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

Guideline **Residue Monitoring Fruit, Vegetables, Potatoes**

QS. Ihr Prüfsystem für Lebensmittel.

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1 Fundamentals

All scheme participants who use plant protection products or post-harvest treatments are obliged to comply with the legal requirements regarding maximum levels and approved active substances/pesticides of each respective production country and country of intended use (**Regulation (EC) No. 396/2005** and/or equivalent provisions). On request, the agricultural/horticultural business must be able to provide proof of the approval of the active substances used for each culture in the country of use.

The Residue Monitoring in the QS scheme refers to fresh unprocessed/unprepared fruit, vegetables and potatoes and serves the purpose of controlling compliance with the maximum legal levels/limit values for

- Active substances of plant protection products/post-harvest treatments and their relevant metabolites
- Pollutants
- Heavy metals
- Nitrate

In addition to this, evidence of not authorised active substances and their metabolites according to the residue definition is checked for the specific crop. A further objective is to identify the causes of possible exceedances of maximum residue levels and detections of unauthorised active substances and avoid them in future by taking suitable measures within the QS scheme.

This guideline outlines the controls and provides specifications for the implementation of Residue Monitoring to ensure constant surveillance on all stages of the QS scheme and to aid laboratories and samplers. The residue situation is monitored through regular product checks and directly by QS within the scope of the constant internal control system.

1.1 Scope

The Guideline Residue Monitoring applies to scheme participants who acquire certification in line with the following standards:

- Production Fruit, Vegetables, Potatoes, QS-GAP
- Wholesale Fruit, Vegetables, Potatoes
- Preparation/ Processing Fruit, Vegetables, Potatoes
- Food Retail/ FR Storage Fruit, Vegetables, Potatoes

The Guideline Residue Monitoring also applies to the following companies/organisations:

- Producer businesses which participate in the QS scheme on the basis of approved standards
- Laboratories
- Sampling institutes
- Coordinators who organise sampling on the Production stage

1.2 Responsibilities

When implementing residue monitoring, the scheme participants/coordinators are responsible for ensuring that the sample related data and/or analysis results are entered into the database (**www.qs-plattform.de**). Analysis results obtained or transferred in other ways are not accepted. A sample can only be used once to make up the targeted number of samples; they may not be used twice.

The scheme participant must comply at all times with the requirements of the QS scheme and always be in a position to demonstrate compliance with said QS requirements. It must ensure that, in addition to the requirements of this guideline and other applicable QS requirements (for example: guideline coordinators agriculture/production, guideline production/QS-GAP, guideline wholesale, guideline preparation/processing, guideline food retail fruit, vegetables, potatoes), the legal provisions that apply in the

country in which the products were produced as well as the country in which they are marketed by the scheme participant are fulfilled.

Producers/coordinators

Implementation of Residue Monitoring for producer businesses is the responsibility of the coordinator who is also responsible for checking whether the analysis results of the samples were entered into the QS database by the laboratory.

The possibility exists of commissioning third parties (producers' organisations, labs etc.) with the implementation of Residue Monitoring.

Wholesale, preparation/processing, food retail storage

The implementation of residue monitoring for wholesalers/ preparation and processing companies/ food retail storage facilities is the responsibility of each respective scheme participant. The scheme participants are also responsible for checking whether the analysis results of the samples were entered into the QS database by the laboratory.

The possibility exists of commissioning third parties (producers' organisations, labs etc.) with the implementation of Residue Monitoring.

Samplers

The samplers are responsible for all stages in the sampling process, including the packaging and forwarding of the sample(s) to the lab.

Laboratories

The laboratories are responsible for the analysis of the samples and are obliged to enter all results correctly into the QS database.

If individual analytical methods are subcontracted to another QS-approved lab, responsibility for the correctness of these results and the entry thereof into the database lies with the commissioning lab.

2 Database

The analysis results entered in the QS database serve among other things as the basis for the review of the control plan.

The scheme participants/coordinators/laboratories can evaluate their analysis results in the QS database via the evaluation tools it contains. In addition to this, anonymised evaluations can be made by QS with the inclusion of all entered test results.

Only the scheme participants/coordinators themselves and QS have access to the stored data of a particular scheme participant/coordinator.

User manuals, supporting documents and format templates for implementing Residue Monitoring in the database can be found in the website under the "Support" tab.

3 Control Plan

The control plan contains the risk groups and countries of risk origin of the products from which the number of mandatory samples to be drawn on the stages wholesale and preparation/processing and the minimum test methods to be applied are calculated. The risk classification and/or number of samples for a certain product can be changed at short notice if necessary. In order to adjust the data to the current residue situation in the QS scheme, the risk groups and countries of origin are revised at least once a

year by a panel of experts (scientific advisory body). The analysis results of the previous year, the national report "Pesticide Residues" and the results of other national and international monitoring systems are used for this purpose.

Each valid control plan has to be implemented.

⇒ Appendix 10.1 Control Plan

4 Total Number of Annual Samples

4.1 Production stage

Product samples have to be drawn and analysed every year in 35% of fruit and vegetable-producing businesses and 5% of potato-growing businesses. The businesses are selected at random by the QS database. The selected businesses are displayed to the coordinator in the QS database as so-called sampling orders. Sampling and analysis for the selected businesses have to be conducted within one year in line with the provisions of this guideline. The culture to be sampled should be selected here from the cultures certified in the producer business with referral to the risk classification of the control plan.

If there is an increase in the number of positive findings (MRL exceeded or detection of unauthorised active substances) among the producers of a single coordinator, QS can increase the number of samples to be drawn by the coordinator.

4.2 Wholesale, preparation/processing, food retail storage stage

The required number of samples is calculated per product and year on the basis of the weight of the produce procured as QS produce. This applies irrespective of whether the goods are marked with the QS certification mark or not. Evidence must be produced that the required number of samples were drawn for a period of 12 months. The samples should be distributed on the basis of risk and seasonal occurrence. An individual sampling plan should be drawn up here for each business.

The provisions listed in the control plan should be regarded as minimum requirements. More frequent analysis for particular parameters can be necessary in certain circumstances within the scope of corporate due diligence and legal requirements. Each business must ascertain and determine this in its in-house risk analysis. Additional samples can be entered into the QS database as so-called "voluntary samples".

⇒ 9.2 Terms and Definitions: voluntary sample

5 Sampling

Sampling is to be conducted and documented in accordance with **Directive 2002/63/EC establishing Community methods of sampling for the official control of pesticide residues in and on products of plant and animal origin**. To satisfy the requirements of mandatory sampling, only fruit, vegetables and food potatoes ready for harvesting or marketing may be sampled. In addition to this, "voluntary samples", "release samples" and "pre-harvest samples" may be drawn and entered into the QS database.

⇒ 9.2 Terms and Definitions: mandatory sample, voluntary sample, release sample, pre-harvest sample

When sampling to determine the nitrate level in vegetable products, the product-specific requirements outlined in Appendix 10.5 must be complied with.

5.1 Stage production

Sampling is organised by the coordinator. Sampling by the producer, a staff member or a third party/organisation commissioned by the producer is not permitted. Samples are taken in agricultur-

al/horticultural businesses (field/storage facility) in the presence and/or with the consent of the director of the business. Alternatively, the sample can be taken after delivery to a buyer's premises (e.g. wholesale, producer's organisation).

Different varieties of a crop/culture (e.g. coloured lettuce) can be sampled as a compound sample. Prerequisite for this is, that all products originate from the same field, had the same treatment regarding plant protection products and that the same maximum residue levels apply. These aspects must be ensured and documented at sampling.

5.2 Stage wholesale, preparation/processing, food retail central storage

Sampling is organised by the scheme participant.

5.3 Requirements for the sampler

Samplers must be proficient and able to ensure that sampling is conducted in accordance with **Directive 2002/63/EC** as well as the provisions of the **"Food Monitoring Manual" published by the Federal Office of Consumer Protection and Food Safety (BVL)** or equivalent national documents. In-house[1] samplers or coordinators and/or experts commissioned by the company could be regarded as proficient. It is the responsibility of the participant/coordinator to ensure that proof of proficiency is presented.

Minutes must be kept of every sampling.

⇒ Appendix 10.2 Sampling Report

Training

As sampling has a great influence on the analysis result, the sampling requirements must be implemented in a comparable manner by all samplers. To support the implementation of these requirements, training events are offered regularly by QS. Participation in these events is voluntary.

Entries into the database

The sample related data must be entered before the end of the laboratory analysis. The entry deadline of maximum 10 days after the sample was drawn must be complied with here.

