Qualitätssicherung. **Vom Landwirt bis zur Ladentheke.**

MONITORING-REPORT

QS. Ihr Prüfsystem für Lebensmittel.

Feed Edition 2019

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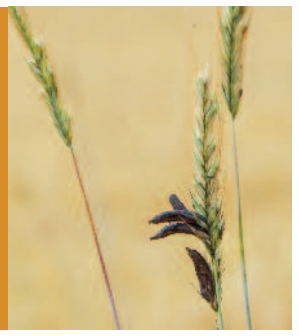


Laboratory Performance Assessment 2019 Page 4

View on mycotoxins New findings in monitoring

Mycotoxins, the toxic metabolic products of moulds, pose a major problem for the safety of many food and feed products. The FAO* estimates that up to 25 percent of annual world harvests are contaminated by mycotoxins. And this has consequences: under unfavourable conditions, the production of this fungal toxins in food and feed starts already on the field and/or during storage, transport and processing and can have acute toxic effects. The chronic intake of even small amounts can lead to organ damage and infertility, among other things. Therefore, in the QS scheme, they are subject to a continuous monitoring. Read more about the analysis results of DON, ZEA and Co. in this report.

Inside the report you will also find more information about the mould ergot. This parameter has been part of the QS control plans for feed producers and traders since 2018.

We wish you a pleasant reading.

Your QS team ■

*http://www.fao.org/3/x2100t/x2100t08.htm

Figures at a glance

... SINCE THE LAST REPORT

Partici-pants	Samples	Analyses	Excee-dances
5,068	22,878	488,428	343

Period: 01.07.2018 to 30.06.2019

Since 2008 a total of 244,843 samples have been taken and 3,943,826 analyses have been performed.

... EXCEEDANCES BY FEED CATEGORIES

Category	Samples	Excee-dances
Feed material	14,271	281
Compound feed	8,393	59
Premixes	130	–
Feed additives	84	3

Period: 01.07.2018 to 30.06.2019

ZEA in sugar beet pulp – Surprisingly high levels detected

Increased residues of the mycotoxin zearalenone (ZEA) were detected in sugar beet pulp from the 2018 harvest. Despite isolated findings in the past, sugar beet was so far considered a non-host plant or a healthy fruit, which is why there is no legal limit or guidance value for the parameter ZEA in sugar beet pulp. However, the contamination of the raw material can lead to the EU guidance values for compound feed being exceeded in the processed product. Piglets and sows are particularly sensitive to increased ZEA concentrations in the feed. The health and performance of the animals can also be negatively affected. Weak piglets at birth and bad or absent heats are just some of the threatening consequences.

In order to guarantee maximum feed safety and thus robust animal health, it is advisable to carry out routine feed analyses and increase the attention paid to the parameter ZEA. It is also important to know the origin of the raw materials used and to limit the proportion of the ingredients accordingly, to prevent a maximum value being exceeded in the compound feed.

As last year's analysis results clearly show a need for action, QS adapted the **requirements** for the Feed Monitoring of sugar beet pulp as of 1 July 2019. The analysis of the mycotoxins DON, ZEA and aflatoxin B1, among others, is now required. Further information on the amendments to the monitoring of mycotoxins can be found on Page 2. ■

OVERVIEW OF QS GUIDANCE VALUES FOR DON AND ZEA IN FEED

QS guidance values (in mg/kg) for DON and ZEA in sugar beet pulps for direct feeding to ...

	DON	ZEA
Piglets	1	0.1
Sows	1	0.25
Pig production	1	0.25
Calves	2	0.5
Cattle	5	–
Dairy cattle	3	0.5
Poultry	4	–

Short and concise

EXTENSION OF TARGET ANIMAL SPECIES

The scope of application for the target animal species covered by the feed sector of the QS scheme shall be extended to all "food-producing animals" on 1 January 2020. This means that in the future, it should be possible to include feed for, for example, sheeps and goats in the QS certification and to advertise this feed as QS products. The QS requirements contained in the Guideline Feed Sector (including Feed Monitoring) will then apply likewise. Further details will be communicated in the coming months.

