

Supporting document water quality

Explanatory notes for the food production



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Contents

1 Scope	3
2 Introduction.....	3
3 Legal requirements and standards.....	3
3.1 Regulation (EC) Nr. 852/2004 on the hygiene of food stuffs.....	3
3.2 Council Directive 2020/2184/EC on the quality of water intended for human consumption	3
3.3 Drinking water Ordinance (TrinkwV)	Fehler! Textmarke nicht definiert.
3.4 DIN EN ISO 19458: Water quality - sampling for microbiological analysis	4
4 Requirement „water quality“ in the QS scheme	6
5 QS requirements on laboratories	10

1 Scope

The following supporting document offers assistance for the implementation of the QS requirement „water quality“. Furthermore, it covers the most important legal requirements and standards regarding the use and quality of water in food companies.

The supporting document takes into account the following guidelines and annexes:

- Guideline Slaughtering/Deboning
- Guideline Processing Meat and Meat Products
- **Guideline Convenience**
- Guideline Butchery
- Guideline Meat Wholesale
- Guideline Wholesale Fruit, Vegetables, Potatoes
- Guideline Preparation/Processing Fruit, Vegetables, Potatoes
- **Appendix 11.2 to the QS-GAP guideline: Requirements for handling processes**

2 Introduction

Water is used in food production as an ingredient as well as for cleaning and manufacturing. The perfect quality of the water used is essential for the production of safe, high-quality food. Requirements for used water are defined by laws, directives and regulations.

Over and above the legal requirements, the QS scheme calls for purpose-oriented testing of water used at the location as part of the company's own self assessment. The aim is to assess the quality of the water used as it comes into contact with products, equipment and surfaces.

3 Legal requirements and standards

Specific requirements for the use and quality of water in general are described in particular in the following standards, laws and directives:

- **Regulation (EC) Nr. 852/2004** on the hygiene of food stuffs
- **Council Directive 2020/2184/EC** on the quality of water intended for human consumption
- **DIN EN ISO 19458**: Water quality – sampling for microbiological analysis

3.1 Regulation (EC) Nr. 852/2004 on the hygiene of food stuffs

Regulation (EC) 852/2004 contains essential basic requirements for the primary production of food as well as its processing and distribution. According to this, among other things, drinking water must be available in sufficient quantity and must not pose a risk of contamination.

3.2 Council Directive 2020/2184/EC on the quality of water intended for human consumption

Directive 2020/2184/EC establishes the legal framework to protect human health from the adverse effects resulting from the pollution of water intended for human consumption by ensuring its wholesomeness and purity.

3.3 Country specific laws and regulations on water quality

Directive 2020/2184/EC is implemented in the EU member states through national law. Compliance with the nationally applicable drinking water requirements is monitored by the relevant authorities.

3.4 DIN EN ISO 19458: Water quality - sampling for microbiological analysis

The essential regulation for microbiological sampling from drinking water installations is **DIN EN ISO 19458**. This internationally valid standard includes, among other things:

- Guidance for planning a sampling program
- Procedure for taking samples for microbiological analyses and during transport
- Handling and storage of samples until the start of the examination

According to the standard, a differentiation can be made between three purposes for assessing water quality:

- Purpose A: Assessment of the water in the water supplier's main pipeline
- Purpose B: Assessment of the water at the extraction fitting and the associated domestic installation
- Purpose C: Assessment of water as it is consumed at the tapping point, including any attached devices and inserts

An overview of the different purposes, sampling methods and location can be taken from table 1. Typical application examples for the respective purposes are shown in table 2.

Table 1: Sampling at a sampling fitting for different purposes (from DIN EN ISO 19458)

Purpose	Water type	Removing attached devices and inserts	Disinfection	Flushing
A	in the main distribution	Yes	Yes	Yes
B	on the extraction fitting	Yes	Yes	No* (minimal)
C	as it is consumed	No	No	No

* Only rinse briefly to equalise the effect of the disinfection of the extraction fitting.

