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BOOK OF ABSTRACT

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Maryam AHMADI[1], Bogdan Ioan PEȚ[1,2], Darius Octav CREȚU[2], Sara Van-BEYLEN[2] Iulia Alida VASILOIU[2], Ionela Vanesa ZAHARIA[2], Mirela AHMADI[1*]

[1]University of Life Sciences „King Mihai I" from Timisoara, Faculty of Bioengineering of Animals Resources, Department Biotechnology;
[2]University of Medicine and Pharmacy „Victor Babes" Timisoara, Faculty of Dental Medicine, B-dul Revoluției din 1989, Timisoara-300070, Romania
[*]*Corresponding author's email: mirelaahmadi@usvt.ro*

Abstract
Neurodegenerative and cognitive disorders, such as Alzheimer's disease, Parkinson's disease, and mild cognitive impairment, represent a growing global health challenge due to their increasing prevalence and lack of effective early diagnostic tools. Conventional clinical and neuroimaging assessments often detect these conditions only after irreversible neuronal damage has occurred. Recent advances in biotechnology have opened new avenues for early and precise molecular diagnosis, enabling the detection of pathological changes long before clinical symptoms emerge. This review explores the current landscape of biotechnological innovations for the early detection of neurodegenerative and cognitive disorders. Key approaches include genomics and transcriptomics for identifying genetic and epigenetic risk markers, proteomics and metabolomics for profiling disease-specific molecular signatures, and the use of nanotechnology and biosensors for rapid, point-of-care diagnostics. Additionally, CRISPR-based molecular assays, liquid biopsy techniques, and artificial intelligence-driven multi-omics integration are transforming diagnostic precision and accessibility. By linking molecular findings with cognitive and behavioral assessments, these technologies provide powerful insights into disease mechanisms and potential therapeutic targets. Despite challenges in standardization, validation, and ethical implementation, biotechnological advances hold immense promise for early intervention, personalized medicine, and improved cognitive health outcomes.
Keywords: biotechnology, neurodegenerative disorders, cognitive disorders.

2 Challenges and perspectives in plant growth under microgravity conditions

Aryan AHMADI[1], Ioan PEȚ[1], Dorel DRONCA[1], Mirela AHMADI[1*]

[1]*University of Life Sciences „King Mihai I" from Timisoara, Faculty of Bioengineering of Animals Resources, Department Biotechnology, e-mail: aryan.ahmadik@gmail.com*

* *Corresponding author's email*: mirelaahmadi@usvt.ro

Abstract
As space agencies and private ventures move toward long-duration missions and extraterrestrial colonization, the need for sustainable life support systems becomes increasingly critical. Plants offer a multifunctional solution, providing oxygen regeneration, food production, CO_2 absorption, and psychological benefits. However, growing plants in microgravity presents a unique set of challenges that compromise their development, physiology, and productivity. This review synthesizes current findings on plant responses to microgravity, with emphasis on altered gravitropism, disrupted fluid dynamics, changes in gene expression, and oxidative stress. We highlight key insights from International Space

Station (ISS) experiments, including the VEGGIE and Advanced Plant Habitat systems, and the use of *Arabidopsis* as a model species to study molecular responses to spaceflight. Biotechnological interventions – ranging from genetic engineering and CRISPR-based genome editing to synthetic biology and microbiome engineering – are examined as promising strategies to overcome microgravity-induced constraints. Additionally, the paper discusses the integration of smart controlled-environment agriculture (CEA) systems and AI-driven hydroponics in closed life-support ecosystems. Looking forward, we outline research priorities such as multi-generational plant growth, long-term radiation effects, and in-space gene editing capabilities. The review concludes with a perspective on how innovations in space agriculture may translate into resilient and efficient agricultural practices on Earth, particularly in extreme or resource-limited environments.
Keywords: biotechnology, plants, microgravity.

3 External morphometric assessment of a 1.5-year-old sterlet (*Acipenser ruthenus*) population, reared in a recirculating aquaculture system

Mădălina ANDREI-CIOABĂ[1], Alexandru-Dorian MICŞESCU-BENGHIA[1], Adrian FILIPESCU[1], Sandra Antonia MIHAILOV[1], Adrian GROZEA[1*]

[1] University of Life Sciences „King Mihai I" from Timişoara, Faculty of Bioengineering of Animal Resources,, e-mail: madalina.andreicioaba.fbira@usvt.ro

* *Corresponding author's email*: adriangrozea@usvt.ro

Abstract
The sterlet (*Acipenser ruthenus*), one of the smallest species within the Acipenseridae family, is a freshwater sturgeon of significant ecological and economic value. Its rapid growth rate, early maturation, and high-quality meat are the main factors that have led to the widespread cultivation of this species in numerous fish farms, particularly those practicing intensive rearing in recirculating aquaculture systems (RAS). Rearing sterlet under controlled conditions is also considered a sustainable approach to the conservation of natural populations, as fish farms can provide biological material for restocking programs. The main objective of this study was to evaluate the external morphometric characteristics of a 1.5-year-old sterlet population reared in a recirculating aquaculture system. To achieve this, morphometric measurements were carried out on 30 sterlet specimens of 1.5 years of age, reared exclusively under RAS conditions at the „Pădurea Verde" Fish Farm, part of the Didactic Station of Timişoara. The recorded data were statistically processed and used to determine the main body indices describing the population's conformation, proportionality and condition. In addition, correlations among the principal morphometric traits were analyzed and interpreted. The results revealed a harmonious body development and low variability within the analyzed group, specific to RAS rearing conditions where environmental parameters and feeding are strictly controlled. The results also contribute to a better understanding of the morphometric particularities of sterlet reared under intensive conditions and provide a scientific reference framework for future studies on the growth dynamics of this species.
Keywords: morphometry, body indices, correlations, RAS

4 Advanced analytical techniques applied in cow milk metabolomics

Adina-Mirela ARITON[1]*, Silviu-Ionuț BORȘ[1], Ioana POROȘNICU[1], Vasile VINTILĂ[1], Elena UNGUREANU[2]

[1]*Research and Development Station for Cattle Breeding Dancu, Iasi, Sos. Iasi - Ungheni No. 9, Romania*
[2]*"Ion Ionescu de la Brad" Iași University of Life Sciences, Faculty of Horticulture, Department of Exact Sciences, Mihail Sadoveanu Alley, no.3, Romania*

* *Corresponding author's email*: amariton@yahoo.ro

Abstract
Milk metabolomics provides a comprehensive analysis of the biochemical content of cow's milk, revealing both the animal's physiological condition and the quality of the end product. Through the identification and quantification of low-molecular-weight metabolites, such as amino acids, fatty acids, sugars, and organic acids, metabolomics enables the detection of biomarkers associated with mastitis, nutritional imbalances, and milk authenticity. The establishment of reliable metabolic profiles relies on advanced analytical techniques, including nuclear magnetic resonance spectroscopy and liquid or gas chromatography coupled with mass spectrometry. This study synthesizes and critically reviews recent research on bovine milk metabolomics employing these state-of-the-art methodologies, aiming to elucidate the biochemical diversity and metabolic complexity underlying milk composition.
Keywords: milk metabolomics, cow, spectrometry, chromatography, biomarkers.

