

Health Food
Innovation Management
Faculty of Health, Medicine and Life Sciences
Maastricht University

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Project number: Q0476

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This report was finalised on 03-06-2014.

Report on the master's programme Health Food Innovation Management of Maastricht University

This report considers the NVAO's Assessment Framework for Limited Programme Assessments as a point of departure.

Administrative data regarding the programme

Master's programme Health Food Innovation Management

Name of the programme:	Health Food Innovation Management
CROHO number:	60512
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specialisations or tracks:	-
Location(s):	Campus Venlo
Mode(s) of study:	full time
Expiration of accreditation:	14-07-2015

The visit of the audit panel Health Food Innovation Management to the Faculty of Health, Medicine and Life Sciences (Campus Venlo) of Maastricht University took place on 18 and 19 March 2014.

Administrative data regarding the institution

Name of the institution:	Maastricht University
Status of the institution:	publicly funded institution
Result institutional quality assurance assessment:	positive

Quantitative data regarding the programme

The required quantitative data regarding the programme are included in appendix 5.

Composition of the audit panel

The audit panel that assessed the master's programme Health Food Innovation Management consisted of:

- Dr. ir. C.D. (Kees) de Gooijer, chair, director of TKI Agri&Food;
- P. (Peter) Wennström, founder, president and expert consultant of The Healthy Marketing Team, Ltd;
- Prof. dr. T. (Tom) van de Wiele, professor in the domain of Gastrointestinal Microbial Ecology and Technology at Ghent University;
- Ir. I.A.J. (Irene) Payens, lecturer in Food Technology at HAS Den Bosch;
- R.A. (Rosella) Koning, BSc., student member, student of the master programmes Food Safety and Nutrition and Health at Wageningen University.

The panel was supported by Mrs. J.J. (Jasne) Krooneman, MSc., who acted as secretary.

Appendix 1 contains the curricula vitae of the members of the panel.

Brief description of the procedures

Preparation

The management of the master's programme Health Food Innovation Management provided a critical reflection as part of the preparation for the assessment. After the project manager checked the completeness of the information in the critical reflection, it was forwarded to the members of the audit panel, who formulated questions based on its content.

Taking a variation in grading into account, 15 theses were carefully selected by the project manager, in consultation with the chair of the panel (see appendix 7 for a list of theses and documents studied by the panel). Each panel member had to review three theses.

The project manager prepared a timetable for the visit, which was discussed with the policy adviser of the master's programme and the chair of the panel. Preparations for the site visit continued only after an agreement on the timetable was reached.

Site visit

During the preparatory meeting, held at the start of the site visit, the panel received instructions regarding the NVAO's assessment frameworks for the higher education accreditation system. It discussed its working method, the findings from the evaluation of the critical reflection and theses, and its perception of the domain-specific framework of reference. The panel also studied additional information on the content of several courses, such as reference books and other learning material, and read reports on consultations in relevant committees/bodies. It analysed important management information and documentation regarding teacher and student satisfaction. Its members did not find it necessary to request any additional theses.

Immediately after the preparatory meeting, interviews were held with representatives of the management, students, lecturers, alumni, the Programme Committee, the Board of Examiners, and finally with the dean and, again, the management team. Nobody made use of the open office hour, when people involved in the programmes had the opportunity to speak freely to the panel.

The site visit concluded with an oral presentation of the preliminary findings by the chair of the panel, consisting of a general assessment and several specific observations and impressions.

Report

After the site visit, the secretary wrote a draft report based on the panel's findings. Subsequently, this draft was sent to the panel for feedback. After processing the feedback of the panel members, the draft report was delivered to the management of the programme to check for factual irregularities. Any suggestions made by the management were discussed with the chair of the panel. The draft report was then sent to the panel members, who had the opportunity to review the changes in the draft report. A few days later, the report was finalised.

Decision rules

In accordance with the NVAO's Assessment framework for limited programme assessments (as of 22 November 2011), the committee used the following definitions for the assessment of both the standards and the programme as a whole.

Generic quality

The quality that can reasonably be expected in an international perspective from a higher education bachelor's or master's programme.

Unsatisfactory

The programme does not meet the current generic quality standards and shows serious shortcomings in several areas.

Satisfactory

The programme meets the current generic quality standards and shows an acceptable level across its entire spectrum.

Good

The programme systematically surpasses the current generic quality standards across its entire spectrum.

Excellent

The programme systematically well surpasses the current generic quality standards across its entire spectrum and is regarded as an (inter)national example.

Summary judgement

This report provides an overview of the audit panel's findings and considerations regarding the master's programme Health Food Innovation Management of Maastricht University. The panel based its judgement on information acquired from the critical reflection, a number of selected theses, the interviews held during the site visit, additional reading material which was available during the site visit, and the digital learning environment. The panel found positive aspects as well as points for improvement. After careful consideration, it concluded that the master's programme Health Food Innovation Management satisfies the requirements for accreditation.

Standard 1 Inteded learning outcomes

The audit panel argues that the master's programme Health Food Innovation Management adequately reflects the domain-specific framework of reference. The framework was found to be clearly formulated, and its purpose matches the profile and intended learning outcomes of the master's programme. The panel is particularly enthusiastic about the multidisciplinary character of the master's programme, which is unique when compared to other national or international health food-oriented programmes. Students are positioned at the interface between the biomedical/life sciences, consumer sciences, national and international food regulations, entrepreneurship and business development. Hence, they gain a practical understanding of how to apply the multidisciplinary approach, and obtain insights and acquire skills that will help them to work in the health food arena as well as in research or commercial leadership functions. The students learn how to learn, in the panel's opinion, and it praises this stance. One of the overarching goals that might be developed further is the sustainability aspect, as this is a topically important matter. The title of the master's programme – Health Food Innovation Management – covers its breadth and fits the content of the courses very well. Regarding the orientation of the programme, the panel states that there is a good match between an academic approach and a professional attitude. In addition, the intended learning outcomes are well described and target the correct academic master's level. Since there is a rather long list of intended learning outcomes, the panel advises the programme management to differentiate between major and minor ones.

Standard 2 Teaching-learning environment

The curriculum of the master's programme Health Food Innovation Management consists of a unique combination of courses, covering a wide range of disciplines and relevant topics, and is continuously being developed by the programme management. The audit panel states that the multidisciplinaryity is an asset that should be treasured. However, it also believes that food technology might need a more in-depth insight. For example, students could probably benefit from making marketing, food technology and finance into electives. The intended learning outcomes are adequately embedded in the courses and contribute to the coherence of the curriculum.

The problem-based learning approach (PBL) is a teaching concept which has three clear strengths. First of all, students have to work in small groups and learn from one another. A positive result of the group work is that it levels out differences between the students, and hence, weaker students are raised up. Second, students acquire interpersonal skills and a problem-solving attitude, which are very useful assets in their future careers. And last but not least, students are trained to handle the challenges of various disciplines. According to the audit panel, which sees the PBL approach as a very positive aspect of the teaching-learning environment, the teaching formats – including introductory lectures, topic-related lectures,

keynote lectures, research seminars, a journal club and site visits – fit the teaching concept adequately.

The audit panel praises the programme management for the achieved intake, especially when considering the remote location (new Maastricht University Campus Venlo, located at a distance from the other Maastricht University Faculties). The PBL approach and the tutors ensure the feasibility of the programme, and this is confirmed by a low drop-out rate. The panel states that the course load could be somewhat increased and that some students might need more challenges. It is enthusiastic about the possibility of going abroad during the master's programme and is pleased to know that foreign students are very well supported during their time in Venlo.

The teaching staff clearly manages to create a vibrant culture among the student population. The audit panel believes that the staff members add an essential human touch to the master's programme, which is of paramount importance to the culture of this curriculum. They are very approachable, and there is a good mix between ages and gender. The panel welcomes the increase in the number of staff with an University Teaching Qualification (UTQ). When it comes to the quantity of the staff members, the panel considers the 3.22 full-time equivalents, which is in line with the faculty standard, to be rather low.

