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ISTANBUL PROJECT ACADEMY

İTÜ NOVA
TEKNOLOJİ TRANSFER OFİSİ

TTO
Boğaziçi Üniversitesi
Teknoloji Transfer Ofisi A.Ş.

İSTANBULTTO
TEKNOLOJİ TRANSFER OFİSİ

KOÇ ÜNİVERSİTESİ

MİTTO
MARMARA ÜNİVERSİTESİ
İNOVASYON VE TEKNOLOJİ
TRANSFER UYGULAMA VE
ARAŞTIRMA MERKEZİ

YTÜ YILDIZ
TEKNOPARK

ISTANBUL PROJECT ACADEMY

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Horizon Europe Cluster 6:

Food, Bioeconomy, Natural Resources, Agriculture and Environment Brokerage Event

Project Idea / Field of Expertise :

Our research group has specific expertise in **metagneomics**, **metabolomics**, and **bioaccessibility studies**. Also, **the isolation and identification of distinct LAB**, **yeast**, and **mould** strains for industrial purposes. In addition, fingerprint markers of the halal cultured meat can be determined by **FTIR and Raman** combined with chemometrics and artificial intelligence applications and confirmed by using **PCR techniques**.

Organisation Name:

YTU Food Engineering Department

Addressed Topic(s) & Call(s):

HORIZON-CL6-2023-FARM2FORK-01-10:
Eradicate micronutrient deficiencies in the EU
HORIZON-CL6-2023-FARM2FORK-01-20:
EU-Africa Union - food safety
HORIZON-CL6-2023-FARM2FORK-01-13:
Cultured meat and cultured seafood - state of play and future prospects in the EU

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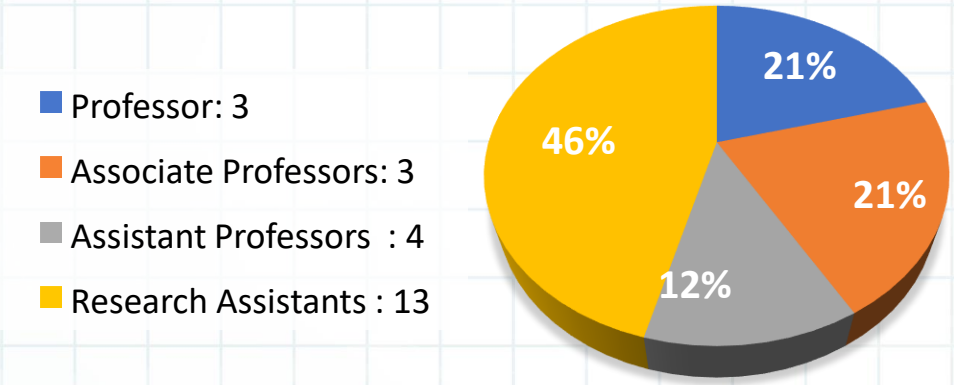
YTU Food Engineering Department

- The Food Engineering Department was established within Yildiz Technical University in 2011.



Many national projects and research articles with high-added value related to the following fields have been carried out by the members of the department.

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SKILLS AND EXPERTISE

- FOOD MICROBIOLOGY
- FOOD PROCESSING
- FOOD BIOTECHNOLOGY
- FERMENTATION TECHNOLOGY
- CEREAL TECHNOLOGY
  EDIBLE OIL TECHNOLOGY
- FUNCTIONAL FOODS
- FOOD RHEOLOGY
- INFRARED SPECTROSCOPY, CHEMOMETRY, RAMAN, CHROMATOGRAPHY-MASS SPECTROSCOPY
- ANTICANCEROGENIC AND CYTOTOXIC ACTIVITY OF BIOACTIVE COMPOUNDS
- NANOTECHNOLOGY IN COLLOIDAL SYSTEMS

