Developments

Department of Agricultural Economics and Rural Development

Head of Department: Dr. Judit Hegyi PhD

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Department staff

Dr. Rózsa Csatai CSc, associate professor, Dr. Nóra Gombkötő PhD, assistant professor, Dr. Judit Hegyi PhD, associate professor, Dr. Károly Kacz PhD, associate professor, Dr. Sándor Kalmár PhD, associate professor, Dr. Katalin Mezei PhD, associate professor, Dr. Anett Németh-Torkos PhD, assistant professor, Prof. Dr. István Szabó CSc, full professor, Dr. Éva Szalka PhD, associate professor, Dr. Imre Tell CSc, associate professor, Dr. Gergely Teschner PhD, assistant professor, Dr. Szabolcs Troján PhD, assistant professor.

Department Research Capacity

Number of full-time lecturers: 12

Qualified ones: 12

Department Overview (Research)

The Department of Agricultural Economics and Rural Development was named in October 2016. As a result of many re-organisation within the Faculty the Department functioned within the framework of several legal predecessors involving several constellation (these were as follows: Department of Farm Management (since 1954), Department of Business Economics (since 1987), Institute of Farm Economics (since 1996), Institute of Economic Sciences (since 2005), Institute of Business Economics and Management Sciences (since 2009), Institute of Economic Sciences (since 2011).

Main research areas:

- Community supported agriculture
- Human resources in food industry
- Support opportunities of getting employment in labour market
- Role of agricultural Universities/agricultural faculties in regional economic development (science lab)

Research services:
- Economic analysis, evaluation and research of agri-food industry (sectoral/business)
- Revealing of consumer and customer preferences with qualitative and quantitative market research methods
- Preparing and executional supporting of strategic decisions with market research methods
- Solving tasks of work organization, preparation of proposal for rationalization
- Economic calculations, efficiency studies, cost and income calculations

**Department Research Areas**

1. short food supply chains (SFSCs), community supported agriculture
2. agricultural marketing, food marketing
3. economic analysis, efficiency studies
4. labor market research
5. role of agricultural faculties in rural development

**Department of Animal Sciences**

**Head of Department:** Prof. Dr. Agnes Bali Papp PhD

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**Department Staff**

Prof. Dr. Ágnes Bali Papp PhD, full professor, Prof. Dr. Borisz Egri MRANH, full professor, Dr. László Gulyás PhD, associate professor, Dr. Erika Lencsés-Varga PhD, associate professor, Dr. László Pongrácz PhD, associate professor, Prof. Dr. Ferenc Szabó DSc, full professor, Dr Károly Tempfli PhD, assistant professor, Dr. Eszter Zsédelly PhD, associate professor, Kovácsné Prof. Dr. Katalin Gaál CSc, professor emerita, Prof. Dr. János Schmidt DSc, MHAS, professor emeritus, Béla Burkus, assistant, Hajnalka Thurner Lengyelné, research assistant, Barbara Tóth, research assistant, Katalin Wurm Némethné, assistant, Csaba László Farkas, PhD student, Róbert Hegedűs, PhD student, Emil Balázs Herceg, PhD student, Róbert Kádár, PhD student, Barbara Kiss, PhD student, Gustav Ingo Struck, PhD student, Andor Szabados, PhD student, Vivien Szabados, PhD student, Klaudia Szalai, PhD student, Orsólya Vida, PhD student.

**Department Research Capacity**
Number of full-time lecturers: 7

Qualified ones: 7

Number of students taking part in PhD study: 10

Department Overview (Research)

Applying the up to date molecular genetic methods in animal husbandry: there are numerous methods to raise the efficacy of production. With the help of these methods the proportion of the desirable allele (which possesses a better productivity-rate) could be increased in the livestock. While examining DNA polymorphism in different farm animals (cattle, pork and poultry) we are enabled to construct a certain feed mixture by which the genetically determined protein and fat metabolism genes of animal population could be influenced in order to meet the criteria of human nutrition.

To decrease the harmful effects of climate change examinations were taken on the livestock, such as heat sock and stress protein genes. To enrich the appropriate alleles in the stocks hereby reduce the caducity and wrong quality animal number.

Healthy (bio) food production: The use of herbs and herbal medicines in conscious human nutrition is getting more and more significant. The use of herbal medicine in animal feeding could elevate the level of the livestock’s health protection (stress decreasing and regeneration of the hepatic state) also that of the efficiency of production, nutritional value and taste of certain products (meat, milk and eggs), hence the agents of the herbs fed to the stock are selected in them. The presence of these agents can be proved by analytical methods. Examining the positive influence of herbal supplementation on the digestion system by the genetic examinations on the changes in the compound of bacteria of the intestinal flora.

