

MONITORING-REPORT




Gate-Keeping in the QS scheme



Page 2

Salmonella: discussion with experts from AGES



Page 3

Relevance of parameters



Page 4

5 Years of Monitoring Report

Further development of QS Feed Monitoring in sight

The QS Feed Monitoring is being developed dynamically and continuously. Current incidents and new findings about residues in feeds are being given direct consideration here. The consequence of this is more extensive specifications on guidance and limit values, as well as the adoption of new test parameters. A **comparison of the monitoring data 2013/2017** shows an increase in analyses as well as exceedances, with a consistent number of samples. 3.5 million analyses have been deposited in the QS database in the meantime. An abiding theme here is and remains **Aflatoxin B1 in corn and corn products**, as well as salmonella, especially in protein-rich feeds. In an interview with experts from AGES (Austrian agency for health and food safety), you can find out more on Page 3 about the analysis, decontamination and prevention of salmonella. You can also read all about the latest developments and new findings in QS Feed Monitoring under "Short and Concise" on this page.

Our current Monitoring Report Feed appears in an adjusted style. We hope you like it and wish you an interesting reading.

Your QS Team. ■

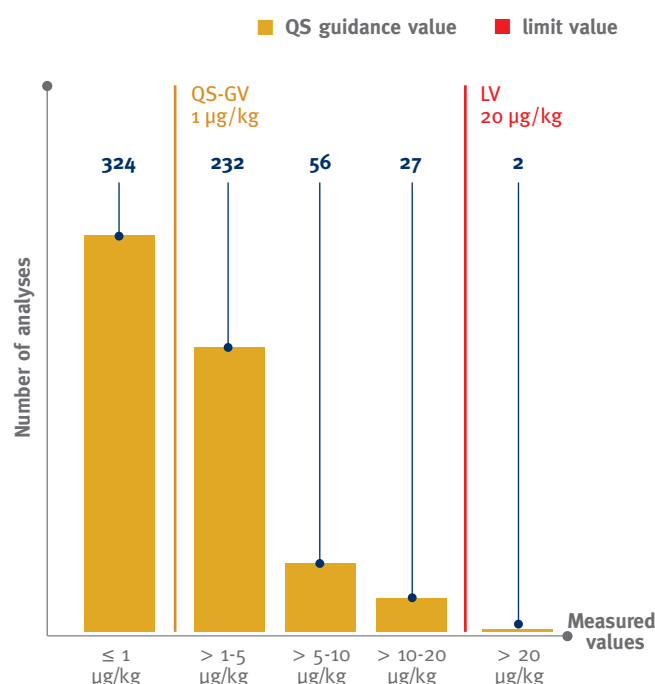
Aflatoxin B1 – Additional sampling proving its worth

With the *Ad-hoc Monitoring Plan Aflatoxin B1 in Corn* introduced five years ago, QS responded immediately to alarming findings of aflatoxins in feed corn in March 2013. Ever since, every batch of corn (products) from the affected countries has to be sampled as a part of QS Feed Monitoring – a 100% monitoring system.

Due to continuing aflatoxin contamination in corn (products), the now renamed Additional Control Plan Aflatoxin B1 became a permanent instrument of the QS Guideline Feed Monitoring with the revision of 2017. In order to control the aflatoxin risk precisely, the plan has been amended a total of 27 times to date. With the adjustments to the risk classification of various countries of origin, a dynamic response is being given to the regional harvest situations.

The latest results from the last 18 months show that the levels of Aflatoxin B1 detected in **feed material samples** is often above the QS guidance value of 1 µg/kg (data basis: 5,670 analyses, 88.7 percent of them below the detection/quantification limit). Based on these results, a continuation of the additional control plan has to be expected. The QS guidance value was only exceeded in isolated instances (5 times) with compound feeds for dairy cattle. ■

AFLATOXIN B1 IN FEED MATERIAL – VALUES ABOVE QS GUIDANCE VALUE



Period: 01.07.2017 until 30.06.2018

QS feed monitoring

... IN A 5-YEAR COMPARISON

Year	Participants	Samples	Analyses	Exceedances
2013	5,010	25,719	427,405	80
2017	4,761	24,452	498,944	255

Period: 01.01.2013 until 31.12.2013
respectively 01.01.2017 until 31.12.2017

Short and Concise

HYDROCYANIC ACID

QS Feed Monitoring has been expanded to include the parameter hydrocyanic acid in the control plan "Oil seeds, oil fruits and other oil-supplying plants, their products and by-products" for linseed and linseed cake. Hydrocyanic acid has a directly toxic effect in humans and animals. The lethal dose (oral) of hydrocyanic acid for animals lies in the range of 1-10 mg/kg, and in humans 1-2 mg/kg body weight. The first examination results show that the limit value in 50 percent of the samples is exploited to more than half and this justifies the continuous control of the parameter. The maximum legally determined level lies at 250 mg/kg in linseed and 350 mg/kg in linseed cake. These values were not exceeded in any of the samples.