The master's programme Health Food Innovation Management is already on an appropriate high-quality level, according to the panel. However, it recommends an increased cooperation between the master's programme and the Programme Committee. In addition, at least one student and one staff member should be present on the Programme Committee.

Standard 3 Assessment and achieved learning outcomes

According to the audit panel, the assessment system of the master's programme Health Food Innovation Management does not yet function adequately. It recommends that the programme management employ a few more staff members to make sure that students get detailed, personal feedback on all their assignments. Although it is convinced that students are aware of the assessment criteria and that the exam types fit the purpose, the assessment of the thesis and internship period requires some improvements. It has three emphatic recommendations to make. First of all, it advises integrating the assessment of the internship in the thesis assessment form. Second, it would like to see a standardised assessment form, in which the criteria and their weight are clarified. Third, it believes it might be worthwhile to add a presentation and oral defence to the thesis assessment, which was the case during the initial two years of the programme. It also feels that the Board of Examiners could use some extra personnel to speed up its reformation process. It appreciates the recent steps that have been taken to ameliorate the quality assurance cycle of assessment procedures.

The panel supports the management in the search for internship placements in industry, and is particularly enthusiastic about the involvement of a second independent supervisor in the thesis procedure. The majority of the selected theses had a clear objective, a logical and consistent line of reasoning, consistent use of footnotes and referencing, and adequate use of English; they demonstrated adequate knowledge of the literature in the field, the research methodology was presented and applied in a well considered way, and there was innovative input from the author. Alumni clarified that due to the multidisciplinary approach of the programme, they are able to operate at the interface of different disciplines. In addition, they know how to present themselves in front of a professional audience, and they benefit in their job search from the interpersonal skills, problem-solving attitude, and connections in industry

which they gained during their internship period. The panel is positively surprised that a relatively large number of graduates continue their academic career in a PhD position.

Based on the content of the selected theses, the good connection with the labour market and the preparation for a career in academia, the panel argues that students of the master's programme Health Food Innovation Management achieve the intended learning outcomes upon graduation.

The committee assessed the standards from the Assessment framework for limited programme assessments in the following way:

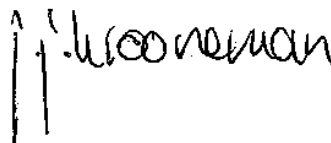
Standard 1: Intended learning outcomes	satisfactory
Standard 2: Teaching-learning environment	good
Standard 3: Assessment and achieved learning outcomes	satisfactory
General conclusion	satisfactory

The chair and the secretary of the committee hereby declare that all members of the committee have studied this report and that they agree with the judgements laid down in it. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 03-06-2014



Dr. ir. C.D. (Kees) de Gooijer



J.J. (Jasne) Krooneman, MSc.

Description of the standards from the Assessment framework for limited programme assessments

Standard 1: Intended learning outcomes

The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements.

Explanation:

As for level and orientation (bachelor's or master's; professional or academic), the intended learning outcomes fit into the Dutch qualifications framework. In addition, they tie in with the international perspective of the requirements currently set by the professional field and the discipline with regard to the contents of the programme.

Findings

This standard first provides an insight into the audit panel's findings regarding the domain-specific framework of reference (1.1). Subsequently, attention is paid to the profile and orientation (1.2) and the intended learning outcomes and their level (1.3).

1.1 Domain-specific framework of reference

In the domain-specific framework of reference (see appendix 2), the four key areas of health and food safety are discussed: biomedical/life sciences, consumer sciences, national and international food regulations, entrepreneurship and business development. According to this reference framework, educational programmes in health and food safety – such as Health Food Innovation Management – embrace a multidisciplinary character which covers those four key areas of science and aims to provide students with insights related to those areas. The educational programmes should touch on a range of disciplines, including physiology, biochemistry, nutrigenomics, metabolomics, genetics, epigenetics, pharmacology, epidemiology, methodology, statistics, food science, food technology, law, entrepreneurship, finance, intellectual properties, social science, psychology and marketing.

The audit panel studied the domain-specific framework of reference and found it to be clearly formulated and correctly implemented. The master's programme has adopted the four key areas of health and food safety, and they are represented in the curriculum. Its multidisciplinary character, which derives from the domain-specific framework of reference, is a unique selling point, even in an international market. According to the panel, the purpose of the reference framework matches the profile and intended learning outcomes of the master's programme.

1.2 Profile and orientation

According to the critical reflection, bringing nutrition and health expertise into research, development, regulatory/food law functions, public affairs and marketing/sales functions is a prerequisite to making operations in the world of healthy foods and beverages successful. The Health Food Innovation Management master's programme deals with these aspects and aims to develop the required insights and skills that will help students to fulfil demanding roles in the health food arena as well as to set a solid foundation for further growth into research or commercial leadership functions.

Regarding the orientation of the programme, the critical reflection stated that the programme highlights the need to develop procedures for health food innovation and policies based on sound evidence of the effectiveness of dietary interventions and consumer demands/needs,

in the context of actual product development from both an academic and an industry-relevant perspective.

The audit panel feels that the profile is very clear. The multidisciplinary character, which was also mentioned in the domain-specific framework of reference, is unique when compared to other health food-oriented programmes. Students learn how to deal with a dynamic environment since they are positioned at the interface between biomedical/life sciences, consumer sciences, national and international food regulations, entrepreneurship and business development. They gain a practical understanding of how to apply the multidisciplinary approach, and obtain insights and acquire skills that will help them to work in the health food arena as well as in research or commercial leadership functions. Students learn how to learn, in the panel's opinion, and it praises this approach.

From the interview with students it became clear that the title of the master's programme – Health Food Innovation Management – covers its breadth and fits the content of the courses excellently. Regarding the orientation of the programme, the panel found a good match between an academic approach and a professional attitude. This was confirmed by alumni during the site visit.

1.3 Intended learning outcomes and academic level

After graduation, students meet several final qualifications (knowledge and understanding, application of knowledge and understanding, judgement, communication, learning skills) which are in line with the Dublin Descriptors. These intended learning outcomes are split into sub-criteria. For example, knowledge and understanding include the requirement to have a broad understanding of the business of healthy eating and of food ingredient classes such as carbohydrates, fibres, lipids, proteins, antioxidants and bioactives. The learning skills intended learning outcome requires students to learn from their own and team performance, but also to be skilled in project management. A full list of the intended learning outcomes is included in appendix 3.

The audit panel studied the intended learning outcomes and found that they are well described and target the correct academic master's level. Since there are many intended learning outcomes, the panel advises distinguishing between major ones and some minor ones.

Considerations

The audit panel studied the domain-specific framework of reference and considers it to be clearly formulated and correctly implemented. It also finds the profile of the master's programme to be very evident. Its multidisciplinary character, which is also mentioned in the domain-specific framework of reference, is unique when compared to other health food-oriented programmes. The title of the master's programme – Health Food Innovation Management – covers its breadth and fits the content of the courses excellently. One of the overarching goals that might be developed a little further is the sustainability aspect, as this is becoming increasingly important. The panel states that there is a great match between an academic approach and a professional attitude, and that the intended learning outcomes are well described and target the correct academic master's level. Given the long list of intended learning outcomes, the panel advises distinguishing between major ones and some minor ones.

Conclusion

Master's programme Health Food Innovation Management: the audit panel assesses Standard 1 as 'satisfactory'.

Standard 2: Teaching-learning environment

The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.

Explanation:

The contents and structure of the curriculum enable the students admitted to achieve the intended learning outcomes. The quality of the staff and of the programme-specific services and facilities is essential to that end. Curriculum, staff, services and facilities constitute a coherent teaching-learning environment for the students.

