

Josip Juraj Strossmayer University of Osijek
Faculty of Food technology Osijek

Strategic Research Programme
2019 – 2023

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Apart from the Committee members, all the members of the Faculty of Food Technology Osijek Faculty Council were invited to participate in writing this document with their remarks and suggestions.

The Strategic Research Programme of the Faculty of Food technology Osijek was approved by the Faculty Council on 16 July 2019, in the academic year 2018/2019.

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1. Short description of the development of the Faculty of Food Technology Osijek

1.1. Historical framework

In 1970, the Chamber of Commerce accepted the initiative of several professors teaching at the Faculty of Technology of the University of Zagreb - Biotechnology Department, to found the Department of Food Technology at the College of Agriculture in Osijek, and in 1971, the College of Agriculture became the Faculty of Agriculture and Food Technology.

With the development of the Food Technology Department, the creation of better working conditions, and with the establishment of the University of Osijek (1975), the prerequisites for the establishment of the Faculty of Food Technology as an independent unit were created. Since 1976, the Faculty of Food Technology (in further text: Faculty) has been working autonomously.

Considering that the Faculty was situated at Tenjska Road, it was fully devastated during the Homeland War in 1991 and 1992. In the war period, the Faculty was relocated, so teaching and other activities of the Faculty were taking place at different locations in Osijek, until it finally got its permanent residence in Tvrđa (at 18 and 20 Franje Kuhača Street).

Since the beginning of higher education, from 1971 until today, the many study programmes at the Faculty of Food Technology Osijek have been completed by 1120 graduate engineers, 622 university bachelors, 422 master's degrees, 50 university specialists, 5 masters of science, and 55 doctors of science, which proves a long tradition in the education of top personnel, which is a great contribution to science and the profession.

1.2. Faculty of Food Technology today

The Faculty's activities are higher education, the establishment and implementation of undergraduate university studies, graduate university studies, postgraduate university studies, as well as scientific research and research in the scientific field of biotechnical, technical and natural sciences, and the interdisciplinary field of science.

All the activities of the Faculty take place at the address Franje Kuhača 18 and 20 and Trg Svetog Trojstva 3, where the Faculty has a total of 5 473 m² of space, which includes: 7 modern lecture rooms, 17 research and 19 student laboratories, auxiliary premises, 2 computer classrooms, a library and a reading room equipped with computers, a room for the student association, the Faculty Council hall, an adequate number of cabinets, teacher offices, and other rooms required for the Faculty's activities.