5.4 Sampling protocol

The sampler must keep records (in line with Appendix 10.2) of the type and origin of the batch, the FVP/WS number and/or QS ID, the owner, supplier or conveyor, as well as the date, time and place of sampling and all other relevant information. The responsible person in each business or the producer and the sampler sign the sampling protocol to confirm that the samples were taken properly by the sampler. Every deviation from the prescribed sampling method has to be recorded. A signed copy of this protocol must accompany every laboratory sample while one additional copy goes to the owner of the batch or his/her representative. The original remains with the sampler.

5.5 Packaging and consignment of samples

The sample must be packed in such a way that damage, negative external influences and contamination are ruled out. The container must be properly marked/labelled (sample number, type of product) and the sample delivered to the laboratory without delay. It must not be allowed to rot during transport, i.e. fresh samples should be kept refrigerated, frozen samples frozen.

[1] On the producer level, sampling by the producer, a staff member or a third party/organisation commissioned by the producer is not permitted. The coordinator must ensure that sampling is performed by a third party here.

6 Laboratories

To guarantee that the quality of analysis results between laboratories is kept at a uniformly high level, only QS-approved laboratories may be commissioned to conduct analyses. Applications for QS approval for residue monitoring should be made directly to QS (Appendix 10.3 Data sheet for laboratories when applying for QS approval).

6.1 Prerequisites for QS approval

The prerequisite for QS approval is presentation of the below-listed documents along with successful completion of a QS laboratory performance assessment. The documentation is verified by QS.

6.1.1 Documentary evidence

Accreditation

The laboratories must have accreditation in line with **EN ISO/IEC 17025,** as amended, for the examination area of Chemicals (Plant Protection Products) in Foods. QS prescribes a methodical accreditation for all test methods that are obligatory in line with the control plan.

The following test methods must be used in the laboratory to gain QS approval:

- Multi-methods with
  - Detection module GC (incl. selective detectors and/or GC-MS coupling); (MS/MS))
  - Detection module LC-MS/MS
    (e.g. DFG S 19, contained in **EN 12393-1, 2 and 3** and /or QuECHERS; contained in **prEN 15662:2007**)
- This also includes active substances quantified after appropriate **modification of the multi-method** in line with the **analytical observations report** e.g. for dithianon, dodine, fenbutatin oxide (EU Reference Laboratory for Single Residue Methods). These active substances can also be quantified by a single method. Subcontracting is not permitted.
- Dithiocarbamates

Other single, group and special methods mentioned in the control plan can be subcontracted.

⇒ Appendix 10.1 Control Plan

Laboratories need to be proficient in all the methods listed in the data sheet for the approval of laboratories or need to allocate the methods to a QS approved laboratory via a subcontract. The QS requirements regarding the subcontracting need to be incorporated. This applies also to the maintenance of the recognition.

If individual test methods have been implemented but not yet listed in the laboratory's accreditation certificate, preliminary approval can be declared. The prerequisite for this is the accreditation of the test method within the next 12 months.

QS validation documentation has to be submitted for the methods applied for. The documentation must at least cover the documents listed in the data sheet. Additional paperwork and documents must be submitted to QS if necessary.

⇒ Appendix 10.3 Data sheet for the approval of laboratories

Minimum requirements for the test spectrum of a multi-method

The laboratory must provide a list of all active substances with quantification limits for the area of Fruit, Vegetables, Potatoes which can be verified by the laboratory. The list should be subdivided in line with the detection modules used (e.g. GC-ECD, GC-FPD, GC-MS(/MS), LC-MS/MS). This also includes active

substances quantified after an appropriate modification of the multi-method (in line with EURL publications).

When using the multi-method, all compounds mentioned in the residue definition of Regulation No. 396/2005 (including esters, conjugates, etc.) must be analysed, if they can be detected by the multi-method. If the multi-method covers active substances (parent substances) with a complex residue definition and findings are made, an appropriate special method for the precise determination of the metabolites must be used in order to satisfy **Regulation (EC) No. 396/2005**. The finding of the special method should be listed in the report.

Subcontracting

The option exists of subcontracting the analysis of the test methods listed in the control plan to another QS-approved laboratory. Subcontracts can only be awarded to laboratories which have QS approval for the analysis of the test method in question. Subcontracts are subject to approval, for which the following documents must be submitted:

- Name of the commissioned laboratory
- Agreement between the laboratories on the subcontract, including details of the parameters to be analysed

Each test method can only be subcontracted to one laboratory. If there is a change to the awarding of a subcontract for a test method, QS must be notified to this effect without any request to do so. The subcontract must be fulfilled by this laboratory and may not be passed on to a third laboratory.

It is the responsibility of the commissioned laboratory to enter the analysis results into the QS database.

In the scope of the laboratory performance assessment the subcontracted test methods have to be delivered to the subcontracted laboratory previously approved by QS. The sample has to be marked as test material in the scope of the laboratory performance assessment and tested for the subcontracted test methods only. The analysis has to be carried out within the period prescribed in the test. Results of the subcontracted analysis have to be transmitted to QS by the laboratory participating in the laboratory performance assessment.

Laboratory suitability tests

Participation in external laboratory suitability tests within the last year prior to application is the prerequisite for QS approval for every analysis method. Evidence must be provided by means of the corresponding documents. If a laboratory has not yet participated, a declaration of intent regarding the planned laboratory suitability test (including the organiser) must be presented.

⇒ Appendix 10.3 Explanation of documents to be submitted

If there are no results of a laboratory suitability test for a particular analysis method as no tests of this kind are offered for them in the required matrix, the decision on the approval of a comparable laboratory suitability test lies with QS.

6.1.2 QS laboratory performance assessments

To acquire QS approval, laboratories in the approval process whose document check was positive must provide proof of their competence in a performance assessment organised by QS before approval is granted. Successful participation in a laboratory performance assessment is mandatory a maximum of one year after completion of a document check, otherwise proof of successful participation in a more recent performance assessment must be produced before QS approval can be granted.

Laboratories in the approval process which participated unsuccessfully in a QS laboratory performance assessment twice in succession must pass two consecutive laboratory performance assessments to obtain QS approval. If a laboratory has failed the performance assessment three times in succession, QS reserves the right to suspend the approval process for 12 months.

Voluntary participation in a QS laboratory performance assessment is possible on request for laboratories which are not in the process of obtaining QS approval and which are not approved by QS. There is no legal right of participation in a laboratory performance assessment.

6.2 Maintenance of QS approval

Annual participation in laboratory performance assessments and suitability tests organised by QS is required among other things for the retention of QS approval.

6.2.1 QS laboratory performance assessment

All laboratories with QS approval are obliged to participate in laboratory performance assessments organised by QS at least once a year. The participating laboratories are evaluated with a points system.

Participation in an additional QS laboratory performance assessment is obligatory if

- the previous QS laboratory performance assessment was failed
- the laboratory did not score the minimum number of required points

In the scope of the laboratory performance assessment the subcontracted test methods have to be delivered to the subcontracted laboratory previously approved by QS. The sample has to be marked as test material in the scope of the laboratory performance assessment and tested for the subcontracted test methods only. The analysis has to be carried out within the period prescribed in the test. Results of the subcontracted analysis have to be transmitted to QS by the laboratory participating in the laboratory performance assessment.

⇒ Appendix 10.4 Evaluation Criteria for Laboratory Performance Assessment

6.2.2 Laboratory suitability tests

Proof of regular participation in other laboratory suitability tests in the field of plant protection products and for approved individual methods in the fruit, vegetables, potatoes matrix must be provided to QS as follows:

- Annual list of laboratory suitability tests scheduled for the current calendar year (by 15 March of the current year)
- Annual list (no later than 15 March of the following year) of the suitability tests taken the previous year with results and, where appropriate, measures taken

The obligatory QS laboratory performance assessment is not counted in here. Voluntary participation outside the obligatory QS laboratory performance assessment can be taken into account.

6.3 Loss of QS approval

If a laboratory loses its approval, existing orders can be worked off and the results entered into the QS database for a maximum of two weeks from the date approval was lost. A new application for approval is only possible after six months at the earliest provided that

- the laboratory successfully participated in a QS laboratory performance assessment
- a new check of documents has been completed
- a laboratory audit was conducted by QS at the expense of the laboratory

⇒ Appendix 10.4 Evaluation Criteria for Laboratory Performance Assessment

6.4 Processing/preparation/analysis of samples

Only samples marked as QS samples on the accompanying sample protocol or which are listed as such in the QS database are to be tested by the laboratories as QS samples.

The processing and preparation of samples for analysis for plant protection product residues must be in accordance with **Annex 1 of Regulation (EC) No. 396/2005,** as amended.