Findings

This standard provides an insight into the curriculum (2.1) of the master's programme Health Food Innovation Management. Special attention is paid to the relation between the learning outcomes and the curriculum in section 2.2. Then the teaching concept, formats and programme-specific services (2.3) and the feasibility (2.4) of the master's programme are analysed. In section 2.5 the quality and quantity of the teaching staff are discussed. This standard concludes with an analysis of the programme-specific quality control (2.6).

2.1 Curriculum

The curriculum of the master's programme consists of eight modules, ranging from 7 to 28 weeks (see appendix 4). Throughout the modules, the role of food and nutrition as well as the related industries, the perception of consumers including their behaviour, risk-taking and health management are emphasised. About one-third of the programme aims to train students in practical skills and in research; two-thirds of the programme consists of compulsory theoretical coursework. The curriculum is spread over two years.

Year 1

In the first module of the programme - *Consumer Concerns, Health Targets and Market Segments* (12 EC) - students are provided with an in-depth understanding of human physiology and metabolism in health and disease, and they are introduced to the multidisciplinary biomedical, technical and commercial backgrounds of 'healthy eating'. In *Consumer Understanding and Behaviour* (10 EC), students gain insights into the basic psychological concepts that account for individual consumer behaviour. The module also explains how these concepts can be applied to the context of food product development and health communications. In the third module, *Biosciences Innovation, Business Development and Entrepreneurship* (18 EC), they get to explore and understand the key components of successful business development, innovation and entrepreneurship in general and in the health food industry in particular. *Food and Ingredient Categories, Carrier Systems and Food Technology* (10 EC) is a module which aims to highlight the health food market segmentation by means of its specialised product categories and related business/technology groups and their function as 'carrier systems'. The first year ends with a module which trains students in the methodology of scientific biomedical studies: *Biomedical Methods and Analytics* (10 EC). This module provides students with knowledge of analytical techniques as well as practical skills used in scientific intervention trials for the substantiation of product benefit claims.

Year 2

The second academic year starts with a module called *Health Foods: Scientific and Regulatory Environment* (10 EC), which provides students with in-depth knowledge and critical understanding of both the theoretical and practical aspects of health and nutrient content claims. This is followed by the *Skills Training: Health and Food Venture Lab* module (10 EC). In it, students gain a profound understanding of the role, analytics, and process of business

planning that leads to the successful creation of new ventures. The second academic year concludes with an *Internship and Thesis*, which covers a period of 28 weeks and is valued at 40 EC.

The audit panel studied the curriculum of the master's programme Health Food Innovation Management and asserts that the combination of courses and topics is unique and relevant. The courses cover a wide range of disciplines and offer the right competences. One of the courses that captures the multidisciplinary angle very well is *Skills Training: Health and Food Venture Lab*, where students discover how all of the different disciplines can be applied simultaneously.

During the site visit, the depth of the multidisciplinary of the curriculum was discussed in several interviews. Some argued that the courses go into sufficient detail, whereas others would like to go somewhat more in depth. The alumni, students, teachers and management discussed whether there should be more background in food technology, but also questioned to what extent this in-depth knowledge could be included. The management argued that it does not want too much specialisation in the curriculum since it aims to deliver graduates who can operate at the interface of different disciplines. The panel supports this view and states that multidisciplinary is indeed an asset to be treasured. However, it also believes that some topics might need a little more in-depth insight. For example, students would benefit if marketing, food technology and finance were offered as electives, thus enabling more in-depth knowledge.

The panel was pleased to find that the curriculum is constantly being developed and improved by the programme management. It considers this a healthy situation and one of the strengths of the programme. It would explicitly like to stress that the curriculum is already very nicely designed and of high quality: it has a coherent structure, covers many relevant disciplines, contains good course material, and offers useful training in a variety of skills such as presenting, writing and developing a business plan.

2.2 Relation between learning outcomes and the curriculum

The audit panel analysed the relation between the learning outcomes and the curriculum. It also focussed on the cohesion and composition within the curriculum.

According to the audit panel, the intended learning outcomes are adequately embedded in the curriculum. A great example is the *Skills Training: Health and Food Venture Lab*, where students have to develop a business plan. This links to intended learning outcome 2f which states that students have to be 'able to develop a business plan for an innovative product or service based on market and competitive research, the regulatory environment, operational analysis and an assessment of financial needs and the expected return'. Another example is the *Biosciences Innovation, Business Development and Entrepreneurship* course, where students get to explore and understand the key components of successful business development, innovation and entrepreneurship in general and in the health food industry in particular. This links to intended learning outcome 1a, which requires students to have 'a broad understanding of the business of healthy eating' and 5b, which requires students to 'integrate the disciplines of life sciences or agro/food innovation with economics and management to drive the innovation chain'.

The panel argues that the way in which the list of intended learning outcomes is linked to the *Internship and Thesis* is rather unrealistic. Currently, there is a table in the critical reflection which shows that nearly all intended learning outcomes are covered during the thesis period.

The panel advises the management to adjust this table to a more realistic overview. In practice, the link between the intended learning outcomes and the content of the curriculum is solid and well worked out.

One of the overarching goals that might be developed a little further is the sustainability aspect, which is addressed in the profile. The management of the programme stated in one of the interviews that this aspect is covered in the curriculum, but that somehow it does not seem to stick in the students' minds. Therefore, they are searching for new ways to deal with this topic, and to make sure that this goal is also clearly represented. The panel greatly appreciates this self-reflective and critical attitude of the programme management.

2.3 Teaching concept, formats and programme-specific services

The audit panel examined which teaching concept and formats form the basis of the offered education, and which programme-specific services support this.

Just like other educational programmes offered by Maastricht University, the Health Food Innovation Management master's programme follows the Problem-Based Learning (PBL) approach to learning. The critical reflection explains that PBL is student-centred and includes active learning from approachable tutors. Students are personally responsible for their academic education and actively address issues in order to apply insights to various questions and gain skills such as presenting, debating, writing and working together in small tutorial groups. The expectation is that tutors participate in those tutorial groups, guiding the group process, asking critical, substantive questions, sharing their knowledge, and supporting students when needed. The critical reflection states that the philosophy behind this process is based on the following three views of what constitutes learning:

- learning is a constructive process: it is the student who gives meaning to the various phenomena that make up the surrounding world;
- learning is a contextual process: the student is required to deal with authentic problems from professional practice, thus improving his/her motivation, memory, and the transfer of what has been learned;
- learning is a social process: the student learns through discourse with others.

In the master's programme Health Food Innovation Management, the teaching concept of PBL is combined with the following teaching formats: introductory lectures, topic-related lectures, keynote lectures, research seminars, a journal club and site visits.

When it comes to programme-specific services, UM Campus Venlo has facilities for students to work in teams and individually. In addition, students have access to library facilities at both the UM Venlo Campus and the Maastricht Campus. The Maastricht University Library (UL) is available 24 hours a day via internet. If necessary, students also have the opportunity to physically enter the Maastricht Library.

The audit panel is of the opinion that the PBL approach is a perfect form to deal with the differences in levels of understanding among students. It has the capacity to raise up the weaker students, which is a very positive aspect according to the panel. The alumni argued that they learned from each other because the PBL approach forced them to work in small groups. The teachers explained that they carefully mix students with different backgrounds, to make sure the groups have a variety of students who can support one another.

The interpersonal skills and the problem-solving attitude are two facets that are useful in the future career of graduate students. This PBL approach can be applied in industry as well as in academia. In addition, it perfectly suits the multidisciplinary nature of the curriculum as it trains students to handle the challenges of different disciplines. According to the panel, the teaching formats fit the teaching concept well.

The panel finds the programme-specific services to be adequate, although it noticed that the distance between Maastricht and Venlo is perceived differently. The international students in particular did not perceive the travel time between the two places as an obstacle. The students stated that they only rarely have to go to Maastricht, however some of them believed that Venlo was not the most appealing place to be located.

2.4 Feasibility

The quantitative data regarding intake numbers, transfers and graduates, the achieved teacher-student ratio, and the average amount of face-to-face instruction per stage of the study programme can be found in appendix 5.