FATS AND OILS

By-products of fats and oils according to the definition contained in Reg. (EU) 2015/1905, may only be procured from 01.01.2019 if they are marked as "feed". This prevents the reclassification of non-feeds to feeds and manufacturers must be able to present certification for the manufacture of these products. The change is the result of harmonisation with the other scheme owners GMP+ Int., AIC and OVOCOM, who have also implemented this requirement.

INTERACTIVE WORLD MAP

The origins and analysis results of feeds all over the world can be accessed at the QS website. The interactive world map provides an overview of the residue situation in the international feed sector and can be used for in-house risk assessment or the opening of new markets. It comprises data from the last 2.5 years (01.01.2016 to 30.06.2018) and is updated regularly. ■





Glyphosate: National restrictions announced

NO CONTAMINATION OF FEEDS DETECTED

After a year and a half of tug-o'-war, the EU member states agreed in November 2017 with a slim majority to extend the authorisation of glyphosate by another five years. The debate is now continuing on national level. In April 2018, Federal Agriculture Minister Julia Klöckner presented a draft regulation for glyphosate in which she is planning comprehensive restrictive measures for the use of plant protection products containing glyphosate and the development of adequate alternatives. Among other things, use of the substance on agricultural surfaces is only to be possible in future in justified exceptional circumstances.

The evaluation of official Feed Monitoring since 2002, as well as data obtained from the QS feed monitoring programme, show that **no contamination of feeds with glyphosate** has occurred up to now. All test results were below the maximum residue level.

99 percent of the data from the QS scheme were below the detection and quantification limits. It was only possible at all to determine a value for glyphosate in four samples, and this value was far below the maximum permissible level in all cases, in line with the regulation on maximum residue levels. ■

SAMPLES OF THE OFFICIAL FEED CONTROL AND QS FOR GLYPHOSATE:

Year	Number of Samples	Year	Number of Samples
until 2009	55	2014	689
2010	34	2015	597
2011	500	2016	643
2012	504	2017	40
2013	646	2018	11
Total:			3,719

Source: Annual statistics on official controls of feed monitoring in the Federal Republic of Germany and QS database

Status: 30.06.2018

Currently applicable application restrictions for glyphosate in agriculture:

- Max. two applications on the same area within one calendar year at intervals of at least 90 days
- Max. 3.6 kg of active substance per hectare and year
- Routine pre-harvest treatment with the goal of controlling harvests or optimising threshing results is not permissible

In addition to this, pre-harvest applications are only permitted in exceptional circumstances when there is a risk of losing the harvest or if harvesting capability has to be ensured. Late applications are only permitted on partial areas on which harvesting would not otherwise be possible due to weed growth through crops in storage and/or the second formation of shoots in cut or standing crops. ■

Gate-Keeping – Procurement of goods from non-certified companies

Information in the database

The gate-keeper regulation has been expanded to include an obligation whereby all raw materials and suppliers used for gate-keeping have to be registered in the QS database. Using this additional information, individual data sets can be better recorded and evaluated with various feeds with the same feed designation. Companies which have already entered feeds procured via the gate-keeper regulation into the QS database are requested to provide the additional information retroactively for deliveries made since 01.01.2018. It can be necessary when opening up new markets to procure goods from non-certified producers or traders for a limited period. For this reason, the option of gate-keeping exists in the QS scheme, e.g. for non-certified additive and premix producers or non-certified traders when procuring agricultural primary products. An essential component of this is the assumption of feed monitoring for the supplier. ■

! If a feed is tested under the gate-keeper regulation, the sample type “Gate-Keeping” must be selected in the database.