HARMONISATION FEED MONITORING

Seven internationally operating standard owners have begun to undertake a joint risk assessment of feed materials, in order to align their requirements for feed monitoring. The aim of the project is to achieve harmonization and thus comparability of the requirements for the analysed parameters, considering national particularities.

The Standard owners are: AIC (Great Britain), EFISC-GTP (Belgium), GMP+ International (Netherlands), Oqualim (France), OVOCOM (Belgium), pastus + (Austria) and QS. ■

Regular revaluation of contaminants

A conversation with experts from BfR

In order to protect the consumer's health, it is essential to limit the content of contaminants in feed and food to acceptable levels from a toxicological point of view, or to minimise them as much as technically possible. For this reason, the German Federal Institute for Risk Assessment (BfR) assesses the health risk posed by contaminants and develops recommendations. A closer look at current figures and data is the basis for an always reliable health assessment.

? Are there mycotoxins that are transmitted from feed to humans via animals?
If agricultural products containing mycotoxins are fed to animals, the mycotoxins may be passed into foodstuffs of animal origin such as meat, milk or eggs. This transfer is described, for example, in the case of aflatoxins, where a carry-over from the feed to milk takes place. However, in meat and eggs, aflatoxins only pass in small amounts.

? What role do combined effects play in mycotoxins?*
Efforts are currently being made to pay greater attention to the aspect of the combined effects in the health assessment of contaminants, including mycotoxins. The corresponding guidelines are currently being developed. The combined effects of certain mycotoxins, such as aflatoxins (sum of the four aflatoxins B1, B2, G1, G2) and ergot alkaloids (sum of 12 different ergot alkaloids), are already being taken into account today. ** Note from QS: The interaction of several substances increases their individual effect on an organism (synergistic combined effect).*

? How often are contaminants re-evaluated?
For contaminants, a periodic revaluation at a certain point in time is not required by law. However, the availability of new data can lead to a re-evaluation of the health assessment. For example, the mycotoxin ochratoxin A is being currently re-evaluated by the European Food Safety Authority (EFSA) and the previous health-based guidance value is being reviewed in the light of new toxicological studies.

? The mycotoxin zearalenone (ZEA) was recently detected in sugar beet pulp. Is a revaluation planned here as well?
The first detection of ZEA in sugar beet took place in the United States more than 20 years ago. In recent years, ZEA has also been repeatedly reported in sugar beets in Europe. This means that sugar beet is not a "new" host plant, but should be taken more into account than in the past in the self-monitoring and, if applicable, in official controls. ■

Regarding ergot, a more detailed evaluation of the actual toxicity can be obtained through the analytical determination of the alkaloid contents. This is because the sclerotia show different levels of the individual ergot alkaloids. For instance, even in a sample with a low ergot content, there may be a relatively high content of ergot alkaloids and vice versa. The working group "Carry over unerwünschter Stoffe in Futtermitteln" *(only available in German)* at the German Federal Ministry of Food and Agriculture (BMEL), recently published a statement with orientation values on ergot alkaloid contents. These have been defined for every individual animal species, as there are clear differences in the species-specific sensitivity to ergot. The working group is composed by experts from the German Federal Institute for Risk Assessment (BfR), the Friedrich-Loeffler-Institut, the Max Rubner-Institut, the Julius Kühn-Institut and other scientific institutions.

Mycotoxin analysis for the 2019/2020 sugar beet campaign

(continued from Page 1)

On 1 July 2019, the mycotoxins aflatoxin B1, DON and ZEA were included in the QS control plan for tubers and roots, their products and by-products. To that end, QS defined guidance values for the parameters DON and ZEA (see table on Page 1).

