for several years. Also, the majority of the schemes appear to focus on analyte groups such as mycotoxins or metals and elements, there are very few rounds relating to feed additives.

In conclusion, there are relatively few PTs for feed additives and there appears to be no more appropriate current commercial PTs available for feed analytes than those being offered by FAPAS and LGC AXIO Proficiency Testing. Use of UK based suppliers for PTs also eliminates potential delays in deliveries from overseas and the associated potential issues with Customs.

Annex 2: OL accreditation status

Laboratory	Current UKAS accreditation status - Feed / Feed additives
Hampshire Scientific Services	No reference to feed.
Kent Scientific Services	Accredited for chemical tests and related opinions and interpretations in animal feedingstuffs - Aflatoxins B1, B2, G1 and G2, Ash, Crude fibre, Copper, Inorganic arsenic, Lead and cadmium, Melamine, Moisture, Nitrogen, Oil, Vitamin A and Vitamin E, Total mercury, Fumonisins B1 and B2 (cereal based feedingstuffs). Accredited in food and animal feeds - Arsenic, Histamine, Mercury. Accredited in Beer, Cereals and Cereal based feedingstuffs - Deoxynivalenol, T2 and HT2 toxins Accredited in unspecified foods and animal feeds - Additives, colourings, preservatives and related contaminants & composition - Development and modification of methods for food and feed analysis using generic in-house method for the techniques HPLC, LC MS, GC, GC MS, AAS, UV VIS, spectrophotometry, microscopy, ELISA and wet chemistry (drying, weighing and titration).
Lancashire County Scientific Services	Accredited in animal feeding stuffs - Ash, Crude oil and fat, Fibre, Moisture, Protein, Vitamin A, Vitamin E, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Selenium and Zinc. Accredited in animal feeding stuffs and food - Additives, contaminants and food composition - Development and modification of methods and analyses for food and animal feed enforcement purposes: Generic Protocol using High Performance Liquid Chromatography with UV, RI, Fluorescence, detection, Gas Chromatography using FID, UV/Vis spectrophotometry, Flame Atomic Absorption Spectrophotometry (AAS), Electrothermal AAS, Hydride generation AAS, Ion Chromatography (IC), Inductively Coupled Plasma Mass Spectrometry (ICPMS).

	Accredited in animal feeding stuffs and food - Allergens, Contaminants (mycotoxins) and Meat Speciation - Development and modification of methods and analyses for food and animal feed enforcement purposes: Generic Protocol using commercially available Enzyme Linked Immunosorbant Assay (ELISA) kits.
Aberdeen Scientific Services (Aberdeen City Council)	Accredited in animal feeding stuffs - Aflatoxins B1, B2, G1 and G2, Ash, Lead and cadmium, Mercury, Moisture, Nitrogen, Oil and Contaminants and composition using generic in-house procedure for the techniques GC, HPLC, AAS, ICP-OES, UV/Visible Spectrophotometry, Microscopy and Classical Techniques. Accredited in animal feeding stuffs, bread and bread products - Crude fibre. Accredited in animal feeding stuffs, food and food products - Vitamin A and vitamin E.
Dundee City Council Scientific Service (Tayside Scientific Services)	Accredited in animal feeding stuffs - Aflatoxins B1, B2, G1 and G2 and Ochratoxin A, Zearalenone, Ash, Crude fibre, Moisture, Oil, Nitrogen and protein, Vitamins A and E, Cobalt, Copper, iron, Manganese, Zinc, Cadmium, Lead, Arsenic and Selenium. Accredited in animal feeding stuffs - Flexible scopes for Compositional Analysis, Additives, colourings, preservatives and related contaminants, Determination of Elements and Foreign Body identification. Accredited in Animal Feeding Stuffs, Foods and Waters - Flexible scope for Detection and/or determination of DNA sequences for speciation, genetically modified organisms (GMO's), allergens and microorganisms
Edinburgh Scientific Services (The City of Edinburgh Council)	Accredited in animal feeding stuffs - Aflatoxins - B1, B2, G1, G2, Ochratoxin A, Ash, Acid insoluble ash, Crude fibre, Oil/fat, Moisture, Nitrogen, Protein, Arsenic, Cadmium, Cobalt, Copper, Lead, Mercury, Selenium and Zinc, Vitamins A and E, Isolation and confirmation of Salmonella spp. Accredited in foods and food products, animal feeding stuffs, and

