



Hungary - where quality food and consumers count



"Multi-actor and multidisciplinary approach of development of novel foodstuffs with high added value and scientifically based health-promoting effect in accordance with trends at the global market"

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Hungary in brief



Republic of Hungary

Central and Eastern Europe

Surface: 93.030 km²

Population: 10 197 119

Capital: Budapest

inhabitants: 1 775 203 fő)

GDP: 124 587 million USD

Main Sectors: Info-communication,
Commercial Services, Automobile
production, Tourism, Mechanics,
Agriculture



Food sector of Hungary - Specialities





Food sector of Hungary - Specialities





The Hungarian strategy and the state of the art in agriculture

- Agriculture amounts 3,8 % of the total GDP, while regarding the entire agribusiness 15 %.
- Hungary is the 11th wheat exporter country in the world (2.1 million tones)
- 83 % of the wheat export is directed towards Europe.
- Fruit and vegetable production: 2,5 million tones, 850.000 tones are exported.
- Recent strategy: production of unique foodstuffs with outstanding quality or high added value.
- Growing of premium quality crops, vegetables, as well as bioproducts constitutes a rapidly developing part of Hungary's agriculture.
- Special production, preserving and transporting technologies are required.
- Building up strategical cooperation with rapidly growing countries in Asia, like Uzbekistan.





Scope of Food Science Research Institution

- National Agricultural Research and Innovation Center is the biggest research network in the country.
- Food Science Research Institute boasts a versatile profile in the field of food science and nutrition-related innovations.
- Establishment of collaborations between scientists and entrepreneurs in the sector.
- Boost the knowledge transfer.
- Initiation of innovative, cooperative multiactor projects.



Specific capabilities of our Institute



New functional foodstuffs and adequate technologies:

- Elaboration of foodstuffs of high added value.
- Optimisation of technologies, development of novel food processing methods.
- ReveaStudy of novel, moderate food processing and preservation technologies.
- Determining human benefits, extent of biological utilisation of bioactive compounds.
- Model studies and human clinical trials on impact of healthy foodstuffs.

Origin protection and food authentication

- Investigation of intrinsic and unique parameters of foodstuffs.
- Development of new analytical and biological methods for authentication.
- Setting up of origin protection data base, fingerprinting food components.

Food safety and hygiene systems

- Evaluation of chemical and biological risk factors.
- Setting up food analytical and food safety database.
- Monitoring, control and further development of food safety systems.
- Improvement of consumer's consciousness by public surveys.



Main trends in the field of food production and preservation

Heat convection technologies	Non-heat technologies
UHST, UHT	Irradiation
Aseptic heat treatment	Ultrasound
Cooking in plastic bags (sous-vide)	UV radiation
Infrared heating	Pulsed light
Ohmic heating	High hydrostatic pressure
Radio Frequency heating	Pulsed electric field
Microwave heating – Microwave vacuum drying	



Development of a novel Microwave vacuum drying procedure in NARIC FSRI

• Advantages

- Higher drying rate compared to traditional methods
- Rapid, mild and even heating
- Energy-efficient
- Microbiological stability
- Higher degree of remained nutritional and aromatic components sensitive to oxidation and thermal degradation
- Improved product quality
 - puffy, crunchy texture

Areas of impact

- New dried products
- Accelerate baking, cooking
- Partial or complete thawing of frozen products
- Accelerate drying processes, post-drying
- Mild pasteurization, sterilization





Research of Pulsed electric field in NARIC FSRI

• Advantages

- Short time, high-voltage pulses
- Inactivation of microorganisms by damaging the cell membrane.
- Non-thermal treatment
- Low power consumption
- Continuous operation

• Research activity

- Inactivation of microorganisms
- Investigation of different properties of fruit and vegetable juices





European Union priorities for rural development 2014-2020

- Knowledge transfer and innovation
- enhancing farm viability and competitiveness of all types of agriculture
- promoting processing of agricultural products, risk management in agriculture
- Preserving and enhancing ecosystems
- Promoting resource efficiency and climate resilient economy in agriculture
- Promoting social inclusion, economic development in rural areas
- Cross-cutting objectives of innovation, environment and climate change



Improve Health, Well-being and Longevity ETP Food for Life challenge fits to EU Horizon 2020 structure

Research proposals:

- understanding of the human metabolic energy efficiency including the **human gut microbiota**
- nutritional, sensory and textural needs of the elderly
- **plant protein sources** for the use in **high quality food** early biomarkers for deviation from the norm
- ***in vitro* models for *in vivo* nutritional predictions**
- use of stable isotopes in food and nutrition research (to develop techniques for food labelling; to determine the metabolic fate of nutrient's)
- role of diet in preventing cognitive decline; treatment of low grade inflammation; drug delivery; delivery of health promoting ingredients.
- **reduction of “anti-nutritive” components** in food (allergens; the gluten challenge)



Health and wellness consumers' trend

- Consumers are increasingly looking for **healthier food with reduced sugar**, or fat content. Weight loss is a strong motivating factor
- These products help **overall wellbeing, digestion** and aid a **healthy diet**.
- A growing segment of consumers are concerned with digestion, which shows there is an increasing demand for **fibre-rich foods**, such as whole wheat bread and cereals, and **sour milk drinks with pro/pre biotics**.
- SALUS - a European network to follow-up the salt level of manufactured foods with the aim of **reduction of salt's amount**.



List of topics for possible cooperation:

- Harmonization of food authentication and safety systems.
- Improvement of scientific tools for origin protection.
- Elaboration of up-to-date food hygiene procedures.
- Development of new, portable tools for on-the-site analysis of contaminations, like biosensors.
- Development of special, new, healthy food products
- Elaboration of novel preserving, processing and manufacturing technologies.
- Development of procedures capable of characterising biological utilizations of foodstuffs with high added value.
- Organization of joint food science symposia, workshops, exchange of experts.
- Cooperation with Uzbek agro-food industrial universities, research institutes and other parties interested in elaboration of mutual projects.



Initial points for future Uzbek-Hungarian R&D Cooperation in Agro-food Sector

- Establishment of bilateral scientific, research and development agreements.
- Initiation of mobility grants for scientists facilitated by reports from both Hungarian and Uzbek Academies of Sciences.
- Involving the relevant national authorities to support mutually financed R+D projects.
- Ministries responsible for agriculture should discuss the possible and joint priorities.
- HORIZON 2020, the EU research and development programme may also provide framework for multinational cooperation.



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Thank you for your kind attention. See you in Hungary!