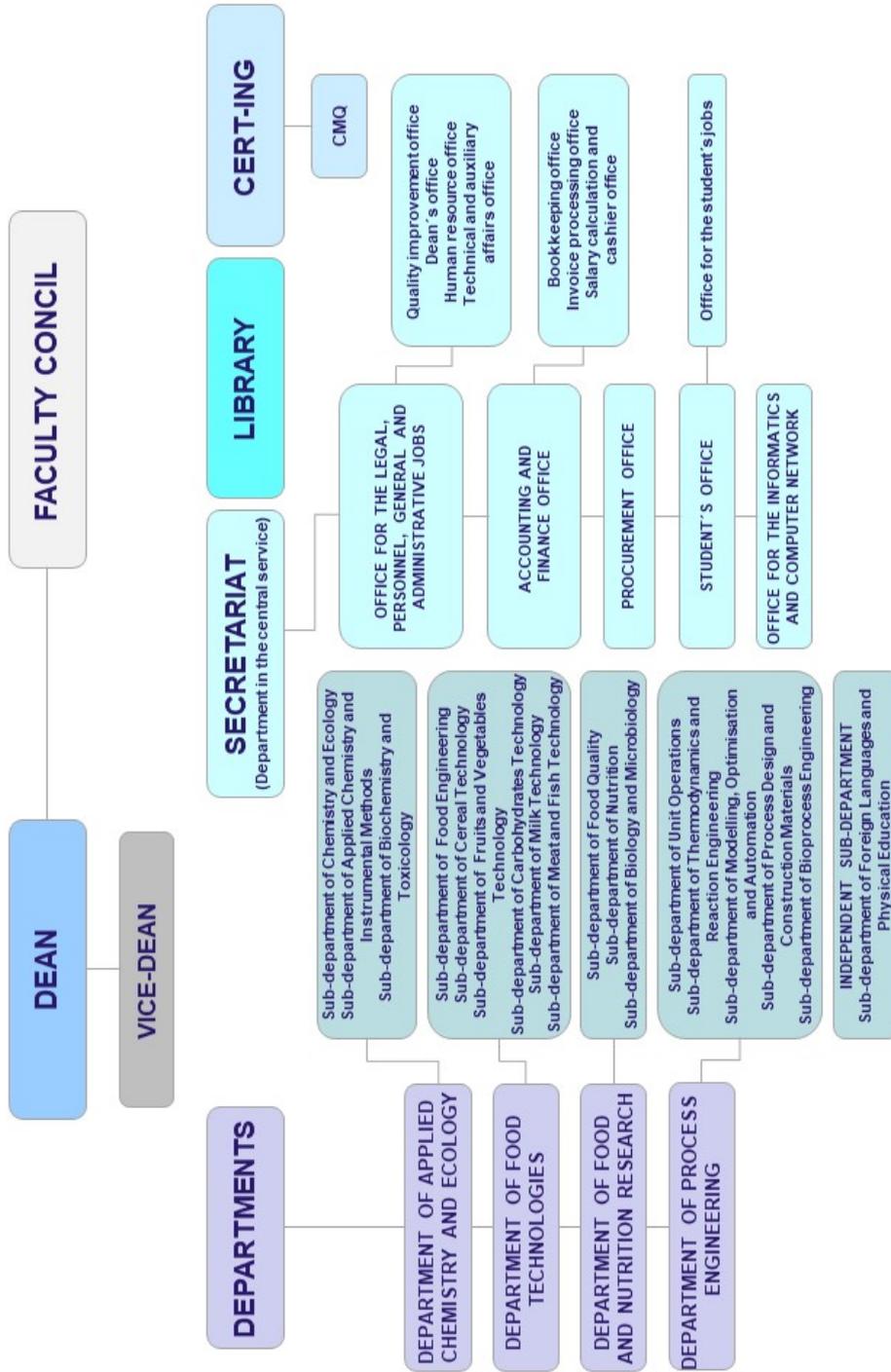


Figure 1. Organizational structure of the Faculty of Food Technology Osijek

1.2.1. Academic, scientific, and professional activity

In the academic year 2005/2006, the first student generation was enrolled according to the Bologna study programme. The study programmes follow the concept “3+2”, i.e. a three-year undergraduate study programme, followed by a two-year graduate study programme. The Faculty carries out one undergraduate university study programme *Food technology* and three graduate study programmes *Food Engineering, Process Engineering, Food Science and Nutrition*. After graduation, the Faculty offers the possibility of continued education as part of the postgraduate university study p *Food Technology and Nutrition* and three postgraduate specialist study programmes (*Food Safety and Quality, Traditional Meat Products Technology, and Nutrition*).

In addition to formal education, the Faculty also conducts various lifelong learning programmes, a total of twelve programmes that have so far been completed by more than 300 attendants. With the successful realization of these programmes, the Faculty strengthened its position as a public educational and scientific institution developing strong relations with different businesses.

The Faculty is able to welcome about 150 new students, and the number of students per year who complete their studies is about 80. The overall count of the students is about 800. 50 teachers holding academic ranks, 20 teaching assistants, and 3 postdoctoral students are employed at the Faculty. In addition, the Faculty employs 2 professional associates in the science and higher education system, 9 technical associates, 16 administration employees, 2 employees in the library, and 7 employees as auxiliary staff.

In addition to working in the area of higher education, scientists and associates employed at the Faculty perform their scientific and research activities through participation in domestic and international scientific and professional projects.

In the previous period, the Faculty was an organizer or a co-organizer of several international and domestic scientific and professional conferences where the employees participated actively, whether through oral or poster presentations, or through professional bodies and committees.

Since 2008, the Faculty has been publishing a scientific journal *Croatian Journal of Food Science and Technology* (a2 category).

At the beginning of 2011, the ALUMNI Association, the Association of Former Students and Friends of the Faculty of Food Technology Osijek (TehnOS) was established, which should have a significant role in linking the Faculty with the economy.

1.2.2. Mission

The mission of the Faculty of Food Technology Osijek is to develop and spread the nationally and internationally recognized excellence in education and research in the field of biotechnical, technical, and natural sciences. The Faculty also works on knowledge transfer and its application for the benefit and prosperity of every section of society. The Faculty provides student and teacher mobility, rational usage of human and material resources, supervision and constant quality enhancement, competitiveness, and international competitiveness with regard to teaching and scientific work. To achieve this mission, the Faculty has a permanent development strategy based on the excellence of scientific, academic, and professional work.

The mission of the Faculty of Food Technology Osijek at the University of Osijek is fully determined by:

1. the field of interest of the Faculty,
2. positive European trends in higher education development, and
3. existing and future legislature of the Republic of Croatia, University of Osijek, or the Faculty.

In accordance with contemporary considerations on the position of higher education, the Faculty develops its area of interest through the following activities:

- a) academic activity – education of competent experts at the level of undergraduate (three year), graduate (two year), postgraduate specialist and doctoral study programmes, and various programmes within the framework of lifelong learning,
- b) scientific activity – participation in scientific projects that raise the general level of fundamental and applied knowledge in the field of interest of the Faculty,
- c) professional activity – participation in professional projects ensures fast and efficient application of the latest scientific knowledge in the economy, and in the field of general and public interest
- d) social work – raising the general social awareness of the position and the role of one's own profession or of the actual problems and achievements in the field of one's own scientific, teaching, and professional work.