A portion (min. 200 g) of every analysis sample (homogenate) must be retained by the laboratory in frozen state for at least three months after analysis has ended.

Defined specifications for the preparation of samples, use of individual samples, compilation of collective samples/ homogenate and storage must be complied with when determining the nitrate level in vegetable products.

⇒ Appendix 10.5 Nitrate Quantification: Provisions for the sampling method and processing of samples

The analysis results must be available within 10 working days of the receipt of the samples.

6.5 Calculation of the degree of exploitation of the ARfD value

The laboratory is obliged to list in all analysis reports the degree of exploitation of the acute reference dose (ARfD) for every active substance for which an ARfD exists. The ARfD values and their degree of exploitation are used and calculated as specified by the EFSA (European Food Safety Authority) or BfR (Federal German Institute for Risk Assessment). On request, QS must be notified of the model used to calculate the ARfD value. The degree of exploitation of the ARfD value must be entered into the database (as a numerical value with a decimal point).

6.6 Evaluation of analysis results

The decisive factor when evaluating the measured values in the QS scheme is the actual value, i.e. the measured value without consideration of an analytical measuring uncertainty (e.g. of ± 50 percent with active substances of the multi-method). If the actual value is above the legally established maximum residue level, this is assessed as an exceedance of the maximum residue level.

6.7 Obligation to enter results into the database

All sample related data records on hand at the laboratory must be processed by the laboratory and entered correctly into the QS database for completion within the specified deadlines. The following deadlines apply to the entering of results:

- The maximum deadline for entry after sampling is 10 working days.
- The analysis results have to be entered into the QS database alongside the corresponding sample number within three working days of the end of the analysis.
- Complaints as defined by the QS definition (exceedance of the maximum residue level and/or detection of unauthorised active substances) which are established by the laboratory must be entered immediately into the QS database by the next working day after the end of the analysis.
- If a data record has to be reset in the QS database due to erroneous entries, the laboratory must complete it again within three working days after the reset or re-transmission to the laboratory in the database.

⇒ 9.2 Terms and Definitions: Complaints

Remarks field, laboratory related data

The remarks field for the laboratory related data should be used for:

- evaluation/assessment of the sample with regard to its marketability in line with applicable legal regulations
- evaluation/assessment of the sample with regard to unauthorised active substances (if conducted by the laboratory).
- entering the name of the sampler if the laboratory offers entry of sample related data as a service but did not draw the sample
- the description of abnormalities and peculiarities

Entry of results into the database

When entering results, there are three other options in addition to the numerical value of the finding (number with a comma):

- "<BG" (means LQ) for findings below the quantification limit
- "n.n." = not detected. This entry is preassigned automatically by the database for all active substances consigned in the laboratory profile with the selected method.
- "n.a." = not analysed. This option should be used if no analysis was made for certain active substances with a consigned method.

6.8 Reporting in the original report

The original report of the analysis entered in the QS Database must contain at least following information:

- Information about sample and sampling (e.g. sample size, condition and if necessary picture)
- Sample receipt date and investigation period
- All tested active substances and metabolites as well as the appropriate limit of determination (substance spectrum incl. date and version number); information transmission (e.g. annex to the analytical report, link to the website) is left to the laboratory)
- Analytical method
- Subcontracting (if necessary)

<u>For positive findings:</u>

- Summary of the proven substances and metabolites
- Residue monitoring and their maximum levels of active substances, metabolites and conversion rate in accordance with currently valid regulations; the regulations should be named, e.g. regulation (EG) Nr. 396/2005, regulation (EG) Nr. 1881/2006, German maximum residue levels
- Reference to recent changes to maximum levels, if relevant
- Percentage utilization of the maximum level in accordance with the residue definition
- Acute reference dose (ARfD) with source (e.g. EU Pesticide Database)
- Utilization of the ARfD stating the model used for calculation (e.g.. NVS II of BfR, PRIMO of EFSA)
- Evaluation of the marketability according to regulation (EG) 396/2005

<u>For the QS laboratory performance assessment:</u>

- Evaluation of the test results in accordance with the current legal requirements, according to the specification of QS without consideration of an extended measurement uncertainty

6.9 Access authorisation and perusal of documents

QS reserves the right to either check compliance with the accreditation requirements and regulations within the scope of a laboratory audit by itself or have them checked by a commissioned person/organisation. The laboratory is obliged to grant QS or a person/organisation commissioned by QS access to all documentation relating to its activities within QS Residue Monitoring.

In addition to this, QS or authorised third parties can commission analyses from the laboratory. If necessary, this can also be done with regard to concealed samples.

7 Exceedances/Not authorized active substances

Legal reporting requirements must be complied with in the event of complaints. QS must also be notified of complaints by the scheme participant/coordinator/laboratory. Findings of ≤0.01 mg/kg are not taken into account, provided that the legal maximum residue level are not lower. If the laboratory reports findings to the third decimal place, these are rounded off in the evaluation.

The customer has the option of having the result of a noncompliant sample checked by a third laboratory by means of an examination of the homogenate.

Evidence from samples, which were taken out of QS residue monitoring, can lead to complaints or be regarded as release samples, in case they are handled and analysed in line with QS requirements. Samples from the official surveillance will be accepted similarly.

7.1 Stage production

After a complaint has been ascertained, the producer is suspended from the further marketing of the culture in question in the QS scheme. The coordinator must ensure that the producer is informed without delay.

Once the producer/coordinator has been notified of a complaint by QS, a case-specific consultancy has to be undertaken within four weeks by the official plant protection or advisory service or by a person/organisation authorised in Germany in line with **Art. 10 of the Plant Protection Law** and evidence to this effect provided to QS. Producers who are certified according to the guidelines "QS Production Fruit, Vegetables, Potatoes" or "QS-GAP Production Fruit, Vegetables, Potatoes" don't have to send a proof about the consultancy to QS, because this will be checked in the next regular audit. Parallel to this, use should be made of consultancy services outside Germany. If consultancy cannot be arranged within this deadline, evidence must be produced that a consultancy appointment has been arranged within two weeks of notification of the complaint. Once consultancy has taken place, evidence thereof must be submitted to QS within one week at the latest.

The producer has the option of submitting a written statement about the complaint to QS through his/her coordinator. On the basis of the documents submitted, QS decides whether sanction proceedings are to be initiated or not. Additional documents can be requested in the course of the sanction proceedings (**Sanction Procedure, Appendix 5.4 of the Guideline General Regulations**.

7.2 Stage wholesale, preparation/processing

Compliance with maximum residue levels with regard to operating equipment (e.g. post-harvest treatment, cleaning agents) is the responsibility of the scheme participant.

Once a complaint has been established, any existing goods from the same batch that may still be in stock on the company's premises are suspended from further marketing in the QS scheme. The scheme participant has the option of submitting a written statement about the complaint to QS. It is then up to QS to decide whether sanction proceedings are to be initiated or not.

If the cause of an exceedance of a maximum level or limit value and/or the use of an unauthorised or unapproved active substance is found to lie with the agricultural/horticultural business, the measures outlined in 7.1, above apply.

7.3 Stage food retail

A corrective actions report, in which the measures to be taken and procedures to be followed in the event of an exceedance are defined, must be on hand and available for presentation at all times.

7.4 Unblocking/regaining eligibility to deliver into the QS scheme

For a business to regain eligibility of delivery after a complaint, a sample from the same culture without any complaint (a so-called "release sample") must be presented to QS along with the analysis report. The sample must be drawn after the defective sample. The sampled product must come from the same field/greenhouse like the complained product. If no more goods from the affected field/greenhouse is available, the field/greenhouse that is harvested next, must be sampled. If the release sample is drawn at a producer business, neutral sampling must be organised by the coordinator.

If a culture is no longer available in the business in the current cultivation period during the suspension of a production business so that the rejected culture cannot be brought into circulation, the business can be reauthorized to deliver into the QS scheme. In this case, the producer must confirm the nonavailability of the culture.

8 Approval of Monitoring Programmes Other than QS

For the approval of other monitoring programmes by QS, evidence of the comparability of the control system with the requirements of the QS Guideline for Residue Monitoring must be produced. QS reaches a decision on approval in its committees in each individual instance.

9 Definitions

9.1 Explanation of symbols

References to related documents are highlighted **in bold type**.

Notes are marked with ***Note:*** *italic text*.

References to other chapters in the guideline are marked with ⇒.