	environmental samples - Detection and Identification of Bacteria DNA using Specific Genomic Sequences
Glasgow Scientific Services	Accredited in feeding stuffs - Ash, Crude fibre, Crude oils and fats, Moisture, Nitrogen, Protein, Crude protein, Cadmium, Copper, Lead, Selenium, Zinc, Calcium, Iron, Magnesium, Manganese, Phosphorus, Vitamin A, Vitamin E
Minton, Treharne and Davies Limited	Accredited in animal feeding stuffs - Ash, Crude fibre, Moisture, Nitrogen and protein, Oil and Generic protocol for the development of methods of analysis under flexible scope using gas chromatography, high performance liquid chromatography, UV-Vis spectroscopy, enzyme linked immunoassay (ELISA), microscopy, titrimetry and gravimetry
Public Analyst Scientific Services, Wolverhampton	No reference to feed / feed additives.

Annex 3: Feed additive authorisation legislation summary

Under the Government Chemist programme regular reviews of legislation relating to feed and food are regularly carried out.

The following Regulation was published relating to the provisional authorisation of cobalt(II) acetate tetrahydrate, cobalt(II) carbonate, cobalt(II) carbonate hydroxide (2:3) monohydrate and cobalt(II) sulphate heptahydrate; The Feed Additives (Form of Provisional Authorisations) (Cobalt(II) Compounds) (England) Regulations 2023. Equivalent regulations were made in Scotland and Wales: The Feed Additives (Form of Provisional Authorisations) (Cobalt(II) Compounds) (Scotland) Regulations 2023 and The Feed Additives (Form of Provisional Authorisations) (Cobalt(II) Compounds) (Wales) Regulations 2023.

The Feed Additives (Authorisations) (England) Regulations 2023 provide for new authorisations, renewal of authorisations and revocation of existing authorising legislation for a number of feed additives. The feed additives listed in this Regulation are:

- Renewal of authorisation of a preparation of endo-1,4-beta-xylanase (EC 3.2.1.8) produced from *Trichoderma reesei* (CBS 143953, formerly ATCC PTA 5588) (identification number 4a11) for chickens for fattening, laying hens, turkeys for fattening, ducks, minor poultry species, weaned piglets and piglets for fattening, and its authorisation extending to the use for all poultry species, piglets (suckling and weaned), pigs for fattening and minor porcine species
- Renewal of authorisation of a preparation of endo-1,4-beta-xylanase (EC 3.2.1.8) produced from *Trichoderma reesei* (CBS 114044) (identification number 4a8i) for piglets (weaned), chickens for fattening, chickens reared for laying, turkeys for fattening and turkeys reared for breeding
- Renewal of authorisation of a preparation of 6-phytase (EC 3.1.3.26) produced from *Trichoderma reesei* (CBS 122001) (identification number 4a12) for pigs, poultry for breeding, poultry for fattening and poultry for laying

- Authorisation of a preparation of *Lacticaseibacillus rhamnosus* (formerly *Lactobacillus rhamnosus*) (IMI 507023) (identification number 1k21701) for all animal species
- Authorisation of a preparation of *Pediococcus pentosaceus* (IMI 507024) (identification number 1k21016) for all animal species
- Authorisation of a preparation of *Pediococcus pentosaceus* (IMI 507025) (identification number 1k21017) for all animal species
- Authorisation of a preparation *of Lactiplantibacillus plantarum* (formerly *Lactobacillus plantarum*) (IMI 507026) (identification number 1k21601) for all animal species
- Authorisation of a preparation of *Lactiplantibacillus plantarum* (formerly *Lactobacillus plantarum*) (IMI 507027) (identification number 1k21602) for all animal species
- Authorisation of a preparation of *Lactiplantibacillus plantarum* (formerly *Lactobacillus plantarum*) (IMI 507028) (identification number 1k21603) for all animal species
- Authorisation of a preparation of *Lactiplantibacillus plantarum* (formerly *Lactobacillus plantarum*) (DSM 26571) (identification number 1k1604) for all animal species
- Authorisation of L-lysine base (liquid) produced from *Corynebacterium glutamicum* (KCCM 80216 or KCTC 12307BP) (identification number 3c326) for all for all animal species
- Authorisation of L-lysine monohydrochloride (technically pure) produced from *Corynebacterium glutamicum* (KCCM 80216 or KCTC 12307BP) (identification number 3c327) for all animal species
- Authorisation of a preparation of 3-nitrooxypropanol (identification number 4c1) for ruminants for milk production and for reproduction.