YTU Food Engineering Department

PROJECTS

HORIZON-CL6-2023-FARM2FORK-01-10: Eradicate micronutrient deficiencies in the EU

- **Koksel, H.,** Utilization of Cold-Extrusion Process in the Production of Cereal Products with Increased Dietary Fiber and Vitamin B Contents and Antioxidant Activity, TUBITAK and The Korea Research Foundation (KRF) Project No. KORE 106O534.
- **Karadag, A.,** Development of Innovative Mucosa-Attachable Liposomal Hydrogel and Nanoliposomal Film Hybrid Systems for Encapsulation of Food Bioactive Ingredients
- **Arici, M.,** Investigation of the Effect of Sourdough Fermentation on Starch Digestibility, Mineral and Protein Bioaccessibility
- **Simsek, O.,** Extracellular recombinant production and optimization of 4,3 and 4,6-glucan transferases and investigation of their use in bakery products.
- **Dertli, E.,** Production, characterization and evaluation of prebiotic roles of glucansucase-based specific polyoligosaccharides.

HORIZON-CL6-2023-FARM2FORK-01-20: EU-Africa Union - food safety

- **Arici, M.,** Development of a Method to Identify Molds Isolated from Traditional Moldy Cheeses by Fourier Transform Infrared Spectroscopy (FTIR) Technique (2019-2010).
- **Arici, M.,** Investigations on the presence of mycotoxins in table fermented olives and mycotoxin production by some mycotoxigenic molds in olives at different temperatures (2005-2006).
- **Arici, M.,** Presence of fumonisin in maize and maize products, degradation of fumonisin B1 by Lactobacillus isolated from infant faeces. 2001-2003.
- **Arici, M.,** Research on the presence of ochratoxin A (OTA) in barley, malt and beer and the degradation of ota by yeast during brewing (2001-2002).

HORIZON-CL6-2023-FARM2FORK-01-10: Eradicate micronutrient deficiencies in the EU

- **Osman Sagdic**, Development of New Methods for Determining the Source of Gelatin Added to Foods for Normal or Adulterative Purposes
- **Nur Cebi,** Determination of Authenticity of Rose Oil Using FTIR and Raman Techniques
- **Nur Cebi**, Developing a Raman spectroscopy and chemometry-based method for the determination of starch pectin and flour additives in yogurt

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YTU Food Engineering Department

PROF DR HAMIT KOKSEL-EU PROJECTS

MoniQA, Quality and Safety Control Strategies for Food, Towards the harmonisation of analytical methods for monitoring quality and safety in the food supply chain, 34 participants	ICC was Coordinator Hacettepe University was a partner (Türkiye tarafının Yürütücüsü)	EU Sixth Framework Programme	2007–2012
Improving Quality and Safety of Cereals and Cereal Products	Collaboration Project between TUBITAK & Hungarian National Research and Technology Office (Türkiye tarafının Yürütücüsü)	TUBITAK & Hungarian National Research & Technology Office	2009–2011
Utilization of Cold-Extrusion Process in the Production of Cereal Products with Increased Dietary Fiber and Vitamin B Contents and Antioxidant Activity Project No. KORE 106O534	(Türkiye tarafının Yürütücüsü)	TUBITAK and The Korea Research Foundation (KRF)	2006–2009
Investigation of the vitamin B contents of cereal products commonly consumed in Turkey	Project Coordinator	Prime Ministry, State Planning Organization	2006–2008
Investigation of the Physical and Chemical Properties of Oils on the Emulsions Stability by Near Infrared Permeability Technique. Hacettepe University Research Fund, Project No. 06 01 601 602 002.	Project Coordinator	Hacettepe University	2008-2010
Development of new wheat-derived foods of the Mediterranean diet with improved nutritional and health value	Partner	PRIMA	2020-

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Our project idea / expertise

HORIZON-CL6-2023-FARM2FORK-01-10: Eradicate micronutrient deficiencies in the EU”

Specific skills: Our research group has specific expertise in metagneomics, metabolomics, and bioaccessibility studies. We can be part of projects on testing the role of the gut microbiome on specific components of food matrixes such as polyphenols which are vulnerable elements of the diet. Also we can be part of projects to monitor the prevalence of a specific element of human nutrition during digestion as well as during the production of the food material as these components can be easily degraded during the food processing conditions..