9.2 Terms and definitions

- Working days
  The days Monday to Friday are regarded as working days in the QS scheme.
- ARfD value (acute reference dose)
  - With active substances for which no ARfD value exists or is required, "n.e." = not required/non-existent should be entered in the entry field.
  - If an active substance has been assigned an ARfD value, the degree to which this value has been exploited should be given (numerical value with decimal point) and not the legally assigned value.
- Complaint
  - Evidence of not authorised active substances and their metabolites according to the residue definition for the crop in the country of origin
  - Evidence of the maximal legal levels being exceeded
  - The actual value is taken into account in the QS scheme, i.e. the measured value without consideration of the measuring uncertainty of ± 50 percent
  - Findings ≤0.01 mg/kg are not taken into account if the corresponding maximum residue level is more than 0.01 mg/kg
- Compound sample
  A compound sample as defined by QS is the representative overall sample. To this end, samples from different places in a lot/batch are combined into an overall sample. In this regard, a "compound sam-

ple" should **not** be seen as the mixing of different products, products from different lots/batches or from different producers into an overall sample. The results of samples of this kind are not approved in the QS scheme as they have no relevant meaning for the individual product.

- Incremental sample
  A quantity of material taken from a single place in the lot or sublot. It may be a single lettuce or spinach head, or handful of baby leaf, or one bag of cut leaves
- Sample type
- The following sample types can be selected in the QS database:

  - As far as the extent of the examination is concerned, the "Mandatory sample/regular sample" complies with the provisions of the control plan. It is possible to commission additional examination methods, but the scope of the examination cannot be reduced. These samples are always products which are ready for harvest and/or sale. The sample can be drawn before, during or after harvesting.
  - If laboratory results are not assigned to all methods applied for, the sample cannot be completed and does not therefore count as part of the target number of samples that the scheme participant has to fulfil.
  - A "release sample" is taken after a complaint. It can be used by the scheme participant to regain his/her eligibility to deliver the noncompliant product into the QS scheme.
  - The "voluntary sample" does not count as one of the mandatory samples that a company has to draw in line with the control plan. The extent of the commissioned method can be selected as desired.
  - The "pre-harvest sample does not count as one of the mandatory samples that a company has to draw in line with the control plan. This type of sample is always evaluated by QS as a sample from products which are not ready for harvest and/or sale. It can be used to estimate the residue situation in a product.

10 Annexes

10.1 Control plan

Annex 10.1 of the control plan is published separately as an extract.

Product	Risk group[1]	Wholesale/Preparation and Processing: one sample per ...t QS purchased produce; but at least one sample	Multi-methods	Dithiocarbamates	Inorganic total bromide	Nitrate	Chlormequat / Mepiquat	Dithianon	Ethephon	Phenoxyalkane carboxylic acids	Matrine (Single method only required for positive findings from the multimethod)[3]	Additional analysis
1. FRUITS FRESH OR FROZEN; NUTS												
i) Citrus fruit												
Grapefruit (Shaddocks, pomelos, sweeties, tangelo, ugli and other hybrids)	3	833	x							O(2,4-D)	x	**Recommendation**: Organotin compound. QAV and Morpholine for every 10th sample **Obligation:** Sampling of each 4th sample after all process steps[2]
Grapefruit (Shaddocks, pomelos, sweeties, tangelo, ugli and other hybrids) (China, South Africa, Turkey)	7	180	x							O(2,4-D)	x	**Recommendation**: Organotin compound. QAV and Morpholine for every 10th sample **Obligation:** Sampling of each 4th sample after all process steps[2]
Oranges	1	2500	x						x*	O(2,4-D)	x	***Obligatiatory for origin:** third countries **Recommendation**: Organotin compound. QAV and Morpholine for every 10th sample **Obligation:** Sampling of each 4th sample after all process steps[2]
Lemons	1	2500	x							O(2,4-D)	x	**Recommendation**: Organotin compound. QAV and Morpholine for every 10th sample. Overseas goods: ethephon at the beginning of the season. **Obligation:** Sampling of each 4th sample after all process steps[2]
Lemons (Chile, South Afrcia, Turkey, Uruguay)	4	625	x							O(2,4-D)	x	**Recommendation**: Organotin compound. QAV and Morpholine for every 10th sample. Overseas goods: ethephon at the beginning of the season. **Obligation:** Sampling of each 4th sample after all process steps[2]
Limes	7	180	x							O(2,4-D)	x	**Recommendation**: Organotin compound. QAV and Morpholine for every 10th sample **Obligation:** Sampling of each 4th sample after all process steps[2]
Mandarins (clementine, tangerine and other hybrids)	2	1250	x							O(2,4-D)	x	**Recommendation**: Organotin compound. Dichlorprop. QAV and Morpholine for every 10th sample **Obligation:** Sampling of each 4th sample after all process steps[2]
Mandarins (clementine, tangerine and other hybrids) (Third countries)	5	500	x							O(2,4-D)	x	**Recommendation**: Organotin compound. Dichlorprop. QAV and Morpholine for every 10th sample **Obligation:** Sampling of each 4th sample after all process steps[2]
Other citrus fruits	7	180	x							O(2,4-D)	x	**Recommendation**: Organotin compound. QAV and Morpholine for every 10th sample **Obligation:** Sampling of each 4th sample after all process steps[2]

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ii) Tree nuts (shelled or unshelled)												
Almonds	1	2500	x								x	
Brazil nut	1	2500	x								x	
Cashew nut	1	2500	x								x	
Chestnut	3	833	x		x*						x	**Obligations:** Chloride/bromide-ratio. Sampling after all process steps.
Chestnut (China, Turkey)	6	417	x		x*						x	**Obligations:** Chloride/bromide-ratio. Sampling after all process steps.
Coconut	1	2500	x								x	
Hazelnut	2	1250	x								x	
Macadamia nut	1	2500	x								x	
Pecans	1	2500	x								x	
Pine nuts	1	2500	x								x	
Pistachio	2	1250	x								x	
Walnut	2	1250	x								x	
Peanut	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Other nuts (shelled or unshelled)	6	417	x								x	
iii) Pome fruit												
Apple	1	2500	x					x			x	
Apple (Poland)	3	833	x					x			x	
Pear	2	1250	x				x*	x			x	***Obligation:** Chlormequat/Mepiquat for each 10th sample
Pear (Germany)	1	2500	x				x*	x			x	***Obligation:** Chlormequat/Mepiquat for each 10th sample
Pear (Argentina, Turkey)	3	833	x				x*	x			x	***Obligation:** Chlormequat/Mepiquat for each 10th sample
Quince	6	417	x					x			x	
Loquat	1	2500	x					x			x	
Medlar	1	2500	x					x			x	
Nashi pear	6	417	x				x*	x			x	***Obligation:** Chlormequat/Mepiquat for each 10th sample
Other pome fruits	6	417	x					x			x	
iv) Stone fruits												
Apricot	3	833	x	x				x			x	**Obligation:** Phophonic acid
Apricot (Turkey)	9	65	x	x				x			x	**Obligation:** Phophonic acid
Sweet cherry	5	500	x	x				x			x	**Obligation:** Phophonic acid
Sweet cherry (Turkey)	7	180	x	x				x			x	**Obligation:** Phophonic acid
Sour cherry	6	417	x	x				x	x*		x	***Ethephon obligated just for industrial cultivation** **Obligation** Phophonic acid
Nectarine	2	1250	x	x				x			x	
Plum (Damson, greengage, mirabelle)	4	625	x	x				x	x*		x	***Ethephon obligated just for industrial cultivation** **Obligation** Phophonic acid
Peach	4	625	x	x				x			x	
Other stone fruits	9	65	x	x				x			x	**Obligation:** Phophonic acid