Intake numbers

The master's programme Health Food Innovation Management has a student population that originates from various countries, although a vast majority (80%) comes from the Netherlands. The total intake has grown rapidly from 4 in 2009 to 37 in 2013.

The audit panel praises the programme management for the achieved intake, especially when considering the remote location (new Maastricht University Campus Venlo, located at a distance from the other Maastricht University Faculties). It was pleased to find that the management is aware of the maximum number of students that they can handle. From the interview with students, it became clear that the programme attracts many students who have a health and sciences background, but who do not wish to continue their career in laboratories. They are interested in the entrepreneurial aspect of the programme and are keen to learn about the industry.

Course load and feasibility

According to the critical reflection, students tend to spend an average of 38 hours per week on their studies. During the site visit, they stated that they spend an average of 30-35 hours per week on the master's programme. This was confirmed by alumni. Many students were able to hold a part-time job while attending the master's programme. Therefore, the panel argues that the programme management might need to reconsider the course load and evaluate whether it could be increased somewhat.

Students also argued that the curriculum is feasible, that none of the courses is perceived as extremely difficult, and that the staff is very approachable. The panel confirms this: the curriculum is feasible, and the students receive excellent guidance. There is always a tutor keeping track of discussions to make sure that all topics required for an examination are covered. The PBL approach also contributes to the feasibility of the programme (see section 2.3). From the interview with the Board of Examiners, it became clear that there were a few dropouts over the years, particularly students with an applied sciences background. Nevertheless, the dropout rate is low, around 95% of the students completes the entire master's programme, and the management expects a completion rate of 100% in the near future.

Internationalisation

Apart from the intake of foreign students, the international outlook of the master's programme is also supported by the opportunity for students to go abroad during their thesis/internship period. These students can apply for subsidies to fully or partially cover travel, housing and living expenses. Internationalisation officers are available to answer practical questions regarding their stay abroad. They can assist the students with visa applications as well as provide advice on housing and information on insurance, et cetera.

The panel is enthusiastic about the possibility of going abroad during the master's programme. During the site visit it became clear that students who go abroad during their thesis and internship period are often placed with foreign universities. It is currently rather difficult to find a placement at a foreign industrial site.

Foreign students who attend the master's programme in Venlo are very well guided, as confirmed during the site visit. In one of the interviews, foreign students stated that they had contact with Maastricht University before they arrived in Venlo, that they were picked up from the station and guided in the formal procedures and housing, and that they received an introduction to Venlo.

2.5 Teaching staff

The audit panel focussed on the quality and quantity of the teaching staff at the master's programme Health Food Innovation Management.

Quality

There are 16 core staff members (with a teaching appointment of >25 hours per academic year) actively involved in the master's programme Health Food Innovation Management: 9 of them are full professors, 3 are associate professors, 3 are assistant professors, and 1 is a PhD student. In other words: 15 of the 16 staff members have a PhD degree. Of the 16 core staff members, 8 of them hold a University Teaching Qualification (UTQ).

The audit panel is particularly positive about the quality of the teaching staff as they clearly manage to create a vibrant culture among the student population. They are very approachable via e-mail and telephone and are open to questions. The panel states that there is a good mix between ages and gender among the staff members, and it is pleased to know that the number of UTQ holders will grow soon. It also praises the management for their personal and adequate way of dealing with students who become severely ill. It believes that the staff members create a human touch in the master's programme, which is valuable.

Quantity

In 2012-2013, 65 staff members performed educational and coordinating roles in the master's programme Health Food Innovation Management. In that year, the staff-student ratio was 1:18.3. The audit panel considers the 3.22 full-time equivalents, which is in line with the faculty standard, to be rather low and recommends that the programme management employ a few more staff members.

2.6 Programme-specific quality control

As stated in the critical reflection, the master's programme Health Food Innovation Management has been integrated into the Maastricht UMC+/FHML quality evaluation structure since the end of 2011. At the end of each module, students are asked to complete an evaluation questionnaire which assesses the quality of the units. In addition, a curriculum evaluation is filled out by students while uploading their master's thesis. The outcomes of

these evaluations are shared with the Biomedical Sciences Programme Committee, which has the freedom to advise the programme coordinator on all matters concerning the quality of education.

The study association UMAMI has established an educational committee that also evaluates module contents, without any involvement of the UM staff. After finishing each module, this committee sends outcomes of these informal evaluations to the module coordinator, who is the primary person responsible for systematically improving the quality of the module.

As part of the ongoing evaluation process, the programme coordinators monitor the performance of alumni in terms of labour market preparation and entrance, position, and the time between the date of graduation and the start of their first job.

From the interview with the Programme Committee, it became clear that the internal quality system should be augmented. The members of the Programme Committee stated that the communication with the master's programme Health Food Innovation Management has to be improved. According to the audit panel, the Health Food Innovation Management programme should have at least one student and one staff member present on the Programme Committee. It also argues that the Programme Committee should have access to all of the information available, for example detailed student evaluations.

Along with the Programme Committee, the master's programme has an advisory board, consisting of participants from Maastricht University and from external parties. As the management clarified during the site visit, this advisory board discusses the content of the courses, student recruitment, international visibility, et cetera. The panel is pleased to know that a new advisory board has recently been established, which includes female members as well.

The panel states that the master's programme is already at a high-quality level, but would nevertheless like to take this opportunity to advise the programme management to improve the contacts with the Programme Committee.

Considerations

The audit panel studied the curriculum of the master's programme Health Food Innovation Management and asserts that the combination of courses and topics is unique and relevant. It is very pleased that the curriculum is constantly being developed and improved and states that the multidisciplinary nature in the curriculum is an asset that should be treasured. Nevertheless, it believes that some topics need a little more in-depth insight. For example, students would benefit if marketing, food technology and finance were electives. The intended learning outcomes are adequately embedded in the courses and contribute to the cohesion of the programme.

The Problem-Based Learning approach is a teaching concept which helps to level out the differences between students. In addition, it is a useful concept for students' future careers as they acquire a problem-solving attitude and develop interpersonal skills. It also trains students to handle the challenges of a multidisciplinary approach. According to the panel, the teaching formats fit the teaching concept well.

The audit panel praises the programme management for the achieved intake, especially when considering the remote location (new Maastricht University Campus Venlo, located at a

distance from the other Maastricht University Faculties). The course load could be somewhat increased, the curriculum is feasible, and the drop-out rate is low. The panel is enthusiastic about the possibility of going abroad during the programme. Foreign students who attend the master's programme in Venlo are very well supported, as confirmed during the site visit.

The audit panel is particularly positive about the quality of the teaching staff as they clearly manage to create a vibrant culture among the student population. They are very approachable via e-mail and telephone and are open to questions. The panel states that there is a good mix between ages and gender among the staff members, and it is pleased to know that the number of UTQ holders will grow soon. It considers the 3.22 full-time equivalents, which is in line with the faculty standard, to be rather low and recommends employing a few more staff members.

From the interview with the Programme Committee, it became clear that the internal quality system should be improved. It feels that the Health Food Innovation Management programme should have at least one student and one staff member present on the Programme Committee. The panel is pleased to know that a new advisory board has recently been established that includes female members as well.

Conclusion

Master's programme Health Food Innovation Management: the audit panel assesses Standard 2 as 'good'.

Standard 3: Assessment and achieved learning outcomes

The programme has an adequate assessment system in place and demonstrates that the intended learning outcomes are achieved.

Explanation:

The level achieved is demonstrated by interim and final tests, final projects and the performance of graduates in actual practice or in post-graduate programmes. The tests and assessments are valid, reliable and transparent to the students.

Findings

This standard considers the findings regarding the assessment system (3.1) and subsequently deals with the question of whether the graduates have achieved the learning outcomes (3.2).

3.1 Assessment system

The audit panel analysed the assessment system of the master's programme Health Food Innovation Management and focussed on the assessment policy, including the functioning of the Board of Examiners, the examinations and the thesis procedure.

