

# QS-Report Fruit, Vegetables, Potatoes 02/2019



Content

- Microbiological analysis
- Traceability tests
- Scheme participant – Gemüsering
- Quarantine pests on potatoes
- Food scanners
- Short & Up to date

Editorial

## Analyse and evaluate EHEC correctly

### QS Workshop on microbiological analysis

**Microbiological findings such as STEC / EHEC often have far-reaching consequences for those involved in the production and marketing chain. On the other hand, such findings in laboratory practice repeatedly raise questions concerning the appropriate analytical procedures and the correct interpretation of the results according to food law. For QS, these numerous open questions were the reason to offer a workshop for private laboratories. The event in Cologne was attended by 20 laboratory employees. Four speakers discussed the major challenges of this area with them.**

**At the event, QS talked to one of the speakers, Dr. Marcus Langen, veterinary specialist for food and deputy managing director of Dr. Berns Laboratory, about the challenges laboratories are facing and the results of the workshop.**

#### WHY ARE THE CORRECT ANALYSIS AND EVALUATION OF EHEC FINDINGS IMPORTANT?

Depending on their genetic makeup, some E. coli strains can cause severe illness in humans with diarrhoea, vomiting and possibly kidney damage. These include STEC (shigatoxigenic E. coli), also known as EHEC (enterohaemorrhagic E. coli) in the case of corresponding clinical symptoms in humans. For preventive consumer

protection and in order to avoid negative consequences for those involved in the production and marketing chain, reliable analysis and correct evaluation of the analysis results are indispensable. Laboratories bear a great responsibility with the correct diagnosis.

#### WHICH PARAMETERS CAN BE USED FOR THE ANALYSIS AND EVALUATION OF THE FINDINGS?

So far, only sprouts must undergo a mandatory analysis. However, as part of the general duty of care of a food company, it can nevertheless be useful to examine other vegetable foods for STEC within the framework of their self-monitoring. The QS guideline Preparation/Processing Fruit, Vegetables and Potatoes explicitly stipulates that ready-to-eat fruit and vegetables must be subject to an appropriate examination at least every three months.

#### WHAT ARE THE CHALLENGES FOR A RELIABLE ANALYSIS AND EVALUATION OF THE FINDINGS?

An important indication of a STEC / EHEC strain is the presence of one or more so-called stx genes. These enable STEC / EHEC to form a toxin in the intestine and damage the cells located there. Successful stem isolation (molecular biological and cultural) is crucial for the reliable STEC / EHEC detection. The challenge in laboratory practice is

Dear readers,

Delivering the best quality is the ambition of all producers. There should be no interference in the subsequent marketing chain, to make sure that consumers can buy flawless products. Food scanners can capture many quality parameters without damaging the product. The QS Science Funds are therefore supporting a research project on the use of food scanners for selected fruits and vegetables.

In a recent QS workshop, we wanted to know which methods are suitable for reliably analysing and correctly evaluating microbiological findings such as EHEC in laboratories. Read more about this in the expert discussion with Dr. Marcus Langen from Dr. Berns Laboratory.

We hope you enjoy reading it.  
Your QS Team



to obtain a STEC / EHEC isolate microbiologically or culturally from food samples in which the molecular biological stx gene is detectable. Normally, samples also contain a predominant number of other (non-STEC) E. coli strains which cannot be distinguished from STEC strains by their appearance on the growth plate. Finding exactly those E. coli colonies that actually carry the stx gene and possibly other pathogenicity genes in itself, is therefore almost like searching for a needle in a haystack and for that reason time-consuming and costly. If in a food sample only the molecular biological detection of one or more stx genes is possible but the cultural proof is not successful, only a “presumed detection” can be reported. In these cases, even experts of the food control authorities do not consider it appropriate to rate a ready-to-eat food as ‘not safe’ according to Article 14 of Regulation (EC) No. 178/2002.

