



Postbus 5050

NL-3502 JB Utrecht

+31 30 87 820 87

[www.AeQui.nl](http://www.AeQui.nl)

[info@AeQui.nl](mailto:info@AeQui.nl)

Bachelor Food Technology  
Master Food Technology  
Master Food Safety  
Master Food Quality Management

Wageningen University

Advisory report of the assessment of the existing programmes  
9 and 10 December 2024

## Colophon

### Institution and programme

Wageningen University

Wageningen

Institutional Audit: yes

Bachelor's programme Food Technology (Croho 56973)

Master's programme Food Technology (Croho 66973)

Master's programme Food Safety (Croho 60112)

Master's programme Food Quality Management (Croho 60109)

Wageningen University

Location: Wageningen

Mode: Full-time

Parttime (online specialisation from the master's programme Food Technology)

### Assessment panel

Stanley Brul, chair

Marloes van Dort, expert

Serafim Bakalis, expert

Liesbeth Jacxsens, expert

Koen Wijsman, student member

Linda van der Grijspaarde, secretary

AeQui Nederland

PO Box 5050

3502 JB Utrecht

The Netherlands

[www.AeQui.nl](http://www.AeQui.nl)

## Summary

On 9 and 10 December 2024, the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management of Wageningen University were assessed. The panel's overall judgement of the four programmes is **positive**.

### Intended learning outcomes

Food technology is a discipline in which students develop into graduates who can work on solutions for, among other things, food security and sustainable production of food. The panel believes that food sciences is a particularly strong and internationally visible discipline at Wageningen University. All four programmes are demonstrably unique within the Netherlands and abroad. The panel welcomes the broad, integrated profile of the bachelor's and master's programmes.

The **bachelor's programme Food Technology** has been set up as a broad programme, offering different options for further graduate studies either at Wageningen University or elsewhere.

The objective of the **master's programme Food Technology** is to provide a multi-disciplinary and specialized programme in food science and technology, where fundamental science on the characteristics of food products and their production process stands central. Until the academic year 2023-2024, the programme offered ten specializations which together cover the broad field of food technology.

The programme has a new structure starting from the academic year 2024-2025. Students will not follow specializations anymore. The idea behind this is to ensure that students follow their own personalized programme, fitting their own interests and needs. Next to the fulltime variant the programme offers a part-time variant as a distance learning specialisation for life-long learners, targeted to students already employed in the food

industry, or in another phase of their life compared to a regular fulltime student. Also, the programme offers an international specialization: the European Master in Food Studies. This specialization is organized by four universities in Europe and sponsored by several multinational food companies.

The **master's programme Food Safety** focusses on an integrated approach of food safety; combining technical aspects (food microbiology, toxicology, allergies) with legal, economic, risk management and communication aspects of food safety. The programme offers three specializations, i.e. Applied Food Safety, Food Law and Regulatory Affairs, and Supply Chain Safety, which range from mainly technical, to food safety governance, technical compliance and supply chain perspective.

The **master's programme Food Quality Management** trains students interdisciplinary (research) skills to be able to deal with a broad variety of complex food quality and safety problems. The programme offers four specializations, namely Quality Control & Assurance, Quality & Food Logistics, User-oriented Food Quality, and Quality Management & Entrepreneurship.

The profiles of the bachelor's programme and the master's programmes are translated into sets of intended learning outcomes, categorised in a) domain-specific knowledge and understanding and applying that knowledge and understanding, b) scientific learning outcomes (research), c) domain specific skills and d) general academic learning. According to the panel, the intended learning outcomes of the four programmes fit the level and

orientation of the programmes and are aligned with the expectations of the (international) professional field. There is sufficient differentiation between the intended learning outcomes of the bachelor's programme and those of the master's programme. The latter are clearly formulated at a higher level.

The programmes have good contacts with the professional field. The programmes align their objectives and curricula with the professional field through informal contacts with stakeholders and annual consultations of their External Advisory Committee.

The panel thus concludes that the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management meet this standard.

#### Teaching-learning environment

The English-language fulltime bachelors' programme has a duration of three years and comprises a total of 180 EC. The English-language fulltime master's programmes have a duration of two years and comprise a total of 120 EC. The part-time distance learning variant of the master's programme Food Technology takes about four years.

The panel notes that the contents of the four programmes enable students to achieve the intended learning outcomes. The bachelor's programme and the three master's programme's programmes have clearly translated the intended learning outcomes into the educational programmes. In the eye of the panel, the online learning variant of the master's programme Food Technology is a valuable addition to regular full-time education.

In the bachelor's programme, the first year mainly consists of general basic science courses, to reach the minimum level necessary for the food science courses. The second year consists solely of food science courses, both discipline related and

integrated courses. During the third year, students can choose a minor or take optional courses. Students also have the option to follow an internship in their elective space in the third year. The master's programmes come with different elements: a joint part, a specialisation and/or optional courses part, a thesis track and an internship (or research project).

The didactic concept of the programmes supports the learning process of the students. The educational formats are adequate. The programmes offer a wide variety of study methods, including lectures, tutorials (making assignments under the guidance of a lecturer), practicals (practical assignments in a lab room) and self-study. The panel believes that the programmes have excellent food safety facilities, which are sufficiently available to bachelor's and master's students.

The programmes have a strong teaching team. The various disciplines are well represented by the input of staff from a variety of research groups, as is practical and scientific experience in the various fields of work, according to the panel.

The admission requirements of both the bachelor's programme and the master's programme adequately match the programmes.

The panel thus concludes that the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management meet this standard.

#### Student assessment

The programmes have an adequate, solid assessment system and assessment procedures. The system is adequately based on the university wide policy. Frequently used assessment forms are written tests (open and/or closed questions), assignment (reflection) report, oral presentation, other assignment and performance. The exams for the parttime distance learning variant are all online.

Quality assurance of assessment is ensured by a proactive Examination Board for the programmes. The board, focusing on a group of programmes, shows a sufficient knowledge of the individual programmes and their assessment. In the past years, the capacity of the Board is sufficiently increased.

The panel thus concludes that the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management meet this standard.

#### Achieved learning outcomes

Students conclude the programmes with a thesis. Some of the intended learning outcomes of the master's programmes are assessed in the internship.

Graduates of the programme have unconditional access to three master's programmes at Wageningen University: Food Technology, Food Safety and Food Quality Management. With an appropriate minor in the third year, access is generally possible for related programmes, such as the master's programme Biotechnology or the master's programme Nutrition & Health. Most of the graduates of the master's programmes will work in the food industry, academic research, or applied research (food research institutes).

Based on reviewing the recent theses of 15 alumni from each programme, the panel finds that the students achieve the intended level of the programmes in the subject area. From surveys and conversations with alumni, the panel concludes that the programme prepares students very well for the job market and that students end up in positions that fit the intended exit profiles.

The panel thus concludes that the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management meet this standard.

#### Suggestions

Looking ahead, the panel offers a number of suggestions for consideration:

- Consider including sustainability in the intended learning outcomes of the programmes, as well as, for example, a focus on digital tools and data science, so that learning outcomes are in line with the developments that will continue at a rapid pace in the coming years. In addition, for programmes with specialisations, consider making the specific features of the specialisations clearly visible in (one or more of) the intended learning outcomes.
- Evaluate and possibly revise the teaching schedule, which students perceive as quite busy. The workload is not evenly distributed and may be too high in some periods.
- For the bachelor's programme, consider increasing the number of food-related course content in the propaedeutic year, also to ensure the distinctive character and the selective purpose of the propaedeutic year.
- Monitor for master's programmes with students from diverse backgrounds whether students do meet expectations and what guidance is needed to get students to the same level. Current provision may not be sufficient in all cases.
- Pay attention to providing proper feedback on the thesis forms.
- Implement a stronger central policy around the teachers' and students' use of AI, focusing not only on the limitations, but also on the possibilities of AI.

All standards of the NVAO framework have been positively assessed. On this basis, the panel provides a [positive recommendation](#) regarding the accreditation of the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management.

On behalf of the entire site visit panel,  
Utrecht, March 2025,

Stanley Brul  
Chair

Linda van der Grijspaarde  
Secretary

## Introduction

### Profile

Wageningen University & Research is a collaboration between Wageningen University and the Wageningen Research foundation. The domain of Wageningen University & Research consists of three related core areas: Food, feed & biobased production, natural resources & living environment and society & well-being. The mission of Wageningen University & Research is 'to explore the potential of nature to improve the quality of life'. Wageningen University & Research has 7,600 employees and 13,100 students.

Wageningen University & Research consists of 1 faculty, 5 departments and 95 chair groups. One of the departments is the Department of Agrotechnology and Food Sciences. In total there are 20 bachelor's programmes, 31 master's programmes and 49 Massive Open Online Courses.

Four programmes in the domain of food sciences are assessed: the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management.