Assessment policy

According to the critical reflection, students are informed in advance about the mode of testing and the weight of each component. If a student wishes to inspect a graded work, he or she is permitted to do so during a four-week period which commences the day the test results are published. One re-examination date is organised for each module, preferably before the thesis period. Owing to the small number of participants or at the request of the module coordinator, the Board of Examiners can authorise oral re-examinations.

From the critical reflection as well as from the interviews held during the site visit, it became clear that students are currently dissatisfied with the quality of the feedback from the teaching staff. The teachers stated that at the moment it is difficult for them to provide personal feedback on each assignment. Students argued that they find it important to receive sufficient feedback on their papers, so they can make improvements afterwards. When students were asked what advice they would give to the management, they stated that the management should reconsider the time allocated to teachers to evaluate the assignments. Teachers argued that the problem could be solved by employing more tutors. The panel agrees with the teaching staff and recommends that the programme management employ a few more staff members.

The Health Food Innovation Management master's programme operates under the authority of the Board of Examiners for Biomedical Sciences. The board is responsible for the rules and regulations applicable to all Health Food Innovation Management examinations. Since 2012-2013, the Board of Examiners and programme coordinators have worked hard to improve the quality control of examinations.

During the site visit, students confirmed that they are aware of what is expected of them in exams. They explained that all the information regarding the background of the course and the manner of grading is included in the course module book. From the interview with the Board of Examiners, it became clear that the board was previously connected to the educational domains Health Sciences and Environmental Sciences. In 2011, an autonomous Board of Examiners for the educational domain of Biomedical Sciences was established. After one year, the chair decided to focus on the bachelor's programmes, and the vice-chair

concentrated on the master's programmes. The Board of Examiners has requested more detailed assessment forms from the programme coordinators. The audit panel appreciates the recent steps that have been taken by the Board of Examiners to ameliorate the quality assurance cycle of assessment procedures. However, to speed up the process, the panel recommends that Maastricht University consider providing the Board of Examiners with more personnel.

Examinations

Students are examined during each module by means of formative evaluation (i.e. 100% attendance, practical work) and summative assessment (e.g. papers, presentations, written exams).

The audit panel confirms that the exam types are diverse enough, match the content of the courses, are of a high overall level, and fit the purpose well.

Thesis procedure

Preparations for the internship period start during module 4 in the first academic year of the master's programme. After an initial information session on the internship and thesis period and before the actual start date of this module, students select an internship company or institution and project. Moreover, they establish contact with an on-site supervisor, start a brief literature review and complete a research proposal. At least six months are spent in the internship company or institution, collecting and analysing data and drafting the thesis. At the end of this period, students return to the university and present the draft to peers and supervisors.

The thesis is assessed independently by the faculty supervisor and a randomly appointed second examiner, using a standard thesis assessment form.

The audit panel appreciates the role of a second independent supervisor. The involvement of a second supervisor is executed consistently and contributes to the entire thesis procedure. Students and alumni confirmed that there is good communication between the supervisors at the university and those located in industry. The students themselves play an important role in the communication as well. As one of the alumni stated: they have to make sure that both supervisors are well aware of the expectations. Several students explained that during their thesis procedure, both supervisors communicated with and even met each other to discuss the student's progress.

During the site visit, the panel also noted that some students experienced difficulty finding an internship placement in small and medium-sized enterprises. Especially those who want to find a placement abroad experience difficulty in finding a suitable place and accept instead a place at a foreign university. The management and the dean confirmed that many companies are not yet aware of the existence and content of the master's programme. The management is therefore actively trying to inform companies about the master's programme to make sure that several internship placements are reserved. The management and the dean are also planning to create some small laboratories, so that students can conduct their research for the industry on the university site.

Although students argued that they are aware of the assessment criteria for the thesis and internship, the panel finds the assessment criteria rather unclear. When it comes to the internship, students only need to 'pass' in order to have their thesis assessed. During the site visit, the management provided a document which contained several thesis criteria. This

faculty document is available to everyone involved in the thesis procedure. However, it is only considered a guideline, and does not provide any information on how different elements should be weighted. The criteria are neither visualised on the thesis assessment form nor included on the internship assessment form. The panel advises the programme management to make the assessment of the internship and thesis more tangible and transparent. It recommends standardising the assessment by including the different criteria in the assessment form and attaching a certain weight to each requirement. In addition, it recommends including the assessment of the internship on the same assessment form, and again clarifying what the criteria are and how they are graded. Grading students on their internship period does justice to those who put in a lot of effort. The panel also believes it might be worthwhile to add a presentation and oral defence to the thesis procedure, which was the case during the initial two years of the programme. According to the panel, it is essential to evaluate if a student is capable of taking a standpoint and defending his or her own findings with the eye on his or her future career.

3.2 Achieved learning outcomes

The audit panel studied 15 theses, and states that the overall level is what one would expect of an academic master's level. In the majority of the selected theses, there was a clear objective, a logical and consistent line of reasoning, consistent use of footnotes and referencing, English was employed adequately, the work contained a demonstration of adequate knowledge of literature in the field, the research methodology was presented and applied in a well considered way, and there was innovative input from the author.

From the interview with alumni, it became clear that there is a good connection to the labour market. They claimed that the master's programme had strengthened their curriculum vitae. The multidisciplinary nature of the programme seems particularly useful when applying for a vacancy. Alumni clarified that they were able to operate at the interface of different disciplines, that their confidence had increased during the two-year master's programme, and that they knew how to present themselves in front of a professional audience. In addition, they benefitted from their interpersonal skills and problem-solving attitude and their connections in industry which they gained during their internship period. Some alumni got a job offer before graduation, some were even offered two different jobs at the same time.

What surprised the panel is the number of students who continued in a PhD position. Despite the fact that many students argued that they chose the master's programme because they did not want to do research in a laboratory, many seem to continue in research upon graduation. The panel is enthusiastic about the way the master's programme prepares students for a professional as well as academic career.

Based on the content of the selected theses and the good connection of the programme with the labour market, the panel argues that students of the master's programme Health Food Innovation Management achieve the intended learning outcomes upon graduation.

Considerations

When it comes to the assessment policy, the audit panel is convinced that students are aware of what is expected from them in assessments and that the exam types fit the purpose well. As students are currently dissatisfied with the quality of the feedback from the teaching staff, the panel recommends that the programme management employ a few more staff members. It appreciates the recent steps that have been taken by the Board of Examiners to ameliorate the quality assurance cycle of assessment procedures. However, to speed up the process, it

advises Maastricht University to consider providing the Board of Examiners with more personnel. Regarding the thesis procedure, it is enthusiastic about the role of a second independent supervisor. It supports the management in the search for sufficient internship placements in industry.

Regarding the assessment of the thesis and internship period, the panel has some strong recommendations. First of all, it advises integrating the assessment of the internship in the thesis assessment form. Second, it would like to see a standardised assessment form, in which the criteria and their weight are clarified. Third, it believes it might be worthwhile to add a presentation and oral defence to the thesis assessment, which was the case during the initial two years of the programme.

Although the assessment of the theses might need some improvements, the panel finds the academic level of the theses to be adequate. It is enthusiastic about the way the master's programme prepares students for a professional as well as an academic career. Based on the content of the selected theses and the good connection with the labour market, the panel argues that students of the master's programme Health Food Innovation Management achieve the intended learning outcomes upon graduation.

Conclusion

Master's programme Health Food Innovation Management: the audit panel assesses Standard 3 as 'satisfactory'.