**WHAT IS YOUR CONCLUSION FROM THE WORKSHOP?**

In the workshop, the participants were given support regarding suitable analytical methods and the correct interpretation of analysis results according to food law. The case studies were particularly well received, in which the participants had the possibility to discuss technical questions and the proper evaluation of

analysis results with each other and the speakers. However, it also became clear that there may be certain cases in which the evaluation of the results from an expert

and food-law point of view is not possible without a doubt. The participants rated the workshop very positively and wished to repeat the event for further discussion. ■



Speakers from left to right: Dr. André Göhler, Bundesinstitut für Risikobewertung (BfR); Dr. Marina Lamparter, BfR; Sascha Schigulski, cibus Rechtsanwälte; Dr. Marcus Langen, Dr. Berns Laboratory GmbH & Co. KG

# QS runs traceability tests: All samples traceable from the retailer back to the producer

**Correct identification and clear traceability of products play a key role in the QS scheme. Therefore, in addition to our regular audits, QS carried out traceability tests over the months June to August 2019. Starting from grocery stores, 47 fruit, vegetable and potato samples labelled with the QS certification mark were traced back through every stage of the value chain to the primary producer. 123 companies from Germany and the Netherlands were involved in the checks.**

**TRACEABILITY TESTS REVEAL ROOM FOR IMPROVEMENT**

In all cases, the products could be traced back from the retail store to the producer. As a result of bulk storage or certain packaging and preparation processes, individual products contained ingredients from up to 6 different producers. In general, between 3 and 4 companies were involved in the production and marketing of a single product. However, the traceability tests also revealed room for improvement. For example, matching the delivery note with the sampled goods posed a challenge in some cases.

In other cases, it was necessary to correct the identification of QS goods in the shipping documents. In addition, the checks showed that confirmation of a delivery’s eligibility for the QS scheme was not always carried out correctly and that in some cases there was not sufficient proof of QS approval. All things considered, participants in the scheme had a positive attitude towards the detection of weak points, as this helps to optimise internal processes.

**VERIFICATION OF TRACEABILITY TESTS THROUGH RESIDUE AND ISOTOPE ANALYSIS**

To verify the traceability tests, 40 product samples were analysed for pesticide residues by a QS approved laboratory. QS compared the active substances detected in the analysis with the pesticides listed in the field register of the respective producer. No anomalies were detected. Only a few active substances were detected which had reached the product due to drift. To further verify the authenticity of 5 products, isotope analysis were carried out for the first time.

The results confirmed the declared origin in nearly every case. Only one blueberry sample showed atypical isotope ratios with regard to its country of origin being Germany. In this case, a further sample was taken from the affected field. This confirmed the atypical isotope ratios, proving the first sample’s origin was Germany.

**FEEDBACK FROM SCHEME PARTICIPANTS AFTER AN AVERAGE OF 9 HOURS AND 18 MINUTES**

In the event of an incident or crisis, rapid reaction and reliable response from participants in the scheme are crucial. For this reason, the traceability tests paid particular attention to the response times between contact being made and the requested information being fed back by each participant: 98% of the companies were able to provide all the information required to ensure traceability within 24 hours (see Figure 1: Overview of response times). ■

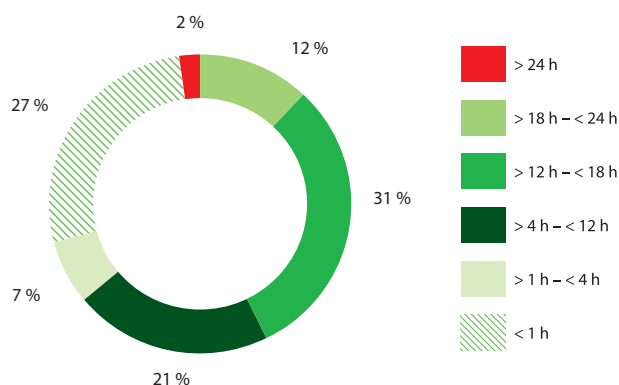


Figure 1: Overview of response times



# One of our scheme participants: Gemüsering

## A natural partner

**Gemüsering has established itself in recent years as one of our leading partners and service providers. The organisation's focus is on regional produce from its own cultivation and also from longstanding partner companies.**