Pork as a model animal of various human diseases: the similarity in human and porcine anatomy and especially that of the digestive system enables us to model the inflammatory organism, pathogen bacteria in intestinal flora, and these results could also be well adopted in human medicine.

Department Research Areas

1. to apply modern genetic methods in animal husbandry, to elevate the efficiency of production and to examine of various genes which are important for the improvement in the value of certain products
2. to compare native and modern poultry species, to examine genes that are important in meat production
3. to examine genes that influence racing efficiency and behavior of horses
4. use of herbs in animal feeding
5. pork as a model animal of various human diseases

Department of Biosystems and Food Engineering

Head of Department: Dr. Attila J. Kovács PhD

Contact:
Department Staff

Dr. Attila J. Kovács PhD, associate professor; Dr. Enzsől Erzsébet PhD, associate professor; Dr. Gábor Milics PhD, associate professor; Dr. Anikó Nyéki PhD, assistant professor; Imre Tolner, lecturer; Szabrina Tihanyi, secretary; István Kovács, technician; Ákos Dakos, PhD student, Tibor Horváth, PhD student, Attila Pörneczi, corr. PhD student.

Prof. Dr. Miklós Neményi DSc, full professor, MHAS; Dr. Károly Kacz CSc, professor emeritus,

Department Research Capacity

Number of full-time lecturers: 5

Professor emeritus: 2

Qualified ones: 6

Number of students taking part in PhD study: 3

Department Overview (Research)

The research activity of our department is diverse. It includes data collection, sensor techniques and sampling methods needed for precision agriculture and site-specific plant production activities. These complemented with UAV (unmanned aerial vehicles or drones) techniques and remote sensing. These results contribute to the examination of the effects of climate change in connection to the development of decision support models (e.g.: DSSAT). Examinations were carried on utilization of bio-based materials. The usability of oil-seeds and cereals (starch) as raw-materials for biofuels (bio-diesel and bio-ethanol respectively) production are compared and tested. Research activities were carried out on development of algae bioreactors and the conditions and parameters of algae production. Examinations of starch based plastics were also carried out. Food technological and food unit operational related researches include drying test of different commodities (such as apple chips) and heat and mass transfer (FE) modeling of the processes. In addition to the optimization of alcoholic fermentation (e.g. the effect of microwave pre-treatment) were also in the focus of our interests. Geostatistical analysis using the software ArcGIS. Comparing different interpolation methods. Developing of software using Visual Basic. Data analysis applying multivariate statistical methods using the software Statistica.

Department Research Areas

1. technical background and sensors in precision plant production
2. food unit operation in food engineering (drying, fermentation)
3. climate change research
4. processing and testing of bio-based materials (bio-plastics, bio-fuel)
5. development of photo-bioreactors (algae projects)
6. comparing different calculation methods of the evapotranspiration
7. evaluation of the crop yield using a successive approximation method

Department of Food Science

Head of Department: Dr. Erika Hanczné Lakatos PhD

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Department Staff

Prof. Dr. László Varga PhD, full professor, Dr. Erika Hanczné Lakatos PhD, associate professor, Dr. Zsolt Ajtony PhD, associate professor, Dr. Balázs Ásványi PhD, associate professor, Dr. László Farkas PhD, associate professor, Dr. Viktória Kapcsándi PhD, assistant professor, Dr. Varga Ágnes PhD, senior lecturer, Fábri Zsófia Nóra, assistant lecturer, Tihanyi-Kovács Renáta, assistant research fellow, Ankhelyi Istvánné, laboratory technician, Mártá Varga Némethné, department engineer Tihamérné Csete, assistant, Evelin Korcz, PhD student, Judit Molnár, PhD student, Rita Székelyhidi, PhD student, Zoltán Tudós, PhD student, Mihály Zakar, PhD student, Beatrix Sik, PhD student, Babett Greff, PhD student

Department Research Capacity

The number of full-time teacher-researcher: 9

Qualified ones: 7

The number of doctoral students participating department: 7

Department Overview (Research)

The direct predecessor of the Department of Food Sciences, i.e. the Institute of Food Sciences, was founded in 1994, comprising three departments as follows: Department of Food Technology and Microbiology, Department of Dairy Science, and Department of Food Quality Assurance. For almost two decades, an EU-accredited Food and Water Testing Laboratory was also operating in the Institute, which was the first such laboratory in Eastern and Central Europe at the time of its establishment.