The programmes are offered in English and use an English title. Ever since the establishment of the bachelor's and master's programme's system, English has been the language of instruction for all master's programmes at Wageningen University and for some internationally oriented bachelor's programmes. This is a condition for a basic principle of education at Wageningen University: the 'international classroom'. The use of the English language is defined in the Code of Conduct of the Wage-

ningen University. With this policy, Wageningen University not only aims to ensure that students from all over the world can participate in the instruction and share its knowledge; it also aims to endow graduates with a basic skill that will help them to launch their (international) careers. The bachelor's programme is offered in English as well. The programme strives to remain at the top food science degrees in Europe and worldwide. Therefore, the programme became fully English-taught and internationally oriented since 2018. The rationale behind the decision is the global nature of food technology and sciences and the need to prepare students for a career in an international job market. The panel considers the statements for both the bachelor's and the master's programmes to be adequate. In this respect, the panel finds it logical that the English-language programmes have also chosen a corresponding English title.

### The assessment

Wageningen University has commissioned AeQui to conduct the current assessment. For this purpose, AeQui, in collaboration with the programme, has assembled an independent and knowledgeable panel. A preparatory meeting with representatives of the programme has taken place.

The assessment was conducted based on the Accreditation Framework for Higher Education in the Netherlands, according to the programme outlined in Appendix 2. The institution has a positive institutional audit decision, and therefore four standards were assessed.

Recommendations for further development were made during the previous assessment. The

programme has acted in response (see Appendix 3). The panel has integrated this follow-up into its considerations for the current assessment.

The panel conducted the assessment independently; the panel received the necessary information to arrive at a judgement. At the end of the assessment, the programme was informed of the findings and conclusions.

This report was sent in draft to the programme; the programme's responses have been incorporated into this final report.

At the initiative of the programme, a development meeting took place during the visit. The results of this development meeting will not affect the assessment presented in this report.

## Intended learning outcomes

Standard 1: The intended learning outcomes tie in with the level and orientation of the programme; they are geared to the expectations of the professional field, the discipline, and international requirements.

### Findings

For the individual programmes, the profile and intended learning outcomes are described. The link with the professional field is then described for the programmes as a whole.

#### *Bachelor's programme Food Technology*

Food technology is a discipline in which students develop into graduates who can work on solutions for, among other things, food security and the sustainable production of food. The bachelor's programme Food Technology is the only academic Bachelor of Science degree programme in the field of food sciences in the Netherlands. The programme has been set up as a broad programme, offering students different options for further graduate studies either at Wageningen University or elsewhere. After successful completion of the bachelor, students have unconditional access to master's programmes at Wageningen University in Food Technology and the related disciplines Food Safety and Food Quality Management. The bachelor in Food Technology gives also unconditional access to the master's in Data Science for Food and Health and the master's in Development and Rural Innovation at Wageningen University.

The profile of the programme is translated into 14 intended learning outcomes, categorised in a) domain-specific knowledge and understanding and applying that knowledge and understanding, b) scientific learning outcomes

(research), c) domain specific skills and d) general academic learning.

The past years the programme has changed in course content, but most learning outcomes remained the same. The changes in the learning outcomes that were made were mostly related to the changes into an international environment, either in terms of knowledge or understanding (e.g. sustainability in the international food production chain), as well as in terms of skills (be able to work in an international environment).

#### *Master's programme Food Technology*

The objective of the master's programme Food Technology is to provide a multi-disciplinary and specialized programme in food science and technology, where fundamental science on the characteristics of food products and their production process stands central. Students are being trained in food research, product design, and production process enhancement. The programme combines the science of different food science disciplines to teach novel mechanistic understanding and to train students in doing research to invoke new principles to pro-actively enable the society to tackle the challenges of converting the world's harvests into safe, healthy and good food. The gained expertise offers diverse opportunities in food research and the food industry.

To optimize food quality throughout the food chain, the programme requires an interdisciplinary approach. This means much attention is paid to the integration of the different disciplines within food technology. The programme includes lecturers from the following Chair Groups: Food Chemistry, Physics and Physical Chemistry of Foods, Food Microbiology, Food Quality & Design and Food Process Engineering. In addition, Chair Groups outside the field of food technology teach and participate in the programme, for example: Rural Sociology, Human Nutrition, Management Studies and Operations, Research and Logistics.

Until the academic year 2023-2024, the programme offered ten specializations which together covered the broad field of food technology. In each of these specializations, students learn how to perform food science research and how to solve problems in the food production process. To make sure that graduates will be able to work in different branches of the food industry or food research area, the specializations are discipline-based instead of product-based, and the student meets at a high level of advanced training in disciplines. The programme has a new structure starting from the academic year 2024-2025. Students will not follow specializations anymore. The idea behind this is to ensure that students are able to follow their own personalized programme, fitting their own interests and needs.

Next to the fulltime variant the programme offers a part-time variant as a distance learning specialisation for life-long learners, targeted to students already employed in the food industry, or in another phase of their life compared to a regular fulltime student.

Also, the programme offers an international specialization: the European Master in Food

Studies. This specialization is organized by four universities in Europe and sponsored by several multinational food companies. This public-private partnership gives students the opportunity to gain a unique international and industry-oriented experience. The European Master in Food Studies remains a separate specialisation.

The profile of the programme is translated into 13 intended learning outcomes, categorised in a) domain-specific knowledge and understanding and applying that knowledge and understanding, b) scientific learning outcomes (research), c) domain specific skills and d) general academic learning. For all specialisations, including the online variant and the European Master in Food studies, the same intended learning outcomes apply. The learning outcomes of the programme in the new structure without specialisations are equal to the previous learning outcomes.

#### *Master's programme Food Safety*

The master's programme Food Safety was developed as a specialization of the Food Technology programme and became a separate programme in 2003. The programme is unique worldwide, with a highly integrated approach to the field of food safety. Most other programmes in this field focus on the technological aspects of food safety or focus on the interaction of food safety and food quality. Generally, other programs often focus either on microbiology or on toxicology. From the beginning, the programme has focused on an integrated approach of food safety; combining technical aspects (food microbiology, toxicology, allergies) with legal, economic, risk management and communication aspects of food safety.

The programme offers three specializations, i.e. Applied Food Safety, Food Law and Regulatory Affairs, and Supply Chain Safety, which range

from mainly technical, to food safety governance, technical compliance and supply chain perspective.

The oldest, and largest, specialization is *Applied Food Safety*. This is the more technical specialization, with emphasis on Food Microbiology, Food Toxicology and making risk assessments based on the knowledge obtained. Students in this specialization come from a large range of backgrounds, food science and technology, human nutrition, dietetics, pharmacy, veterinary sciences, or other life science programmes.

The second specialization is *Food Law and Regulatory Affairs*. This programme provides students with a solid legal foundation regarding key issues in food safety and food regulation at international, EU and national level, as well as questions of trade, consumer and intellectual property rights law.

The third specialization *Supply chain Safety* was developed specifically on the demands of the food industry. The food industry is very international, with supply chains from all over the world. The more complex the supply chain, the higher the food safety risks. Graduates have knowledge about the complexity of the supply chains in relation to safety.

The profile of the programme is translated into 12 intended learning outcomes, categorised in a) domain-specific knowledge and understanding and applying that knowledge and understanding, b) scientific learning outcomes (research), c) domain specific skills and d) general academic learning. For all specialisations, the same intended learning outcomes apply. Although the specialisations have changed in course content over the last years, the learning outcomes only slightly changed.

#### *Master's programme Food Quality Management*

The master's programme Food Quality Management trains students interdisciplinary (research) skills to be able to deal with a broad variety of complex food quality and safety problems. The integrated approach of the programme is the techno-managerial approach, combining natural sciences (to get insight in behaviour of the food systems) and social sciences (to get insight in behaviour of the human systems) to the study and assessment of food quality management processes in the agri-food chain. The techno-managerial approach requires interdisciplinary research skills. To acquire these skills, students must gain knowledge in a certain disciplinary domain on the one hand (to have a substantial knowledge in the natural or social science). On the other hand, students must gain knowledge in the typical 'food quality management' theories & concepts, and must learn to apply the interdisciplinary research approach, including critical reflection on their own research performance.

The programme offers four specializations, namely Quality Control & Assurance, Quality & Food Logistics, User-oriented Food Quality, and Quality Management & Entrepreneurship.

The four specialisations cover the whole field of Food Quality Management and are based on the roles graduates will have after completing the programme. All specialisations contain a cluster of compulsory and restricted optional courses that target specific learning outcomes linked to the specialisation.

The specialisation *Quality Control and Assurance* is the more technology-oriented specialisation, linking to the Food Safety programme. Students will perform research in topics such as, food safety culture, risk-based auditing, food integrity management, effectiveness of food

safety management systems in global supply chains, development and food safety enforcement in emerging countries. Graduates are intended to work in the Food Quality and Safety departments of food companies or as consultants.