5 UV–Vis characterization of aqueous plant extract mixtures with potential gastrointestinal applications in calves

Adina-Mirela ARITON[1]*, Silviu-Ionuț BORȘ[1], Ioana POROȘNICU[1], Vasile VINTILĂ[1], Elena UNGUREANU[2]

[1]*Research and Development Station for Cattle Breeding Dancu, 707252, Iasi, Iasi - Ungheni Alley No. 9, Romania*
[2]*"Ion Ionescu de la Brad" Iași University of Life Sciences, Faculty of Horticulture, Department of Exact Sciences, Mihail Sadoveanu Alley, no.3, Romania*

** Corresponding author's email: amariton@yahoo.ro*

Abstract
Gastrointestinal disorders are common in neonatal calves, leading to impaired growth, increased mortality, and higher veterinary costs. Phytogenic compounds, especially aqueous plant extracts, are gaining attention as natural alternatives due to their antimicrobial, antioxidant, and anti-inflammatory properties. In this study, mixtures of aqueous extracts from medicinal plants traditionally used for gastrointestinal protection were prepared and characterized using ultraviolet–visible (UV–Vis) spectroscopy. The spectra revealed absorption bands associated with phenolic compounds, flavonoids, and other secondary metabolites. These results demonstrate the potential of phytogenic extracts to

protect calves against gastrointestinal issues and highlight UV-Vis spectroscopy as a reliable method for preliminary chemical assessment.
Keywords: calves, plant extracts, polyphenols, UV–Vis spectroscopy, prevention.

6 Interbreeds differences in Bovine semen quality characteristics before and after cryopreservation

Sara Ataei-Nazari[1], Filip Benko[1], Michal Ďuračka[2], Peter Ivanič[3], Eva Tvrdá[1,4*]

[1]Institute of Biotechnology, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2 – 94976 - Nitra, Slovakia, sara.ataeinazari@uniag.sk
[2]AgroBioTech Research Centre, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2 – 94976 - Nitra, Slovakia, filip.benko@uniag.sk
[3]Slovak Biological Services a.s., Breeding station in Lužianky - 951 41 - Lužianky, Slovakia, michal.duracka@uniag.sk
[4]Chair of Animal Breeding and Biotechnology, Institute of Veterinary Medicine and Animal Sciences, Estonian University of Life Sciences, Kreutzwaldi 62 – 51006 - Tartu, Estonia, eva.tvrda@uniag.sk

** Corresponding author: eva.tvrda@uniag.sk*

Abstract
Semen from different *Bovine* breeds and also individuals in an especial *Bovine* breed was shown to vary in sperm quality characteristics and subsequently cryo-resistance. Defining these differences for further exploring the underlying mechanisms can be acquired as a strategy to improve semen parameters responsible for cryopreservation resistance. The current experiment was conducted to evaluate the semen parameters in Holstein (dairy breed), Simmental (dairy and meat dual-purpose) and Limousin (meat breed) breeds before and after cryopreservation. Semen samples were collected from 5 bulls from each breed. The computer-assisted sperm analysis (CASA) was used to evaluate the motility parameters including total and progressive motilities and secondary kinematic parameters including path velocity, linear velocity, curvilinear velocity, lateral amplitude of head displacement, beat cross frequency, straightness and linearity in fresh and post-thawing semen samples. Data were analysed by the general linear model (GLM) procedure of SAS software in a complete randomized design. Least-square means (LSM) were computed and tested for differences by the Tukey's test. Difference between least-squared means was significant at $P < 0.05$. Fresh semen parameters were not affected by the type of species, whereas there were some post-thawing differences in semen quality characteristics. Post-thawing total and progressive motilities were highest in Holstein semen fallowed by Simmental and Limousine breeds. Moreover, progressive velocity was highest, medium and lowest respectively in Holstein, Simmental and Limousine breeds. The results from the current demonstrate that the semen from Holstein as a dairy breed has more satisfactory quality characteristics comparing to other two breeds which can be critical in fertility and conception rate and the sperm cells of this breed are more resistant to cryopreservation comparing to Simmental and Limousine breeds. Further research would be warranted to explore the underlying mechanisms responsible for this superior quality parameters to improve the strengths and mitigate the weaknesses.
Keywords: Breed, Cryo-preservation, kinematic parameters, Sperm quality.

This study was supported by the EU NextGeneration EU through the Recovery and Resilience Plan for Slovakia under the project no. 09I03-03-V04-00483.

7 Preliminary spatial assessment of the relationship between artificial releases and the current distribution of the Grey Partridge (*Perdix perdix* L.) in Hungary

László István BEIER [1], Ferenc JÁNOSKA [2*]

[1] University of Szeged, Faculty of Agriculture, Department of Animal Sciences and Wildlife Management, Hungary e-mail: beier.laszlo.istvan@szte.hu
[2] University of Sopron, Faculty of Forestry, Institute of Wildlife Management, Hungary e-mail: janoska.ferenc@uni-sopron.hu
** Corresponding author's email: janoska.ferenc@uni-sopron.hu*

Abstract
The Grey Partridge (*Perdix perdix* L.) has suffered a long-term decline across Europe, with population reinforcement through captive-bred releases becoming a widespread management tool. In Hungary, the ecological role and spatial consequences of such practices remain insufficiently documented.
This study presents a preliminary spatial assessment of the relationship between artificial release sites and the present distribution of *P. perdix*. Locations of past and recent releases were georeferenced and compared with verified occurrence records from the Hungarian Ornithological and Nature Conservation Society (MME). Spatial overlay and basic density analyses in QGIS revealed a notable geographic overlap between release areas and recent observations. A moderate positive correlation between the two datasets suggests that artificial releases may considerably shape the current pattern of free-ranging populations.
These findings, while preliminary, highlight the need for more detailed temporal and ecological analyses to clarify the contribution of reintroduced individuals to the persistence of wild populations. The results provide a foundation for future quantitative studies and management evaluation in Hungarian agricultural landscapes.
Keywords: *Perdix perdix*, reintroduction, GIS, wildlife management, Hungary, spatial analysis