Since its foundation in 1991, Gemüsering has developed into a nationally and internationally diversified company. Along with tomatoes, cabbage and carrots, its range also includes many other vegetable and fruit products. The company's own cultivation and close cooperation with selected longstanding production partners enable continuous control and monitoring, from the selection of seeds and specific varieties through production and harvest to delivery to the customer. Its production in Germany is complemented by its own production facilities in southern Europe. Moreover, Gemüsering maintains close cooperation with large and specialised producers in order to ensure year-round availability of its products. The company's own trading and service providers ensure supplementary procurement and an efficient logistics system with the shortest and fastest possible transport routes. Digitisation of systems and

use of artificial intelligence for data processing, as well as the latest technical equipment for production, sorting and packaging are all areas in which Gemüsering is constantly investing.

### QUALITY, SAFETY AND SUSTAINABILITY

Gemüsering's superior quality management system, combined with quality assurance by individual partners, ensures that all requirements are known, monitored and met along the entire production and supply chain. In this sense, Gemüsering has relied on the cross-stage QS scheme for more than 10 years, for its operations both in Germany and abroad. Since the standard is supported by all parties involved in the value chain, it enjoys a high level of acceptance. Furthermore, its cooperation with QS promotes the intensive exchange of information in all areas for the benefit of the entire sector. In order to meet the ever more complex requirements while guaranteeing the speed and flexibility that are essential when handling fresh products, a professional and motivated team is key, says Dr. Thorsten Strissel, Head of Central Quality Management at Gemüsering.

Moreover, its networks help with any challenges. In this regard, cooperation with QS is indispensable. The acceptance of the QS scheme along the entire supply chain has made it possible to mitigate or completely solve many problems. According to Dr. Strissel, for Gemüsering, it is important to keep the standard practicable and up to date for the future as well. To this end, there is no substitute for an active dialogue with all parties involved, as is taking place today through QS.

### CLIMATE NEUTRALITY

In 2017, Gemüsering was the first company from the "Fresh Vegetables and Fruit" sector to be successfully certified for the sustainability standard of the Center for Sustainable Management – ZNU (Witten/Herdecke). In many areas, it was able to rely on the QS specifications. **"We also appreciate the continuous development of the QS-GAP standard in this field and are glad to support this in our regular professional exchanges,"** says **Dr. Strissel.** ■



Gemüseproduktion Felgentreu GmbH

## Quarantine pests on potatoes

### Analysis of the current situation in Germany and preventive measures

*Guest article by Dr. Eva Fornefeld, Julius Kühn Institut, Federal Research Institute for Cultivated Plants*

**Bacterial ring rot and bacterial wilt or brown rot pose serious risks to potato production. Even if the number of cases in recent years in Germany, the second largest potato cultivation area in the EU, was low or sometimes the bacteria responsible for the outbreak – *Clavibacter michiganensis* ssp. *sepedonicus* (also known as "Cms") or *Ralstonia solanacearum* ("Rs") – were not found in any of the samples, the occurrence of the diseases in other potato-growing countries poses the risk of their introduction to Germany. This is particularly problematic given the lack of possibilities for controlling the bacteria in the plants or tubers, since no resistant potato varieties are available yet.**

In potatoes, the bacterium Cms can cause bacterial ring rot. The bacterium Rs triggers wilt or brown rot in potatoes. Both bacteria are regulated in the Annex I, Part A of the Directive 2000/29/EC, i.e. their introduction and dissemination are prohibited in EU Member

States. Regarding the production of seed potatoes, all propagation enterprises are tested for the quarantine pests Cms and Rs, and random samples are tested in ware potatoes. In total, the laboratories of the federal states analyse around