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v) Berries and small fruit												
a) Grapes												
Table grapes green (Egypt, EU, South Africa)	1	2500	x								x	
Table grapes green (Greece, India, Italy)	3	833	x				x*				x	***Obligation:** Chlormequat/Mepiquat for origin India
Table grapes green (third country)	2	1250	x								x	
Table grapes blue	3	833	x						x		x	
Table grapes blue (Egypt, India, South Afrcia, Turkey)	4	625	x				x*		x		x	***Obligation:** Chlormequat/Mepiquat for origin India
Kiwiberry (mini kiwi)	3	833	x								x	
b) Strawberries												
Strawberry (Outdoor)	1	2500	x								x	
Strawberry (Outdoor) (North Africa)	5	500	x								x	
Strawberry (Greenhouse)	1	2500	x								x	
c) Cane fruit												
Blackberry	6	417	x								x	
Raspberry	6	417	x								x	
Dewberry (Loganberry)	6	417	x								x	**Obligation:** Phophonic acid for each 3rd sample
Other cane fruits	6	417	x								x	
d) Other small fruit and berries												
Cultivated Blueberry	3	833	x								x	
Cowberry	5	500	x								x	
Cranberry	2	1250	x								x	**Obligation:** Phophonic acid
Currant (red, black and white)	5	500	x								x	
Gooseberry	6	417	x								x	
Jostaberry	3	833	x								x	
Rose hip	3	833	x								x	**Obligation:** Phophonic acid
Mulberry	3	833	x								x	**Obligation:** Phophonic acid
Elderberries (wild rowan berry)	3	833	x								x	
Cape gooseberry; Physalis	2	1250	x								x	
Other small fruits and berries	6	417	x								x	**Obligation:** Phophonic acid
vi) Miscellaneous fruit												
a) Edible peel												
Date	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Fig	1	2500	x						x		x	**Obligation:** Phophonic acid for each 3rd sample
Fig (Brazil, Turkey)	4	625	x						x*		x	*Ethephon, obligatory for origin Brazil. Obligation for origin Turkey at the beginning of the season until end of August **Obligation:** Phophonic acid for each 3rd sample
Table olive	5	500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Kumquat	6	417	x						x*		x	*Ethephon, obligatory at the beginning of the season **Obligation:** Phophonic acid for each 3rd sample
Carambola	6	417	x								x	**Obligation:** Phophonic acid for each 3rd sample
Kaki; Japanese persimmons	3	833	x						x*		x	*Ethephon, obligatory at the beginning of the season for origin Spain
Other miscellaneous fruits with edible peel	6	417	x								x	

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b) Inedible peel, small												
Kiwi	1	2500	x								x	
Kiwi (Chile, Greece)	3	833	x								x	
Lychee	3	833	x								x	**Obligation:** Sulphur dioxide (SO_2), Phophonic acid
Maracuja; Passionfruit (Granadilla)	7	180	x								x	**Obligation:** Phophonic acid
Maracuja; Passionfruit (Granadilla) (Columbia)	9	65	x								x	**Obligation:** Phophonic acid
Prickly pear; cactus fruit; pitaya	8	100	x								x	**Obligation:** Phophonic acid
Other small miscellaneous fruits with inedible peel	9	65	x								x	**Obligation:** Phophonic acid
c) Inedible peel, large												
Avocado	5	500	x								x	**Obligation**: Cadmium and lead for each 4th sample
Banana	1	2500	x								x	**Obligation:** Phophonic acid
Mango	5	500	x								x	**Obligation:** Phophonic acid
Mango (Brazil, Peru)	6	417	x								x	**Obligation:** Phophonic acid
Papaya; Tamarillo	7	180	x								x	**Obligation:** Phophonic acid
Pomegranate (EU, South Africa)	5	500	x								x	**Obligation:** Phophonic acid
Pomegranate (Third Countries)	9	65	x								x	**Obligation:** Phophonic acid
Pineapple	2	1250	x						x		x	
Bread fruit; Jackfruit	6	417	x								x	**Obligation:** Phophonic acid
Cherimoya; Rambutan	6	417	x								x	**Obligation:** Phophonic acid
Durian	6	417	x								x	**Obligation:** Phophonic acid
Guava	8	100	x								x	**Obligation:** Phophonic acid
Other large miscellaneous fruits with inedible peel	9	65	x								x	**Obligation:** Phophonic acid
2. VEGETABLES FRESH OR FROZEN												
i) Root and tuber vegetables												
a) Potatoes												
Potato	1	2500	x		**O**						x	**Obligation:** Sampling of each 4th sample after all process steps[2]
b) Tropical root and tuber vegetables												
Ginger	9	65	x								x	
Cassava (Dasheen, eddoe (Japanese taro), tannia, manioc)	4	625	x								x	**Obligation:** Phophonic acid for each 3rd sample
Sweet potato	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Yams (Potato bean (yam bean), Mexican yam bean)	4	625	x								x	**Obligation:** Phophonic acid for each 3rd sample
Other tropical root and tuber vegetables	9	65	x								x	

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(c) Other root and tuber vegetables except sugar beet												
Beetroot	3	833	x	O							x	**Obligation:** Phophonic acid for each 3rd sample
Carrot (bunch)	2	1250	x								x	**Obligation:** Phophonic acid for each 3rd sample
Carrot (bulk goods)	2	1250	x								x	**Obligation:** Phophonic acid for each 3rd sample
Carrot (bulk goods) (Germany)	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Celeriac	6	417	x								x	**Obligation:** Cadmium (Cd), Lead (Pb) **Obligation**: Phosphonic acid for each 3rd sample
Horseradish	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample **Recommendation:** Cadmium (Cd), Lead (Pb)
Jerusalem artichoke	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Parsnip	3	833	x								x	**Obligation:** Phophonic acid for each 3rd sample **Recommendation:** Cadmium (Cd), Lead (Pb)
Parsley root	3	833	x								x	**Obligation:** Phophonic acid for each 3rd sample
Radish (Outdoor)	2	1250	x								x	
Radish (Greenhouse)	1	2500	x								x	
Small radish (Outdoor)	1	2500	x								x	
Small radish (Outdoor) (Italy)	3	833	x								x	
Small Radish (Greenhouse)	1	2500	x								x	
Scorzonera	1	2500	x								x	**Obligation:** Cadmium (Cd), Lead (Pb)
White Turnip; Turnip; Swedes	3	833	x								x	**Obligation:** Phophonic acid for each 3rd sample
Other root and tuber vegetables except sugar beet	6	417	x								x	
ii) Bulb vegetables												
Garlic	1	2500	x								x	**Obligation** for stock goods (Feb. - May): Maleic hydrazide **Obligation:** Phophonic acid for each 3rd sample
Onions (Silver skin onions)	1	2500	x								x	**Obligation** for stock goods (Feb. - May): Maleic hydrazide
Shallots	1	2500	x								x	**Obligation** for stock goods (Feb. - May): Maleic hydrazide **Obligation:** Phophonic acid for each 3rd sample
Spring onions	1	2500	x								x	
Spring onions (Egypt; Italy)	5	500	x								x	
Other bulb vegetables	5	500	x								x	
iii) Fruiting vegetables												
a)Solanaceae												
Tomato	1	2500	x								x	
Peppers	1	2500	x						x*		x	*Ethephon: obligatory for the winter season for origin Greece, Spain, Third countries (not valid for green peppers)
Peppers (Hungary, Morocco, Turkey)	4	625	x						x*		x	*Ethephon: obligatory for the winter season for origin Third countries (not valid for green peppers)
Chilli peppers	1	2500	x								x	
Chilli peppers (Third Countries)	7	180	x								x	
Aubergines	1	2500	x		O						x	
Okra; Lady's fingers	9	65	x								x	**Obligation:** Phophonic acid for each 3rd sample
Other Solanaceae	9	65	x								x	

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b) Cucurbits- edible peel												
Cucumber	2	1250	x								x	
Gherkin	1	2500	x								x	
Courgette	3	833	x								x	
Courgette (Belgium, Spain)	6	417	x								x	
Other cucurbits with edible peel	6	417	x								x	
c) Cucurbits - inedible peel												
Melon (Muskmelon, Kiwano)	2	1250	x								x	
Pumpkin	2	1250	x								x	
Water melon	1	2500	x								x	
Other cucurbits with inedible peel	2	1250	x								x	
d) Sweet corn												
Sweet corn	1	2500	x								x	
iv) Brassica vegetables												
a) Flowering brassica												
Broccoli	2	1250	x								x	
Broccoli (Italy)	4	625	x								x	
Cauliflower	2	1250	x								x	
Other flowering brassica	4	625	x								x	
b) Head brassica												
Brussels sprout	1	2500	x								x	
Red cabbage	1	2500	x								x	
White cabbage	1	2500	x								x	
Pointed cabbage	2	1250	x								x	
Savoy cabbage	4	625	x								x	
Other head brassica	4	625	x								x	
c) Leafy brassica												
Chinese cabbage (Indian (Chinese) mustard, pak choi)	3	833	x								x	
Kale	7	180	x								x	
Other leafy brassica	7	180	x								x	
d) Kohlrabi												
Kohlrabi (Outdoor) without leaves	2	1250	x								x	
Kohlrabi (Outdoor) with leaves	6	417	x								x	**Obligation:** Analysis of tuber and leaf
Kohlrabi (Greenhouse) without leaves	2	1250	x								x	
Kohlrabi (Greenhouse) with leaves	4	625	x								x	**Obligation:** Analysis of tuber and leaf