The specialization *Quality and Food Logistics* provides the knowledge for understanding how complex food supply chains work, with emphasis on product quality, sustainability and technology. Further, innovative logistics concepts and dedicated decision support models will be developed to deal with increased complexity and contemporary developments in the agri-food sector. Students will perform research on topics such as quality controlled logistics, logistics collaboration concepts, the techno-managerial systems approach for food supply chain management, sustainability in food chains, etcetera. The knowledge and skills that students gain in this specialization prepare them to work in many agri-food industries and organizations including food processing, fresh food trader/wholesaler, and also food/logistics consulting companies. They can work as a supply chain or logistics manager as well as a quality manager or product developer with profound knowledge about logistics and quality aspects and how they may influence each other in the agri-food sector.

The specialization *User-Oriented Food Quality* studies food quality from the consumer's perspective. Students learn to contribute to an improved quality after the point of sale. In this specialization, research topics are e.g. how consumers perform food-related practices and how companies can anticipate on this, the consumer perception of quality attributes of food and how to improve perceived quality.

The specialization *Quality Management and Entrepreneurship* gives insight into developing businesses in the complex and dynamic environment of the agri-food chain, considering the several and sometimes conflicting demands (on quality, safety, environment-sustainability) posed by consumers, companies (e.g. retailers, producers), governmental agencies and/or NGO's. Research thesis topics are e.g. on how food companies deal with such different and dynamic demands in designing a management system, the influence of such stakeholders on prioritizing the demands.

The profile of the programme is translated into 11 intended learning outcomes, categorised in a) domain-specific knowledge and understanding and applying that knowledge and understanding, b) scientific learning outcomes (research), c) domain specific skills and d) general academic learning. For all specialisations, the same intended learning outcomes apply.

#### *Link with the professional field*

To match the demands of the field, the programmes maintain formal and informal contacts with potential employers. In addition to the frequent contacts and meetings of staff with representatives of the professional field, there is an External Advisory Committee that meets annually to discuss the intended learning outcomes, the content and quality of the programme and the performance of graduates.

Consultation sessions of the programme with the External Advisory Committee, representing the professional field, confirm that the learning outcomes of all four programmes are in line with the requirements of the labour market.

### Considerations

The panel believes that food sciences is a particularly strong and internationally visible discipline at Wageningen University. All four programmes are demonstrably unique within the Netherlands and abroad. The panel welcomes the broad, integrated profile of the bachelor's and master's programmes.

The panel assesses that the intended learning outcomes of the four programmes fit the level and orientation of the programmes and are aligned with the expectations of the (international) professional field. According to the panel, there is sufficient differentiation between the intended learning outcomes of the bachelor's programme and those of the master's programme. The latter are clearly formulated at a higher level. This is especially clear from the intended learning outcomes that specify the academic and research skills that students need to obtain. The panel recommends that programmes consider including sustainability in their intended learning outcomes, as well as, for example, a focus on digital tools and data science, so that learning outcomes are in line with the developments that will continue at a rapid pace in the coming years.

The panel appreciates the programme's good contacts with the professional field. The programmes align their objectives and curricula with the professional field through informal contacts with stakeholders and annual consultations of their External Advisory Committee. The panel notes that the programme's good relations with the professional field enable it to continuously monitor current developments and incorporate them into the programme's profile and programme.

Regarding the bachelor's programme Food Technology, the panel notes the following.

According to the panel, the programme has a strong, broad knowledge base ranging from food engineering to food microbiology that introduces students to the different components of the food science domain. The intended learning outcomes are in line with the broad, integrated profile of the bachelor's programme. The domain-specific intended learning outcomes adequately cover the relevant knowledge, insight and experimental skills. There is sufficient attention to research skills, underlining the research-based nature of the programme. There is also attention to professional competences, such as communication and working in an international environment. The panel suggests a clearer indication of how the programme compares itself with other internationally oriented programmes in this field. The programme is clearly unique and, according to the panel, could express its uniqueness more in its profiling.

Regarding the master's programme Food Technology, the panel notes the following. The profile of the master's in Food Technology on how to design solutions for problems in the process of producing food is relevant according to the panel. The intended learning outcomes are appropriately general and multidisciplinary to match the many specialisations and choices and the broad field of food technology.

In 2018, the previous panel recommended managing the life cycle of the specialisations to keep the programme manageable. The new structure, from 10 specialisations to tailor-made programmes per student, is a good development, according to the current panel, making it easy to keep up with developments and adapt quickly to market needs.

Regarding the master's programme Food Safety, the panel notes the following. The panel

appreciates the specific focus on the full domain of Food Safety; the intended learning outcomes guarantee that students have a broader scope, as they comprise both technical, legal and social aspects of food safety.

The specialisations cover important aspects of the domain. Due to their nature, different specializations have a stronger focus on one or more of the learning outcomes. However, the panel is of the opinion that the uniqueness of the specialisations should be reflected more in the intended learning outcomes, for example by breaking down one or more of the learning outcomes to the different specialisations. For example, the panel can imagine that nuances are needed in the intended learning outcomes regarding the focus on law of one of the specialisations.

The previous accreditation panel was in 2018 of the opinion that the professional field requires graduates from the specialization food law and regulatory affairs of this programme. However, the panel was wondering whether future employers still had to get used to these specialists, which could lead to uncertainty for some students regarding their future. The panel expected that the arrival of a new chair holder for the LAW chair group would help in this respect. The current panel notes that the chair holder of the LAW group has given a great boost for this specialisation. This has led to the current specialisation being well recognised.

Regarding the master's programme Food Quality Management, the panel notes the following. The intended learning outcomes guarantee that students have a broader scope and are able to deal with a broad variety of complex food quality management issues, being able to work in the broad work field of food enterprises along the entire agri-food chain. The programme is

highly interdisciplinary and the learning outcomes reflect this. The specialisations cover important aspects of the domain. The panel suggests that the uniqueness of the specialisations should be reflected in the intended learning outcomes, for example by breaking down one or more of the learning outcomes to the different specialisations.

For the panel, it is clear that the combination of natural sciences and social sciences makes the master's programme Food Quality Management a stand-alone master's rather than a specialisation of the master's programme Food Safety. It is clear that the influx in both masters differs and that students have different interests. However, the panel notes that the professional field in particular makes a limited distinction between the two domains and cannot always clearly name the difference. The two domains often intermingle in the Food Safety domain. More publicity could also be given to the difference between the programmes and their attractiveness to students from different backgrounds, the panel observes. The panel understands that the programmes are already adapting information and marketing to better reach the diverse student population that might be suitable to enter the Food Quality Management programme. The panel appreciates this and also advises the programmes to tighten the profiles and the intended learning outcomes derived from them to make the distinction clearer. Currently, the intended learning outcomes are very similar, with 'safety' and 'quality' being used interchangeably. The profile could more clearly express the uniqueness of Wageningen graduates from both programmes, the panel argues.

Taking these considerations into account, the panel assesses that the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme

Food Safety and the master's programme Food  
Quality Management meet this standard.

## Teaching-learning environment

Standard 2: The curriculum, the teaching-learning environment and the quality of the teaching staff enable the incoming students to achieve the intended learning outcomes.

### Findings

The academic year consists of 6 periods. Period 1,2,5 and 6 comprise seven weeks of classes, time for self-study and the exam week. In these periods students of all programmes often follow two courses worth 6 EC each. Periods 3 and 4 entail of four weeks in which both the lectures and the exams take place. In these periods students usually follow one course worth 6 EC.

The curricula and teaching-learning environment of the bachelor's programme and the three master's programmes are discussed separately. General information is then given for the three programmes on programme specific facilities, admission criteria and staffing.

### *Bachelor's programme Food Technology*

The English-language fulltime bachelors' programme has a duration of three years and comprises a total of 180 EC.

The first year mainly consists of general basic science courses, to reach the minimum level necessary for the food science courses. In addition to these, the first year also contains three food science courses.

The second year consists solely of food science courses, both discipline related and integrated courses. Each of the integrated courses focuses on a certain theme or topic and each integrated course consists of at least two different disciplines. Most of the food related courses and a number of the basic courses include one or more weeks of (laboratory) practicals. In the student chapter, students say that courses offer students a deep understanding of food science

and that the practicals closely relate with the obtained knowledge. Courses build upon each other and are well-organised. The students are positive about the broad multidisciplinary courses. Courses combining mathematics, physics, chemistry and biology and deepening the understanding of processes behind 'food on the table'. The multidisciplinary courses are an introduction to many different chair groups and topics as well.

During the third year, students can choose a minor or take 30 EC as optional courses. Most students choose a minor within the field of food science and technology. Other popular minors are in the social sciences or in nutrition. An increasing number of students follows a minor or optional courses abroad, which is encouraged by the programme, as it broadens the perspectives of the students. Students also have the option to follow an internship of 12 EC in their elective space in the third year. The internship consists of a supervised placement in a food company or food-related organisation in- or outside the Netherlands, which enables students to gain practical experience outside the university.