11,000 samples from seed potato production and around 2,000 samples from ware potatoes across Germany every year. During the 2017 harvest, Germany reported two cases of Cms in seed potatoes. There were no positive samples in



ware potatoes. That same year, EU laboratories detected Cms in 29 lots of seed potatoes and in 894 lots of ware potatoes. In Germany, Rs were found in two samples of ware potatoes, but in no samples of seed potatoes. For the 2017 harvest, Rs were confirmed in 10 lots of seed potatoes and 14 lots of ware potatoes throughout the EU. In 2018, none of the seed potato samples in Germany tested positive for Cms, only two

ware potato samples tested positive for Cms, and Rs were not detected at all. Cms and Rs can lead to considerable losses in quality and yield. In addition, the measures required by phytosanitary protection services in the event of infestation involve restrictions on affected farms including bans on cultivation and sale. Therefore, the focus is on preventing the introduction and transmission of quarantine pests such as Cms and Rs

and thus their dissemination in Germany, and on consistently implementing appropriate preventive measures. Effective prevention includes, above all, the use of healthy, pest-free seed potatoes, because infected tubers are the starting point for infections. Seed tubers should not be cut as this can lead to transmission to healthy potatoes. Other measures include compliance with appropriate crop rotations, the control of previously planted tubers which can turn into weeds and the cleaning of machinery, especially when they are used on several farms or production sites. Furthermore, consistent farm hygiene is important, as the bacteria can survive outside the plants. ■

## No touching, just looking

### How food scanners can evaluate the quality of fruit and vegetables along the supply chain

**Comprehensive quality assurance – from production to marketing – is very important, particularly in the „Fresh Vegetables and Fruit“ sector. From the start, production has a great influence on the quality of the final product. Damaging processes that may harm quality can start right from the initial harvesting and lead to losses. Since a purely visual inspection cannot provide a satisfactory assessment of product quality, a research project co-financed by the QS Science Funds is currently developing the concept of using food scanners to record quality parameters for selected fruit and vegetable varieties.**

Food scanners are handy portable devices that use the principle of near-infrared technology. A research project at the University of Applied Sciences Weihenstephan-Triesdorf is currently evaluating the potential of these devices in determining the product quality of fresh fruit and vegetables. This topic will be further investigated in a follow-up project, funded by the QS Science Funds that will conclude with a cooperative doctorate. The results from the first project phase, in which food scanners were tested on tomatoes, proved the potential of this new measuring technology: at the touch of a button and within a few seconds, variables such as the sugar content, firmness and dry matter content of the fruit could be determined non-destructively with a high degree of prediction accuracy. Similarly good results were achieved in further investigations of other types of fruit: in particular, parameters for determining

the degree of ripeness, such as sugar and dry matter content, could be determined for the selected fruits with a high degree of non-destructive accuracy. In the second phase of the project, supported by the QS Science Funds, the potential of this technology for application throughout the entire value chain will be tested. The main focus here is on

the practical possibilities of using food scanners for quality control and quality assurance. The predictive accuracy of valuable ingredients will also be examined in this phase of the project. You can find out more about the QS Science Funds Fruit, Vegetables, Potatoes project at <https://www.q-s.de/qs-scheme/qs-science-fund.html> ■



In the second phase of the project, the predictive accuracy of ingredients, the analysis of which is currently very costly and time-consuming (e.g. lycopene in tomato), will be evaluated using food scanners.

## Short & Up to date

### RANDOM SAMPLE AUDITS FOR HARVEST HYGIENE

Also this year, randomly selected companies were checked to ensure that QS hygiene requirements were being implemented, that the company hygiene instructions were followed during harvesting and that the harvest staff had been trained appropriately. 27 of the 28 audits were carried out successfully. No issues were found at 18 companies (i.e. no C and D evaluations). There was still room for improvement in 10 companies, particularly in the

requirements for toilets for harvesters, premises and facilities, as well as hygiene instructions. QS special auditor Pablo Schucht Lessa summarises:

**“The companies are aware of the importance of hygiene issues. Compliance with the unannounced hygiene audits was therefore given. I see the greatest need for improvement of the field toilet facilities. The field toilets with integrated water tank including washbasins and soap dispensers have proven to be a good, practical solution.”** ■

#### PUBLISHING DETAILS

##### Editor:

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

[www.q-s.de](http://www.q-s.de)