1.2.3. Vision

The vision of the Faculty of Food Technology at the Josip Juraj Strossmayer University of Osijek is to be an elite scientific and educational institution in Croatia, focused on internationally recognized scientific, developmental, and technical research in the area of biotechnology, technical and natural sciences, adjusted to the European Higher Education Area and the

European Research Area. The Faculty will continue to educate internationally acknowledged competent and high-quality experts, and it will carry out internationally acknowledged scientific and technical research and provide support to economic development. The Faculty aims at being recognized by its excellence, thus becoming a desirable institution of higher education, a reliable business partner for domestic and international scientific and educational institutions and students. To achieve these goals, the Faculty will cooperate with national and international partners in the area of education and economy, providing permanent supervision, quality enhancement, and competitiveness of its curriculum, as well as scientific and professional work.

2. Analysis of the scientific potential of the Faculty of Food technology Osijek

2.1. Scientific potential and the activities of the Faculty of Food Technology Osijek

According to the external re-accreditation process, which was implemented for the Faculty of Food Technology Osijek in April of 2013, and the acquired quality evaluation for the evaluated institute of higher education, the Faculty of Food Technology has received the following evaluation in the area of **Scientific and Professional Activity**:

1. **Standard: *The institute of higher education regularly implements activities that result in original scientific work, which contributes to the total knowledge and is based on the results of basic research, applied research, and developmental research.***
2. **Level of implementation: *Fully implemented***

Staff of the Faculty of Food technology Osijek:

- Full professors with tenure: 9
- Full professors: 17
- Associate professors: 13
- Assistant professors: 9
- Lecturers: 2
- Postdoctoral students: 3
- Teaching assistants: 20
- Senior expert associates: 2
- Expert associates: 4
- Technical associates: 9
- Library: 2 (senior librarian and library advisor)
- Administration employees: 16
- Employees as auxiliary staff: 7

In addition to working in the area of higher education, scientists and associates employed at the Faculty perform their scientific and research activities through participation in domestic and international scientific and professional projects. Over the past 5 years, 5 projects funded by the EU Structural Funds have been implemented, 7 scientific projects funded by the Croatian Science Foundation, 2 Adris Foundation projects, 3 international projects, and 15 university projects. In 2015, the Scientific Centre of Excellence was established: the **ZCI for Bioprospecting Sea - BioProCro**, the holder of which is the Ruđer Bošković Institute, and the Faculty participates as a partner institution.

According to the Croatian Scientific Bibliography (CROSBI), in the period from 1 January 2014 to 31 December 2018, the Faculty scientists have published 578 scientific publications indexed in different databases (Web of Science Core Collection, Current Contents Connect, CAB Abstract, Food Science and Technology Abstract, etc.). Out of that number, 215 papers belong to the a1 category. The total paper citation indexed in WoS and CC is 6588, and the h-index of the Faculty is 39, and in Scopus it is 7329, with the h-index of 41.

In the past period, the Faculty was an organizer or a co-organizer of several international and domestic scientific and professional conferences where the employees participated actively, whether through oral or poster presentations or through professional bodies and committees. As the organization of scientific conferences is a very important segment of the promotion of science and the profession, as well as the institution itself, the Faculty intends to continue to organize the international congresses "Flour-Bread", "Ružička Days", "Water for All", "With Food to Health", "Students Conference Green" and the domestic conference "Young Scientist Days" which will take into account the involvement of young scientists in the organization.

Since 2008, the Faculty has been publishing a scientific journal *Croatian Journal of Food Science and Technology* (a2 category), and the journal is now indexed in the CAB Abstracts database, the FSTA (Food Science and Technology Abstract) database, the EBSCO Publishing, Inc. Database, the Portal of Croatian Scientific Journals (HRČAK), Directory of Research Journals Indexing, the Science Library Index database, Google Scholar, Directory of Open Access Journals (DOAJ), OpenAIRE, Genamics JournalSeek, the Base Biofield Academic Search Engine, the Directory Indexing of International Research Journals, the International Innovative Journal Impact Factor (IIJIF), and J-Gate.

The Faculty works on linking and collaborating with research groups within the Faculty, and on the implementation of co-institutional (collaborative) and interdisciplinary research, thus increasing the ability to participate in international projects.

Scientists from the Faculty have won numerous awards over the past five years:

- National Science Award – Life Achievement Award
- National Science Award – Annual Award for Science
- National Science Award – The Annual Award for Popularization and Promotion of Science

- National Science Award – The Annual Award for Junior Research Assistants
- Danubius Young Scientist Award for Croatia
- A Special Charter for Innovation and Promotion of Authentic Croatian Products and their Implementation given by the Project Management Institute– International Project Management Association
- The awards of the Croatian Academy of Sciences and Arts for the highest scientific and artistic achievements in the Republic of Croatia
- The Award of the Croatian Academy of Engineering “Rikard Podhorsky”
- The Award of the Croatian Academy of Engineering for young scientist “Vera Johanides”, the Annual Award to Young Scientists given by the Croatian Microbiological Society
- The Annual Science Award from the Osijek-Baranja County

Also, the Faculty of Food Technology Osijek gives out the Annual Award for achievements in the field of research, teaching and professional work according to the Regulation on Recognitions and Awards (<http://www.ptfos.unios.hr/index.php/dokumenti>).