An important change in the past years was changing into an international programme. According to the Self Evaluation Report, it took some time before the mindset of teachers was really changed, for example in the illustrations of international food examples. In the Self Evaluation Report is stated that the increase in international staff and students has helped to make the content of the courses really diverse and international. Both teachers and students

indicated that they perceive the international classroom as beneficial for all. For instance, students indicated that the self-enrolled case study groups almost never consist of Dutch students only. This is operationalized in the Food Technology Skills Academy. Students work in that context on their own skills development in the clusters communication, personal development, research and responsibility. A digital portfolio tool is used to organize and reflect on a learning trajectory with often different activities divided over different courses. The second year's final course, Food Properties and Function is a place where, at the course level consumer perspective and food technology/ science perspective come together. Overall, it is recommendable to include a stepping stone model where and how in the program internalisation and intercultural aspects are addressed.

Nearly every course has a number of teaching methods, designed for that specific course. Overall, most of the contact hours within the first and second year of the programme are based on practicals, this can be either lab-based practicals or computer-based practicals. In line with the Wageningen University strategy, the programme has flipped part of the teaching in several courses. This implies that the time spent in the class is used for more discussion and reflection for example by doing group work or by tutorials, and the usage of knowledge clips has increased. In the student chapter, students mention that the programme is too busy, specifically period 2 and 6 are mentioned. The programme offers few possibilities to do resits which causes even more pressure according to the students.

#### *Master's programme Food Technology*

The English-language fulltime master's programme has a duration of two years and comprises a total of 120 EC. The programme offers

a parttime distance learning variant as well. Also, a European Master in Food Studies together with other universities.

Until the academic year 2023-2024, the fulltime master's programme offered 8 specialisations. From the current academic year, the programme does not work with specializations anymore. Students define their own specialisation, by choosing their own set of courses. To ensure that all students obtain the intended learning outcomes, the programme has created lists with core courses and domain courses from which the students can choose and a framework has been created with some rules. The part-time distance variant specialization and the European Master in Food Studies specialization do not follow the new structure and keep their current structure.

Throughout the first-year, students take 60 EC of compulsory, core, domain and elective courses. The core courses within the field of food technology can be regarded as a subset from the domain courses. Domain courses have a clear link with food technology (in research on food products and/or production, design, and development of food products). To help students in choosing the courses, several profiles are defined.

The second year of the programme is similar to the old programme with the specialisations. Students have to do a thesis of 36 EC and an internship of at least 24 EC. Both the thesis and internship need to have a clear relationship with food technology. They can be done at several chair groups. Chair groups define pre-requisite courses to ensure students have the specific knowledge and skills to be able to execute the specific thesis topic at the desired academic level.

Many courses offer a lab practical, and/or tutorials (incl. case studies) and group work, resulting in around 25 contact hours a week for the core and domain courses on average for the full-time programme. The more technical courses have on average more contact hours/week. Laboratory practicals are an important part of the curriculum and are considered essential to the programme. However, the programme has also invested in developing innovative teaching methods to deal with large groups of students and to activate and stimulate the learning process of students. Part of the lab classes have been replaced by a digital pre-lab simulation case study, in which students work on a real research problem, similar to the experiments that students will perform in the lab classes.

The parttime distance learning variant comprises courses from the (previous) specialisations off the fulltime variant, which have been redesigned for an online programme. The programme can be followed in 4 years with 2 years of courses and two years of thesis and internship, or as a blended 3-year programme, in which the student combines the thesis and internship full-time in one year. The overall programme has been designed as a broad specialisation, to make it suitable for students from different roles and fields in the food industry. Contrary to the fulltime variant, the courses have been reduced to 3 EC each, as 6 EC courses are generally perceived as too long for online programmes. Plenary lectures have been replaced by knowledge clips and regular group work by online group work. Some courses have live question hours on top of discussion boards for example. The laboratory practicals from the campus education have been either replaced by simulation experiments or are included in the Wageningen Weeks. The latter are two two-week intense laboratory practicals, taught on

Campus. Students thus have to travel to Wageningen twice during their studies to obtain the practical experience. At the same time, these weeks are also used for in person interaction between teachers and students.

The European Master in Food Studies specialisation has a different setup as compared to the other specialisations. This specialisation is also limited to approximately twenty students, resulting in a multicultural and diverse group of students. In the first year the students follow courses on food structure, physics and chemistry at Wageningen University (September-December), on consumer studies, management and sensory science at University College Cork in Ireland (January-February) and on food process technology at AgroParisTech-Massy in France (March-April). The second year starts with a ten-month research project, a combination of thesis and internship, as the thesis is conducted at an industry, but is supervised and examined by staff members of the food chair groups of Wageningen University. Throughout the whole programme, students also work together (partly also on distance) to complete their two-year food product development-oriented team project, on which they receive extra coaching and support from the company members of the board as well, e.g. for the production of a prototype of their food innovation.

#### *Master's programme Food Safety*

The English-language fulltime master's programme has a duration of two years and comprises a total of 120 EC. The first year is composed of 60 EC of courses. The second year contains a 36 EC thesis and a 24 EC internship. The programme consists of a common part and a specialization part.

The common part of the programme consists of two compulsory courses for all students on food

law and food safety management. Furthermore, the course *Food Microbiology* is recommended for all students with no Food Microbiology in their prior education.

In their second year, students write a thesis of 36 EC at one of the chair groups related to their field of specialization. The thesis has to be performed at Wageningen University. During their thesis students apply their knowledge by conducting research under supervision. In addition, students do an internship of at least 24 EC. Students will have to perform individually as a professional in a different environment. During the academic internship, acquired knowledge and skills are brought into practice while gaining relevant work experience at an academic level and working on personal learning objectives in a potential future work field, such as a company, public institution, research organization, or non-governmental organization. Usually, students choose an internship in line with their specialization but exceptions are possible when students have sufficient background knowledge in another related field. The academic internship is performed outside Wageningen University.

All specializations contain a cluster of compulsory courses, restricted optional courses that prepare students for a thesis linked to their specialization and within their area of interest and courses that function as multidisciplinary bridges and broaden the perspective of students. Students specialize in one of the three specializations, preparing them for a career as an academic with an elevated level of expertise and skills.

A mixture of teaching methods is used in the courses and can be quite different from one course to another. Many courses in the first and third specialization offer a lab practical, all specializations also have case studies and group

work, resulting in 20-25 contact hours a week for the first and third specialization and around 15 for the second specialization. Nearly every course combines a variety of teaching methods, designed for that specific course. Next to general didactical teaching methods, also other methods are used to teach students domain specific skills. In the law courses students need to research food law using the relevant legal databases and information sources, deploy legal reasoning, and the students have to write legal briefs to solve real-life legal problems ('cases') in the food domain.

#### *Master's programme Food Quality Management*

The English-language fulltime master's programme has a duration of two years and comprises a total of 120 EC. The first year is composed of 60 EC of courses spread over six periods, the second year contains a 36 EC thesis and a 24 EC internship.

The first-year courses can be divided into two parts; compulsory courses in the area of food quality management (24 EC), and at least 12 EC of specialisation courses. During the first period, students start with the course *Food Quality Management*, which is an introduction to the field of food quality management and introduces the concept of the Techno-Managerial Approach. Due to the diversity in the background of the students, it is necessary to have an introductory course to upgrade and align the knowledge of the students, and introduce the central concept of the Techno-Managerial Approach for the following courses. In the second period, the course *Food Law* is compulsory. Food laws are inherently protective laws, that is, the pure aim of the law is to protect the quality and safety of our foods. The other two additional compulsory courses, *Food Quality Management Research Principles I* and *II* are scheduled in the 4th and 5th period. These courses

build further on the basic course food quality management. In these courses, students will select a food quality issue with a team and learn how to apply the techno-managerial approach in analysing this complex issue and solving a complex food quality management situation for a real-life perspective.

In the common part of the programme, all students learn the fundamentals of Food Quality Management and a lot of the specific knowledge and (research) skills belonging to the Techno-managerial approach in the four compulsory courses. Period 2 can be used to help students gain additional knowledge depending on their previous education. In the specialization courses, students can acquire specific knowledge or skills for their preferred graduate profile.

With less time spent on practicals and more on groupwork, this programme has a somewhat different teaching philosophy compared to the other master's programmes in the food domain. The number of contact hours is comparable to the other programmes with an average of 24 contact hours per week. There is a lot of focus on group work, although lab-work, lectures and tutorials also are part of the teaching methods, depending on the chosen specialization. Collaborations with industrial partners are established that allow students to intimately understand the framework in which stakeholders in the agri-food chain operate. Currently, these collaborations are realized in excursions, particular courses, internships and thesis projects. In addition, guests from the industry frequently lecture in regular courses.

#### *Programme specific services and facilities*

Most of the teaching activities are organized in one of the relatively new educational buildings, that also include laboratory practical rooms

based on the newest innovations. Besides these general facilities, the students can make use of the facilities from the different chair groups to perform all kinds of analyses.

From the start until the end of the programmes, pro-active and upon request personal guidance is provided. Pro-active action is taken upon students with a delay in study progress according to a monitoring protocol developed by the programme team. The team for the four programmes contains 11 study advisers that are dedicated to guide students through their studies. For students with a functional disability, students can also appeal to the study adviser, the student deans or psychologists.