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v) Leaf vegetables and fresh herbs												
a) Lettuce and other salad plants including Brassicaceae												
Lamb's lettuce (Outdoor)	4	625	x	O	x*	O					x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Lamb's lettuce (Greenhouse)	4	625	x	O	x*	O					x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Head lettuce (Outdoor)	2	1250	x	x	x*	x					x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Head lettuce (Greenhouse)	2	1250	x	x		x					x	
Head lettuce (Greenhouse) (Belgium)	4	625	x	x		x					x	
Iceberg lettuce (Outdoor)	1	2500	x	O	x*	x					x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Coloured lettuce (Lollo, Leaf-oak, Batavia) (Outdoor)	4	625	x	x	x*	x					x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Coloured lettuce (Lollo, Leaf-oak, Batavia) (Greenhouse)	4	625	x	x	x*	x					x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Romaine lettuce (Outdoor)	1	2500	x	x	x*	x					x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Romaine lettuce (Greenhouse)	1	2500	x	x		x					x	
Escarole/broad-leaf endive (wild chicory, red-leaved chicory, radicchio, curly leave endive, sugar loaf)	2	1250	x	x	x*						x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Escarole/broad-leaf endive (wild chicory, red-leaved chicory, radicchio, curly leave endive, sugar loaf) (Germany; Spain)	4	625	x	x							x	
Land cress	1	2500	x								x	
Rocket, Rucola	6	417	x		x*	x					x	***Obligation** for origin Italy, as well Chloride/Bromide ratio
Mizuna (Leaves and sprouts of Brassica spp)	5	500	x								x	
Other lettuce and other salad plants including Brassicaceae	6	417	x			x					x	
b) Spinach and similar leaves												
Spinach	3	833	x	x		x					x	**Recommendation:** Cadmium (Cd), Lead (Pb)
Spinach (Industrial production)	1	2500	x	x		x					x	**Recommendation:** Cadmium (Cd), Lead (Pb)
Purslane (Winter purslane (miner's lettuce), glasswort)	7	180	x								x	**Obligation:** Phophonic acid for each 3rd sample
Chard	7	180	x								x	
Turnip greens	3	833	x								x	
Other spinach and similar leaves	7	180	x								x	
c) Vine leaves (grape leaves)												
Vine leaves	9	65	x	x							x	**Obligation:** Phophonic acid for each 3rd sample
d) Water cress												
Water cress (Water convolvulus, Water clovers, Water mimosas)	4	625	x								x	**Obligation:** Phophonic acid for each 3rd sample
e) Witloof												
Witloof	3	833	x								x	

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f) Fresh herbs and edible flowers[(2)]												
Pot herbs												
[(2)] for entire f) fresh herbs (Italy, Third Countries)	9	65	x								x	
Chervil	8	100	x								x	
Chives	8	100	x								x	
Dill leaves	8	100	x								x	
Celery leaves; Sorrel	8	100	x								x	
Coriander leaves	8	100	x								x	
Lovage	8	100	x								x	
Parsley	8	100	x								x	
Sage	8	100	x								x	
Rosemary	8	100	x								x	
Thyme	8	100	x								x	
Basil	8	100	x								x	
Mint	8	100	x								x	
Tarragon (Hyssop)	8	100	x								x	
Wild garlic	8	100	x								x	
Caraway	8	100	x								x	
Bay leaves	8	100	x								x	
Marjoram	8	100	x								x	
Oregano	8	100	x								x	
Savory	8	100	x								x	
Common balm; Lemon balm	8	100	x								x	
Edible flowers	8	100	x								x	
Other fresh herbs and edible flowers	9	65	x								x	
Cut herbs												
[(2)] for entire f) fresh herbs (Italy, Third Countries)	9	65	x	x*							x	***Obligation:** from November to March for each 4th sample
Chervil	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Chives	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Dill leaves	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Celery leaves; Sorrel	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Coriander leaves	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Lovage	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Parsley	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Sage	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Rosemary	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Thyme	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample

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Basil	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Mint	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Tarragon (Hyssop)	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Wild garlic	8	100	x								x	
Caraway	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Bay leaves	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Marjoram	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Oregano	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Savory	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Common balm; Lemon balm	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Edible flowers	8	100	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
Other fresh herbs and edible flowers	9	65	x	x*							x	***Obligation:** for origin Southern Europe from November to March for each 4th sample
vi) Legume vegetables (fresh)												
Beans (with pods)	2	1250	x								x	**Obligation:** Phophonic acid
Beans (with pods) (Spain; Third Countries)	6	417	x								x	**Obligation:** Phophonic acid
Beans (without pods)	2	1250	x								x	**Obligation:** Phophonic acid for each 3rd sample
Beans (without pods) (Third Countries)	4	625	x								x	**Obligation:** Phophonic acid for each 3rd sample
Peas (with pods) (Mangetout (sugar peas))	3	833	x								x	**Obligation:** Phophonic acid for each 3rd sample
Peas (with pods) (Third Countries)	7	180	x								x	**Obligation:** Phophonic acid for each 3rd sample
Peas (without pods)	2	1250	x								x	**Obligation:** Phophonic acid for each 3rd sample
Peas (without pods) (Third Countries)	4	625	x								x	**Obligation:** Phophonic acid for each 3rd sample
Other legume vegetables (fresh)	7	180	x								x	
vii) Stem vegetables (fresh)												
Asparagus white	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Asparagus green	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Celery	5	500	x	O							x	**Obligation:** Phophonic acid for each 3rd sample
Celery (Beglium; Spain)	7	180	x	O							x	**Obligation:** Phophonic acid for each 3rd sample
Fennel	4	625	x								x	**Obligation:** Phophonic acid for each 3rd sample
Fennel (Germany)	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Globe artichoke	1	2500	x								x	
Leek	3	833	x								x	
Rhubarb	1	2500	x								x	**Obligation:** Phophonic acid for each 3rd sample
Bamboo shoots	1	2500	x	O							x	**Obligation:** Phophonic acid for each 3rd sample
Other stem vegetables (fresh)	7	180	x								x	

Product	Risk group[1]	Wholesale/Preparation and Processing: one sample per ...t QS purchased produce; but at least one sample	Multi-methods	Dithiocarbamates	Inorganic total bromide	Nitrate	Chlormequat / Mepiquat	Dithianon	Ethephon	Phenoxyalkane carboxylic acids	Matrine (Single method only required for positive findings from the multimethod)[3]	Additional analysis
viii) Fungi												
Cultivated fungi (common mushroom, oyster mushroom, shi-take)	3	833	x				x				x	**Recommendation:** single method glyphosate **Obligation:** Phophonic acid for each 3rd sample
Wild fungi (morels, chanterelle)	6	417	x								x	**Obligation:** Analysis on radiation exposure **Obligation:** Phophonic acid for each 3rd sample **Recommendation:** Mercury (Hg), Cadmium (Cd)
Other cultivated fungi	6	417	x								x	
3. PULSES, DRY												
Beans	1	2500	x								x	**Obligation:** single method glyphosate **Obligation:** Phophonic acid for each 3rd sample
Lentils	2	1250	x								x	**Obligation:** single method glyphosate **Obligation:** Phophonic acid for each 3rd sample
Peas (chickpeas, chickling vetch)	1	2500	x								x	**Obligation:** single method glyphosate **Obligation:** Phophonic acid for each 3rd sample
Other pulses, dry	2	1250	x								x	
4. OTHER SPROUTS AND SHOOTS												
Other sprouts and shoots	1	2500	x								x	

Legend:

x	**obligatory analysis**
O	**additional recommendation**

Multi methods:

GC	Group of selected pesticides identified by gas chromatography
LC-MS/MS	Group of selected pesticides identified by LC-MS/MS
2,4-D	Herbicide from the group of Phenoxyalkyl carbonic acid

[1]The risk grouping of the products is made by QS and is based on a scale from 1 (lowest risk) to 9 (highest risk).

[2]At least the first sample and afterwards every 4th sample needs to be taken after all process steps

[3]For positive detections of Matrine by multi-method(s) a precise quantification of the active substance by a single method is required, if this is not ensured by the multi-methods.