2.2. Professional activity

The professional activity of the Faculty in the past 5 years can be seen:

- in the realization of 41 started and / or completed professional projects,
- in numerous other activities such as the organization of professional conferences, participation in the work of professional societies, implementation of professional courses, giving expert opinions, expertise, and other,
- in the implementation of 12 lifelong learning programs,
- in signing forty cooperation agreements with business and public institutions,
- in carrying out laboratory analyses for companies by independent units or laboratories of the Faculty.

With the aim of intensifying cooperation with the economy, independent units operate at the Faculty:

- a CERT-ING organization unit, that has the purpose of unifying and developing scientific research and professional work, publishing activities, and advisory and other activities.
- The Centre for Meat Quality (CMQ) operates within the framework of CERT-ING. Its aim is to conduct research in the field of technology and quality of traditional meat products, carry out laboratory analyses for the needs of producers of traditional meat products, and educate and consult producers of traditional meat products.
- Laboratory for Wine Analysis, established and equipped through the implementation of two international projects ("SeeNet II" and "INNOWINE"), in cooperation with the Italian Development Agency of the Friuli Venezia Giulia Region, the Udine University,

Osijek-Baranja County, and with the operational support of the RRA (Regional Development Agency) of Slavonia and Baranja.

- Honey Analysis Laboratory, equipped through the IPA Project HR-SRB Panonian Bee.

The Faculty also has an ALUMNI Association, associates or former students and friends of the Faculty of Food Technology Osijek (TehnOS), which should have a significant role in linking the faculty to the economy.

One of the strategic objectives of the Faculty is to enhance the cooperation with the private and the public sectors, to develop projects and research directly connected to those sectors, and to provide financial gain to the Faculty that comes from such sources outside of the institution and not resulting from science and education. The general state of the economy in the Republic of Croatia, and especially in the eastern part of Croatia, is not enviable, and therefore the possibility of cooperation with the economy is limited, even though this way of cooperation and the concrete application of the results of scientific research could result in significant progress of the economy. The staff of the Faculty has made considerable efforts in recent years to intensify cooperation with the economy, which can be seen through the implementation of the mentioned professional projects, by signing the cooperation agreement, by making several professional studies, and by performing consultancy services. The Faculty possesses the capacities and competencies for even more intensive cooperation with the economy and will therefore encourage:

- the realization of joint projects with the economy,
- signing new agreements on co-operation with the economy,
- signing new agreements with companies that serve as academic bases of the Faculty
- the promotion of postgraduate specialist and doctoral study programmes,
- the establishment of new lifelong learning programmes in line with the needs of the economy,
- the implementation of laboratory analyses of interest to the economy.

2.3. SWOT ANALYSIS

The identification and analysis of positive and negative, as well as internal and external factors, are necessary for easier assignment of tasks required for achieving strategic goals, and the feasibility of the Strategy. Therefore, the SWOT analysis (*Strengths, Weakness, Opportunities, Threats*) was used as a generally accepted project design tool.

INTERNAL FACTORS	
S - ADVANTAGE / STRENGTHS	<ul style="list-style-type: none"> • Long-standing experience in higher education, scientific, research, and professional work • Productive scientific activity as a basis for academic activity • Potential for interdisciplinary research • Individual research teams experience in the application and implementation of projects funded by the EU and the Croatian Science Foundation (HRZZ) • Continuous increase of resources for scientific research and procurement of equipment • Young academic, scientific, and research staff • Organization of international scientific congresses, as well as national scientific and professional conferences • Publishing international scientific-professional journals • Significant increase of employee mobility and cooperation with foreign researchers (in the last 5 years) • Relatively high employability of graduates • Satisfactory teachers/assistants vs. students ratio • Student satisfaction (student questionnaire) and quality communication with students • Continuous lifelong learning programme development • Activities of the Faculty's ALUMNI organization
W - DISADVANTAGE/ WEAKNESS	<ul style="list-style-type: none"> • Limited space (lacking a 200-seat amphitheatre, offices, accredited laboratories, space for semi-industrial equipment) • Lack of resources for financing and co-financing projects • Insufficient quantity of scientific and research and semi-industrial equipment • Lack of collaborative (inter-institutional) projects of interdisciplinary character • Poor level of engagement by some teachers - researchers within the Faculty • Insufficient long-term training (3 months or more) of scientific and teaching staff at foreign institutions • Insufficient number of incoming mobilities of students, postgraduate students, and teachers from foreign universities • Insufficient cooperation with the business sector • Insufficient number of patents • Low exam pass rate for certain courses • Insufficiently active and motivated students