Equivalent Regulations apply in the devolved administrations: The Feed Additives (Authorisations) (Scotland) Regulations 2023, and The Feed Additives (Authorisations) (Wales) Regulations 2023.

With regards to EU legislation, the following amendments to feed additive authorisations were made during the year:

Authorisations

- Preparation of lasalocid A sodium for chickens for fattening, the denial of authorisation of a preparation of lasalocid A sodium as a feed additive for chickens reared for laying, the withdrawal from the market of a preparation of lasalocid A sodium as a feed additive for chickens for fattening and chickens reared for laying
- Preparation of endo-1,4-beta-xylanase, endo-1,4-beta-glucanase and xyloglucan-specific endo-beta-1,4-glucanase produced by *Trichoderma citrinoviride* DSM 33578 for poultry for fattening, poultry reared for laying and reared for breeding, and ornamental birds
- Preparation of 6-phytase produced by *Trichoderma reesei* CBS 146250 for all poultry species and all pigs
- Preparation of *Saccharomyces cerevisiae* CNCM I-1077 for dairy cows, cattle for fattening, minor ruminant species for fattening and camelids for fattening
- Preparation of endo-1,3(4)-beta-glucanase produced by *Aspergillus fijiensis* CBS 589.94 for chickens for fattening and weaned piglets
- L-Lysine monohydrochloride and L-Lysine sulphate produced by *Corynebacterium glutamicum* CGMCC 17927 for all animal species
- Preparation of *Lentilactobacillus diolivorans* DSM 33625 for all animal species
- 2-acetylfuran and 2-pentylfuran for all animal species
- Preparation of riboflavin (vitamin B2) produced by *Bacillus subtilis* CGMCC 13326 for all animal species
- Preparation of *Lactiplantibacillus plantarum* ATCC 55058 and a preparation of *Lactiplantibacillus plantarum* ATCC 55942 for all animal species
- Butyric acid, ethyl butyrate, ethyl isobutyrate, ethyl isovalerate, methyl isovalerate, 2-methyl-2-pentenoic acid, 6-methylhept-5-en-2-one, undecan-2-one, octan-2-one, nonan-2-one, octan-3-one, tridecan-2-one, 5-methylhept-2-en-4-

one, dodecano-1,5-lactone, tetradecano-1,5-lactone, 5-methylfurfural, 4-phenylbut-3-en-2-one, p-anisyl alcohol, 4-methoxybenzaldehyde, piperonal, vanillin, p-anisyl acetate, benzyl benzoate, isobutyl salicylate, isopentyl salicylate, benzyl salicylate and diphenyl ether for all animal species