Gate-Keeping in numbers

TOP 10 – PRODUCT GROUPS WITHIN GATE-KEEPING

Product Group	Number of Samples	of which mainly ...
Cereal grains, their products and by-products	1,021	Maize, Wheat
Oil seeds and oil fruits and other oil-supplying plants, their products and by-products	210	Soybean, Rapeseed
By-products of fermentation and distillation	95	Vinasse, Dried stillers grain feed
Products and by-products from terrestrial animals	62	Animal Fat
Premixes	61	–
Minerals	56	Calcium carbonate, Sodium chloride
By-products of milk processing	28	Whey/Milk powder
Former foodstuff, products and by-products of food production	27	Bakery and pastry products, Dairy products
Tubers and roots, their products and by-products	25	Dried sugar beet pulp, Potato protein
Proteins obtained from microorganisms	21	Brewer's/Yeast

Period: 01.01.2017 until 30.06.2018



TOP 20 – ORIGINS WITHIN GATE-KEEPING

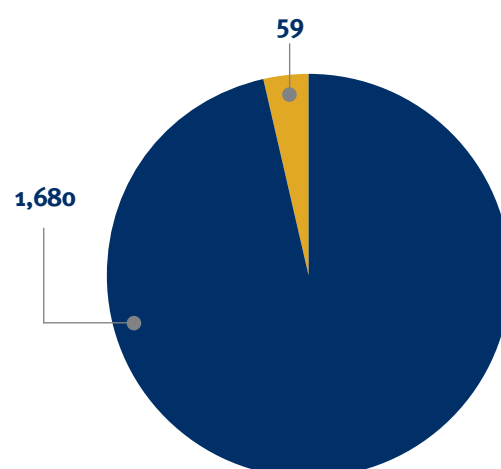
Country	Number of Samples	Country	Number of Samples
Spain	301	France	43
Italy	300	Brazil	33
Hungary	282	USA	29
Poland	130	Bulgaria	27
Croatia	125	India	15
Ukraine	112	Ireland	14
Romania	71	China	12
Serbia	54	Indonesia	12
Russia	49	Denmark	10
Germany *	46	Slovakia	9

*Purchase of premixes/additives

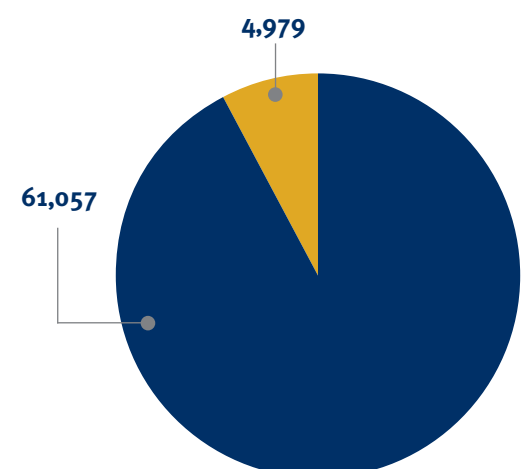
Period: 01.01.2017 until 30.06.2018

The samples that were examined for gate-keeping hardly show any defects (proportion of samples with exceedances of maximum levels, limit values for action or guidance values lies at 3.4 percent). A glance at the individual analyses shows that levels were below the detection/quantification limit in 92.5 percent of the samples.

SAMPLES WITHIN GATE-KEEPING



ANALYSES WITHIN GATE-KEEPING



■ ... of which without exceeding
■ ... of which with exceeding

■ ... of which values < LOD/LOQ
■ ... of which values > LOD/LOQ

Period: 01.01.2017 until 30.06.2018

Salmonella: Analysis, decontamination, prevention

A discussion with experts from AGES



In order to guarantee food safety and minimise the spread of salmonella through the slaughter of pigs and poultry, strict regulations are in place for the handling and storage of feeds. Only animals that are given unobjectionable feed can provide safe food. Franz Doppelreiter and Dr. Andreas Adler, experts from AGES (Austrian Agency for Health and Food Safety), explain the analysis methods that exist, the available decontamination methods and how recontamination can be prevented.

Which analysis methods currently exist for the detection of salmonella and how much time do they each require?

A variety of methods are available for the detection of salmonella. These follow very different analytical principles, such as ELISA, PCR or cultural processes. The duration of analysis is influenced by the type and duration of the accumulation stages and lies between at least one day with the PCR and four days with cultural methods.

How can a negative result of reanalysis of the same sample material be explained?