The three master's programmes developed the course Wageningen Scientific Preparation Week together. This course, which is taught prior to the start of the academic year, is meant for external students to the programme (i.e. not coming from a bachelor's programme of Wageningen University). The course is recommended to all external students, but voluntarily. About 70% of the external students take part in the course. This course makes these new students acquainted with the Wageningen University learning environment. The students will work on several course activities: searching and using scientific literature, lab experiments, report writing, calculation cases, giving presentations, group work, and exam training. Most course activities are based on food science concepts. Some activities within the course are compulsory, and some activities students can choose themselves depending on what skills they would like to train. With this course, the programmes aim to provide a smoother start of the programme.

### *Admission requirements*

Students are admissible to the bachelor's programme with a vwo diploma with the profile Nature and Technology and/or Nature and Health. There are opportunities for admission based on other diplomas. For example, there is the possibility for admission of students aged twenty-one or older through the so-called Colloquium Doctum. Bachelor: The difference in background in Mathematics and Statistics is covered in the first year of the programme, where students are assigned to either Mathematics 1 or Statistics 1 based on their vwo profile or international diploma. Students lacking biology or physics are not compensated but are informed that courses as Introduction to Cell Biology (for lack of Biology) may be more challenging. In practice the programme does not see a higher drop-out level for students lacking either biology or physics at secondary education level.

For the master's programme Food Technology, the entry requirement is a bachelor's degree in Food Technology, Biotechnology, or equivalent. The students coming in from the bachelor's programme Food Technology are a substantial part of the total amount. Also, a large number of students is coming in with a non-Dutch bachelor's degree or with an HBO (University of Applied Sciences) bachelor's degree. This leads to a high diversity in the programme, in terms of nationalities, knowledge and skills, school systems, and learning styles. This needs attention in terms of dealing with diversity in assumed knowledge and skills. The programme has started with a working group that will look into the options to offer more student-centred learning paths in skills and competences as well.

For the master's programme Food Safety, the entry requirement is a bachelor's degree in Food Technology, Nutrition and Health, or

equivalent. The student body is very heterogeneous; about 70 % of the students are international students of up to 20 different nationalities. The academic background of the students also reflects this diversity. The students of the programme come from the fields of e.g. food sciences, nutrition & health, veterinary medicine, pharmacy, law, etcetera.

For the master's programme Food Quality Management, the entry requirement is a bachelor's degree in Food Technology, Nutrition and Health, Management and Consumer Studies, or equivalent. The academic background of the students is diverse. The programmes' students come from the fields of e.g. food sciences, nutrition & health, veterinary medicine, pharmacy, but also management studies etcetera. The student body is heterogeneous; about 75 % of the students are international students with many different nationalities and cultures. Although the background of students is diverse, the programme believes that not the whole target group is reached. Currently the programme is adapting its information and marketing to better reach the diverse student population that might be suitable for starting the programme.

### *Staff*

The programmes each present a list of between 30 and 90 key staff members, from one of the five food chair groups or from one of Wageningen University's other chair groups. Most of the teaching staff have earned a (Senior) University Teaching Quality or are in the process to get qualified.

The university stimulates its staff to evaluate and further improve their English language skills, as stated in the university's Code of Conduct for Foreign Languages: 'All teaching staff at Wageningen University must be proficient in English. All lecturers are asked to evaluate and,

if necessary, improve their level of English language proficiency. During recruitment and selection of new lecturers, explicit attention will be paid to their language proficiency’.

Students of the bachelor’s and master’s programme are positive about their teachers. Bachelor students experience professors as knowledgeable. Master students state that teachers are highly qualified and have a lot of research experience in key topics. However, some bachelor students note that not all professors are able to give good teachings, some do not ensure enough interaction with students.

In the programmes, courses are taught by a relatively substantial number of teachers. The policy of the programmes is to employ specialists in each course. For example, a course is coordinated by a single chair group, but different teachers (from the same or other chair groups) each teach only a small part on their own field of expertise. The number of teaching staff per course varies throughout the programmes. Courses with more intensive teaching methods employ more staff members, scientific staff in tenure track and other academic staff members construct the students, with the support of technicians, research or teaching assistants and PhD students.

### Considerations

The panel has established that the contents of the bachelor’s programme and the three master’s programmes enable students to achieve the intended learning outcomes. The programmes have clearly translated the intended learning outcomes into the educational programmes. In the eyes of the panel, the admission requirements of both the bachelor’s programme and the master’s programme adequately match the programmes.

According to the panel, there is strong collaboration between different chair groups within the programmes and courses, which has resulted in integrated, multidisciplinary courses in which staff from different chair groups work together. These integrated courses make the students aware of the complexity of foods and food science and prepare them better for their thesis work. In some periods, alignment between courses could be a bit better, the panel notes. Here, according to the panel, the cooperation between teachers of different courses could perhaps be strengthened a little more.

The panel observes that programmes are doing their best to keep abreast of current affairs. The panel encourages the programmes to continue to do so, including around topics such as AI and block chain, for example.

In the eyes of the panel the didactic concept and educational formats of the programmes are excellent and support the learning process of the students. The panel is positive about the number of contact hours and the diversity in teaching methods. Students are constantly in contact with other nationalities and cultures, resulting in a good practice of the international classroom. According to the panel, the teamwork, case studies and practicals in the courses offer sufficient opportunities for students to apply their knowledge and understanding. The intensive teaching methods in the programmes result in some very intensive periods but are essential to the programme and appreciated by students and the professional field.

The university has opted for a format of six periods per year, with a short third and fourth period, so that minors, for example, fit well with teaching elsewhere. However, the panel notes that for some courses, the third period is on the short side to fully grasp the material. Students

also perceive other times in the year as quite busy. The panel recommends that the programmes carefully evaluate and possibly revise the teaching schedule. If necessary, spread courses over two periods.

The tutoring and provision of information to students are conducive to study progress and tie in with the needs of the (international) students and students with functional disabilities. The level and quality of support from student advisers, who are also lecturers and therefore know the content of the programmes well, is strong, according to the panel.

The panel observes that the programmes have a strong teaching team. The various disciplines are well represented by the input of staff from a variety of chair (research) groups, as is practical and scientific experience in the various fields of work. The panel observes that the staff is also qualified for the execution of the programme in terms of educational expertise. The panel notes that all staff members have adequate English language skills for teaching which is guaranteed by the university's policy. The panel appreciates the opportunity to get an appointment with an emphasis on teaching, which increases the number of lecturers with a focus on developing and delivering teaching. Students feel heard, seen, understood, respected, and appreciated by all the staff (study advisers and teachers). However, some attention needs to be paid to the teaching qualities of some teachers, who are less capable of appropriate interaction, the panel concludes from the student chapter of the bachelor's programme. A concern is still the high workload, which was also mentioned by the previous visitation panel in 2018. The panel notes that this is adequately addressed. The panel observes for example that the programmes implemented sufficient measures to reduce the work pressure like hiring extra teachers that support in many courses. Also, the

centralized exam invigilators have helped to reduce the time that staff members need to spent on exam invigilation.

The panel is impressed by the specific facilities available for the Food Safety domain. The panel visited some of the state-of-the-art equipment during the visitation visit, namely the food chemistry, fermentation and chemostat facilities mimicking food digestion, as well as the pilot plant scale facilities. Also the facilities for desk-work of thesis students working with the chair groups were amply up to standard. The panel learned from the interviews that students also have the opportunity to gain experience about these facilities and conduct work here in the education programme. There is also scope for bachelor students to learn about the facilities, the panel noted. The students value the high quality of facilities.

The panel has some specific considerations regarding the bachelor's programme Food Technology. The panel notes that the programme has a strong discipline-based orientation. The first year of the programme students are getting a broad scientific base in disciplines like (physical) chemistry, microbiology, toxicology and mathematics, while the second-year students acquire knowledge and skills of all basic disciplines in food science and technology which enables them to specialize in the master programmes. According to the panel, the students are trained well in general scientific (research) skills. The panel understood from both staff and students that there is a need for more food-related content in first-year courses. The panel recommends looking at this seriously, also to ensure the distinctive character and the selective purpose of the propaedeutic year.

The programme offers many opportunities for the students to design a programme towards

their own interests with the selection of minors, optionals and the possibility for a study abroad. The panel notes that students highly appreciate the number and high variety of practicals that are offered.

The panel calls attention to some critical comments made by students in the student chapter. For example, they call for more field trips to companies to get a real-life insight into how companies work and technologies are applied. Students also indicate that they want more focus on ethics and health. Students note the rapid technological innovations and feel that the programme could pay more attention to socio-economic and environmental impact through multidisciplinary lectures and group work.

The panel has some specific considerations regarding the master's programme Food Technology. As described, from this academic year, the programme does not work with specializations anymore. Students define their own specialisation, by choosing their own set of courses. The panel spoke with first year students about their experiences with this new design. The panel notes that the new design is not yet optimal for the first group. However, the interviews show that working with individually designed programmes is a good one, and that after the start-up problems have been overcome, an optimal, flexible opportunity is being offered to students to achieve the intended learning outcomes and be able to pursue their own interests within them.