8 Effect of the level of incorporation of *Leucaena leucocephala* and *Tithonia diversifolia* on the nutritional value of fish pellets

Bienvenu FOGANG ZOGANG [1*], Zeinabou BOUBAKARY[2]

1 University of Ngaoundere, University Institute of Technology
2 University of Ngaoundere, National School of Agro Industrial Sciences

** Corresponding author's email: fobiezogang@yahoo.fr*

Abstract
The present study on the effect of the incorporation of spent grains and leaves of *Tithonia diversifolia* and *Leucaena leucocephala* on the food value of pellets for fish was carried out in the Food Engineering and Technology, and Chemical Engineering laboratories, during the period from May to July 2023. The main objective supported by this work is a contribution to the valorization of the industrial effluent that is the spent grain and the leaves of legumes with a view to reducing the production costs of fish feed. To achieve this, the following methodology was adopted. At first it was a question of harvesting and drying the fresh leaves of *Tithonia diversifolia* and *Leucaena leucocephala*. Subsequently, using Excel VBA software, we were able to generate nine (9) iso-energy formulas. In a third step, it was necessary to formulate the

pellets themselves, carry out bromatological and rheological analyzes and finally carry out a profitability study. From this approach, it emerges that the protein, lipid and crude cellulose contents of the dried leaves of *T. diversifolia* and *Leucaena leucocephala* were respectively: 26.63g/100g DM and 32.15g/100g DM; 3.93g/100g DM and 4.36 g/100g; then 7.19 % and 9.47 %) dry matter; (31.07 - 37.19 g/100gMS) ash content; (8.93 - 13.59g/100gDM) for the lipid content; (21.02 – 34.23g/100gDM) for protein content. While the energy parameters oscillate between (21.8 -38.88g/100gDM) for the carbohydrate content, and (319.19-320.68 Kcal/100g) for the energy value. At the end of this work, it emerges that the P2 pellet fulfilled as many criteria as possible for the choice of the best formulation in terms of the physico-chemical results. The incorporation of legume leaves in fish feed not only increases its protein content but also its energy value and production cost.

Keywords*:* Legumes, *Tithonia diversifolia*, *Leucaena leucocephala*, pellet, formulation, food value.

9 Effects of the level of incorporation of distiller's grains and blood meal on some nutritional and rheological properties of pellets for *Clarias gariepinus*

Bienvenu FOGANG ZOGANG [1]*, Kafanh[2]

1 University of Ngaoundere, University Institute of Technology
2 University of Ngaoundere, National School of Agro Industrial Sciences

* *Corresponding author's email: fobiezogang@yahoo.fr*

Abstract
Feed plays a decisive role in the success and economic profitability of fish farming, as it accounts for around 70% of production costs. when formulating an efficient feed, its cost and nutritional quality, which must cover all the essential nutritional needs of fish, must be taken into account. this study focuses on the formulation and characterisation of fish pellets based on industrial effluents. the overall objective is to formulate and characterise fish pellets based on beef blood meal, brewery draff and slaughterhouse blood. to achieve this, the following methodology was adopted. First, we identified the nutritional needs of the fish. Then, using an experimental design, we developed 16 fish pellet formulations in order to characterise them. We then determined the physical and chemical characteristics of the formulated pellets, in particular the protein content, which ranged from 11.88 to 45.04 g/100 g DM, the lipid content (1.11 to 3.7 g/100 g DM), ash content (48.73 to 72.98 g/100 g DM) and dry matter (85.63–89.63%). Furthermore, energy parameters such as total sugar content (3.98–32.36 g/100 g DM) and energy value (114.24–214.74 kcal) varied with the different formulations tested. In terms of rheological characteristics, only formula 8 had a buoyancy index of 90%. On the other hand, the friability index varied from 12.44% to 41.2%. Our study shows that bovine blood and brewery spent grain can indeed be used as raw materials in fish feed formulations.

Keywords: Brewer's grains, blood, pellets, fish feed, formulation

10 Formulation and characterisation of multi-nutritional blocks based on cashew nut waste (*Anacardium occidentale L.*)

Bienvenu FOGANG ZOGANG [1]*, Jules MARIE[2], Saidou CLÉMENT[1], Ngathic JOSIANE[2]

1 University of Ngaoundere, University Institute of Technology
2 University of Ngaoundere, National School of Agro Industrial Sciences

* *Corresponding author's email: fobiezogang@yahoo.fr*

Abstract
The main objective of this work is to valorise cashew nut waste as animal feed through the production of multi-nutritional blocks. The methodology used consisted of formulating multi-nutritional blocks (MNBs) with different levels of cashew nut waste incorporation. Five (5) formulations were generated by substituting wheat meal in a conventional multi-nutritional block formula (25, 50, 75 and 100%). From these generated formulations, rheological (hardness, cohesion, colour) and bromatological (protein, lipid, ash, water, fibre and energy content) characterisations and drying kinetics were performed. This methodological approach revealed that the colour of the BMNs varied significantly from light to dark with increasing incorporation levels. Furthermore, regardless of the level of cashew nut waste incorporation, the average drying time was six (6) hours. Following the drying kinetics performed on Matlab 2017, Midili's model best describes the drying of these multi-nutritional blocks. In terms of hardness, BMN25 showed the best resistance. The protein contents obtained increased with the increasing level of cashew nut waste incorporation, respectively 6.70, 6.89 and 7.18 g/100 g. The lipid contents showed the same trend, with values ranging from 2.54 (BMN25) to 3.75 g/100 g DM (BMN75). The ash contents showed the same trend. Metabolisable energy ranged from 2,170.55 to 994.46 kcal g/100 g DM. The dairy Feed Unit (DFU) and Meat Feed Unit (MFU) values obtained were comparable, regardless of the increasing level of cashew nut waste incorporation. This work demonstrated the technological feasibility of incorporating cashew nut waste into multinutritional blocks for ruminant feed, which proved to be very interesting as it enhanced the bromatological value of the formulated BMNs. Furthermore, this technology will add value to the cashew nut industry.

Keywords: Cashew nut waste, Multinutritional blocks, Bromatological characteristics, Drying kinetics.