General conclusion

The audit panel was pleased to visit the master's programme Health Food Innovation Management. It was excited to find itself in this very vibrant community for two days. Despite its remote location (new Maastricht University Campus Venlo, located at a distance from the other Maastricht University Faculties), the relatively new master's programme has managed to attract an impressive number of highly motivated and extremely dedicated national and international students. According to the panel, the multidisciplinary character of the curriculum should be treasured. It prepares students to work at the interface of different disciplines, which is their unique contribution in the labour market. Graduates have a technical background plus sufficient entrepreneurial knowledge to manoeuvre between technical specialists and the company management. The teaching-learning environment is rather challenging and dynamic, and has a human touch. The curriculum is tailored towards filling gaps in industry, which makes the programme an international example and a role model. During the site visit, the audit panel noted that there are still some bumps on the road, particularly in the form of the quality assurance and the assessment cycle. Nevertheless, the outcome and the programme itself are of a high standard, and the audit panel is convinced that the management will continue to develop the master's programme further so that its reputation will be better known in the national and international health food industry in the near future.

Conclusion

The audit panel assesses the *master's programme Health Food Innovation Management* as 'satisfactory'.

Appendices

Appendix 1: Curricula vitae of the members of the audit panel

Dr. ir. C.D. (Kees) de Gooijer became managing director of Food & Nutrition Delta in 2006. Since 2012 he has been chairman of the board of directors of the Topconsortium for Knowledge and Innovation for the Biobased Economy (TKI-BBE), and director of the bureau for the TKI-Agri&Food. De Gooijer received his master's degree (with honours) in Food Sciences at Wageningen University, and completed his PhD on Cascades of Bioreactors at the same university in 1995. From 1999 until 2000, he was director of the Educational Institute of Technology and Nutrition of Wageningen University. De Gooijer was director of the State Institute of Food Safety (RIKILT) from 2000 till 2003. Thereafter, he was the general director of the Agrotechnology and Food Sciences Group of Wageningen University and Research Center. In addition, de Gooijer is vice-chairman of the Royal Dutch Chemical Society, member of the executive committee of the Institute for Sustainable Process Technology (ISPT) and the TKI-ISPT, board member of the international advisory committee for an investment programme of Yes Bank in India, advisory board member of BF3 Ltd, *Syntens Noord-Oost*, and member of several editorial boards in life sciences.

P. (Peter) Wennström is the founder of The Healthy Marketing Team Ltd, an international and multicultural brand strategy consultancy focused on innovation, marketing and branding in food and health. Wennström has over 25 years of experience in international brand management and consultancy in nutrition, health and wellness - working for clients in FMCG, functional foods and beverages, ingredients, dietary supplements and OTC. He is regarded as one of the world's leading experts in functional foods marketing and is the author of *The Four Factors of Success – how to innovate healthy brands* and co-author of *The Food & Health Marketing Handbook*.

Prof. dr. T. (Tom) Van de Wiele is professor at the Laboratory of Microbial Ecology and Technology at Ghent University (Belgium). Following his master's degree in Bioscience Engineering, he obtained his PhD in Applied Biological Sciences in 2004. He obtained a postdoctoral fellowship from Ghent University's Special Research Fund (2005-2006) and the National Science Foundation (FWO – Vlaanderen). Van de Wiele was a visiting scholar at Ohio State University (USA) in 2007. In 2010, he was appointed professor in the domain of Gastrointestinal Microbial Ecology and Technology at Ghent University. His primary research interests deal with the study of the gut microbiome, its metabolic potency, the interactions with the host, and the development of methods to steer the gut microbiome in a health-promoting direction. Besides the microbial analysis of the gastrointestinal environment from animal models or human intervention trials, his group has broadly expertise in the *in vitro* simulation of gastrointestinal digestive processes.

Ir. I.A.J. (Irene) Payens teaches Food Technology at the HAS *Hogeschool*. Within the educational programme, Payens coordinates the 'Food&Health' track. In addition, she is currently involved in designing a new curriculum for the Food Technology programme. In previous years, Payens was involved in the development of new HAS programmes, such as the master's programme Food, Business and Innovation (Anton Jurgens Institute) and the higher vocational programme International Food and Agribusiness (IFA). Prior to her job as a teacher, Payens worked within the 'Food&Pharma' industry, in several national and international management functions.

R.A. (Rosella) Koning, BSc. is currently a student at the master's programmes Food Safety and Nutrition and Health at Wageningen University. She was also a board member of the study association of Nutrition and Health. In this function, she set up a mentoring system to

guide first-year students. She was also a student member of the Programme Committee of Nutrition and Health. She subsequently joined the board of the Education Institute, which assures the quality of all BSc and MSc programmes at Wageningen University. Other activities alongside her studies have a commercial-scientific background. For example, she has worked as a nutritional consultant, finding scientific answers to questions about new technologies or nutrient groups and translating these answers into presentations aimed at project leaders and managers.

Appendix 2: Domain-specific framework of reference

Health and food safety have become a main driver for innovation, new product development and communication strategies in the food and beverage industry. Analysis of the reactions in the market to new products that are communicated to be healthy and/or to have a specified health benefit, have led to the insight that there are 4 domains that act in concert and mutually determine the degree to which new products or services will be successful. Basically, the way in which the information is sent to consumers and is received by them, is influenced by these 4 domains: 1) the food industry marketing, 2) the opinion of health professionals, 3) the legal boundaries, 4) the consumer perceptions and opinions. Understanding these 4 domains and the overarching needs of sustainability and fair trade are essential for an appropriate estimation of the chance of market success of any innovative idea. For this reason, educational programmes in health and food safety embrace a multidisciplinary character which covers the following areas of science (fig 1):

- Biomedical/life sciences: addressing nutrition and health research;
- Consumer sciences: addressing consumer perception and decision cues;
- National and international food regulations: setting legal boundaries to operate;
- Entrepreneurship and business development: from idea to market.

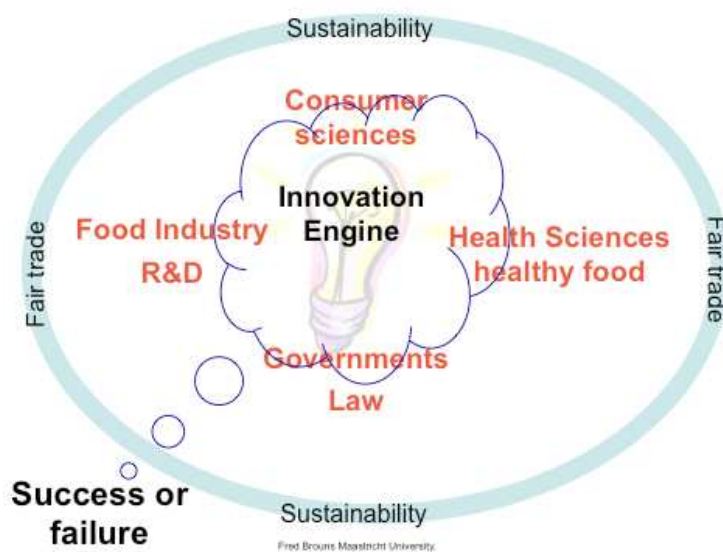


Figure 1: key areas of science in health and food safety

A multidisciplinary teaching programme

Bridging nutrition and health expertise into research, development, regulator/food law functions, public affairs and marketing/sales functions is a prerequisite to make operations in the world of healthy foods and beverages successful. The aim of educational programmes is to develop the required insights and skills that will help students to fulfill demanding roles in the health food arena as well as to set a solid base for further growth into research or commercial leadership functions in industry, governmental and non-governmental organisations. Aspects from the following disciplines play a role in the matters to be taught:

physiology, biochemistry, nutrigenomics, metabolomics, genetics, epigenetics, pharmacology, epidemiology, methodology, statistics, food science, food technology, law, entrepreneurship, finance, intellectual properties, social science, psychology and marketing.