Our major research areas include the development and production of (1) health-promoting (a.k.a. functional)
foods such as probiotic products and (2) preserved foods manufactured with mild preservation methods.

**Department Research Areas**

1. development of functional fermented milks containing various biologically active substances
2. genomic characterization of exopolysaccharide production by lactic acid bacteria
3. comparative evaluation of conventional plating methods used for selective enumeration of lactic acid bacteria and bifidobacteria and their application in microbiological quality control of fermented milks
4. food products manufactured by sous-vvid technology
5. stimulating the growth rate and fermentation activity of yeast strains
6. microbiological examination and physicochemical analysis of food raw materials and technology development

**Department of Plant Sciences**

**Head of Department:** Dr. Zoltán Molnár PhD

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**Department Staff**

Soil Management Unit: Prof. Dr. Rezső Schmidt CSc, full professor, Dr. Dóra Beke PhD, associate professor, Genetics and Plant Breeding Unit: Dr. Péter Szabó PhD, associate professor, Péter Póth, assistant researcher, Horticultural Unit: Dr. József Iváncsics PhD, associate professor, Pólyáné Dr. Borbála Pólyáné-Hanusz PhD, associate professor, Crop Production Unit: Dr. István Gergely PhD, associate professor, Dr. Ferenc Petróczki PhD, associate professor, Dr. János Pap, assistant professor, Prof. Dr. István Késmárki, professor emeritus, Plant Biology Unit: Prof. Dr. Vince Ördög DSc, full professor, Dr. Zoltán Molnár PhD, associate professor, Plant Protection Unit: Dr. Anikó Farkas PhD, associate professor, Dr. Gábor Kukorelli PhD, assistant professor, Dr. Rita Ledóné-Ábrahám PhD, associate professor, Dr. Lajos Németh, research fellow, Prof. Dr. Péter Reisinger DSc, professor emeritus, Péter Bálint, research assistant, Ildikó Lobik, technician, Damjánne István Miksó, assistant, Anita Súlyné-Máté, assistant, Georgina Takács, research assistant, Péterné Takács, assistant, Ildikó Kéri-Schmidthoffer, PhD student, Nóra Makra, PhD student, Zoltán Szántó, PhD student.

**Department Research Capacity**

The number of full-time teacher-researcher: 14

Qualified ones: 11
The number of doctoral students participating department: 3

**Department Overview (Research)**

Soil isolated microalgae and cyanobacteria have been examined for more than two decades mainly for agricultural purposes. For the experiments, studies and measurements the Department has chemical and microbiological laboratories as well as special laboratories for maintenance and cultivation of microalgae strains. The special strain culture collection (Mosonmagyaróvár Algal Culture Collection, MACC) contains about one thousand strains which is unique in Hungary. All together 432 different strains can be cultivated under controlled temperature and light conditions in 3 algal culture rooms at the same time. Using these rooms, numerous comparative bioassays and algal experiment can be performed simultaneously.

The Department has been dealing with plant cell and tissue cultures since 1986. Several strains of the MACC proved to have significant plant hormone (auxin, cytokinin) production thus they may be suitable to influence the growth and development of tissue cultured plants. Our goal in this field is the additional analysis of further strains of our algae collection on cell and tissue cultures of plant species which are difficult to be cultivated.

The 400 ha-s educational farm of the Faculty is supervised by the Department of Plant Sciences where we first of all carry out research with special regard to the development of the production technology of cereals covering the testing of varieties, investigation of plant protection and soil management methods and fertilization experiments.

Within plant protection research we put a special emphasis on the field of herbology. Recently the most promising methods are related to precision agriculture that exploit possibilities offered by geoinformatics and sensor technology resulting in the elaboration of environmentally friendly technologies using low rate of chemicals.

Horticultural research carried out at the Department mostly deals with the pear production of the country covering the study of varieties and the management of orchards.

Due to the depletion of plant nutrient sources and the need of efficient recycling the inclusion of wastes and secondary raw materials will become more and more important element of plant nutrition technologies. At the same time, it has to be done with special care to the environment safeguarding the interests of nature and the priority of environmental aspects.