11 Authentication of honey using molecular and physicochemical methods

Marinela BORA[1], Silvia PĂTRUICĂ[1], Roxana LAZAR[1], Lucian AVRĂMESCU[1], Alexandru PANICI[2], Mirela AHMADI[1*]

[1]University of Life Sciences „King Mihai I" from Timisoara, Faculty of Bioengineering of Animals Resources, Department Biotechnology, Calea Aradului 119, Timisoara – 300645, Romania.
[2]University of Life Sciences „King Mihai I" from Timisoara, Faculty of Engineering and Applied Technologies, Calea Aradului 119, Timisoara – 300645, Romania.

** Corresponding author's email: mirelaahmadi@usvt.ro*

Abstract
Honey is a natural product of high nutritional, medicinal, and economic importance, whose authenticity has become a major concern due to the increasing incidence of adulteration. Common fraudulent practices include the addition of sugar syrups, mislabeling of botanical or geographical origin, and blending with inferior products. This review focuses on the integration of molecular biology and physicochemical analytical techniques – including UV–Vis spectroscopy – for the authentication of honey and detection of adulteration. Molecular approaches such as DNA barcoding, qPCR, and next-generation sequencing enable the identification of floral and entomological origins, providing precise biological traceability. Physicochemical techniques, including isotopic ratio mass spectrometry (IRMS), high-performance liquid chromatography (HPLC), and UV–Vis spectroscopy, serve as powerful complementary tools. UV–Vis spectroscopy, in particular, allows rapid, non-destructive evaluation of honey composition based on characteristic absorbance patterns associated with phenolic and flavonoid compounds, while deviations in spectral profiles can indicate adulteration with sugar syrups. The integration of molecular and spectroscopic data, often supported by chemometric modeling, enhances the sensitivity and reliability of honey authentication. Together, these interdisciplinary approaches offer a robust framework for quality control, regulatory enforcement, and consumer protection in the honey industry.
Keywords: honey, adulteration, molecular tests, physicochemical methods.

12 Sheep wool as a biotechnological resource – Modern approaches to sustainable utilization

Marinela BORA [1], Teodora Liana TOADER [1*], Dana Iuliana Neață [1*], Igori BALTA [1], Dragoș NICA [2], Teodor VINTILĂ [1]

[1] University of Life Sciences „King Mihai I" from Timisoara, Faculty of Bioengineering of Animals Resources, Biotechnology Study Field, e-mail: Marinela.Bora.FBIRA@usvt.ro
[2] The National Institute of Research—Development for Machines and Installations Designed for Agriculture and Food Industry (INMA), Bulevardul Ion Ionescu de la Brad 6, 013813 Bucuresti, Romania, nicadragos@gmail.com

** Corresponding author's email: teodora.toader@usvt.ro, dana.neata@usvt.ro*

Abstract
With a sheep and goat population of 11.87 million heads, Romania ranks second in terms of these livestock in the hierarchy of European Union member states, after Spain. The main products exploited from sheep are meat

and milk. Although wool has been exploited for millennia for the production of clothing, in recent decades its economic importance has decreased, even becoming a waste that is difficult to manage for Romanian sheep farmers. Sheep wool is mainly composed of proteins (95%-98%), most of which is keratin. This paper explores the possibility of identifying new uses for wool, addressing the protein component that can be used in various biotechnological formulas, as a component of the circular bioeconomy. The total number of sheep in 2023 reached 10,299,549 heads, and the total wool production in Romania reached 25,638 tons according to statistics. Properties of wool fibers, such as durability, flexibility, fire resistance, recommend them as components in composite materials. The α-keratin extract obtained from wool has numerous practical applications, in the cosmetic field, medicine, in the biomaterials industry in the manufacture of bioplastics, composite materials and functional textiles. Our research approaches wool as a potential natural, efficient and ecological fertilizer. Used as fertilizer, wool can be applied in various forms: shredded, in the form of pellets or hydrolysates integrated into culture substrates. Using wool as fertilizer reduces the amount of waste, decreases dependence on chemical fertilizers and closes a cycle in the circular bioeconomy.

Keywords: sustainability, circular economy, bioeconomy, organic waste, sheep wool, fertilizer

13 Application of natural deep eutectic solvents (NADESs) for the extraction of polyphenols from blue poppy (*Papaver somniferum*) by-products

Danica BOŽOVIĆ [1*], Sanja VOJVODIĆ [1], Zoran ZEKOVIĆ [1], Branimir PAVLIĆ [1]

[1]University of Novi Sad, Faculty of Technology, Pharmaceutical engineering, e-mail: danica_bozovic@live.com; sanja.milosevic@uns.ac.rs; zzekovic@tf.uns.ac.rs; bpavlic@uns.ac.rs

* *Corresponding author's email: danica_bozovic@live.com*

Abstract

Poppy (*Papaver somniferum*) is one of the oldest cultivated plants, primarily used in the food industry. Due to its rich chemical composition, which includes alkaloids, polyphenols, vitamins, and fatty acids, poppy has also found application in alternative medicine. In this study, poppy pressed cake (a by-product remaining after the cold pressing of poppy seeds) was used as the raw material. A pretreatment step involving supercritical fluid extraction, after which the defatted pressed cake was subjected to NADES extraction. Twelve NADESs were evaluated to determine the most efficient one in terms of total phenolic content and antioxidant activity. The NADES extraction was carried out at 40 °C for 60 minutes, with a stirring speed of 600 rpm and a solid-liquid ratio of 1:10 (m/m).

The total phenolic content obtained using different NADESs ranged from 1.77 to 4.97 mg GAE/g DW. Among them, NADES 11, composed of betaine and citric acid in a molar ratio of 1:3, showed the highest efficiency. Regarding antioxidant activity, determined by the DPPH assay, the values ranged from 3.05 to 9.86 mg TE/g DW. In this case, NADES 6, a mixture of choline chloride and malonic acid (1:1), stood out as the most effective solvent. Based on the obtained results, it can be concluded that this new generation of green solvents, which are non-toxic and environmentally friendly, can be successfully applied for the extraction of polyphenols from poppy by-products. In addition to the application of an innovative extraction technique, the approach also enables the valorization of a high-value waste material.