EXTERNAL FACTORS	
O – POSSIBILITIES/ OPPORTUNITIES	<ul style="list-style-type: none"> • Construction and equipment for new premises of the Faculty • Connecting with other universities and scientific institutions, as well as fostering inter-institutional and interdisciplinary research projects • Active cooperation with the business and public sectors • Call for applications on scientific and professional projects (EU grants, HRZZ) • Fostering employees' publishing activity • Encouraging applications for international projects • Possibility of participating in programmes for the outgoing mobility of employees and students (ERASMUS, CEEPUS, IAESTE) • Establishing new study programmes and lifelong learning programmes • Organizing promotional activities, seminars, workshops and the like
T – THREATS/ IMPEDIMENTS	<ul style="list-style-type: none"> • Poor general economic situation – low level of interest in research and professional projects by the business sector • Changes in financing higher education institutions (funding restrictions) • Insufficient number of assistants in individual departments • Insufficient appropriations for scientific and research projects from the state, private and local community funds, and foundations • Lack of resources for the procurement of new equipment and the maintenance of current equipment • Lack of incentives for young scientists in the form of financing their initial scientific and research projects • Insufficient support and financing for lifelong learning

3. Strategic goals and the organizational development plan of the Faculty of Food Technology Osijek at the Josip Juraj Strossmayer University of Osijek

In January of 2018, the Council of the Faculty of Food Technology Osijek at the Josip Juraj Strossmayer University in Osijek adopted the ***Development Strategy of the Faculty of Food Technology Osijek for the period 2017/2018-2021/2022*** (hereinafter referred to as: “The FFTOS Strategy”; <http://www.ptfos.unios.hr/index.php/dokumenti>).

The Faculty Development Strategy is based on a self-analysis of the current state and on the criteria and conditions under which the Faculty operates, on the principles and recommendations of the European Union's strategic documents that form the European Research Area (ERA) and the European Higher Education Area (EHEA), national and university strategic documents, valid legislation, as well as the general acts of the university and the

Faculty. During the creation of the Strategy, the Faculty's distinguishing features, the conditions in which it operates, and the broader social contexts were taken into account. The demands of students and employers, as well as the overall society, i.e. the political and economic environment, are changing faster than ever before, so the Faculty's openness and flexibility are important in order to meet the demands and take advantage of the available development opportunities. In the forthcoming period, the Faculty's activities will be focused on achieving high standards of organization of all services, human resources development, and research achievements, taking into account the circumstances in which the Faculty operates. The establishment of an effective quality management and quality assurance system in all segments of activities is a priority in order to meet the needs of all stakeholders.

The strategic areas of development of the Faculty of Food Technology Osijek are:

- 1. Education and students,**
- 2. Research and innovations,**
- 3. Cooperation and**
- 4. Organization, resources and quality assurance system.**

3.1. Education and students

STRATEGIC GOAL: Improving the existing and establishing new study and lifelong learning programmes, as well as continuously improving the academic process.

Key indicators

- **Number of upgraded study programmes**
- **Number of new study programmes**
- **Number of new lifelong learning programmes**
- **Number of e-learning courses, i.e. courses taking place online (partly or completely)**

Tasks:

1. Raising the quality level (improvement) of the existing study programmes, study conditions, and the position of the students
2. Developing new study programmes in accordance with the needs of the economic sector
3. Developing new lifelong learning programs that will be aligned with the needs of the wider community, especially the economy, and increasing the frequency of conducting existing programmes
4. Intensifying the implementation of field work within undergraduate and graduate programmes

5. Improving the quality of education through the use of e-learning (implementation of the educational process using the information and communication technologies)

3.2. Research and innovations

STRATEGIC GOAL: Improving research capacities, scientific and innovation work, as well as enhancing co-operation and the transfer of knowledge and research results to the economy.

Key indicators

- Number of employees involved in project implementation
- Income for project implementation per teacher
- Number and quality of published a1 papers per year per scientist
- Number of citations per year per scientist
- Number of defended PhD theses
- Number of projects with the industry

Tasks:

1. Defining the scientific and research priorities of the Departments and the Faculty
2. Encouraging the application and implementation of scientific, infrastructural, or professional projects
3. Continuously increasing the quantity and quality of published scientific papers, especially papers indexed in WoS databases
4. Increasing the number of defended PhD theses
5. Encouraging professional activities and Faculty services
6. Developing analytical methods and technological processes of interest to the economy.
7. Encouraging the development of new, innovative products and technologies.

3.3. Cooperation

STRATEGIC GOAL: Enhancing international, inter-institutional, and business cooperation.

Key indicators:

- Number of incoming and outgoing mobilities
- Number of scientific and professional conferences and summer schools
- Number of joint international and inter-institutional projects
- Number of joint projects with the economy and the local community

Improving international cooperation and mobility

1. Improving the international recognition of the Faculty, increasing the mobility of students and teachers, and linking research teams and institutions on joint projects
2. Encouraging the organization of international scientific conferences and summer schools with lecturers from foreign institutions
3. Encouraging the cooperation of scientists at the Faculty with other institutions and scientific centres of excellence
4. Improving cooperation with the economy, public institutions, and the local community
5. Encouraging the cooperation between scientists and business entities or public administration bodies in the application and implementation of joint projects
6. Increasing the active participation of ALUMNI Association members in various activities of the Faculty and increasing the number of Association members

3.4. Organization, resources, and the quality assurance system

STRATEGIC GOAL: Continually improving human, spatial, as well as scientific and research capacities of the Faculty.