In addition, interaction with key-players from the food and beverage industry, operating in the health foods space, can contribute significantly to fulfill final qualifications that meet actual job requirements with a high biomedical and business innovation character in today's market. A MSc. programme aims to provide students with the following required insights:

1. Biomedical/life sciences research on nutrition and health

- Basic research on the effects of food components on the etiology of disease may lead to new insights and innovative ideas for new product development (NPD) in the food arena;
- The implementation of basic research findings in applied settings will lead to insights on the efficacy of dietary measures to impact on health and disease;
- Observational studies may provide ideas about the link between certain food/nutrient exposures and incidence of disease. Such studies justify the design of controlled intervention trials to determine the effects of dietary recommendations or supplementations, in order to substantiate intervention effects;
- Understanding possibilities and pitfalls of a number of clinical intervention models and the use of validated biomarkers that are commonly used to study the effects of dietary components on human health status is a prerequisite for determining the targets, timelines and expected outcomes of studies.

2. Consumer sciences

- For the selection of appropriate development targets, a selection should be made based on specific criteria such as size of population affected, level of consumer knowledge/understanding/trends/behaviour, food fit, sensory factors and preferences and competitive landscape co-affecting consumer choices. In depth consumer insights and market research falls into place here.

3. Food market and related industrial developments

- The health foods market, health concerns, trends and innovations. How does this market look like? What are the key-players? What are limitations and pitfalls to innovation? Which functional ingredients are being used in what types of food/drink to achieve which benefits to the consumer? Essentials of digestion, absorption, distribution and metabolism of selected food components are essential to understand their potential impact on health management and disease risk reduction;
- New food and nutrient isolation/extraction and processing techniques have led to the development of new ingredients and new types of foods;
- Ingredient modification techniques have allowed the design of food ingredients that did not exist as such previously and can now be developed as novel foods.

4. National and international food regulations

- With the development of the worldwide web and the growing interregional trade, products find their way all over the world. Insight in differences and communalities in food law and local regulation on food safety and health claims is essential to avoid project failures.

Related to the specific domains that fundament the programme, the students will:

- be able to identify trends and developments in the 4 area's listed above;

- be able to merge biomedical and consumer sciences data in innovative ideas and concepts that are economically attractive;
- have insights and skills to help develop scientifically sound studies addressing health benefits, consumer behaviour and market developments;
- be able to translate scientific evidence into scientifically sound product benefits and understandable consumer benefit claims;
- be able to bridge research and development functions with commercial functions.

Appendix 3: Intended learning outcomes

Based on the general objectives of the M-HFIM, the profile of an M-HFIM graduate student has been specified. The qualifications are operationalised into 43 final qualifications.

After graduation, students meet the following final qualifications, in line with the 'Dublin Descriptors':

1. Knowledge and understanding

- a. A broad understanding of the business of healthy eating;
- b. Essentials of digestion, bioavailability, distribution and metabolism of selected food components on health management and disease risk reduction related to Heart Health, Gut Health, Weight Management, Diabetes, Personalized Nutrition, Vitality and Healthy Ageing, Cognition and Mental Performance, Sports nutrition and Clinical Nutrition;
- c. In-depth insights in consumer health concerns, public and industrial targets for health management, market structure and its developments;
- d. Comprehension of various Food Categories, among which Dairy, Bakery, Beverage, Confectionary, Fruit and Vegetable and Meat as potential 'carrier systems' for health ingredients;
- e. Knowledge on food ingredient classes such as carbohydrates, fibres, lipids, proteins, antioxidants and bioactives;
- f. Insight in technical opportunities to improve taste, texture and composition profile;
- g. Comprehension of the pathobiology and etiology of chronic metabolic disorders in which lifestyle and diet play a significant role, especially obesity, diabetes, cardiovascular disease and irritable bowel syndrome;
- h. Comprehension of the role of epidemiology in assessing 'Diet-Health' relationships;
- i. Insights in emerging technologies that impact on the food production process and the opportunities for innovation in the area of food composition, taste, texture and mouth-feel;
- j. Understand the drivers and processes of biosciences based food innovation, business development and entrepreneurship;
- k. Understand the triggers of food innovation and the key challenges of translating perceived opportunity into a marketable product;
- l. Appreciate the consequences of business modelling choices on the feasibility and value promise of food innovations and food ventures;
- m. Insights in research methods used to understand the market and its dynamics, especially consumer desires, concerns, perceptions and behaviour;
- n. Insights in Public Health Care and the Environmental and Regulatory Influences that impact on it;
- o. Understanding public health and risk/benefit assessment (incl. toxicology aspects);
- p. Appreciation of food and consumer regulatory environment: functional foods, novel foods, health claims, nutrition content claims, regulations and requirements for approval submissions in EU, US, Japan and China;
- q. Understanding environmental and socio-economical influences on food consumption;
- r. Insight in the needs to organise Novel Foods post-launch monitoring of complaints and side effects;
- s. Knowledge about relevant biomedical analytics and technologies such as body composition analysis, stable isotope methods, in vitro digestion models, cell line models, nutrigenomics, metabolomics and sensory test models;
- t. Insight in clinical trial design and its role related to impact on the degree of health benefit evidence;
- u. Insight in the design and role of meta-analyses.

2. Application of knowledge and understanding

- a. Read, interpret and translate scientific data into short information that is understandable by individuals with a non-technical background such as managers in commercial functions, sales men and lawyers. Yet, this “laymen level of information” should be scientifically correct;
- b. Critical evaluation of scientific literature;
- c. Critical appraisal of new benefit claims in the light of scientific evidence;
- d. Translate scientific data to industrially relevant input and concepts;
- e. Able to apply project management methods to the development of novel technology, foods or services;
- f. Able to develop a business plan for an innovative product or services based on market and competitive research, the regulatory environment, operational analysis and an assessment of financial needs and the expected return.

3. Judgment

- a. Critical evaluation of the scientific literature in terms of ranking of the degree of evidence based on the design and methodology of the clinical studies;
- b. Critical evaluation of scientific literature in terms of drawing conclusions that are supported by “the weight of the evidence” and that can survive the challenge of critics;
- c. Critical assessment of the chance of success of desired benefit claims in the light of the regulatory environment in the area of planned product launch;
- d. Critical overall early assessment of the potential likelihood of commercial success of innovative ideas in the light of technical, business and regulatory feasibility;
- e. Critical assessment of practical problems (and their solutions) that relate to doing food innovation.

4. Communication

- a. Capable to communicate scientific information in a non-scientific environment, to the general population and its sub-populations;
 - b. Capable to discuss scientific and regulatory aspects of new ideas/concepts with commercial functions in the industry and with spoke persons of the regulatory and scientific governmental authorities;
 - c. Able to report scientific study results in an understandable way in writing as well as in presentations;
 - d. Able to discuss opportunities and plans for food related business opportunities with scientists, IP experts, marketeers, food engineers and investors.
- ## *5. Learning skills*
- a. Understanding the basics required for the implementation, execution and coordinating of scientific nutritional studies;
 - b. Integrate new insights from the disciplines of life sciences or agro/food technology with economics and management, to drive science-based food innovation;
 - c. Capable of keeping up to date with scientific literature, using the latest internet-based tool;
 - d. Is able to learn from own and team performance;
 - e. Is able to learn from negative experiences and failures;
 - f. Skilled in project management;
 - g. Able to build a business case and establish an appropriate business plan.

Appendix 4: Overview of the curriculum

Structure of the M-HFIM programme (2013-2014)

Year 1

1	Consumer Concerns, Health Targets and Market Segments	10 weeks	12 ECTS
2	Consumer Understanding and Behaviour	7 weeks	10 ECTS
3	Biosciences Innovation, Business Development and Entrepreneurship	12 weeks	18 ECTS
4	Food and Ingredient Categories, Carrier Systems and Food Technology	7 weeks	10 ECTS
5	Biomedical Methods and Analytics	7 weeks	10 ECTS

Year 2

6	Health Foods: Scientific and Regulatory Environment	7 weeks	10 ECTS
7	Skills Training: Health and Food Venture Lab	7 weeks	10 ECTS
8	Internship and Thesis	28 weeks	40 ECTS

Appendix 5: Quantitative data regarding the programme

Data on intake and graduates

Intake and origin of Health Food Innovation Management students

Origin students	2009		2010		2011		2012		2013	
	N	%	N	%	N	%	N	%	N	%
The Netherlands	4	100	10	56	28	90	23	82	28	76
EEA/EU	0	0	3	22	1	4	3	11	6	16
Outside EEA/EU	0	0	3	22	2	6	2	7	3	8
Total	4	100	16	100	31	100	28	100	37	100

Graduates of Health Food Innovation Management

Cohort	2009		2010		2011	
	%	N	%	N	%	N
Completion rate	100	4	94	15	94	29

Teacher-student ratio achieved

In the 2012/13 academic year, 16 staff members were involved for more than 25 hours a week in the programme. All hours worked in 2012/13 by the teaching staff equal 3.22 full-time equivalents. In the same year, 28 first-year students and 31 second-year students were enrolled in the master's programme Health Food Innovation Management, creating a staff-student ratio of 1:18.3.