Keywords: green solvents, innovative extraction technique, valorisation of waste, antioxidant activity

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14 The impact of microplastic exposure on male reproductive health: A review

Alexandra CEBZAN[1], Beatrice Ana-Maria SÎRBU[1*], Bogdan PEȚ[1], Cătălin Bogdan SÎRBU[1], Liliana PETCULESCU CIOCHINĂ[1], Gabi DUMITRESCU[1]

[1]*University of Life Sciences "King Mihai I" from Timisoara, Faculty of Bioengineering of Animal Resources, Department of Biotechnology, email: beatrice.jitea@usvt.ro*

* *Corresponding author's email: beatrice.jitea@usvt.ro*

Abstract
Microplastics (MPs) are ubiquitous in marine and freshwater ecosystems, terrestrial environments, atmospheric samples, and living organisms. The purpose of this review is to investigate the pervasive role of MPs in reproductive health and how associated chemicals influence the hypothalamic–pituitary–gonadal (HPG) axis, testes, ovaries, embryo, and placenta, as well as their impact on subfertility and infertility worldwide. MPs may lead to reduced testicular size, disorganization of spermatogenic cells, and decreased size and diameter of seminiferous tubules, resulting in germ cell loss. Consequently, MPs can compromise sperm quality by reducing both sperm count and motility. Microplastics contain endocrine-disrupting chemicals (EDCs), such as phthalates, bisphenol A, polyvinyl chloride, and other additives, which can mimic estrogen and disrupt the HPG axis by binding to estrogen receptors (ER). MPs may also cross the blood–brain barrier, reaching the hippocampus and triggering localized inflammation mediated by IL-1β, IL-6, and TNF-α. Furthermore, MPs promote the accumulation of the toxin MC-LR (microcystin-LR) in the gonads, exacerbating gonadal damage and reproductive toxicity, which is associated with altered gene expression within the HPG axis. Polystyrene microplastics (PS-MPs) can inhibit the expression of testosterone, steroidogenic enzymes, and the StAR protein in primary Leydig cells. They may also reduce sperm quality and testosterone levels by inhibiting the LH-mediated LHR/cAMP/PKA/StAR signaling pathway. We conclude that intensifying research on MP degradation is essential in order to develop viable degradation methods for these materials, which currently persist in the environment for decades.
Keywords: microplastics, degradation, reproductive system, males, infertility

15 Preliminary results on the aquatic phytotoxicity of Difenoconazole on duckweed (*Lemna minor*)

Cosmina-Alecsia COSMA[1], Diana-Maria ISTRATE[1*], Constantina-Bianca VULPE[2,3], Bianca-Vanesa AGACHI[1,3], Adina-Daniela IACHIMOV-DATCU[1,3]

[1] *West University of Timişoara, Faculty of Chemistry, Biology, Geography, Department of Biology, Pestalozzi 16, 300115, Timişoara, Romania, e-mail: cosmina.cosma03@e-uvt.ro, diana.istrate02@e-uvt.ro, bianca.agachi@e-uvt.ro, adina.datcu@e-uvt.ro*
[2] *West University of Timişoara, Advanced Environmental Research Institute, Department of Scientific Research in Biology, Oituz, 4, 300086 Timişoara, Romania, e-mail: constantina.vulpe@e-uvt.ro*
[3] *The Academy of Romanian Scientists, Ilfov 3, 050044, Bucureşti, România*
* *Corresponding author's email: diana.istrate02@e-uvt.ro*

Abstract
Difenoconazole is a widely used triazole fungicide in the European Union. While effective against fungal pathogens, it may pose risks to non-target organisms, including aquatic plants, for instance through rainwater

runoff from treated fields. This study provides preliminary data on the phytotoxic effects of difenoconazole on *Lemna minor* (duckweed) using a growth inhibition assay. Ten fronds, organized in colonies of three to four fronds each, were exposed to 30 mL of test solutions at six concentrations: 12.5, 1.25, 0.125, 0.0125, and 0.00125 g/L for 7 days. The results indicated that only the lowest concentrations (0.0125 g/L and below) allowed the survival and growth of green fronds, while higher concentrations led to chlorosis and impaired growth. Colony numbers increased with increasing concentration, but the number of fronds per colony showed that the highest concentration produced effects comparable to the positive control (0.5% zinc chloride). Intermediate concentrations (1.25 and 0.125 g/L) induced colony fragmentation alongside chlorosis, which was not observed at 0.0125 g/L; at the lowest concentration (0.00125 g/L), growth patterns were similar to the negative control. These findings suggest a concentration-dependent phytotoxic effect of difenoconazole on duckweed, affecting both colony structure and frond health. Further research is warranted to confirm these preliminary observations and to elucidate the mechanisms underlying triazole-induced stress in aquatic plants.

Keywords: Growth inhibition, Colony structure, Chlorosis, Non-target aquatic plants, Concentration-response

16 Cultivation of the species *Phacelia tanacetifolia Benth*., in the context of climate changes and sustainable development in agriculture

Saida-Roxana FEIER-DAVID[1], Ioan PEȚ[1], Silvia PĂTRUICĂ[1] , Roxana LAZĂR[1], Gheorghe David[2*]

[1]*University of Life Sciences "King Mihai I" from Timisoara, Faculty of Bioengineering of Animal Resources, Calea Aradului, 119, 300645, Timisoara, Romania,* *e-mail: saida.feierdavid@usvt.ro*
[2]*University of Life Sciences "King Mihai I" from Timisoara, Faculty of Agriculture, Calea Aradului, 119, 300645, Timisoara, Romania*

** Corresponding author's email: gheorghe_david@usvt.ro*

Abstract

Native to the American continent and part of the *Hydrophyllaceae* botanical family, *Phacelia tanacetifolia Benth*. is an annual cultivated species that has become increasingly important in recent years in the current ecological context, marked by many evident climate changes. Known as the honey plant that "saves" honey production in difficult years when acacia harvesting productions present poor results, phacelia has recently attracted the attention of Romanian farmers due to its remarkable agrophytotechnical characteristics. These include the species high genetic resistance to extreme weather conditions (drought and even frost), resistance to diseases and weeds, short vegetation period and even its ability to contribute to soil improvement (specially when used as green manure). Also, due to its distinct characteristics, it can also be used as a fodder species with an extremely high degree of palatability, and from an ecological point of view, it actively contributes to the preservation and improvement of biodiversity.

This study aims to explore the multiple uses of this valuable species, both from a honey and fodder perspective, as well as from the perspective of the agro-ecological advantages offered by its expansion in cultivation.