The monitoring is carried out as a harvest screening at the beginning of the sugar beet campaign:

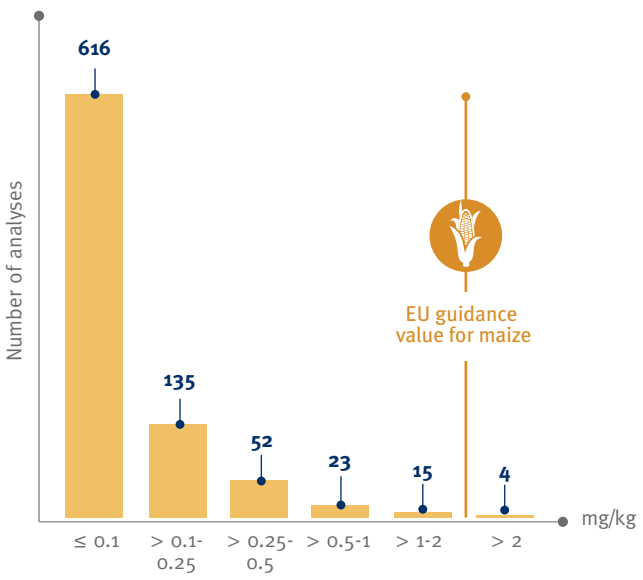
During the first two weeks of the campaign, on at least three days, a representative sample of the sugar beet pulp is taken and analysed for mycotoxins. This is carried out for every location. The analysis results for these samples must be uploaded in the QS database within three weeks after the start of the campaign. If the QS guidance values are exceeded: QS and the customers of the goods must be informed, and the analysed value must be communicated. For feed deliveries to livestock owners for direct feeding, a recommendation for use must be made (percentage use limit for the ration).

If the harvest screening reveals a contamination of the sugar beet pulp, the monitoring is extended to the whole campaign. ■

Facts and figures about mycotoxins in the QS Feed Monitoring

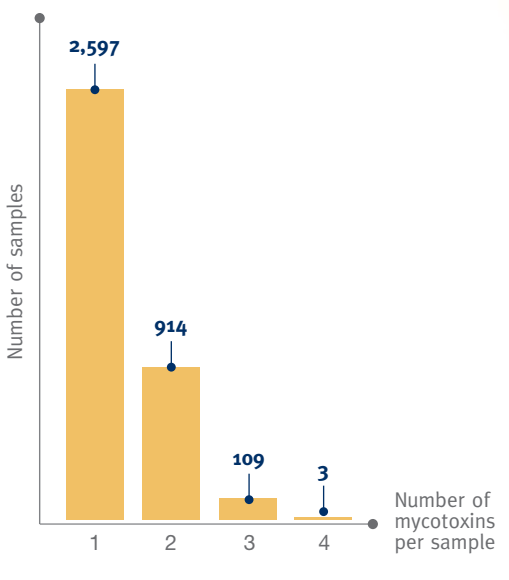
DON, ZEA, OTA, aflatoxin B1 and ergot are included in the control plans of the QS scheme. With the exception of ergot, the mycotoxins are analysed by QS approved laboratories. The results are entered into the QS database. Ergot is initially visually inspected by the company itself during the incoming goods inspection.

ZEA IN FEED MATERIALS
TWO VALUES EACH IN SUGAR BEET PULP AND MAIZE > 2 MG/KG



Period: 01.07.2018 to 30.06.2019

SAMPLES WITH MORE THAN ONE MYCOTOXIN
40 % OF THE SAMPLES CONTAIN TWO OR MORE MYCOTOXINS



Ergot in grain – recognise, analyse, determine

QS certified companies have carried out analyses for ergot in every lot of grain delivered, since 1 January 2018. The fungus (*Claviceps purpurea*), whose alkaloids are highly toxic, is particularly common in rye, but also infests wheat, triticale, barley and even maize. This can also be seen in the monitoring results of the companies.