Salmonellae are usually unevenly distributed in the material to be examined. Using the random sample method, it is impossible to determine the absence of salmonellae in feeds with absolute certainty. You have to be satisfied with the statement that a certain number of salmonella are not exceeded in a certain quantity of a feed batch with a defined degree of probability. Just because reanalysis produces a negative result does not in any way mean that the positive result previously achieved during initial analysis can be “corrected”, nor can it be interpreted as an indication of a non-contaminated feed batch.

Acid can be added to feed material to deactivate the salmonella. What should be observed here?

Reliable decontamination of salmonella-containing feeds by means of organic acids is only possible with relatively high dosage rates, but not with all of the preparations available on the market here either. Studies show that the reliable elimination of salmonella contamination with acidic preparations can only be recommended for feed materials (raw material) with high additive doses, i.e. 7% with an application time of one day or 6% with seven days.

What decontamination options are there apart from the addition of acid?

Feed can be sanitised with an appropriate amount of expense and effort, above all using thermal methods. According to the latest available knowledge, pelletisation in combination with long-term conditioning (temperature > 85° C, application time > 4 min) and pressure conditioning (expansion/extrusion with process temperatures of > 110° C for several seconds and a pressure of > 25 bar) reliably kills the salmonella in feeds.

What role does dust play in salmonella contamination?

Due to their large surface area, dust particles constitute an excellent medium for salmonella so that positive findings are more likely in dust samples than in the feeds themselves. The examination of dust along the entire production chain best reflects the hygiene status of a feed.

Can a connection be made between salmonella in feeds, animals and humans?

As the pathogens of salmonellosis, salmonellae are one of the most significant causes of bacterial infection in the world. Salmonellosis in humans is attributed primarily to the intake of contaminated foods and in some cases, it has been possible to trace contamination of foods of animal origin containing these disease pathogens back to feed contaminated with salmonella. Salmonella can lead to infections in humans through products of animal origin, such as eggs and poultry meat. Pathogenic microorganisms like salmonella can be carried over to feed material production via the basic products used in the feed and can find their way into the food chain via the infection of agricultural livestock.

What measures can be taken in a farming business to prevent recontamination?

It should be ensured above all that clean areas are separated from unclean areas. The process stages should be set up in such a way that “sanitised” or thermally treated feeds do not come in contact with untreated raw materials. The formation of condensation can be prevented or at least reduced through the insulation of the relevant plant/equipment and parts of the building and an adequate exchange of air. The examination of dust samples and/or swabs along the entire raw materials and product chain facilitates the estimation of the risk and the identification of critical points for possible salmonella contamination. ■

Rise in salmonella findings in the feed sector

Whereas the proportion of positive findings was as low as 0.07 percent in 2016 (2015: 0.13 percent), it lay at 0.23 percent in 2017 and at 0.35 percent in the first half of 2018.

SALMONELLA FINDINGS 2017/2018

Year	Number of Analyses	of which positives findings	Percentage of positive findings
2017	10,472	24	0.23 %
2018	3,948	14	0.35 %

Period: 01.01.2017 until 30.06.2018

The increase in positive findings is particularly conspicuous in incident and crisis management. They are the cause of most incidents, with the proportion of salmonella cases reported to QS rising from a good 30 percent of all incidents in 2016 to almost 67 percent in 2017. The majority of all positive findings were detected in feeds containing proteins, such as soya and rapeseed meal, which are an ideal medium for the propagation of salmonella.

SALMONELLA CASES WITHIN INCIDENT AND CRISIS MANAGEMENT

Year	Total Feed Cases	of which cases with Salmonella	Percentage of Salmonella cases
2017	48	32	66.67 %
2018	22	18	81.82 %