10.2 Sampling Report

for plant-based material within the scope of Residue Monitoring

Customer: _____

Sample number (Sample ID): _____

Name of commissioned laboratory: _____

Name of sampler: _____

Date of sampling: _____

Time of sampling: _____

Place of sampling: _____
(field/store/incoming/outgoing goods)

QS Identification Number
or Location Number: _____
(lace of sampling)

Sample Type

☐ Mandatory/regular sample

☐ Voluntary sample

☐ Release sample

☐ Pre-harvest sample

Sample for stage

☐ Production

☐ Wholesale

☐ Preparation/Processing

Product details (supplier/producer)

Name: _____

Address: _____

QS ID No. or WS/FVP number: _____
(producer or supplying wholesaler)

Product: _____ Variety*: _____

☐ Greenhouse culture ☐ Greenhouse/cut product ☐ Greenhouse/pot product

☐ Open grown culture ☐ Open grown/cut product ☐ Open grown/pot product ☐ unknown

For producer samples field/batch designation or GPS data: _____

For wholesale samples batch or traceability number: _____

Country of origin: _____ Destination country*:

_____

Federal state*: _____ Sample quantity: _____
(number/weight)

Plot/lot number*: _____ Article No*.: _____

Peculiarities/abnormalities*:

_____

_____

Commissioned examination method:

☐Multi-methods ☐ Dithiocarbamates ☐ Total bromide ☐ Nitrate

☐ Chlormequat/Mepiquat ☐ Dithianon ☐ Ethephon ☐ Phenoxy alkane carboxylic acids

☐ Other _____

_____ _____

Signature
Responsible person/producer/supplier

Signature
Sampler

*Voluntary entry

10.3 Registration form for laboratories

To apply for QS approval in the scope of Residue Monitoring fruit, vegetables and potatoes

A. General data
Laboratory:
Address:
Postcode/City:
Country:
Phone:
Fax:
E-Mail:
VAT-ID: (only specified if the company head office is not in Germany)

B. Responsibilities	
Contact person:	
Name:	E-Mail:
Representative:	
Name:	E-Mail:

C. Accreditation in accordance with EN ISO/IEC 17025[2]	
☐ implemented	☐ under development

[2] Please tick as appropriate.

D. Accreditation in accordance with EN ISO/IEC 17025 for at least the following test methods[3]

Multi-method[4] (e.g. DFG S 19; contained in EN 12393-1, -2 and -3/QuECHERS) with LC-MS/MS and GC-MS(/MS) **(a subcontract is not possible)**

☐ implemented ☐ under development

Modified multi-method (in line with EU reference laboratory, Single Residue Methods, Analytical observation report) (e.g. for dithianon, dodin, fenbutatin oxide, phenoxy alkane carboxylic acids (free acids, esters), QACs)

☐ implemented ☐ under development ☐ single/special method

Single/special methods for active substances with more complex residue analysis (incl. metabolites)

Amitraz[4,5]	☐ implemented	☐ under development	☐ subcontracted
2,4-D[4]	☐ implemented	☐ under development	☐ subcontracted
Haloxyfop[4]	☐ implemented	☐ under development	☐ subcontracted
Fluazifop-p-butyl[4]	☐ implemented	☐ under development	☐ subcontracted

Single/special methods (a subcontract is not possible)

Dithianon[6]	☐ implemented	☐ under development
Fenbutatin oxide	☐ implemented	☐ under development
Dithiocarbamates[7]	☐ implemented	☐ under development

Single/special methods for very polar active substances

Chlorate/Perchlorate	☐ implemented	☐ under development	☐ subcontracted
Chlormequat/Mepiquat	☐ implemented	☐ under development	☐ subcontracted
Ethephon	☐ implemented	☐ under development	☐ subcontracted
Glyphosate	☐ implemented	☐ under development	☐ subcontracted
Maleic acid hydrazide	☐ implemented	☐ under development	☐ subcontracted
Amine alcohols[8]	☐ implemented	☐ under development	☐ subcontracted
Phosphonate/Fosetyl	☐ implemented	☐ under development	☐ subcontracted

[3] Please tick as appropriate.
[4] The parent substance has to be detected via the multi-method. In the process, the traces below the limit of quantification of 0,01 mg/kg have to be considered. If there is a finding, a single method must be used for more precise determination of the metabolites in order to satisfy the requirements of regulation 396/2005. The finding of the single method has to be named in the report.
[5] The relevant metabolites for the residue definition can be detected via multi-methods. In that case, a subcontract is not possible.
[6] Acquisition with a multi-method is possible.
[7] e.g. DFG S 15; EN 12396-1 or -2 or -3
[8] Morpholine/Diethanolamine/Triethanolamine

Other Single/special methods

Total bromide[9]	☐	implemented	☐	under development	☐	subcontracted
Nitrate[10]	☐	implemented	☐	under development	☐	subcontracted
Heavy metals	☐	implemented	☐	under development	☐	subcontracted
Sulphite	☐	implemented	☐	under development	☐	subcontracted
Quaternary ammonium-compounds	☐	implemented	☐	under development	☐	subcontracted

E. Subcontracts

☐ subcontract/s enclosed

F. Spectrum of analysis

(List of the active substances and quantification limits which can be tested by the laboratory, subdivided by the used detection modules (e.g. GC-MS(/MS), GC-FPD, GC-ECD; LC-MS/MS)

☐ complete list enclosed

G. Copy of a test report

☐ enclosed

H. Participation in ring tests in the matrix Fruit/Vegetables/Potatoes within the last year prior to application (for all applied methods)

☐ report and laboratory code enclosed

☐ participated, results are still outstanding

Parameters: _____

I. Declaration of commitment

We commit ourselves to enter the laboratory results into the QS database in accordance with the chronological requirements of the guideline residue monitoring.

Signature/stamp: _____

[9] e.g. DFG S 18 or Propylenoxid-Methode; both are described in EN 13191-2
[10] Method EN 12014-2

J. Correctness of reported information
Hereby we confirm the correctness of the reported information. Any changes will be reported to QS unrequested. Date: _____ Signature/stamp: _____

With receipt of the application documentation and prior to the beginning of the document check, a one-off handling fee of **1.500 €** must be paid (plus VAT at the legally valid rate). On receipt of the approval, the handling fee will be credited against first year's annual fee for approval.

Explanations: Documents to be submitted

In addition to the completed data sheet for the document check, the following documents[11] have to be submitted for the approval procedure.

1. Accreditation certificate including enclosures for all applied methods in German or English.

- List of methods with status "under development".The evidence has to be submitted that the accreditation is expected within the next 12 months.

2. Validation documents for all applied test methods. The documentation should comprise the following:

- Consideration of typical matrix types (for pesticides water-rich, water- and acid-rich, starch-rich, fat-rich).
- Dopings repeated five times at the limit of quantification and on a higher level, e.g. ten times higher.
- Representation of the mean values of the recoveries and the variation coefficients.
  - Representation of the lab-internal extended measuring uncertainty.
  - At the multi-method: Complete spectrum of analysis of all active substances and metabolites (including limits of quantification), subdivided according to the used detection components.
  - Representation of the mean values of the recoveries and the coefficients of variation of the entire spectrum of substances or at least their typical representatives.
  - Confirmation that validation has complied with the required criteria for identification, in particular when checking the limit of quantification (e.g. measurement of two mass transfers in GC-MS/(MS) and LC-MS/MS).
- Information about the used methods for active substances with complex residue definition:
  - Identification and validation of all analytes via the multi-method, e.g. Amitraz, Flonicamid, Spinosad
  - Use of additional single methods for detection of residue definition, e.g. alkaline hydrolysis in phenoxycarboxylic acids. In this case, beside the acids, also typical ester compounds or conjugates have to be validated.

3. Verification documents (current procedures for performance review during routine analysis)

- Verification of recovery for all parameters of all examination methods.
- at the multi-method
  - all analytes of the substances spectrum within one year,
  - Presentation of data for new active substances, e.g. newly included active substances in the examination spectrum by QS.

4. Laboratory suitability tests

- Overview of all submitted laboratory suitability tests.
- Proof of participation in current external laboratory suitability tests has to be submitted for every applied examination method presented in the form of the original report including cover sheet and laboratory code.
  - for multi-method, at least three participations in the previous year or current year
  - for single methods, at least one participation in the last five years
  - for missing laboratory suitability tests, planning for an intended participation.

5. Copy of an exemplary test report including all relevant residue levels (cf. requirements for test reporting, guideline 6.8).

6. Documentation of subcontracting (if necessary).

[11] The documents must be submitted in such a form that the numbering listed above can be found in the electronic document name or in a document overview.

10.4 Evaluation Criteria for Laboratory Performance Assessment

Determination of a single test result

The following requirements must be met to pass a laboratory performance assessment:

- All active substances identified
- Correct quantification of at least n-2 active substances
  (the result per active substance must lie within the range of 70-120% of the added content)
- No incorrect positive active substance finding

The following applies to the awarding of points for a single test:

	Points
Points per participation in a laboratory performance assessment	+2
Points for every incorrectly positively/negatively identified active substance	-5
Points for every incorrectly quantified active substance	-1

For test methods which can be awarded in subcontract, the points are awarded for the participating laboratory; independent from whether the test method was conducted by the laboratory itself or subcontracted. There is no award of points for the subcontracted laboratory.