Keywords: phacelia, honey plant, fodder, climate change, cultivation

17 Obtaining and targeted breeding of high-performance dairy cows utilizing advanced technology

Garnik GILOYAN[1], Nazik KASUMYAN[1], Tatevik SARGSYAN[1.2*], Yuri MARMARYAN[1]

[1]Armenian National Agrarian University, Research Center of Selection, Genetics and Feeding of Agricultural Animals, 0009, Koryun str. 19, Yerevan, Republic of Armenia
[2]Ministry of Economy of the Republic of Armenia, 0010, M.Mkrtchyan str. 5, Yerevan, Republic of Armenia

** Corresponding author's email: tatevsargsyan85@gmail.com*

Abstract
As a result of individual customized pair selection, the genetic potential for milk productivity of daughters of the bull with property number Agadis AB 1217 was 10,000 kg of milk, with the main selection traits being milk fat + milk protein at 743 kg. Meanwhile, the genetic potential for milk productivity of daughters of the bull with property number Lolis AB 121723 was 9,702 kg of milk and 720 kg (milk fat + milk protein), respectively. The daughters of bull Lolis AB 121723 showed a genetic potential of 9,702 kg milk and 720 kg combined milk fat and protein.
The heifers born from the pairing and raised with advanced technology reached Live weight of 477 kg at the age of 18 months which is 23 kg (or 4.6%) below the first-class breed standard requirement.
The linear growth data demonstrates the development of well-proportioned body formation in heifers. The coefficient of variation (Cv) of 3, 6, and 12 months of age is between 0.6-1.9 %. These findings demonstrate weight uniformity in heifers across all studied age groups, indicating genotypic consistency and homogeneity in animals produced through heterogeneous pair selection and reared using advanced technologies. These traits represent crucial applied and prospective components for selection programs and genetic improvement complexes.
Keywords: characteristic, development, genotype, growth, pair selection, trait

18 Learning entrepreneurship together with concepts regarding green and circular bioeconomy in universities. Case study: faculties from West University of Timişoara

Adina-Daniela IACHIMOV-DATCU[1], Mariana – Adina MATICA[1*]

[1] West University of Timisoara, Chemistry, Biology, Geography Faculty, Department of Biology, e-mail: daniela.iachimov@e-uvt.ro

** Corresponding author's email: mariana.matica@e-uvt.ro*

Abstract
The academic study of entrepreneurship at universities with non-economic profiles has emerged as a relatively recent practice. For this reason, many students still require support for developing the skills needed to manage potential businesses in their specialization area. At the same time, the transition from a linear to a circular economy is also considered relatively recent but was strongly supported by the European Commission and other European Union institutions through a series of guidance documents, written in an accessible and clear language, not sufficiently promoted in Romania. In this context, the implementation of educational activities dedicated to sustainable development goals, circular economy concepts, alternative energy sources, and green energy production became essential for university students, especially those who study in the field of science. These initiatives contributed to broadening career prospects, stimulating creativity, and providing practical tools for training specialists capable of

responding to current and future labor market demands. At the West University of Timișoara, students from various faculties participated in training activities focused on these emerging topics, in a project entitled „PEO/302424/INstruire prin Stagii de Practică sau Internship-uri RElevante pentru JOBuri de calitate - INSPIRE JOB". The experiences in question have been shown to have several notable effects on the participants. These effects include strengthening communication skills, encouragement of collaboration across disciplines, and the opportunity for the development of innovative projects. Also, as a result for a year of implementing such activities, positive changes in vocabulary, knowledge and perception regarding green and circular bioeconomy concepts, but also regarding entrepreneurship were observed.

Keywords: bioeconomy perception, entrepreneurial education, circular economy

19 Genetic characterization of poplar hybrids edited with the CRISPR/Cas9 base editing system

Patricia ILIA[1], Teodor VINTILA[1*], Jan VAN DOORSSELAERE[2], Lennart Hoengenaert[3,4], Wout Boerjan[3,4]

[1] University of Life Science King Mihai I from Timisoara, Faculty of Bioengineering of Animal Resouces, Department of Biotechnology, e-mail: patriciailia05@gmail.com
[2] VIVES University of Applied Sciences, campus Roeselare, Agro and Biotechnology, e-mail: jan.vandoorsselaere@vives.be
[3] VIB Center for Plant Systems Biology, VIB, Ghent, Belgium
[4] Department of Plant Biotechnology and Bioinformatics, Ghent University, Ghent, Belgium

** Corresponding author's email: teodorvintila@usvt.ro*

Abstract
Current gene editing methods represent essential tools for studying gene function, as well as for improving desirable traits in forest trees, such as poplar (*Populus spp*), which due to their fast growth and ease of manipulation represent a valuable model for plant biotechnology. The experiment presented in this study dealt with the genetic characterisation of CRISPR/Cas9 base edited *P. tremula x P. alba* lines. These lines contained two guide RNAs to target two *ALS* genes and one guide RNA targeting *CCoAOMT1* (a gene involved in lignification). Genomic DNA was extracted from the plants using the NucleoSpin Plant II kit and PCR amplification was conducted in order to generate *CCoAOMT* and *ALS* amplicons. The transgenic lines also carry a neomycin phosphotransferase II (*nptII*) gene as selection marker and PCR was performed to demonstrate the presence of this gene. Sanger sequencing of *CCoAOMT* and *ALS* amplicons revealed indel mutations in some of the alleles confirming successful base editing. These findings show the applicability of CRISPR based editing in poplar, supporting its potential in genetic improvement of woody plants (Hoengenaert et al, 2025).

Keywords: poplar (*Populus* spp), *Agrobacterium,* PCR, sequencing, genetic characterisation, genetic transformation

20 Preliminary Results on the Terrestrial Phytotoxicity of Difenoconazole on Radish (*Raphanus sativus*) and Maize (*Zea mays*)

Diana-Maria ISTRATE[1*], Cosmina-Alecsia COSMA[1], Adina-Daniela IACHIMOV-DATCU[1,3], Bianca-Vanesa AGACHI[1,3], Constantina-Bianca VULPE[2,3]

[1] West University of Timişoara, Faculty of Chemistry, Biology, Geography, Department of Biology, Pestalozzi 16, 300115, Timişoara, Romania, e-mail: diana.istrate02@e-uvt.ro, cosmina.cosma03@e-uvt.ro, bianca.agachi@e-uvt.ro, adina.datcu@e-uvt.ro
[2] West University of Timişoara, Advanced Environmental Research Institute, Department of Scientific Research in Biology, Oituz, 4, 300086 Timişoara, Romania, e-mail: constantina.vulpe@e-uvt.ro
[3] The Academy of Romanian Scientists, Ilfov 3, 050044, Bucureşti, România