In further optimising the programme, the panel asks attention to student demands for more courses in ethical frameworks, research courses that prepare for starting the thesis, and more creative assignments. The panel also advises the programme to look in extending the attention

to project management and product/process development. The panel notes that skills are often not explicitly present in courses, which makes students not completely aware of their needs, and does not empower students to actively develop and improving their skills. The panel appreciates the intention of the programme to continue in the development of offering an even more student-centred programme on skills, competences and attitudes relevant for food scientist.

The panel asks the programme to continue monitoring whether students from different backgrounds are meeting expectations with regard to admission requirements. Based on comments of students, the panel notes that this was not always the case in the past years. For example, students were less skilled in writing and were not used to group work and basic practical skills like pipetting. Sometimes, courses and groupwork are hindered by differences between group members in technical knowledge or English language level. The non mandatory summer school doesn't seem to be enough to equalize the levels.

The panel calls attention to some critical comments made by students in the student chapter. Students think the programme could include more industry practices. Students mention they would like more attention for professional skills and attitude. Also, they would like more collaboration with other universities and companies, more attention for ethics and social aspects to broaden insights, more attention to the financial aspects in both approaches and examples; and they would like courses in sensory techniques, since these upcoming techniques are becoming more important. To have a better understanding of the work field, they would like to have more global examples and real cases in courses, a stronger interdisciplinary focus that includes

food technology, agrotechnology, sustainability and climate and examples of promising start-ups. As to the latter, students mentioned TU Delft start-ups being well-known in the Netherlands, while WUR startups are not visible.

The panel is positive about the flexibility of the *part-time distance variant specialization*, enabling students to find their own pace and combine the programme with full-time work in a company. For the programme, learning engagement and contact is a concern, the programme concludes based on the results of evaluations. The panel appreciates the changes that the programme made to improve this. The practicals, tutorials and case studies result in intensive periods, but are essential to the programme and appreciated by students important for reaching the learning outcomes. The panel recommends that the programme continues to monitor the dropout rate in the distance variant, which is higher than in the full-time programme. The panel understands that the dropout rate is always likely to remain higher in a part-time variant, but states that adjustments may be possible that would reduce the dropout rate.

Company interaction and guest lectures could be stimulated, according to part-time students. The panel advises the programme to follow up on that. Also, to allow students to learn more from each other, the panel suggests that part-time students and their working environment should be involved in the regular master's programme.

The panel appreciates the *European Master in Food Studies*. This programme offers students a rich learning environment. While the content of this programme is accurate, the panel does call attention to monitoring carefully whether students were eventually offered all intended learning outcomes and whether these were

assessed at the right level. Because of the offerings at different universities, the panel thinks that it is extra important.

The panel has some specific considerations regarding the master's programme Food Safety. The programme is well balanced between disciplinary and integrated courses. The programme has clearly invested in strengthening (research) skills throughout the programme, resulting in better preparation for the thesis, according to students the panel spoke to.

The panel agrees with the programme's choice to keep the specialisations in the programme, together with described courses and learning lines. They offer enough options for students and provide the necessary structure for the diverse student body. By loosening the specialization structure, or giving more flexibility, the panel agrees with the programme that it would not be able to ensure all the learning outcomes of the programme, as it needs the T-shaped programme to reach the combined broadness and depth.

The panel calls attention to some critical comments made by students in the student chapter. Students would like to have more excursions, e.g. visits to farms, factories. Additionally, they would like to do courses to learn to work for a real commissioner.

The panel has some specific considerations regarding the master's programme Food Quality Management. The panel appreciated the programme's ability to serve students from diverse backgrounds well with the programme and get all on the same level. The previous accreditation panel recommended to analyse the learning outcomes of the programme and made sure they are covered in all the specializations. The current panel notes that the eleven learning

out-comes of the programme are clearly translated in the programme.

The panel is positive about the internship at one of the stakeholders in the food chain in the master's programmes Food Safety and Food Quality Management. However, the panel understood that for the master's programmes, it is mostly not possible for many students to do an internship in the time allotted for it, so they generally have a longer study period. The panel believes that the programme, in consultation with industry, should ensure that students should be able to complete the programme in two years.

The panel calls attention to some critical comments made by students in the student chapter. For example, students miss specific certifications that are required for jobs related to the field of food safety and quality, such as those for auditors. Besides, the programme could offer

more statistic courses to support research activities.

Some students follow a combined programme to obtain a degree from both master's programmes. The panel appreciates this valuable opportunity highly, while also hearing from students that putting together an allowed programme takes more effort than necessary. The panel suggests that programmes re-evaluate how this procedure can be simplified.

In summary, according to the panel, the curriculum, faculty, and facilities for all four programmes form a cohesive, inspiring learning environment. Taking these considerations into account, the panel assesses that the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management meet this standard.

## Student assessment

Standard 3: The programme has an adequate system of student assessment in place.

### Findings

In the course guides, the programmes provide detailed information about the assessment.

In the bachelor's programme, the courses of the programme have a variety of assessment methods such as written exams (often computer-based) with closed and/ or open questions and exercises (or combinations), individual or group assignments, (computer)practical reports, case studies, presentations, and participation in course work (laboratory or tutorial/assignment performance). Most courses apply multiple summative assessments within a course to address the different types and levels of learning outcomes. Besides formal (graded) assessment, many courses also use forms of formative assessment of (on-line) peer-feedback and individual reflections to help the learning process of students.

In the master's programme Food Technology, assessment methods vary between courses. Most courses apply multiple summative assessments within a course to address the different types and levels of learning outcomes. Besides formal (graded) assessment, many courses also use forms of formative assessment of (online) peer-feedback and individual reflections to help the learning process of students.

The online exams of courses within the distance-learning programme are almost always scheduled on the last Thursday of the period of 4 weeks. The exams are proctored. A proctored exam is an online exam that is closely monitored to ensure the quality of the exam.

In the master's programmes Food Safety and Food Quality Management, most courses apply multiple summative assessments within a course to address the different types and levels of learning outcomes. Besides formal (graded) assessment, many courses also use forms of formative assessment of (on-line) peer-feedback and individual reflections to help the learning process of students.

To properly assure the quality of interim examinations and final examinations, there are institution-wide guidelines and instructions for assessment. These guidelines and instructions include the following: the method of testing whether the student has met the learning outcomes; the procedures for testing in individual teaching methods; the role of assessment strategies and assessment criteria in the examination per course; and the supervision on these aspects by the Examiners and the Examining Boards.

Wageningen University has four Examining Boards: Life Sciences, Social Sciences, Environment and Landscape, and Technology and Nutrition. Each of the boards is responsible for the examination arrangements for one of the four groups of study programmes. Joint degrees have their own specific Examining Boards. The four programmes in the Food domain fall under the Examining Board Technology & Nutrition. This Board consists of a chair, a secretary, a second secretary, six other members and one external member (employed by Utrecht University).

The Examining Board evaluates the sets of study components, approves exemptions, and determines the results of the final evaluations of the study programmes. The Examining Board is also responsible for assuring the quality of interim examinations and final evaluations. The Examining Board periodically consults with the programme directors.

### Considerations

The panel judges that the programmes have an adequate, solid assessment system and assessment procedures. The system is adequately based on the university wide policy, the panel notes. Multiple adequate assessment types are implemented in the programmes: from written exams to (individual and group) assessments. The panel believes that the variety of assessment formats allows students to develop the necessary knowledge and skills. Partly through the use of test exams prior to exams, it is clear to students how and on what they will be assessed. The panel notes that suitable testing is deployed for the parttime distance learning variant of the master's programme Food Technology, which students can take flexibly and online. In the Self Evaluation Reports and in the student chapters, and also by the previous accreditation panel in 2018, some critical comments are made about the chosen forms of testing. Partly due to the growth in the number of students, the number of multiple-choice exams has increased. Although the panel notes that the test forms fit the learning objectives to be achieved, the panel recommends that the programmes evaluate whether the use of open questions, for example, is still feasible in some cases and could be a better option. This also requires attention to adequate skills assessment. The panel appreciates the programme's attention to this. The programme is reflecting the experiences and results from the student evaluations.

The panel appreciates the frequent use of group work, which is an appropriate assessment of the intended learning outcomes. Since the previous accreditation in 2018, where the panel commented on the limited amount of feedback on group work, the amount of feedback has increased. However, it did occur to the panel from the interviews that preparation for working together and giving feedback to each other could be done better and earlier. Attention is also needed for individual assessment of group work.

According to the panel, the procedures for assessing the final product of the programmes, the thesis, are clear and the assessment itself is sound. However, the panel notes that the feedback on assessment forms of theses is not always of the same level. Different thesis forms are used and in a number of cases, for example, the feedback is limited or only mentions points for improvement, so that the grounds for the judgment are not in line with the outcome from the completed Rubric. The panel is pleased to hear that the Examining Board will pay attention to this in the coming year and recommends that the programmes harmonise the assessment forms and pay attention to giving proper feedback on the forms, for example in calibration sessions with each other to assess whether the justification for a judgement can also be followed by outsiders.