Key indicators

- **Constructing and equipping the new premises of the Faculty**
- **Number of published textbooks**
- **Number of courses for scientific-teaching, teaching, and non-teaching staff**
- **Increasing the share of Faculty's own resources in its revenue**

Tasks:

1. Increasing workplace facilities needed for scientific, as well as educational purposes; this aim is related to the construction of new premises of the Faculty of Food Technology at the University Campus Osijek. Conservation and protection of the archaeological site at the new Faculty premises, which started on 22 August 2016, has finished successfully. When it comes to the construction of new premises, at this very moment, the Faculty is in its preliminary conceptual design stage. Moreover, the Faculty is meeting all other prerequisites necessary for the construction of the new Faculty premises, which would satisfy our needs for conducting basic and secondary/ additional activities.
2. Providing necessary administrative support in the research field, as well as regarding economic cooperation/ collaboration. Furthermore, we would like to encourage both incoming and outgoing mobility of teaching and administrative staff, and for that reason, we would like to employ an Assistant for International Cooperation and Projects.

3. Increasing the number of Faculty book manuscripts/textbooks written by our teaching staff.
4. Upgrading scientific and research equipment by investing into scientific and research laboratories and other equipment, and also into computers and IT equipment, together with encouraging the use of open source computer programs.
5. Encouraging lifelong learning education of our administrative staff, primarily in writing and conducting administrative work related to different projects, especially international ones (Assistant for International Cooperation and Projects, accountants, etc.)
6. The increase of our own assets in the total income of the Faculty (financially sustainable Faculty).
7. Improvement of the waste management strategy by purchasing containers for selective waste disposal.

4. Expected outcomes of the Strategic Scientific Research Programme for the period 2019 – 2023

With regard to the strategic goal of the development plan for the scientific-research and professional work of the FFTOS, we are setting the following goals for the scientific research programme:

Goal: Encouraging the application and implementation of scientific, infrastructural, or professional projects

Outcome: Increased number of applied and approved domestic and international competitive scientific projects

Goal: Continuously increasing the quantity and quality of published scientific papers, especially papers indexed in WoS/CC databases

Outcome: Increased number of published scientific papers in the next five years, especially papers indexed in CC and WoS databases (especially in high-ranked, high-impact scientific journals) and increased citation of papers

Goal: Increasing the number of defended PhD theses

Outcome: Increase in the number of defended doctoral theses in the next five years

Goal: Encouraging professional activities and Faculty services

Outcome: Increased number of implemented analytical methods of interest to the economy and provided services (analysis, consulting, etc.)

Goal: Improving the international recognition of the Faculty, increasing the mobility of students and teachers, and linking research teams and institutions on joint projects

Outcome: Increase in incoming and outgoing mobility of scientists; Increased number of professional projects, as well as scientific and professional papers resulting from the cooperation with the economy and public institutions

Goal: Encouraging the organization of international scientific conferences and summer schools with lecturers from foreign institutions

Outcome: Increase in the number of scientific and professional conferences and summer schools, as well as an increased number of invited foreign lecturers

Goal: Encouraging the cooperation of scientists at the Faculty with other institutions and scientific centres of excellence

Outcome: *The participation of the Faculty as the institution-partner in at least one scientific centre of excellence*

Goal: Improving the cooperation with the economy, public institutions, and the local community

Outcome: *Increased inflow of assigned revenue for scientific-research work*

Goal: Providing administrative support for research and the cooperation with the economy

Outcome: *Increased number of persons employed in project management work*

Goal: Improving research and information equipment

Outcome: *Better equipment for research and student laboratories*

5. Research topics at the Faculty of Food Technology Osijek

The Science Committee of the Faculty of Food Technology Osijek proposes the following **Priority Research Areas of the Faculty of Food Technology Osijek:**

- 1. Development and improvement of the production of high-quality food**
- 2. Food safety and quality**
- 3. Increasing the efficiency of industrial processes and environmental protection**
- 4. Nutrition and lifestyle habits in health protection**

1. Development and improvement of the production of high-quality food

- Development of novel and functional food products and additives;
- Studying the biologically active compounds and product properties during processing and storage of fruit, vegetables, and grains;
- Improvement of procedures for minimal fruit and vegetable processing;
- Development of new modified starches and research into alternative starch modification processes;
- Improvement and standardization of technological processes for traditional cheese production;
- Application of membrane processes in food and beverage production;

- Retention and recuperation of aroma during various processes of food production;
- Development and standardization of the production of wines and fruit wines, and research on the functional and oenological properties of the obtained products;
- Research on the effect of chemical and technological factors on oxidative and rheological properties of fats, oils, and their products;
- Research on the possibilities of improving the nutritional and functional properties of cereal-based products by adding various raw materials with increased biological activity;
- Improvement of the production technology, quality, safety, marketing, and branding of traditional meat products;
- Research on the cryoprotective and cryo-stabilizing action of different additives on fish and meat proteins over the course of freezing and storage;
- Investigation into biologically active compounds present in extracts obtained from plants and food industry by-products and waste;
- Development and implementation of encapsulating processes with the aim of stabilizing and improving the bioavailability of natural bioactive compounds.