The topics to contribute:

- Enrichment of food systems by different techniques in order to assess if the specific element of nutrition can be taken at physiological level (Encapsulation),
- Modification of food structure for modification of release properties and increasing bioavailability of micronutrients,
- Numerical modeling of release kinetics of micronutrients from different food matrix for optimization of food structure depending on the functional properties,
- The extensive microbial fermentation library owned by our group is an excellent resource for microbial gene diversity. Enzymes and metabolites produced by microorganisms can mediate the elimination of non-communicable diseases. For example, with the characterization of innovative microbial enzymes, modification of starch in food systems, elimination of maillard products, removal of toxins can be achieved.

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Our project idea / expertise

“HORIZON-CL6-2023-FARM2FORK-01-20: EU-Africa Union - food safety”

Specific skills: Recent studies revealed the importance of mainly lactic acid bacteria (LAB) strains for the production of novel cereal-based foods of African countries. Mould species can also play roles for the production of these fermented foods. To decrease the formation of the mycotoxins standardisation of the cultures to be used in these fermentations can be crucial. In this regard identification of dominant techno-functional LAB strains as well as non-mycotoxin former mould species can be the method choice. As YTU Food Engineering Department, we have the expertise and capabilities to isolate, identify and grow distinct LAB, yeast and mould strains for industrial purposes. So we can play roles to find novel strains for the production of African fermented foods. Standardisation of the fermentation conditions by using novel LAB and yeast species can result in the degradation or transformation of the mycotoxins if they are formed. Also using protective cultures (especially LAB) can prevent the formation of mycotoxins. Recently microbiome based applications have also become important for the purposes described above. We have also ability on NGS applications to identify the microflora of these fermented foods during their ripening period. This data can also be easily applied for the scale-up purposes as our department has a pilot based production area.

The topics to contribute

- Design tools to improve risk assessment of health risks, including long term risks of mycotoxins. Risk assessment and other evidence should inform the regulatory systems.
- Contribute towards the development of a food safety strategy for Africa, including monitoring and an early warning system (biosensor design)
- Contribute to a better understanding how fermentation can reduce mycotoxin levels in food products.
- Identify solutions and business cases to improve microbiome based approaches such as traditional and new food fermenting, drying and coating processes for reducing food waste and promoting longer shelf life. Develop approaches for scale-up.

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Our project idea / expertise

HORIZON-CL6-2023-FARM2FORK-01-13: Cultured meat and cultured seafood - state of play and future prospects in the EU

Specific skills: Cultured meat is an innovative meat product which is developed as a solution to the sustainability problems worldwide. However, cultured meat is acceptable to Muslims only if the stem cells, medium and scaffold biomaterials are obtained from Halal sources and if the stem cells are sourced from a halal slaughtered animal, and no blood or animal-derived serum is used in the growth process. Besides the contribution of Muslims to the halal food market at the rate of USD 1.17 trillion (2019), fair and equal human rights obligates for clear availability for the halal cultured meat and the reliable source information of cultured meat sold in the markets. In this contex, our research group developed a novel method to determine the source of gelatin added to foods for normal or adulterative purpose. Also, several studies have been conducted such as detection of lard in butter using Raman spectroscopy combined with chemometrics, classification of gelatin gummy candies in relation to the gelatin source using ATR-FTIR and classification and discrimination of bovine, porcine and fish gelatins using FTIR and Raman spectrotrophs. **At this point**, we have the expertise and capabilities to develop new methodologies and techniques for both production and authentication of the halal cultured meat using FTIR and Raman spectrotrophic techniques combined with chemometrics.

Proposed activities for the project:

•In our proposal, an international survey study was planned to determine the consumer perception for cultured meat consumption. The survey will thoroughly investigate the safety risks, religious concerns, ethical aspects and health aspects. The results of the survey will be visualized by using strong statistical techniques.

•In the scope of this proposal, new methodologies will be developed for halal cultured meat production. The fingerprint markers of the halal cultured meat will be determined by using strong fingerprinting techniques such as FTIR and Raman combined with chemometrics and artificial intelligence applications. Obtained results will be confirmed by using PCR techniques.

•New and halal sustainable ingredients will be developed for halal cultured meat production

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THANK YOU...