** Corresponding author's email: diana.istrate02@e-uvt.ro*

Abstract
Difenoconazole is a triazole fungicide authorized for use in the European Union, but it may pose risks to non-target organisms such as terrestrial plants, either directly exposed through agricultural applications or indirectly affected in surrounding areas. Therefore, assessing its potential terrestrial phytotoxicity is essential. This study presents preliminary data on the phytotoxic effects of difenoconazole on two agriculturally relevant plant species, *Raphanus sativus* (radish) and *Zea mays* (maize), using a germination test on filter paper. Ten seeds of each species were exposed to 1.5 mL of five difenoconazole concentrations: 250, 12.5, 1.25, 0.125, and 0.0125 g/L. The preliminary results showed that the highest concentration (250 g/L) completely inhibited seed germination, while the lower concentrations allowed most seeds to germinate. In radish, the highest root growth occurred at 12.5 g/L, while lower concentrations allowed germination without significant differences among them. In maize, germination was also completely inhibited at 250 g/L, with lowest root growth at 12.5 g/L and increased growth at moderate to low concentrations, with no significant differences among the three lowest treatments. These findings suggest potential concentration-dependent phytotoxic effects of difenoconazole, with species-specific sensitivity patterns. Further research is needed to confirm these preliminary observations and to better understand the mechanisms underlying triazole-induced phytotoxicity in terrestrial plants.
Keywords: Seed germination, Root development, Non-target plants, Triazole fungicide, Concentration-dependent effects

21 Use of proteolytic enzymes in cattle nutrition - A Review

Zakhar IVANNIKOV [1], Marina SARVILINA [2]

[1] University of Szeged, Faculty of Agriculture, Department Agricultural Engineering, e-mail: zakharivannikov2004@gmail.com
[2] University of Szeged, Faculty of Agriculture, Department Agricultural Engineering, e-mail: sarvilinamarina@gmail.com

Abstract
The use of proteolytic enzymes in cattle feeding represents a promising direction for enhancing feed digestibility and potentially the Feed Convertion Ratio (FCR). Proteases mainly act as catalysts in the hydrolysis of peptide bonds producing easily digestible amino acids, which are important for adult

animals and even more so in young stock, who require a sufficient amount of amino acids due to their intensive growth period. Optimizing amino acid assimilation with the help of proteases contributes to increased feed efficiency, higher average daily weight gains, and improved overall animal health. Furthermore, it allows for a reduction in the need for expensive protein supplements, thereby increasing production profitability. This article analyzes scientific studies aimed at investigating the effects of various protease dosages in cattle diets and also notes the effects of combining proteolytic enzymes with other feed additives, mainly exogenous enzymes. The effects of each experimental group were compared with both the control group and among themselves to evaluate optimal enzyme application strategies.
Keywords: feed additive, protease, assimilation, dairy cows, bulls

22 The phytopharmaceutical properties of 6 segetal and ruderal weed species - a review

Diana-Ioana MARCU[1], Sandra-Florina LELE[1], Ioan PEȚ[1], Gheorghe DAVID[2], Saida-Roxana FEIER-DAVID[1]*

[1] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Bioengineering of Animal Resources, Calea Aradului, 119, 300645, Timisoara, Romania, e-mail: diana.marcu@usvt.ro
[2] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Agriculture, Calea Aradului, 119, 300645, Timisoara, Romania

** Corresponding author's email: saida.feierdavid@usvt.ro*

Abstract
Currently, the market for supplements and natural remedies in our country is constantly expanding. Against the backdrop of the COVID-19 pandemic, there has been a rise in public concern about improving and maintaining overall health, and topics such as prevention, early treatment, integrative medicine, and promoting longevity are attracting an increasing interest.
Typically associated with a healthy lifestyle, proper stress management, promoting quality interpersonal connections, and spending time in nature, these biotechnological products have proven their therapeutic value over time, through their special biochemical properties and antibacterial, antiviral, anti-inflammatory, or antitumor effects, addressing a wide range of conditions, such as gastrointestinal, cardiovascular, diabetes, autoimmune diseases or even oncological conditions.
This manuscript aims to highlight and explore the distinguished phytopharmaceutical properties of six species that are less known in Europe for their qualities and uses. These plants, *Xantium strumarium, Cirsium arvense, Convolvulus arvensis, Artium lappa, Agropyron repens,* and *Capsella bursa-pastoris,* are mainly known as segetal and ruderal species. They are part of four different botanical families, but share a remarkable biochemical potential, including the posibility to be used in various natural remedies, as well as in preparations and pharmaceutical products characteristic for classical medicine.

Keywords: pharmacology, medicinal plants, bioactive compound, segetal species, phytotherapy, phytochemistry

23 Physical and Technical Wool Traits of Mazekh Sheep Breed

Yuri MARMARYAN[1], Zorik BAMBUKHCHYAN, Tatevik SARGSYAN[1.2], Valeri ALEKSANYAN[3], Levon TER-ISAHAKYAN[4], Davit NAVASARDYAN[1]

[1]Research Center of Selection. Genetics and Feeding of Agricultural Animals. Armenian National Agrarian University. 0009. Koryun str. 19. Yerevan. Republic of Armenia
[2]Ministry of Economy of the Republic of Armenia. 0010. M.Mkrtchyan str. 5. Yerevan. Republic of Armenia
[3] Center for Ecological-Noosphere Studies of the National Academy of Sciencs. 0025. Abovyan str. 68. Yerevan. Republic of Armenia
[4]«Pedigree Animal Breeder's Association» NGO. 0037. Azatutyan str. 1/21. Yerevan. Republic of Armenia

** Corresponding author's email: marmaryanyuri@gmail.com*

Abstract
Mazekh sheep are raised in different regions of the Republic of Armenia, including farms in the village of Qanaqeravan in Kotayk region (located at 1250 m above sea level) and in the village of Koghb Tavush region (located at 750 m above sea level). The wool of Mazekh breed is coarse and consists of various fractions: fluff, awn, dead hair. The shearing of wool-producing rams ranges from 1.8 (2021) to 3.0 kg (2022-2023) per year. However, selective breeding and pairing, have led to an increase in the shearing of ewes up to 3.0 kg. The obtained values of washed wool yield are quite high across sex and age groups of sheep on the farms. Thus, the indicator was 62.8% for rams, for ewes - 64.7%, and 73.3% for 1-2-year-old young sheep (2021). The wool strength values of Mazekh sheep were determined by age and sex groups.
Keywords: length, mazekh, sheep, thickness, wool