In interviews with management, lecturers, the Examining Board and students, the panel discussed how programmes deal with the use of AI by students. It became clear to the panel that there is a lot of focus on this issue within the university. Guidelines are in use and the university is tightening them further, the panel noted, but programmes would benefit from a stronger central policy, according to the panel. Students must indicate in their thesis whether and how

they have used AI, but it is not yet clear what the implications are for assessment. Is the assessment lower if AI has been used for reporting, for example? The panel suspects that there are now differences between assessors and that both students and examiners would benefit from clearer guidelines and implications.

According to the panel, quality assurance of assessment is ensured by an initiative-taking Examining Board for the programmes. The Board, focusing on a group of programmes, show sufficient knowledge of the individual programmes and their assessment. In the years 2021 to 2023 the Board was understaffed. Consequently, chair group visits/assessments were sometimes

postponed. Since then, the capacity of the Board is sufficiently increased. For ensuring the quality and uniformity of assessment in general, the panel appreciates the increased use of calibration sessions in which assessors participate. The panel notes that the Board is catching up and will adequately address the checks on the quality of assessment and final works.

Taking these considerations into account, the panel assesses that the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management meet this standard.

## Achieved learning outcomes

Standard 4: The programme demonstrates that the intended learning outcomes are achieved.

### Findings

#### *Bachelor's programme*

The bachelor thesis (24 EC) is the concluding part of the bachelor's programme. This thesis is defined as an individual scientific research project, in the field of food science and technology. The thesis is a unified project of the five food related chair groups, using the same learning outcomes, evaluation form and rubric. As part of the thesis, students follow advanced lectures on (professional) ethics, and the students have to do an assignment to describe the ethical aspects of their work. Most students are also part of the thesis rings at the chair groups, where, among others, they provide feedback to each other and which thus are part of the active learning strategy of the university. During the thesis, the student is supervised generally by a staff member or PhD student as a daily supervisor. The final examination is conducted by the daily supervisor and a staff member (mandated by the examiner).

Graduates of the programme have unconditional access to three master's programmes at Wageningen University: Food Technology, Food Safety and Food Quality Management. With an appropriate minor in the third year, access is generally possible for related programmes, such as the master's programme Biotechnology or the master's programme Nutrition & Health. Nearly all the graduates continue with an advanced master's degree, the large majority does so in the master's programme Food Technology. Some students continue with the two other Food-related MSc programmes (Food Safety

and Food Quality Management), and very few continue with another MSc programme at Wageningen University or elsewhere.

#### *Master's programmes*

The master thesis (36 EC) is the concluding part of the master's programmes in the food domain. Students choose a project that is in line with their specialisation and personal interest, within the options provided at Wageningen University. Thesis research is usually part of ongoing research in the Wageningen University chair groups or research institutes. In some cases, thesis topics are initiated by the student or are the result of discussions between the student and supervisor. In a six-month period (based on fulltime weeks) students draft a research proposal in which they have to demonstrate that they are able to design and plan their research with the development of theoretical framework and hypothesis and the setup of methodological design. Subsequently they execute the research with the collection, and analysis of the data, discussion of results and students need to be able to draw conclusions out of the results and report on the findings in a written report and oral presentation.

During the thesis, the student is supervised generally by a staff member, often with an additional PhD student as a daily supervisor. The final examination is conducted by the staff member and examiner.

After their thesis, students conclude their programme with a 24 EC internship, in which they need to apply all their learnings to individual

research again, but now in the professional field outside the university. The students have learned the required domain knowledge and research skills in the courses and applied them in the thesis. In the internship the students should be ready to apply their research methodology on new topics in new environments and acquire fast the required knowledge on the specific research field. The generally good results in the internship proof this is indeed the case.

The Industrial Thesis European Masters Food Studies of the master's programme Food Technology comprises 60 EC. It consists of a ten-month research project that combines a thesis and internship, as the thesis is conducted at an industry. It is supervised and examined by staff members of the food chair groups of Wageningen University.

Most of the graduates will work in the food industry, academic research, or applied research (food research institutes).

### Considerations

To form an opinion about the final level of the students, the panel read recent theses of a total of fifteen graduates per programme and viewed the assessments of these works. The selection included theses with a variety of topics and a distribution between lower and higher grades. Theses from all specialisations were considered, including theses from the online variant and the European Master of the master's programme Food Technology. The panel found that all the theses attested to the bachelor's or master's level and the content matches the profiles of the programmes. The quality of the works varies, with the grade given corresponding to the

panel's assessment of quality. In general, the panel was pleased with the quality of the work. Adequate research ability is evident in all theses. This finding is in line with the strong research profiling of the bachelor's programme and the master's programmes.

The panel calls attention to opportunities for choices for thesis topics. In both the bachelor's programme and the master's programme Food Safety, students feel that the choice is limited.

From surveys and conversations with alumni, the panel concludes that the programme prepares students very well for the job market and that students end up in positions that fit the intended exit profiles.

A general observation of the previous accreditation panel for all four programmes was that efforts could be made to establish alumni policies at programme level. From the interviews, the panel established that initiatives in this respect were currently limited to the central university level. Existing alumni relations at programme level were mostly informal, which means that the possibilities that alumni have to offer were not optimally used. Noting that the situation in recent years is still like the observations described by the previous panel, the current panel recommends that programmes strengthen formal contacts with alumni.

Taking these considerations into account, the panel assesses that the bachelor's programme Food Technology, the master's programme Food Technology, the master's programme Food Safety and the master's programme Food Quality Management meet this standard.

## Attachment 1: assessment panel

[Stanley Brul](#), chair, is a professor at the University of Amsterdam specializing in microbial food safety and molecular biology. He has led research projects funded by NVWA and NWA-ORC METAHEALTH. He is also an educator, program coordinator, and evaluator for academic programs, contributing to various national and international scientific committees.

[Serafim Bakalis](#) is a professor of Dairy Technology at the University of Copenhagen. His research focuses on sustainable food processing and digital tools in food engineering. He collaborates with industry leaders such as Procter & Gamble and Nestlé and has secured over €30 million in research funding.

[Liesbeth Jacxsens](#) is a professor at Ghent University specializing in food safety management and risk assessment. She has published over 200 scientific papers and contributes to EFSA and JEMRA panels. She teaches internationally, including at Ghent University's Global Campus in South Korea.

[Marloes van Dort](#) is a senior education policy advisor at Erasmus University Rotterdam. She has expertise in curriculum development, assessment, and educational policy. She played a key role in implementing new study programs and quality assurance frameworks.

[Koen Wijsman](#) is a recent MSc Medicine graduate from Leiden University. He is currently a Research Trainee at the Mayo Clinic, Department of Gastroenterology, and has completed NVAO training as a student panel member.

The panel was supported by [Linda van der Grijspaarde](#) as an independent secretary on behalf of AeQui.

All panel members have completed and signed a statement of independence and impartiality, and these have been submitted to NVAO.

## Attachment 2: site visit program

Monday 9 December

Time	What	Who
9.00-10.30	Arrival panel and preparation	
10.30-11.15	Interview management of programmes	Programme Director Dean of Education Member of BoE Co-chair of PC MFS/MFQ Co-chair of PC MFS/MFQ Member daily board PC BFT/MFT
11.30-12.30	Guided tour	
12.30-13.30	lunch	
13.30-14.15	students bachelor BFT	Student start year 2023 Student start year 2023 Student start year 2022 Student start year 2022 Student start year 2022 Student start year 2022 Student start year 2021 Student start year 2021
14.30-15.15	teaching staff BFT and MFT/MFT-DL	Staff member (Food Chemistry) Staff member (Food Quality and Design) Staff member (Food Physics) Staff member (Food Process Engineering) Staff member (Food Physics) Staff member (Food Quality and Design) Staff member (Food Microbiology)
15.30-16.15	students master MFT (including alumni)	Student start year 2023 Student start year 2023 Student start year 2023 Student start year 2024 Student start year 2024 Alumnus (Unilever) Alumnus (FQD WUR) Alumnus (Foodcase)
16.30-17.15	students MFT-DL (online) (including alumni)	Student start year 2022 Student start year 2022 Student start year 2023 Student start year 2023 Student start year 2024 3 alumni
17.15-17.45	Internal deliberation panel, recap day 1	

## Tuesday 10 December

Time	What	Who
9.00-9.45	Examining Board + study advisors	Secretary Examining Board Secretary Examining Board  Study Advisor Study Advisor
10.00-10.45	students master MFS and MFQ (inc alumni)	Student (MFQ-A 2023), Student (MFS-A 2022), Student (MFS-A 2023), Student (MFQ-D, 2023) Student (MFS-A, 2023)  Alumnus (MFQ, now employed by Danone) Alumnus (MFQ/MFS, Danone) Alumnus (MFS, Viterra)
11.00-11.45	teaching staff master MFS and MFQ	Staff member (Food Quality and Design), Staff member (Toxicology), Staff member (Food Microbiology), Staff member (Food Quality and Design), Staff member (Food Microbiology), Staff member (Law), Staff member (Law)
12.00-14.30	lunch and deliberation time	
14.30-15.00	Oral report of the panel	All welcome
15.00-16.30	Theme session/ development dialogue	Staff member (Food Microbiology), Staff member (Law), Staff member (Study Advisor) Staff member (Food Quality and Design), Staff member (Food Quality and Design), Staff member (Programme Director),

The open consultation took place online prior to the visitation. No students or staff members attended this.