- Preparation of diclazuril for chickens reared for laying and pheasants
- Preparation of *Saccharomyces cerevisiae* DBVPG 48 SF for horses, dairy ruminants and pigs
- Preparation of *Macleaya cordata* mixture for all poultry species for fattening
- Preparation of *Bacillus velezensis* NITE BP-01844 for all poultry species for fattening, chickens reared for laying, turkeys reared for breeding, minor poultry species reared for laying or for breeding and ornamental birds
- Preparation of endo–1,4-beta-mannanase produced by *Paenibacillus lentus* DSM 33618 for all poultry species for fattening and reared for laying or breeding, weaned piglets, weaned piglets of minor porcine species, pigs for fattening and minor porcine species for fattening
- Preparation of *Lentilactobacillus buchneri* DSM 32650 for all animal species
- Lactic acid produced by *Weizmannia coagulans* DSM 32789 for all animal species except all aquatic animals and ruminants without a functional rumen
- Disodium 5′-inosinate produced by fermentation with *Corynebacterium stationis* KCCM 80235 for all animal species
- L-isoleucine produced by *Corynebacterium glutamicum* KCCM 80185 for all animal species
- Red quebracho extract from *Schinopsis balansae Engl*. or *Schinopsis lorentzii* (*Griseb*.) *Engl*. for all animal species
- Ethyl oleate, nona-2,6-dien-1-ol, pent-2-en-1-ol, trans-2,cis-6-nonadien-1-ol, 2-dodecenal, nona-2(trans),6(cis)-dienal, nona-2,4-dienal, trans-2-nonenal, 2,4-decadienal, hepta-2,4-dienal, deca-2(trans),4(trans)-dienal, dodec-2(trans)-enal, hept-2(trans)-enal, non-2-enal, nona-2(trans),6(trans)-dienal, undec-2(trans)-enal, trans-2-octenal, trans-2-decenal, tr-2, tr-4-nonadienal, tr-2, tr-4-

undecadienal, hex-2(trans)-enyl acetate, hex-2-enyl butyrate, oct-1-en-3-one, isopulegol, 4-terpinenol, linalyl butyrate, linalyl formate, linalyl propionate, linalyl isobutyrate, 3-methyl-2-cyclopenten-1-one, methyl 3-oxo-2-pentyl-1-cyclopentylacetate, benzophenone, benzyl cinnamate, ethyl salicylate, 1,2-dimethoxy-4-(prop-1-enyl)-benzene, myrcene and β-ocimene for all animal species

- Ethyl heptanoate, ethyl 2-methylbutyrate, isopentyl acetate, 3-methylbutyl 3-methylbutyrate, 2-methylpropionic acid, 3-methylbutyl butyrate, 2-methylbutyl acetate, hex-2-en-1-ol, hex-2(trans)-enal, allyl hexanoate, allyl heptanoate, linalool, 2-methyl-1-phenylpropan-2-ol, alpha-ionone, beta-damascone, nootkatone, beta-ionone, alpha-irone, beta-damascenone, (E)-beta-damascone, pentadecano-1,15-lactone, 2-phenylethan-1-ol, phenethyl isovalerate, 4-(p-hydroxyphenyl)butan-2-one, 2-methoxynaphthalene, 2-isopropyl-4-methylthiazole and valencene for all animal species
- Preparation of endo–1,4-beta-mannanase produced by *Aspergillus niger* CBS 120604 for all poultry species for fattening
- Preparation of endo–1,4-beta-xylanase produced by *Komagataella phaffii* ATCC PTA-127053 for all poultry species for fattening, breeding, and reared for laying or breeding
- Preparation of *Bacillus subtilis* DSM 5750 and *Bacillus paralicheniformis* DSM 5749 for calves for fattening, lambs for rearing and for fattening and minor ruminant species for rearing and for fattening, and amending the terms of the authorisation for suckling piglets
- Robenidine hydrochloride as a feed additive for rabbits for breeding and rabbits for fattening
- Guanidinoacetic acid and a preparation of guanidinoacetic acid for chickens reared for breeding and chickens reared for laying in feed and in water for drinking, and chickens for fattening in water for drinking