Table 2: Typical application examples of the sampling methods according to purposes A, B and C

Purpose	Example Extraction Point	Typical examples
A	in the main distribution	<ul style="list-style-type: none"> Operator of a water supply system (e.g. in the case of water from an own well): The scope of testing and the frequency (depending on the type and size of the water supply system) are legally defined (nationally applicable law). In the case of purchases from the public network, food processing companies can also refer to the analyses of the supplier (usually the waterworks).
B	on the extraction fitting	<ul style="list-style-type: none"> Ring main: sampling of the water inlet and the most distant tap in the internal pipe network Sampling of extraction fittings of washbasins or angle valves of showers (e.g. for testing for legionellae in the sanitary area of the staff). Sampling of "large systems for drinking water heating" for legionella (sampling as a series of samples: outlet drinking water heater, inlet circulation pipe, peripheral sampling points)
C	How it is used: Faucets, showers for food, tubes, equipment	<ul style="list-style-type: none"> Sampling of taps or tubes for water used to clean products and/or objects and equipment that come into contact with products, or as an ingredient, examples: <ul style="list-style-type: none"> - Ice maker for ice/fill - Sausage showers or flow-through basins for product cooling - Wash basin for fruit, vegetables or potatoes - Equipment for brine, infusions or marinades Sampling of taps or tubes for water used to clean surfaces that come into contact with the products

In the EU legal bases as well as in the national regulations, reference is made to the sampling procedures according to purpose A (water treatment plants and water collection tanks, main distribution) and according to purpose B (consumer's extraction fitting) of **DIN EN ISO 19458**.

Independently of the legal requirements listed above according to purpose A and B, self-monitoring of water is to be carried out in the QS scheme using the sampling procedure according to purpose C. Accordingly, plant components, devices and inserts (such as tubes, sieves) are included in the microbiological investigations (for details see chapter 4).

4 Requirement „water quality“ in the QS scheme

Over and above the legal requirements, the QS scheme calls for a purpose-oriented examination of water used in the company as part of the company's own control measures. **The aim is to assess the quality of the water used as it comes into contact with the products, equipment or surfaces.** Accordingly, water used for the production and/or treatment of foodstuffs and for cleaning objects and equipment that come into contact with foodstuffs, irrespective of its origin and physical state, must be subjected to microbiological testing.

Sampling must be carried out by a qualified sampler (e.g. trained staff) in accordance with purpose C of **DIN EN ISO 19458**: directly at the sampling point: without removing attached devices and inserts, without prior disinfection and without draining water.

Only accredited and officially approved laboratories may be commissioned to analyze the water.

A detailed overview of the "water quality" requirement in the various QS guidelines can be found in table 3.

Practical examples of the systematics of a risk-oriented sample plan for the examination of drinking water with explanations can be taken from table 4.

Attention:

- Water analyses that are drawn according to purpose A or B do not fulfil the QS requirement "water quality", as these are not drawn according to purpose C.
- *If analyses according to purpose C are required in the QS scheme, the test parameters and limit values specified in Table 3 apply (irrespective of EU or national regulations). If the specified limit values are exceeded, measures to avoid product contamination must be defined and documented immediately.*
- Independent of the QS requirement "water quality", food companies must commission water analyses according to purpose A or purpose B in accordance with national law and official requirements.