The legal maximum level in feed is 1,000 mg/kg, which corresponds to 0.1 percent ergot content. The dark-coloured grains catch the eye as soon as the goods are received. To be able to evaluate the infestation, the ergot must be sorted out. Some companies carry out the counting automatically by means of a colour reader, other companies rely on the trained eye of specially qualified employees. In case of an infestation, it is important to determine whether or not the legal maximum level is exceeded. Companies often set their own stricter limits. ■

≤ Maximum level (0.1 %):
Accepting (and processing) of the goods is possible

> Maximum level (0.1 %)
Companies must decide: reject the goods or cleaning

Occurrence of ergot – Annual statistics from the BMEL and data from the private sector

CONTAMINATIONS IN OFFICIAL SAMPLES DECLINING SINCE 2013

Annual statistics	2012	2013	2014	2015	2016	2017
total	**252**	**356**	**327**	**251**	**238**	**226**
Complaints	18	47	28	14	18	11
in %	7.14	13.20	8.56	5.58	7.56	4.87
Feed companies						
total	**135**	**188**	**185**	**159**	**160**	**171**
Complaints	6	29	16	10	17	10
in %	4.44	15.43	8.65	6.29	10.63	5.85
Primary producers						
total	**117**	**168**	**142**	**92**	**78**	**55**
Complaints	12	18	12	4	1	1
in %	10.26	10.71	8.45	4.35	1.28	1.82

BMEL annual statistics on ergot in grains

ERGOT INFESTATION A RISK NOT ONLY FOR RYE

During the evaluation of the first company data since the introduction of the mandatory analysis, most of the findings were detected in rye, along with triticale, wheat and barley. Fortunately, the limit values exceeded are very low at 1.9 percent for rye and wheat, and at 0.3 percent for triticale. In barley, ergot was detected, but the limit value was not exceeded. In maize (90 lots) and spelt (36 lots) no ergot was found at all (*not included in the diagram*). ■

HOW TO RECOGNISE ERGOT IN GRAIN?

Ergot's sclerotia (hardened permanent forms in fungi) are slightly curved, dark coloured and usually protrude from the husks of the grain (see picture).

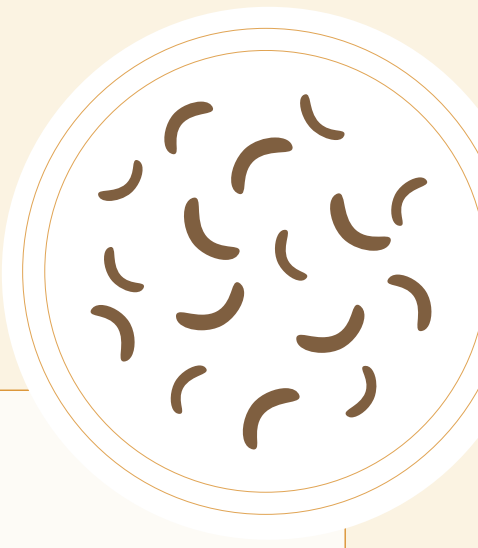
HOW TO FORM A SAMPLE FOR THE ANALYSIS OF ERGOT?

From a representative and homogenized sample of the lot of grain delivered, at least 500 grams are weighed, and any ergot counted that may be present.