2. Food safety and quality

- Development of instrumental methods for food product analysis, for the purpose of: The assessment of nutritional functionality, safety, and quality; the identification of origin; and the identification of authenticity and spurious products.
- Development and application of sensory methods in food quality assessment.
- Development and validation of methods for extraction, isolation, and purification of mycotoxins from various raw materials, foods, and physiological samples (and their detection);
- The study of the effect of fungicide application on mycotoxin occurrence, malting quality, and safety of different raw materials in malt production;
- Studying the application of non-destructive methods in food analysis;
- The interaction of bioactive substances, research on the bioavailability of bioactive secondary metabolites.
- Studying the antimicrobial action of natural compounds and mixtures (essential oils) on selected groups of microorganisms
- Modification of natural and synthetic compounds, and their influence on selected groups of microorganisms important in the food industry and their application.
- Research on plant response (cereals, industrial, and medicinal plants) to abiotic and biotic stress factors in terms of the screening of resistant genotypes and the improvement of the nutritional status of plants, in order to increase the quality, yield, and the nutritional value of products.

3. Increasing the efficiency of industrial processes and environmental protection

- Studying the eco-friendly methods for organic synthesis of biologically active compounds; estimation of bactericidal, antifungal, antioxidant, and antitumor properties of products, as well as the elucidation of the mechanism of action of bioactive components with the use of proteomics;
- Development of green methods of extraction, identification, and isolation of bioactive compounds from different plant materials, and the determination of their biological activity;
- Application of preparative chromatography in the production of purified enzymes, proteins, and active compounds, for the purposes of food, biotechnology, and pharmaceutical industries;
- Studying and monitoring the quality of surface waters and groundwaters, determining the efficiency of the water treatment process used for water for human consumption and the wastewater purification process, determining the physicochemical and microbiological parameters of water quality;
- Studying the field of computer vision and mathematical and computer tools in the field of modelling, optimization, and automation;
- Studying the energy efficiency and economic feasibility of convection dryers;
- Research on the improvement of water efficiency in cooling systems during extraction, and the construction of recirculating cooling water systems,
- Studying the prospects of using various agri-food industry by-products and waste for the production of novel food products and additives;
- Research on the possibilities of implementing agri-food industry waste in all phases of biodiesel production in micro-reactors, with the aim of establishing sustainable biodiesel production.
- Studying the possibilities of the implementation of agri-food industry waste in the production of lignolite enzymes and high-value natural bioactive compounds.
- Biotransformation of phenolic compounds in micro-reactors;
- Bioconversion of lignocellulosic material into high-value animal feed;
- Investigation into different waste lignocellulosic materials as alternative adsorbents for the removal of pollutants from aqueous solutions (waste water);
- Application of selected types of moulds and white-rot fungi for the biodegradation of pollutants originating from the food and chemical industries;
- Research on the application of microbiology in ecological plant cultivation, testing the efficiency of microbiological preparations as biological fertilizers, biological pesticides,

fungicides, herbicides, and insecticides on the yield and quality of raw materials in food production;

3. Nutrition and lifestyle habits in health protection

- Quality analysis of the available food composition data of various products, and their inclusion in the main food composition database. The main goal is the development of a multifunctional on-line food composition database.
- The analysis of functional properties of various products and the effectiveness of dietary supplements, especially plant-based ones, through human studies.
- Food consumption studies on various population groups from Croatia.
- Comparative study of dietary habits across Croatia's regions and a comparison with neighbouring countries.
- Surveys of dietary and lifestyle habits focused on athletes.
- A longitudinal prospective cohort study of mother-child pairs who were recruited during the study on pregnant women, with the aim of determining the role of pregnancy and the environmental factors on the child's growth and development in the later phases of life.
- A survey on the impact of poverty on nutritional and health status of various population groups (especially children) across Croatia.
- Eating disorders in children and adolescents (primarily anorexia nervosa) and fad dieting as a risk factor for health later in life.
- The use of meta-analysis and systematic review methodology to improve recommendations in the field of nutrition, both prevention and treatment, i.e. evidence-based practice in nutrition.
- Nutritional epidemiology studies that assess the relationship between dietary and lifestyle habits, along with other personal characteristics (age, gender), with the risk for various diseases, especially carcinoma, neurodegenerative and gastrointestinal diseases, and thyroid and autoimmune diseases.
- Determining the impact of various chronic diseases (chronic pain, irritable bowel disease) on the psychophysical state and the quality of life, with the analysis of the burden on the healthcare system and the society.
- Infectious diseases surveys from the aspect of food safety (of foods at high risk of contamination, like fresh fruits and vegetables) and the assessment of their role in the aetiology of other diseases like carcinoma.