Table 3: Overview of the required water analyses and sampling procedures for self-assessment according to the QS guidelines

QS Guidelines	Examination parameters and QS limits	Examination frequency	Note/restriction
Processing	<ul style="list-style-type: none"> <i>Escherichia coli</i> (<i>E. coli</i>): 0 CFU/100 ml 	<ul style="list-style-type: none"> according to a risk-orientated plan, but at least annually (approx. every 12 months) 	<ul style="list-style-type: none"> Risk-oriented investigation plan with description of the tapping point, investigation purpose and sampling frequency
Butchery	<ul style="list-style-type: none"> Enterococci: 0 CFU/100 ml 		<ul style="list-style-type: none"> In addition to the tapping points in the production and washing area, the risk assessment should also consider conversions, possible dead lines or backflows and, if necessary, the demarcation of service water (e.g. pre-rinsing) or water circuits in the live animal area of a slaughterhouse (e.g. nipple drinkers).
Slaughtering/ Deboning	<ul style="list-style-type: none"> Colony counts at 22 °C: 100 CFU/ml 		
Convenience	<ul style="list-style-type: none"> Colony counts at 36 °C: 100 CFU/ml Coliform bacteria: 0 CFU/100 ml 		<ul style="list-style-type: none"> Does not replace the testing obligations according to nationally applicable drinking water requirements

In Table 3, explicit reference is only made to these test parameters and limit values for self-monitoring in accordance with purpose C (irrespective of EU/national regulations).

QS Guidelines	Examination parameters and QS limits	Examination frequency	Note/restriction
Meat Wholesale	<ul style="list-style-type: none"> <i>Escherichia coli (E. coli)</i>: 0 CFU/100 ml 	<ul style="list-style-type: none"> according to a risk-orientated plan, but at least annually (approx. every 12 months) 	* Additional applies:
Storage Meat and Meatproducts	<ul style="list-style-type: none"> Enterococci: 0 CFU/100 ml 		<ul style="list-style-type: none"> Process/washing water must be replaced and/or treated at regular intervals on the basis of a risk assessment. The risk of contamination must be kept as low as possible. For the water used in the final wash cycle, the above-mentioned requirements for conducting microbiological water analyses apply. Water used for the application of post-harvest treatment agents must also be sampled according to the mentioned requirements. The obligation to carry out water analyses is only necessary if products are handled that are suitable for raw consumption.
Wholesale Fruit, Vegetables, Potatoes*			
Preparation/Processing Fruit, Vegetables, Potatoes *			
Appendix 11.2 to the QS-GAP guideline: Requirements for handling processes*			

Table 4: Practical examples of the systematics of a risk-oriented sample plan for the examination of drinking water with explanations

Operating mode	Tap	Purpose (A, B, C)	Risk classification / legal regulation	Justification m = microbiological c = chemical	Sub-search-frequency	Examination parameter	Limit values
General	according to condition authority	B	by law	m: Edition authority c: Edition authority	according to Condition Authority	<i>according to national legislation</i>	<i>according to national legislation</i>
Processing Meat	salami slicer	C	high	m: Use for rinsing of equipment and tables	min. annually	<i>Escherichia coli</i> Enterococci Colony counts at 22°C Colony counts at 36°C Coliform bacteria	0 CFU/100 m 0 CFU/100 ml 100 CFU/ml 100 CFU/ml 0 CFU/100 ml
Processing Meat	ice	C	high	m: Use of ice as Ingredient	min. annually	<i>Escherichia coli</i> Enterococci Colony counts at 22°C Colony counts at 36°C Coliform bacteria	0 CFU/100 m 0 CFU/100 ml 100 CFU/ml 100 CFU/ml 0 CFU/100 ml
Wholesale; Preparation/ Processing	washbasin	C	high	m: Washing water	min. annually	<i>Escherichia coli</i> Enterococci	0 CFU/100 m 0 CFU/100 ml

5 QS requirements on laboratories

For self-monitoring in accordance with the QS requirements, the testing laboratories for drinking water must be officially approved.

The prerequisite for applying for an accreditation is the presentation of a valid accreditation according to **DIN EN ISO 17025** for the requested test parameters in drinking water as well as the regular successful participation in interlaboratory tests.

Sampling for self-monitoring within the framework of QS requirements can also be carried out by internally trained personnel (i.e. documented training, proof of training and competence test) in consultation with the inspection body.

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