## Attachment 3: Recommendations from previous assessment

The programme was last visited for accreditation in 2018. The following overview of recommendations from the previous visitation and follow-up by the programme is taken verbatim from the critical reflections. The panel states that the programmes have incorporated the recommendations well. Under the various standards, the panel addresses this.

### *Bachelor's programme Food Technology*

**Recommendation:** Pay continuous attention to the workload for staff members for long-term success.

**Reaction:**

During 2012-2017, first year student numbers grew, from 74 to 185. But it turned out that 2017 was the top year and from 2020 onwards, the number of students has had a yearly influx of ~130-135 students. The stable number has helped to reduce the fear of a further strong increase in student numbers, but attention has been paid to the work pressure of staff members anyway. The successfully implemented measures were kept and further measures were taken like hiring extra teachers that support in many courses. Also, the centralized exam supervisors have helped to reduce the time that staff members need to spent on exam invigilation. And during Covid-19 the web-based assessment tool ANS became common practice for almost all courses. Especially when multiple assessors need to check different exam questions, this tool can save a lot of time for distribution of different parts of the exam. It also helps in reducing time and energy for printing exams, which is helpful for large courses.

Some of the measures that were initially implemented to reduce the work pressure, remained in the programme because of the positive effect on the student's learning process. For example, digital lab-simulations or tutorials or other pre-lab assignments were initially developed to reduce the time a student needs to spend in the lab. But to stimulate students to prepare their classes and practicals is a particularly good step in their learning process and also a safe place to practice. Therefore, we have incorporated these digital learning materials in several courses.

**Recommendation:** The main challenge was to continue providing (written) feedback throughout

the programmes with increasing student numbers. The panel recommended to choose quality of feedback over quantity.

**Reaction:** The programme BFT has implemented a learning trajectory in BFT to divide writing skills over several courses. A template for report writing and agreements between teachers has helped to align the learning trajectories. Students get instructions and feedback on different parts of a scientific report in different courses. This has spread the workload. The PC is currently also working on other skills trajectories in the context of Food Technology.

**Recommendation:** Use of multiple-choice questions. High student numbers could result in using relatively many multiple-choice assessments. It is important that the programmes pay sufficient attention to this aspect as well as to the motivation of students when giving (too) many MC assessments.

**Reaction:** During corona period all exams had to be converted to digital assessments and this required a lot of effort. After corona, the digital examination remained. Although many courses use combinations of different types of exam questions and different assessment methods, some courses currently use only multiple-choice questions. The PC is currently looking into the balance on the use of multiple-choice questions in courses in the programme and wants to make their own policy on the variety of assessment within courses. The Programme committee is working on it and some agreements for changes have already been made.

### *Master's programme Food Technology*

**Recommendation:** Manage the life cycle of the specializations to keep the programme manageable.

**Reaction:** The programme finds it very important to remain up to date to the demands of the working field and to remain the food technology

programme as an international reference in the area of food technology training. But the programme management understands the recommendation of the panel that the programme also needs to be manageable. The last 2 years we have conducted an education innovation project for the structure of the master food technology with the ten specialisations. This project has resulted in a new structure for the programme, which started in the academic year 2024-2025.

**Recommendation:** The panel was positive about the Scientific Preparation Week (YFS10801) for students who are new in Wageningen. The panel believed also Wageningen students would benefit from (parts of) this course, specifically with respect to intercultural awareness.

**Reaction:** The programme management agreed with this opinion and has implemented activities on intercultural awareness in the common course Product and Process Design (FQD60312). There are also some plans to implement an activity in Food Ingredient Functionality (FCH30306), the first course of the programme, which is followed by many students. The programme management is currently looking into options to implement even more learning activities related to skills and competencies in the programme.

**Recommendation:** Dealing with high student numbers and the workload for staff members. Although the programme has been rather successfully dealing with the increasing student numbers and still offering a rich learning environment, the panel wondered if the situation was sustainable in the long term.

**Reaction:** The programme management is indeed aware of issues that can arise with high student numbers. The amount of teaching staff has been growing, especially by hiring teachers with no research obligations who also have more time for education innovations and have efficient coordination skills. The programme is also centrally organizing both the thesis and internship coordination.

**Recommendation:** The panel noticed that it was sometimes a challenge to find sufficient supervisors for thesis work and often PhD students were included. The panel emphasized the importance of training and supervising the PhD students for this task.

**Reaction:** We are still involving PhD students in thesis supervision, because we think it is also important for PhD students to get the opportunity to supervise students. A training on supervising students is offered to PhD students and they can use it as part of their development programme. And the supervisors of PhD students are also involved in the thesis supervision of students. And chair groups have thesis rings (or an alternative) in which all kind of activities are offered to students and feedback is given by peers as well.

**Recommendation:** The main challenge was to continue providing (written) individual feedback throughout the programme with increasing student numbers and the panel recommended to choose quality of feedback over quantity.

**Reaction:** The programme management agrees feedback is very important and therefore it was chosen to implement a compulsory individual writing assignment in the first period to make sure that each student receives at least 1-time individual feedback before writing the thesis.

**Recommendation:** High student numbers could stimulate using more multiple-choice assessments, so the panel advised the programme to pay sufficient attention to the balance in the number of MC assessments in the programme.

**Reaction:** For the Master Food Technology, we have checked the amount and at the moment the use of multiple-choice questions is limited and we make sure this remains this way.

#### *Master's programme Food Safety*

**Recommendation:** The accreditation panel was of the opinion that the professional field requires graduates from the specialization food law and regulatory affairs of this programme. However, the panel was wondering whether future employers still had to get used to these specialists, which could lead to uncertainty for some students regarding their future. The panel expected that the arrival of a new chair holder for the LAW chair group would help in this respect.

**Reaction:** Indeed, the chair holder of the LAW group has given a great boost for the education. New teachers (and researchers) have been hired, many courses have been renewed, the research of the group has extended with food systems being one of their 3 research lines, and last year the

group has also organized a conference about the future of food systems law. Together with the name change of the specialization in 2017, this has led to the current specializations being well recognised.

#### *Master's programme Food Quality Management*

**Recommendation:** Analyse the learning outcomes of the programme and make sure they are covered in all the specializations.

**Reaction:** Most of the eleven learning outcomes of the programme are of an integrated nature, underpinning the integrated, interdisciplinary nature of the programme. This will lead to graduates who are trained in an integrated and interdisciplinary way. Students get ample opportunity to apply knowledge and skills in various courses. Several courses are placed in a learning line, which are following up on each other, and students will reach learning outcomes on higher levels further on in the programme. In most courses students need to analyse complex problems, critically judge results, and work with real life situations or literature from both technological and social sciences. Communication skills are developed in multiple courses

throughout the programme. Intercultural skills and understanding are developed in the multinational student population. The integrated techno-managerial approach stimulates students to use and develop learning skills in order to improve their performance. The specialization courses, thesis and internship allow students to follow a tailor-made learning process and train students in specific profiles for the roles graduates will have, while reaching the learning outcomes of the programme.

**Recommendation:** Provide feedback to group work.

**Reaction:** In several courses feedback sessions are now built in the course schedule. In some courses students discuss their assignments of their group with peers and the teacher (e.g. in FQD64306), while in other courses the assignments are discussed in plenary sessions in tutorials (e.g. in LAW22806). These contact moments between the student and teacher are highly valuable as formative feedback is important for their learning process.

## Attachment 4: reviewed documents

- Self-Evaluation Reports of the four programmes
- Question for discussion session with the panel

### *Courses*

- Course documentation of the four programmes: course guides and assessments of several courses
- Assessment form MSc Internship WU
- Food Science Internship Coordination
- MSc Internship Course Guide WU – MFT, MFS, MFQ
- Rubric MSc Internship 2024-2025

### *Thesis*

- 15 theses and assessments per programme
- Thesis Course Guide Wageningen University 2023-2024
- BFT Bachelor Thesis Agreement Example
- BFT Thesis Assessment rubric
- BFT Thesis Course Guide
- Master Thesis learning agreement
- Presentation to students – Master thesis in MFQ

### *Examining board*

- FBE Annual Report 2020-2021
- FBE Annual Report 2021-2022
- FBE Annual report 2022-2023

### *Programme committees*

- Programme Committee Annual report 2020-2021 and annual plan 2021-2022
- Programme Committee Annual report 2021-2022 and annual plan 2022-2023
- Programme Committee Annual report 2022-2023 and annual plan 2023-2024