It should be noted that the above-mentioned priority areas of the Faculty are not final, but are subject to changes and upgrades depending on:

- the financial situation of the Faculty,
- the application and realization of domestic and international scientific and professional projects,
- cooperation with the Economy
- cooperation with other scientific research teams and institutions from the country and abroad.

The Faculty's activities will be focused on maximizing the potential of individual research groups and their specific knowledge, in order to strengthen the co-operation with research teams within the Faculty and the implementation of interdisciplinary research. In line with the possibilities, the Faculty will constantly encourage applications for international and domestic funding sources for scientific and professional projects. Furthermore, it will continue to work on improving the co-operation with researchers and institutions in the Republic of Croatia and beyond. It will also work to improve the co-operation with other sectors, the economy, the local community, and state institutions.

6. Performance indicators for the implementation of the Strategic Research Programme for the period 2019 – 2023

Encouraging the application and the implementation of scientific, infrastructural, or professional projects

Indicator	Target value	Responsible persons	Report	Time
Number and value of scientific projects financed from domestic sources	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Number and value of international projects	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Number and value of the projects funded by the EU	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018

Number and value of professional projects	Growth	Faculty employees	Vice-dean for development and professional work	2019 - 2023 in comparison with 2014-2018
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Continuously increasing the quantity and quality of published scientific papers, especially papers indexed in WoS/CC databases

Indicator	Target value	Responsible persons	Report	Time
Number of published a1 papers	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
The number of published a1 papers in Q1 and Q2 journal quartiles	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Number of quotes per year per scientist	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018

Increasing the number of defended PhD theses

Indicator	Target value	Responsible persons	Report	Time
Number of defended PhD theses	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018

Encouraging professional activities and Faculty services

Indicator	Target value	Responsible persons	Report	Time
Number of implemented analytical methods of interest for the industry	8	Faculty employees	Vice-dean for development and professional work	2022
Number of provided services (analysis, consulting, etc.)	Growth	Faculty employees	Vice-dean for development and professional work	2019 - 2023 in comparison with 2014-2018

Improving the international recognition of the Faculty, increasing the mobility of students and teachers, and linking research teams and institutions on joint projects

Indicator	Target value	Responsible persons	Report	Time
The number of cooperation agreements	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Number of incoming and outgoing mobilities of teaching staff and students of the Faculty	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Number of informative workshops on mobility programmes	Growth	Vice-dean for science	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Number of publications realized with researchers from foreign institutions	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Number of applications submitted and approved in cooperation with foreign institutions	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Development of the course content and the implementation of existing courses in English	Growth	Faculty employees	Vice-dean for education	2019 - 2023 in comparison with 2014-2018
Faculty brochure in English	1	Faculty administration and the heads of the departments	Vice-dean for science	2019
New website of the Faculty	1	Faculty administration and the heads of the departments	Vice-dean for science	2019

Encouraging the organization of international scientific conferences and summer schools with lecturers from foreign institutions

Indicator	Target value	Responsible persons	Report	Time
Number of scientific and professional conferences and summer schools	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018

The number of invited foreign lecturers	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
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Encouraging the cooperation of scientists at the Faculty with other institutions and scientific centres of excellence

Indicator	Target value	Responsible persons	Report	Time
Faculty as a partner institution in a scientific centre of excellence	Cooperation agreement	Faculty administration, Faculty employees	Vice-dean for science	2019 -2023
Number of joint research projects of the Faculty with other partners in scientific centres of excellence	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018

Improving cooperation with the economy, public institutions, and the local community

Indicator	Target value	Responsible persons	Report	Time
Number of cooperation agreements with the economy and the local community	Growth	Faculty employees	Vice-dean for development and professional work	2019 - 2023 in comparison with 2014-2018
Establishing the Committee for Cooperation with the Economy and an adopted action plan	One decision	Faculty administration	Vice-dean for development and professional work	2019
Promotion of professional activities of the Faculty (media, educational workshops, forums, humanitarian actions, etc.)	Growth	Faculty employees	Vice-dean for development and professional work	2019 - 2023 in comparison with 2014-2018

Providing administrative support for research and the cooperation with the economy

Indicator	Target value	Responsible persons	Report	Time
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Number of persons employed in project management work	1	Faculty administration	Dean	2019
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Improving research and information equipment

Indicator	Target value	Responsible persons	Report	Time
Capital equipment quantity	Growth	Faculty employees	Vice-dean for science	2019 - 2023 in comparison with 2014-2018
Computer equipment	Growth	Faculty employees	Vice-dean for development and professional work	2019 - 2023 in comparison with 2014-2018
Infrastructure for e-learning	A functional e-learning system	Faculty administration, head of the IT and computer network	Vice-dean for development and professional work	2019