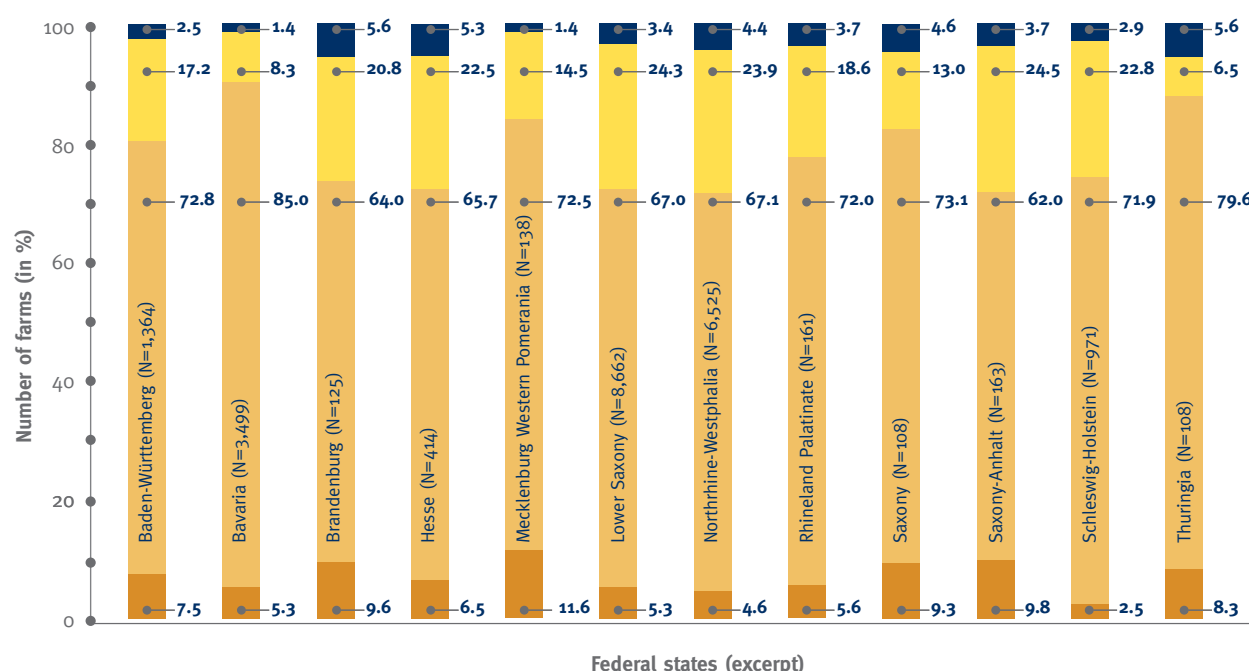
Period: 01.01.2017 until 30.06.2018

SALMONELLA MONITORING IN AGRICULTURE

QS also conducts comprehensive salmonella monitoring in pig farms in order to identify farms with an increased salmonella risk. Unlike feed monitoring, meat juice or blood samples from the animals are tested for antibodies against salmonella. If the result is positive, this means that the animal has had contact with salmonella at least once in its life and has formed antibodies. Farms are classified into categories (I to III), depending on the result (many or few positive findings). Category I stands for farms with a low risk of introducing salmonella to the meat production chain. Farms in Categories II and III must introduce measures to reduce salmonella contamination.

Extensive salmonella monitoring is done in poultry fattening businesses too by taking samples of every delivery of chicks or reared turkeys, while every herd is tested for salmonella before slaughter. ■

SALMONELLA CATEGORISATION OF PIG FARMS – FEDERAL STATES IN COMPARISON



■ Category III
 ■ Category II
 ■ Category I
 ■ without categorisation
 N: Number of farms



Laboratory performance assessment for feed

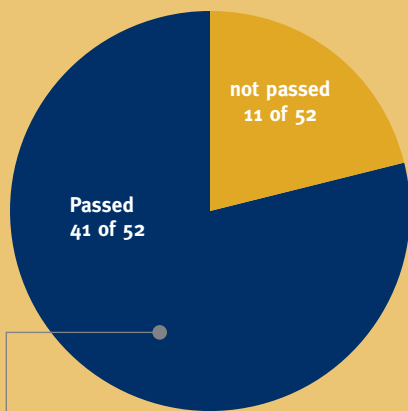
IMPLEMENTATION QUALITY OF THE LABORATORIES UNDER SCRUTINY

52 QS-recognised feed laboratories participated in the laboratory performance assessment that was organised in spring this year. Laboratory performance assessments enable the laboratories to identify problems and sources of error, thus continuously improving the quality of the analyses. The tests are deliberately designed to reveal and rectify weaknesses. This is substantiated by the result of the spring test in which 41 of the 52 participating feed laboratories passed, with 56 percent of the participants producing completely error-free analyses. ■



This year, the laboratories faced the challenge of identifying dioxin-like PCB in the test material within 21 days and quantifying it correctly. Two samples of the test matrix corn meal containing different quantities were sent to each lab.