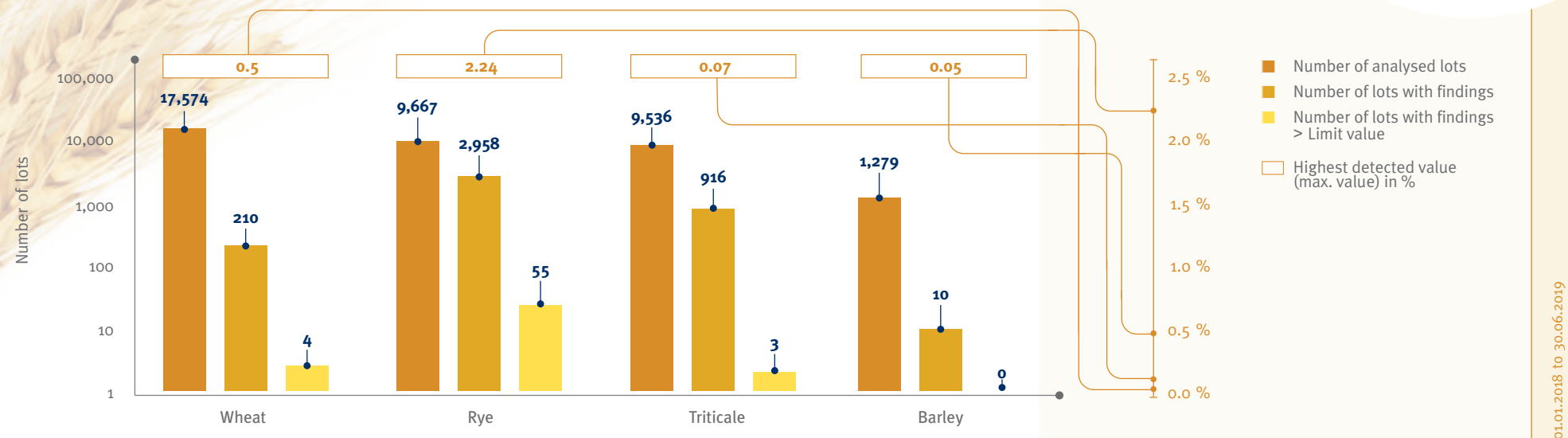
HOW IS THE RESULT CALCULATED?

The grain is spread on a light surface and the dark ergot is removed from the sample. The collected ergot is weighed.

$$\text{Ergot content in \%} = \frac{\text{Weight of ergot fragments in grams}}{\text{Weight of the final sample in grams}} \times 100$$



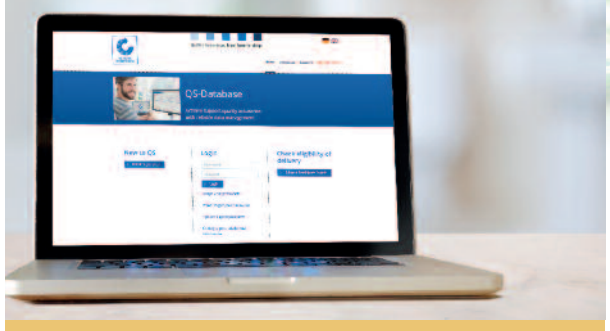
ERGOT CONTAMINATION AT QS CERTIFIED FEED COMPANIES



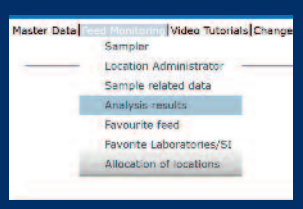
Preparing for the audit – time is money

Evidence of all analyses carried out for the feed monitoring in the QS database is one of the central audit criteria. In just a few steps you can prepare for it in the QS database. The following screenshots show you how you can compile your data in Excel format, for example, and how you can present the analyses to the auditor via further filter options. This saves you valuable time during the audit. ■

1. LOGIN INTO THE QS DATABASE



2. VIA THE MENU TO THE ANALYSIS RESULTS



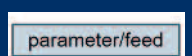
3. NARROWING THE ANALYSIS RESULTS VIA FILTER OPTIONS

Analysis results

Search criteria

- Sample ID
- Status
- Type of sample
- Sampler
- Commissioned laboratory
- Country of origin feed
- Name of feed
- Laboratory's internal sample number
- Date of sampling from — Date of sampling to
- Exceeding
- Sampling parameter

