"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

National Agricultural Research and Innovation Centre
Food Science Research Institute, Budapest
Food sector of Hungary - Specialities
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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 Usbekistan.
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.
• ling 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

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<th>Heat convection technologies</th>
<th>Non-heat technologies</th>
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<td>Cooking in plastic bags (sous-vide)</td>
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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
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 fade 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/prebiotics**.
- 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.
Thank you for your kind attention. See you in Hungary!