Renewals

- Preparation of 6-phytase produced by *Aspergillus oryzae* DSM 33699 for poultry, pigs for fattening, weaned piglets and sows
- Preparation of endo-1,4-beta-xylanase produced by *Trichoderma reesei* CBS 114044 for chickens for fattening, chickens reared for laying, turkeys for fattening, turkeys reared for breeding and weaned piglets
- Copper chelate of hydroxy analogue of methionine for all animal species
- Preparations of *Lactiplantibacillus plantarum* DSM 12836, *Lactiplantibacillus plantarum* DSM 12837, *Lentilactobacillus buchneri* DSM 16774, *Pediococcus acidilactici* DSM 16243, *Pediococcus pentosaceus* DSM 12834, *Lacticaseibacillus paracasei* DSM 16245, *Levilactobacillus brevis* DSM 12835, *Lacticaseibacillus rhamnosus* NCIMB 30121, *Lactococcus lactis* NCIMB 30160, *Lentilactobacillus buchneri* DSM 12856 and *Lactococcus lactis* DSM 11037 for all animal species
- Preparation of *Lactiplantibacillus plantarum* DSM 19457 for all animal species
- Preparation of *Pediococcus pentosaceus* DSM 23376 for all animal species
- Preparation of endo-1,4-beta-xylanase produced by *Trichoderma reesei* CBS 143953 and endo-1,3(4)-beta-glucanase produced by *Trichoderma reesei* CBS 143945 for poultry species, weaned piglets, pigs for fattening, lactating sows and minor porcine species (weaned piglets, pigs for fattening and lactating sows), the authorisation for suckling piglets and minor porcine species (suckling piglets)
- Preparation of *Lactiplantibacillus plantarum* DSM 8862 and DSM 8866 for all animal species
- Preparations of *Lactiplantibacillus plantarum* DSM 12836, *Lactiplantibacillus plantarum* DSM 12837, *Lentilactobacillus buchneri* DSM 16774, *Pediococcus acidilactici* DSM 16243, *Pediococcus pentosaceus* DSM 12834, *Lacticaseibacillus paracasei* DSM 16245, *Levilactobacillus brevis* DSM 12835, *Lacticaseibacillus rhamnosus* NCIMB 30121, *Lactococcus lactis* NCIMB 30160, *Lentilactobacillus buchneri* DSM 12856 and *Lactococcus lactis* DSM 11037 for all animal species

Corrections and amendments

- Correcting Implementing Regulation (EU) 2020/996 concerning the authorisation of the preparation of carvacrol, thymol, D-carvone, methyl salicylate and L-menthol as a feed additive for chickens for fattening, chickens reared for laying and minor poultry species reared for laying
- Amending Regulations (EC) No 2380/2001, (EC) No 1289/2004, (EC) No 1455/2004, (EC) No 1800/2004, (EC) No 600/2005, (EU) No 874/2010, Implementing Regulations (EU) No 388/2011, (EU) No 532/2011 and (EU) No 900/2011 as regards the name of the holder of the authorisation of certain additives in animal feed
- Amending Regulations (EC) No 2380/2001, (EC) No 1289/2004, (EC) No 1455/2004, (EC) No 1800/2004, (EC) No 600/2005, (EU) No 874/2010, Implementing Regulations (EU) No 388/2011, (EU) No 532/2011 and (EU) No 900/2011 as regards the name of the holder of the authorisation of certain additives in animal feed and correcting Implementing Regulation (EU) No 532/2011

Denial and suspension

- Denial of the renewal of the authorisation of a preparation of robenidine hydrochloride (Cycostat 66G) for rabbits for breeding and rabbits for fattening and repealing Implementing Regulation (EU) No 532/2011
- Temporary suspension of the authorisation of lasalocid A sodium and lasalocid A sodium (Avatec 150 G and Avatec 15 % cc) as feed additives for chickens for fattening and chickens reared for laying. Following the submission of supplementary information Regulation (EU) 2023/1172 implemented the authorisation of lasalocid A sodium (Avatec 150 G) for chickens for fattening and denied its use for chickens reared for laying. This regulation also implemented the withdrawal of the feed additive lasalocid A sodium (Avatec 15 % cc).

Withdrawals

The following feed additives are to be withdrawn from the market as no applications for authorisation renewal were received by the appropriate deadlines.

Feed additives to be withdrawn from the market for all species and categories of animals