If a laboratory performance assessment is failed, participation in the next test is obligatory.

Determination of the total number of points

Calculation begins with participation in the first laboratory performance assessment after receipt of QS approval. Previous test results are not included in the evaluation. The following rules apply:

- The points scored in the individual tests are added together.
- A maximum total of 10 points can be scored.
- No negative total number of points is possible (in the event of a negative total number of points, the accumulated number of points is set to zero for the next test).

The following applies to the determination of the total number of points:

	Points
Bonus for laboratories applying for initial approval (starting credit) when participating in a laboratory performance assessment for the first time	+2
Additional graduated points deduction for the repeated occurrence of errors in the first/second/third subsequent test	-1/-2/-3
Obligatory participation in the next test with a total number of points	≤4

Approval is lost:

- if with a total number of zero points the subsequent test is failed
- if after three tests in a row no positive number of total points each was achieved.

Once QS approval has been lost, it can only be regained after a minimum of six months.

- The prerequisites for regaining approval are:
  - Successful participation in a laboratory performance assessment
  - Successful check of documents by QS
  - Successful laboratory audit by QS at the expense of the lab.

10.5 Nitrate Quantification: Provisions for the sampling method and processing of samples

To guarantee the comparability and accuracy of nitrate levels and/or analysis results in the vegetable produce of one harvest, the following requirements must be met for QS samples on basis of **Regulation (EC) No. 1882/2006**.

Sampling in the field

Samples must be representative. Areas

- with different soil types
- which were subjected to different forms of cultivation
- containing different crop varieties
- harvested at different times

should be treated as separate plots or fields. Cultures harvested from narrow patches or protected areas should be taken from several beds and combined into one collective sample. Samples should be taken by following a "W", "X" or "Z"-shaped pattern in the field.

Product-specific information on the sample size and processing can be taken from Tables 1 and 2.

Sampling in the storage area

The sampling method applies to batches ≤ 25 tonnes.

Large batches (> 30 tonnes) should in principle be divided into sub-batches of 25 tonnes provided that sub-batches can be physically separated. As the weight of the batch is not always an exact multiple of 25 tonnes, the weight of the sub-batches may only exceed the nominal weight by a maximum of 25%, which means that the sub-batch may weigh between 15 and 30 tonnes. If the batch cannot be physically separated into sub-batches, the sample is taken from the batch.

Each batch whose conformity has to be checked has to be examined separately. In cases in which a sampling method of this kind would have unacceptable consequences for trade because the batch would get damaged (due to the packaging type, transport mode etc.), other sampling methods can be used provided that the sample is sufficiently representative of the sampled batch and the sampling method is described and documented in detail. The place from which a sample is removed from the batch should be selected at random.

Minimum number or weight of the individual samples or units

The following applies to the amount of the sample:

For field samples:

- The sample must comprise at least 10 plants/units and a weight of at least 1 kg must be reached
- For samples on trading level:
- The minimum number of incremental samples respectively units differs depending on the weight of the respective lot wherein a sample weight of at least 1 kg must be reached

Weight of lot (kg)	Minimum number of incremental samples to be taken
< 50	3
50 to 500	5
> 500	10

Use of individual samples after submission

Only fresh sample material should be used to determine the nitrate level. The deep freezing of sample material is not permitted. The processing/extraction of the sample must be done no later than 24 hours after the sample was taken. Earth, severely soiled and other inedible outer, severely damaged leaves and plant parts should be removed from the individual samples. Lettuce stalks should be left in the product but the part on the outside should be cut off flush with the outermost leaf. It is not permitted to wash the samples. Earth, for example, should be removed with a dry brush. Several product-specific measures are listed in Table 2.

Compiling a collective sample - homogenising

To compile a collective sample, the entire sample quantity has to be homogenised. It is not permitted to use only individual segments of the individual samples, but homogenisation can be facilitated by lightly crushing the individual samples in advance. With large sample volumes, several cycles are possible depending on the technical equipment, provided that the slurries can be well combined subsequently. Proof must be provided that the method used results in complete homogenisation.

One or more analysis and reserve samples should be drawn from the homogenised collective sample. The reserve samples should be frozen in such a way that the level of the nitrate quantity is not impaired.

Extraction and analysis methods

Extraction should be done with hot water (80° C). Extraction with cold water or methanol/water (30/70) is not permitted.

The analysis must be made immediately after extraction, i.e. within a period of two hours. In rare circumstances, waiting times of up to half a day at the most are possible for organisational reasons provided that the sample is kept in a cool, dark place.

The nitrate must be quantified in compliance with the official method ASU L26.00-1 (equivalent to EN 12014-2) by means of HPLC /IC.

Tab: 1: Lettuces: average edible plant parts

A) Open grown lettuce							
Lettuce Variety	**Plant weight**	**Preparation for marketing**		**Kitchen waste**		**Edible portion**	
	Example	**Percent waste**	**Selling weight**	**Percent waste**	**Example**	**Percent**	**Example**
Batavia with outer leaves	**600 g**	20 %	480 g	20 %	120 g	**60 %**	360 g
Oakleaf with outer leaves	**600 g**	20 %	480 g	20 %	120 g	**60 %**	360 g
Iceberg packed in film	**1,200 g**	35 %	780 g	5 %	60 g	**60 %**	720 g
Iceberg with outer leaves	**1,200 g**	20 %	960 g	20 %	240 g	**60 %**	720 g
Endive with outer leaves	**1,200 g**	20 %	960 g	20 %	240 g	**60 %**	720 g
Curly endive with outer leaves	**600 g**	20 %	480 g	20 %	120 g	**60 %**	360 g
Garden lettuce with outer leaves	**600 g**	20 %	480 g	20 %	120 g	**60 %**	360 g
Garden lettuce hearts	**600 g**	35 %	390 g	5 %	30 g	**60 %**	360 g
Lollo with outer leaves	**500 g**	20 %	400 g	20 %	100 g	**60 %**	300 g
Radicchio hearts	**600 g**	35 %	390 g	5 %	30 g	**60 %**	360 g
Romana mini hearts	**400 g**	35 %	260 g	5 %	20 g	**60 %**	240 g
Romana large hearts	**800 g**	35 %	520 g	5 %	40 g	**60 %**	480 g
Romana large with outer leaves	**800 g**	20 %	640 g	20 %	160 g	**60 %**	480 g
Salanova	**400 g**	20 %	320 g	20 %	80 g	**60 %**	240 g
B) Greenhouse lettuce:							
With roughly 25 % waste, the edible portion lies at around 75% here							

Tab. 2: Nitrate Quantification: Product-specific provisions for the sample size and processing of relevant vegetable varieties (+AVV-DÜP)

Product	**Minimum size of the laboratory sample**	**Handling and subsequent cleaning after receipt of samples in all stages**	**Preparation of the analysis sample (collective sample)**
Spinach (250114) and lamb's lettuce (250102)	1 kg	Remove earth (without water), dirty, inedible and damaged plant parts; clean root if necessary	Entire sample material is homogenised together
Lettuce[1]	1 kg	Remove earth (without water), outer dirty, inedible and damaged plant parts, then cut off the stalk flush with the outermost leaf	Entire sample material is homogenised together, several cycles possible with large volumes
Beetroot (250409)	1 kg	Cut off the greens flush with the beet, remove earth	Entire sample material is homogenised together, several cycles possible with large volumes
Rocket (250142)	1 kg	Remove dirty, inedible and damaged plant parts	Entire sample material is homogenised together

[1] Lactuca sativa L. (incl. lettuce hearts) (250126, 250101, 250222, QS600016, QS600015)

Revision Information Version 01.01.2020

Criterion/ Requirement	Changes	Date of change
1 Fundamentals	**Clarification:** The residue monitoring refers to fresh unprocessed/unprepared fruit, vegetables and potatoes	01.01.2020
6.1.1 Documentary evidence	**Clarification:** When using the multi-method, all compounds mentioned in the residue definition of Regulation No. 396/2005 (including esters, conjugates, etc.) must be analyzed, if they can be detected by the multi-method.	01.01.2020
6.7 Obligation to enter results into the database	**Clarification:** If a data record has to be reset in the QS database due to erroneous entries, the laboratory must complete it again within three working days after the reset or re-transmission to the laboratory in the database.	01.01.2020
10.1 Control plan	**Change:** The risk groups including tonnages, relevant methods and additional analysis were revised.	01.01.2020

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