**Department Research Areas**

1. effect of micro-organisms (occurring naturally or dispersed artificially in plant/soil-systems) on soil fertility and their impact on plant growth and development
2. efficacy of microalgae biomass against plant pathogenic fungi
3. volatile organic compounds from microalgae and cyanobacteria biomass against pests
4. study of in vitro micro-propagation of recalcitrant plants
5. development of plant production technologies
6. development of plant protection technologies (plant pathology, entomology, herbology)
7. horticultural research with special regard to fruit production
8. utilization of secondary raw materials in crop production
Department of Water and Environmental Sciences

Head of Department: Dr. Renátó Kalocsai PhD

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Department Staff

Dr. habil. Renátó Kalocsai PhD, associate professor, head of department, Dr. Flórián Bakcsa CSc, associate professor, Dr. Gábor Koltai PhD, senior research fellow, Prof. Dr. Gyula Pinke PhD, full professor, Ottília Schiller, lecturer, Prof. Dr. Pál Szakál CSc, full professor, Dr. Gyula Tóásó PhD, associate professor, Dr. Zoltán Varga PhD, associate professor, Prof. Dr. Zoltán Varga-Haszonits DSc, professor emeritus, Dávid Vasas, laboratory technician, Eszter Rózsa, PhD student, Károly Tatárvári, PhD student, Attila Péntek, PhD student, Péter Puss, PhD student, Boglárka Lipótová, PhD student, Katalin Nagy, PhD student, Katinka Blazek, PhD student, Tamás Kolejanisz, PhD student, Ákos Dokos, PhD student, Viktória Vona, PhD student, Andor Endre Tóth, PhD student

Department Research Capacity

Number of full-time lecturers: 8
Qualified ones: 7
Number of students taking part in PhD study: 11

Department Overview (Research)

The research of the Department of Water and Environmental Sciences include analysis of many abiotic (physical and chemical properties of the soil, meteorological factors, hydrological conditions) and biotic (weeds, crops, pests) components of the complex environment systems. Due to the diverse scientific skills and interests of department staff it is possible to examine the arising problems in multidisciplinary approach. Another main research activity of the department is the agricultural utilization of industrial waste. The goal is to extract - as complex compounds - the copper and zinc-containing waste which is resulted in many areas of industry and utilize those as nutrients for plants. The objective is the production of high quality, functional food. Animal manure from waste water sludge is composted and its composition is optimized. Production of selenium-enriched mushroom for nutritional purposes is carried out as well.

Department Research Areas
1. weed surveys
2. study of the correlations between soil testing results and the composition of cultivated plants
3. monitoring type fauna studies and ecological condition survey of macroinvertebrates in different types of habitats, and plant protection studies concerning on pests
4. study of the relationship between groundwater, soil moisture, weather and land use
5. research on the effect of climatic variability on cultivated crops and farm animals
6. development of environmental information system for agricultural decisions
7. waste recycling, composting
8. investigation of unwanted chemical element and trace element content of fish sticks, feeding stuffs, feed materials and fish feed
9. comparative analysis of the content of basidium fungi from different production sites

Recent Publications of the Departments (in English, German, 2017)

Department of Agricultural Economics and Rural Development


Department of Animal Sciences

E Kovács, S Mitro, K Tempfli, P Zenke, Á Maróti-Agóts, L Sáfár, Á Bali Papp, A Gáspár: A specific selection programme is required in the autochthonous Cikta Sheep which is endangered by own frequent ARQ prion haplotype. LANDBAUFORSCHUNG 67: (2017)


Department of Biosystems and Food Engineering

Kovács Attila:

Some application of infrared thermo-camera from agricultural basic research to testing grain dryers

In: Farkas István (szerk.)

23rd workshop on energy and environment book of abstracts . 32 p.


4. Milics G, Kovács A J, Deákvári J, Szalai K D, Pörneczi A, Fülöp Sz:

Advances in Remote Sensing applications in site-specific plant production

In: Nyéki Anikó, Kovács Attila József, Milics Gábor (szerk.)

Towards sustainable agricultural and biosystems engineering. 407 p.


Milics Gábor, Kovács Attila J, Pörneczi Attila, Nyéki Anikó, Varga Zoltán, Nagy Viliam, Lichner Lubomír, Németh Tamás, Baranyai Gábor, Neményi Miklós:

Soil moisture distribution mapping in topsoil and its effect on maize yield


Nyéki A, Milics G, Kovács A J, Neményi M:

Effects of Soil Compaction on Cereal Yield: A Review


Nyéki A É, Mesterházi P Á, Deákvári J, Szalay K, Kalmár J, Neményi M:

Determining the correlation between soil structure and spectral characteristics for decision support in precision agriculture

In: Nyéki Anikó, Kovács Attila József, Milics Gábor (szerk.)
Tolner I T , Ambrus B , Szalay K D:

Software base system model, ANSYS Fluent of developed bubble column (Air lift) Tubular photobioreactor

In: Nyéki Anikó , Kovács Attila József , Milics Gábor (szerk.)