Average amount of face-to-face instruction per stage of the study programme

The average amount of face-to-face instruction is 12 hours per week, excluding the internship/thesis period.

Appendix 6: Programme of the site visit

Tuesday 18 March 2014		
08.15	08.30	Reception audit panel <ol style="list-style-type: none"> 1. Prof. Fred Brouns – Coordinator M-HFIM 2. Dr. Freddy Troost – Assistant Coordinator M-HFIM 3. Guy Bendermacher, MSc – Policy Adviser Institute for Education (IfE)
08.30	11.15	Preparatory meeting
11.15	12.00	Interview with management <ol style="list-style-type: none"> 1. Prof. Mirjam oude Egbrink – Scientific Director IfE FHML 2. Dr. Hans Savelberg – Director of Education Biomedical Sciences 3. Prof. Fred Brouns – Coordinator M-HFIM 4. Dr. Freddy Troost – Assistant Coordinator M-HFIM
12.00	12.45	Lunch
12.45	13.30	Interview with students <p><i>Year 1</i></p> <ol style="list-style-type: none"> 1. April Boessen 2. Andrew Tandra <p><i>Year 2</i></p> <ol style="list-style-type: none"> 3. Alvaro Fuentes 4. Aileen Mulja 5. Inge van der Pol 6. Debra de With
13.30	13.45	Break
13.45	14.30	Interview with teaching staff <ol style="list-style-type: none"> 1. Dr. Caroline Goukens (School of Business and Economics) 2. Dr. Wynand Bodewes (Maastricht Centre for Entrepreneurship) 3. Dr. Jogchum Plat (FHML, department of Human Biology) 4. Prof. Pieter Dagnelie (FHML, department of Epidemiology) 5. Prof. Ellen Vos (Faculty of Law)
14.30	14.45	Break
14.45	15.45	Interview with Programme Committee <ol style="list-style-type: none"> 1. Jacob Pilon (student member) 2. Kim van Kol (student member) 3. Dr. Ton Hopman (chair) 4. Dr. Willem Voncken (staff member)
15.45	16.00	Open office 'hour' + internal meeting of the audit panel
16.00	16.45	Interview with M-HFIM alumni <ol style="list-style-type: none"> 1. Vincent van Buul: PhD student SBE

		<ol style="list-style-type: none"> 2. Iseli de Waard: currently unemployed 3. Adeline Putri: Scientific knowledge manager at Danone Nutricia Research 4. Joep Matthee: Assistant Nutrition and Health Manager at Unilever 5. Ellen Wilms: PhD student Nutrition-Gastroenterology 6. Maikel Borm: sales manager Rafti Sugar Solutions
Wednesday 19 March 2014		
09.00	10.00	Interview with Board of Examiners + assistant coordinator <ol style="list-style-type: none"> 1. Dr. Gea Hageman – Chair Board of Examiners Biomedical Sciences 2. Dr. Harry Gosker – vice-Chair Board of Examiners Biomedical Sciences 3. Dr. Freddy Troost – Assistant Coordinator M-HFIM
10.00	10.30	Internal meeting of the audit panel
10.30	11.15	Final interview with management (including the dean) <ol style="list-style-type: none"> 1. Prof. Albert Scherpbier – Dean FHML 2. Prof. Mirjam oude Egbrink – Scientific Director Institute for Education FHML 3. Dr. Hans Savelberg – Director of Education Biomedical Sciences 4. Prof. Fred Brouns – Coordinator M-HFIM 5. Dr. Freddy Troost – Assistant Coordinator M-HFIM
11.15	12.45	Internal meeting audit panel + lunch
12.45	13.00	Presentation of preliminary findings

Appendix 7: Theses and documents studied by the audit panel

Prior to the site visit, the audit panel studied the theses of the students with the following student numbers:

i585882	i599352	i614688	i429120	i401676
i618209	i616680	i6038285	i567418	i477303
i6039313	i6041953	i6041581	i6039683	i6041413

During the site visit, the audit panel studied, among other things, the following documents (partly as hard copies, partly via the institute's electronic learning environment):

- Subject-specific reference framework and the learning outcomes of the programme;
- Overview of the curriculum;
- Outline description of the curriculum components;
- Teaching and examination regulations;
- Overview of allocated staff;
- List of the last 25 final projects or the final projects of the past two years;
- Overview of the contacts maintained with the professional field;
- Report on the institutional quality assurance assessment;
- Reports on consultations in relevant committees/bodies;
- Test questions with corresponding assessment criteria and requirements and a selection of actual administered tests and assessments;
- Selection of final projects with corresponding assessment criteria and requirements;
- Reference books and other learning materials;
- Summary and analysis of recent evaluation results and relevant management information;
- Documentation regarding teacher and student satisfaction.

Appendix 8: Declarations of independence



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Kees de Gooijer

HOME ADDRESS: Vleerweg 47 a
6703 Cm
Wageningen

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Health Food Innovation Management

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

Thi Agri&Food

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;



HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: *Wageningen*

DATE: *28-03-2014.*

SIGNATURE:



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Peter Wennström

HOME ADDRESS: Gråbovågen 200
24495 Dösjebro
Sweden

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Health Food Innovation Management
MSc Programme

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

Maastricht University

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;



HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INsofar AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: *Venlo*

DATE: *19/7 2014*

SIGNATURE: *Member*



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Tom VAN DE WIELE

HOME ADDRESS: Ridder A. Stas de Riehellalaan 27
9820 MERELBEKE

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT /
SECRETARY:

Masten Health Food Innovation Management

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

Maastricht University

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;



HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INsofar AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: MERELBEKE

DATE: 16-03-2014

SIGNATURE:

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Irene Payens

PRIVÉ ADRES:

Ceintuurweg 2
5271 AS Sint-Michielsgestel

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

"Health Food Management"
Universiteit Maastricht

AANGEVRAAGD DOOR DE INSTELLING:

Universiteit Maastricht

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE Zouden KUNNEN BEÏNVLOEDEN;



VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE
AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN
VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN
WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER
REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS:

DATUM:

Sint-Michiëlsgestel

17 december 2013

HANDTEKENING:

A handwritten signature in black ink, consisting of several stylized, overlapping loops and curves, positioned below the 'HANDTEKENING:' label.



ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM:

Rosella Koning

PRIVÉ ADRES:

Dijlgraaf 4-17 C - kamer 2
6708 PG Wageningen

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Health Food Innovation

AANGEVRAAGD DOOR DE INSTELLING:

Universiteit Maastricht

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOULDEN KUNNEN BEÏNVLOEDEN;



VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE
AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN
VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN
WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER
REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS:

Wageningen

DATUM:

16 november 2013

HANDTEKENING:

A handwritten signature in black ink, appearing to read 'R. A. Teninc', is written over a horizontal line.



DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Jasne Krooneman

HOME ADDRESS: Kazernesstraat 8N
Amsterdam

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS ~~APPLICANT~~ / SECRETARY:

Health Food Innovation Management

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

Maastricht University

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;



HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INsofar AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: *Venlo*

DATE: *18-03-2014*

SIGNATURE: *J. J. J. J. J.*