4. DOWNLOAD THE EXCEL SPREADSHEET WITH THE BUTTON PARAMETER / FEED



5. OVERVIEW OF ANALYSIS RESULTS FOR THE AUDITOR

	A	B	C
1	Product	Active substances	Number of analyses
2	Soya beans	Aflatoxin B1	2
3	Soya beans	Dioxin	2
4	Soya beans	Dioxinlike PCB	2
5	Soya beans	Salmonella	12

IMPRINT

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Based on: Analysis results of QS feed monitoring from April 2008 to June 2019

Status: September 2019

Laboratory Performance Assessment 2019:

Work of outstanding quality

49 QS-approved laboratories from seven **countries** participated in this year's Laboratory Performance Assessment for Feed. The result underlines their expertise: all 49 laboratories successfully passed the assessment. 46 of the 49 laboratories even passed the test without any errors. The laboratories did not know neither the parameter to be tested, nor the sample material nor the exact date of shipment in advance. This year's task was to analyse two different samples for the heavy metals *arsenic, lead, cadmium* and *mercury*. As first sample material the laboratories received a complete feed for pigs, the second sample was a mineral feed.

With the Laboratory Performance Assessment, QS tests the analytical quality of the laboratories once a year. In turn, this enables them to identify problems and sources of error and thus continuously improve the quality of their analyses. ■

DISTRIBUTION OF PARTICIPATING LABORATORIES IN EUROPE

Parameters year-on-year

What is the trend for the different parameters? Where should specific measures be taken to minimise inputs of undesirable substances? In order to support you in your daily work, we have again mapped the trend of 12 selected parameters. The three-year comparison shows: the levels of dioxins and dl PCBs, measured at 50 percent of the strictest limit value, fluctuated between the years 2016 and 2018, however, the level remains about the same. In contrast to the other heavy metals, cadmium was more frequently measured in 2018, but the values are lower than in previous years. The trend for lead and mercury is declining. ■

ANALYSIS RESULTS OF UNDESIRABLE SUBSTANCES IN A THREE-YEAR COMPARISON 2016/2017/2018

	2016			2017			2018			Trend	
Parameter	**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	4,455	87.21 %	4.50 %	4,642	90.41 %	4.62 %	4,234	86.35 %	4.18 %	→	→
dl PCB	4,237	85.58 %	3.78 %	4,497	89.44 %	5.40 %	4,101	85.49 %	4.51 %	→	→
Total dioxins and dl PCB	1,911	89.48 %	1.70 %	2,073	89.77 %	4.35 %	1,830	88.80 %	2.28 %	→	→
ndl PCB	3,726	68.92 %	1.44 %	4,285	75.03 %	1.65 %	3,704	76.65 %	1.48 %	↗	→
Arsenic	5,856	31.75 %	21.30 %	6,341	30.83 %	20.87 %	5,607	31.50 %	20.89 %	→	→
Lead	5,931	46.03 %	9.23 %	6,379	45.27 %	9.07 %	5,662	44.58 %	8.16 %	↘	↘
Cadmium	5,933	64.92 %	4.67 %	6,378	65.27 %	4.28 %	5,656	67.36 %	4.02 %	↗	↘
Mercury	5,858	7.34 %	11.86 %	6,341	7.00 %	11.26 %	5,600	6.93 %	8.51 %	↘	↘
Salmonella**	10,114	0.07 %	–	10,472	0.23 %	–	9,739	0.18 %	–	→	–
AwS[a]***	870	0.57 %	–	970	0.62 %	–	827	3.02 %	–	↗	–
Pirimiphos-methyl[b]	4,651	13.24 %	99.84 %	4,974	10.55 %	100.00 %	4,593	11.06 %	100.00 %	→	→
Chlorpyrifos-methyl[b]	4,651	3.23 %	63.33 %	4,974	2.92 %	67.59 %	4,593	2.66 %	54.92 %	↘	↘

*Value above limit of detection/quantification **only positive/negative findings

a = Antibiotic active substances b = Pesticides Trend: increasing (↗), constant (→), declining (↘)