Towards sustainable agricultural and biosystems engineering. 407 p.
(ISBN:978-615-5776-03-8)

Department of Food Science

Lakatos E, Neményi M, Kapcsándi V:

Effect of microwave treatment on fermentation process

In: Nyéki Anikó, Kovács Attila József, Milics Gábor (szerk.)

Towards sustainable agricultural and biosystems engineering. 407 p.
(ISBN:978-615-5776-03-8)

Molnár J, Ásványi B, Varga L:

Vitaminadagolás hatása élesztőgombák szaporodási kinetikájára (Effect of vitamin supplementation on growth kinetics of yeasts)

ACTA AGRONOMICA ÓVÁRIENSIS 58:(1) pp. 60-72. (2017)

Nagy P, Fábri Zs N, Varga L, Reiczigel J, Juhász J:

Effect of genetic and nongenetic factors on chemical composition of individual milk samples from dromedary camels (Camelus dromedarius) under intensive management

Gabriella Dravecz, Nikoletta Laczi, Zsolt Ajtony, László Bencs:

Solid sampling determination of Pb, Cd and Cr in black tea leaf by high resolution continuum source graphite furnace atomic absorption spectrometry

In: Allessandro D'Ulivo (szerk.)

Book of abstracts of the 9th Euro-Mediterranean Symposium on LIBS (EMSLIBS) and Colloquium Spectroscopicum Internationale (CSI) XL. 597 p.


M Kovács, O Dóka, D Bicanic, Zs Ajtony:

Application of laser-based photoacoustic spectroscopy and colorimetry for quantification of anthocyanin in hard boiled candy


Nagy P, Fábri Zs N, Varga L, Reiczigel J, Juhász J:

Effect of genetic and nongenetic factors on chemical composition of individual milk samples from dromedary camels (Camelus dromedarius) under intensive management


Székelyhidi Rita:

Analysis of the aroma chemicals of ten different herbs using HS-SPME-GC-MS technique


Department of Plant Sciences

Domonkos Zs; Szabó-Szigeti V; Farkas A; Pinke Gy; Reisinger P & Tóth P (2017): Spread of common ragweed (Ambrosia artemisiifolia L.) on arable land in the Zitny Ostrov. Journal of Central European Agricultur 2017, 18(1): 29-41., ISSN 1332-9049

Makra N; Gell G; Juhász A; Soós V; Molnár Z; Órdög V & Balázs E (2017): Molecular characterization of Nostoc and Anabaena microalgae isolates. 8th Symposium on Microalgae and Seaweed Products in Plant/Soil-systems. 26-27 June. p: 32


Stirk WA; Aremu AO & Ördög V (2017): Can nitrogen stress be used to induce the accumulation of therapeutic compounds in microalgae? Phycologia, 56(4): 180-181.

ISSN: 0031-8884


Balázs E; Makai Sz; Kiss T; Maróti G; Makra N; Ördög V & Soós V (2017): The draft genome of a high lipid content Scenedesmus sp. (strain MACC-401) microalgae. 8th Symposium on Microalgae and Seaweed Products in Plant/Soil-systems. 26-27 June. p: 28.


Ördög V; Bálint P; Németh L & van Staden J (2017): Effective microalgae against fungal plant pathogens. 8th Symposium on Microalgae and Seaweed Products in Plant/Soil-systems. 26-27 June. p: 44.


Ábrahám R; Hrabovszky E & Szénási Á (2017): Thrips species associated with gladiolus. 5th Symposium on Palaearctic Thysanoptera Cracow 26-29, September.

Szénási Á; Orosz Sz; Ábrahám R & Jenser G (2017): Thysanoptera species collected by suction trap in Hungary. 5th Symposium on Palaearctic Thysanoptera Cracow 26-29, September.


Department of Water and Environmental Sciences

Tóth B, Kúsz N, Bózsity N, Zupkó I, Csizmadia V, Pinke G, Hohmann J, Vasas A:
Phytochemical and pharmacological investigation of Sideritis montana L.


Tóth Barbara, Kúsz Norbert, Forgo Peter, Bózsity Noémi, Zupkó István, Pinke Gyula, Hohmann Judit, Vasas Andrea:

Abietane diterpenoids from Sideritis montana L. and their antiproliferative activity