OVERALL RESULT OF PERFORMANCE ASSESSMENT FOR FEED



29 all congeners identified and correctly quantified
 10 with one quantification error
 2 with two quantification errors

Parameters in an annual comparison

More detections of ndl PCB and cadmium – Values on the same level

The increase in detections of non-dioxin-like PCB and cadmium deserves special emphasis in the latest annual comparison. The values, measured at 50 percent of the strictest limit value, were on the same level as the previous year. In addition to the positive salmonella findings, the detection of antibiotically active substances also increased in 2016 and 2017 (from 0.22 to 0.62 percent). The active substance Pirimiphos-methyl, which is used to protect stored produce, was detected less frequently compared to the previous year. ■

ANALYSES RESULTS OF UNDESIRABLE SUBSTANCES IN A 3-YEAR COMPARISON 2015/2016/2017

Parameter	2015			2016			2017			Trend	
	Number of analyses	Value determined*	Values ≥ 50 % of strictest limit value	Number of analyses	Value determined*	Values ≥ 50 % of strictest limit value	Number of analyses	Value determined*	Values ≥ 50 % of strictest limit value	Value determined	Values ≥ 50 % of strictest limit value
Dioxins	4,579	87.49 %	7.41 %	4,455	87.21 %	4.50 %	4,642	90.41 %	4.62 %	↗	→
dl PCB	4,387	85.82 %	6.53 %	4,237	85.58 %	3.78 %	4,497	89.44 %	5.40 %	↗	↗
Sum Dioxins and dl PCB	1,993	89.76 %	7.66 %	1,911	89.48 %	1.70 %	2,073	89.77 %	4.35 %	→	↗
ndl PCB	3,852	65.06 %	5.31 %	3,726	68.92 %	1.44 %	4,285	75.03 %	1.65 %	↗	→
Arsenic	5,841	31.30 %	18.82 %	5,856	31.75 %	21.30 %	6,341	30.83 %	20.87 %	→	→
Lead	5,924	46.17 %	8.04 %	5,931	46.03 %	9.23 %	6,379	45.27 %	9.07 %	→	→
Cadmium	5,924	63.54 %	4.86 %	5,933	64.92 %	4.67 %	6,378	65.27 %	4.28 %	↗	→
Mercury	5,851	6.03 %	9.07 %	5,858	7.34 %	11.86 %	6,341	7.00 %	11.26 %	→	→
Salmonella**	10,405	0.13 %	–	10,114	0.07 %	–	10,472	0.23 %	–	↗	–
AwS**	905	0.22 %	–	870	0.57 %	–	970	0.62 %	–	↗	–
Pirimiphos-methyl	4,844	12.10 %	99.66 %	4,651	13.24 %	99.84 %	4,974	10.55 %	100.00 %	↘	↗
Chlorpyrifos-methyl	4,845	2.70 %	77.10 %	4,651	3.23 %	63.33 %	4,974	2.92 %	67.59 %	→	↗

*Value above LOD/LOQ

**only positive/negative results

AwS = Antibiotic active substances

Relevance of parameters

EXTENSIVE CONTROL PLANS WITH A SYSTEM

QS covers a variety of parameters which are relevant to feed. These are essentially contaminants which have special significance for the health of animals and humans and for which limit values have been established, either per EU legislation or through separate guidance values defined by QS together with experts. The structure of the control plans in the QS scheme is risk-based. All parameters were categorised as relevant to the feed or processing method to be examined (e.g. PAH with direct drying of the product) or to the target animal (e.g. Aflatoxin B1 for dairy cattle) and must be examined and complied with. The determined parameters do not necessarily have to be specific to each feed, but they can have an influence on the safety of the feed

through environmental influences or cross contamination. Dioxins are to be found in most control plans for this reason. The contamination does not have to emanate from the product or production process either, it can be caused by improper storage (e.g. next to contaminated material) or transport (e.g. through the goods previously transported). By conducting examinations on each individual production stage (manufacturers and traders), a broad-based monitoring system is implemented which ensures the best possible surveillance of feeds, as well as supporting quality assurance within each company. ■

IMPRINT

Editor:
 QS Qualität und Sicherheit GmbH
 Dr. Hermann-Josef Nienhoff, Geschäftsführer
 Schedestr. 1–3
 D-53113 Bonn
 Phone +49 228 35068-0
 Fax +49 228 35068-10
 E-Mail: info@q-s.de
 www.q-s.de



Design:
 Susanne Del Din (del din design, Siegburg)
Pictures:
 QS Qualität und Sicherheit GmbH,
 Shutterstock

Data basis: Analysis results of QS feed monitoring from April 2008 to June 2018