- Polyoxyethylene(20)-sorbitan monooleate
- Tragacanth
- Vermiculite
- Perlite
- Vitamin B12 or Cyanocobalamin. All forms with the exception of the preparation of cyanocobalamin produced by *Ensifer adhaerens* CNCM I-5541 containing ≤ 1 % of cyanocobalamin, solid form
- *Lactobacillus casei* NBRC 3425 (ATCC 7469)
- *Saccharomyces cerevisiae* NBRC 0203 (IFO 0203)
- Alpha-amylase EC 3.2.1.1 from *Aspergillus oryzae* CBS 585.94
- Caramel colours as colouring agents authorised for colouring foodstuffs by Community rules
- *Abies alba Mill*., *A. sibirica Ledeb*.: Pine needle oil
- *Eleutherococcus senticosus Rupr. et Maxim*. / Acanthopanax s. Harms: Taiga root extract (solvent-based)
- *Helianthus annuus L*.: Sunflower absolute/Sunflower oil/Sunflower tincture
- *Origanum heracleoticum L*.: Greek oregano extract/oleoresin/Greek oregano oil
- *Origanum heracleoticum L*.: Oregano oil
- *Petroselinum sativum Hoffm. / P. crispum Mill. / P. hortense L*.: Parsley leaf oil /Parsley seed oil
- *Trachyspermum ammi (L.) Sprag. et Turr*.: Ajowan oil
- *Bupleurum rotundifolium L*.: Hare's ear tincture
- *Boswellia serrata Roxb. ex Colebr*.: Olibanum tincture

- *Bambusa sp*.: tincture
- *Pimenta dioica L. Merr. / P. officinalis Lind L*.: Allspice oil
- Difurfuryl Sulfide/Flavis No 13.056
- Isopulegone/Flavis No 07.067
- alpha-Damascone/Flavis No 07.134
- Difurfuryl ether/Flavis No 13.061
- 4-(2-Furyl)but-3-en-2-one/Flavis No 13.044

Feed additives to be withdrawn from the market for certain species or categories of animals

- Sodium nitrite – Dogs, Cats
- Agar - Pets and other non-food producing animals
- Clinoptilolite of volcanic origin - Pigs, Poultry
- Hexamethylene tetramine – Bovines, Ovines, Pigs, Poultry, Rabbits, Horses, Goats
- Endo-1,4-beta-xylanase/EC 3.2.1.8 produced by *Trichoderma longibrachiatum* (CNCM MA 6-10 W) - Laying hens, Turkeys for fattening, Chickens for fattening
- Erythrosine as colouring agent authorised for colouring foodstuffs by Community rules – Reptiles, Cats
- Erythrosine - Ornamental fish
- *Humulus lupulus L. flos*: Hop extract (strobiles) rich in beta acids - All animal species with the exception of weaned piglets, pigs for fattening and minor porcine species weaned and for fattening
- 4,5-Dihydro-2-methylfuran-3(2H)-one/Flavis No 13.042 - All animal species with the exception of pets
- 4-Hydroxy-2,5-dimethylfuran-3(2H)-one/Flavis No 13.010 - All animal species with the exception of pets
- 1-Methoxy-4-(prop- 1(trans)-enyl)benzene/Flavis No 04.010 - Poultry and fish

- Eugenol/Flavis No 04.003 - Poultry
- Omega-6 Essential Unsaturated Fatty acids (as octadecadienoic acid) - Sows for reproduction, Sows in order to have benefit in piglets, Cows for reproduction

Glossary of Acronyms

AAS	Atomic absorption spectrometry
DNC	4,4'-dinitrocarbanilide
ELISA	Enzyme-linked immunosorbent assay
FID	Flame ionisation detector
FSA	Food Standards Agency
FSS	Food Standards Scotland
GC	Gas chromatography
GC-MS	Gas chromatography mass spectrometry
GMO	Genetically modified organism
HPLC-FL	High-performance liquid chromatography - Fluorescence detection
HPLC-UV	High-performance liquid chromatography - UV detection
IC	Ion chromatography
ICP-MS	Inductively coupled plasma mass spectrometry
ICP-OES	Inductively coupled plasma optical emission spectroscopy
LC-MSMS	Liquid chromatography with tandem mass spectrometry
LOD	Limit of detection
NIR	Near-infrared
NIRS	Near-infrared spectroscopy
NRL	National Reference Laboratory
OL	Official Laboratory
PCR	Polymerase chain reaction
PT	Proficiency test
RASFF	Rapid Alert System for Food and Feed
RI	Refractive index
RP-HPLC	Reversed phase high performance liquid chromatography
UKAS	United Kingdom Accreditation Service
WGS	Whole genome sequencing