24 Experimental approaches for circular bioeconomy education: integrating sustainable biotechnologies and green innovation in student training

Mariana – Adina MATICA[1*], Adina-Daniela IACHIMOV-DATCU[1]

[1] Department of Biology, Faculty of Chemistry, Biology, Geography, West University of Timişoara, Pestalozzi 16, Timişoara, Timiş, Romania

** Corresponding author's email: mariana.matica@e-uvt.ro*

Abstract
This study aimed to promote scientific understanding and transversal competences among students through experimental sessions focused on sustainable biotechnologies and circular bioeconomy principles. The activities were part of the CFABVC center within the project entitled „PEO/302424/INstruire prin Stagii de Practică sau Internship-uri RElevante pentru JOBuri de calitate - INSPIRE JOB", emphasizing the reduction of environmental impact by transforming biological resources and waste into value-added biodegradable materials. Three experimental sessions were designed to illustrate key concepts of green biotechnology: (1) reducing the environmental footprint of the seafood industry by valorizing chitosan from crustacean waste; (2) using Lemna minor (duckweed) to recover nutrients and reducing sugars from wastewater; and (3) producing biodegradable films from crustacean residues. The sessions involved hands-on laboratory activities, demonstration experiments, and interactive discussions. Student feedback was collected through questionnaires and analyzed

quantitatively and qualitatively to assess the development of transversal competences and perception of scientific relevance. Data analysis revealed an increased level of student engagement and understanding of sustainability-related topics. Over 85% of participants reported enhanced awareness of the circular use of biological resources, while more than 75% indicated that the activities improved their problem-solving and teamwork skills. The experimental sessions effectively combined scientific inquiry with environmental education, fostering both technical and socio-professional competencies. The integration of experimental learning focused on circular bioeconomy topics contributes not only to environmental awareness but also to the development of key transversal competences. The CFABVC activities demonstrate the value of combining biotechnology, microbiology, and educational innovation as tools for science popularization and sustainable skill formation in higher education..

Keywords: biodegradable materials; science education; student competences; green innovation.

25 The influence of hormonal and non-hormonal biotechnologies on reproductive efficiency in domestic ruminants

Elena NEAGU[1], Denisa RUSU[1], Cristina BOCȘE[1], Alexia HRITUC[1], Beatrice Ana-Maria SÎRBU[1*], Cătălin Bogdan SÎRBU[1]

[1]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Bioengineering of Animal Resources, Department of Biotechnology, email: elenaneagu100@gmail.com

** Corresponding author's email: beatrice.jitea@usvt.ro*

Abstract

This paper summarizes and compares the effects of hormonal and non-hormonal biotechnologies on reproduction in domestic ruminants. Hormonal protocols, including the use of prostaglandins and gonadotropins, as well as estrus synchronization schemes, have demonstrated high efficiency in increasing ovulation and conception rates. In parallel, non-hormonal methods, such as natural estrus stimulation by the presence of males, photoperiod control, and nutritional optimization, support reproduction under natural conditions while promoting animal welfare. Modern biotechnologies encompass advanced processes such as embryo transfer, in vitro fertilization, and cloning, enabling precise management of reproductive performance. In addition, technologies like biosensors and sexual activity monitoring systems allow accurate estrus and embryo quality assessment. Reproductive efficiency is closely linked to genetic improvement, which enables the selection of superior breeding stock and the transmission of desired traits, such as increased milk or meat production, disease resistance, and feed efficiency, to subsequent generations. Comparative analysis indicates that integrating hormonal and non-hormonal approaches maximizes reproductive efficiency, optimizes oocyte and embryo quality, and reduces health risks. Future directions include the application of natural biostimulators, molecular evaluation of fertility, and conservation of genetic resources, emphasizing the importance of multidisciplinary strategies in ruminant reproduction.

Keywords: domestic ruminants, hormones, in vitro fertilization, reproduction efficiency

26 Donkey meat and milk as part of human diet – quality, nutritional characteristics and obstacles

Djordje PAJIČIĆ [1*], Jasna LONČINA [2], Tijana LEDINA [2], Ivana BRANKOVIĆ LAZIĆ [3], Nikola ČOBANOVIĆ[4]

[1] Veterinary Specialized Institute "Sombor", Sombor, Serbia, e-mail: djordjepajicic505@gmail.com
[2] University of Belgrade, Faculty of Veterinary Medicine, Department of Food Hygiene and Technology, Belgrade, Serbia, e-mail: jasna.djordjevic@vet.bg.ac.rs
[3] Institute of Meat Hygiene and Technology, Kaćanskog 13, Belgrade, Serbia, e-mail: ivana.brankovic@inmes.rs
[4] University of Belgrade, Faculty of Veterinary Medicine, Department of Food Hygiene and Technology, Belgrade, Serbia, e-mail: cobanovic.nikola@vet.bg.ac.rs

** Corresponding author's email: djordjepajicic505@gmail.com*

Abstract
Donkeys have long been recognised for their significant contribution as working animals throughout history. Their strength, endurance, and adaptability have made them indispensable in agricultural and transport settings across various cultures. In recent years, there has been a notable shift in how donkeys are perceived, with increasing attention being paid to their roles in the production of both milk and meat. This change reflects a growing awareness of the nutritional and economic benefits associated with donkey-derived food products. Donkey meat is characterized by a low content of fat and cholesterol, and a high content of protein and iron, as well as a favourable fatty acid profile, which makes it a good alternative to conventional types of meat. Donkey milk is characterized by high digestibility, low fat content, high lactose content, a favourable ratio of saturated and unsaturated fatty acids, as well as the presence of bioactive substances or compounds with an antimicrobial effect. The quality of donkey meat and milk can be affected by many factors such as breed, age, diet, season and stage of lactation. Although numerous positive effects on the health of consumers have been established, the production and consumption of donkey meat and milk is still much smaller compared to the meat and milk of other animal species. One of the primary obstacles hindering the broader adoption of donkey meat and milk as part of human diet is the current level of consumer awareness. Many consumers lack sufficient knowledge regarding the benefits and qualities of donkey products, which in turn limits both demand and acceptance in the market. By actively increasing public awareness about the nutritional value and potential advantages of donkey meat and milk, it is possible to stimulate greater interest among consumers. Despite the growing interest of the scientific public, the need for further research still exists, as well as the need for the promotion of sustainable donkey breeding and the adoption of legal regulations aimed at quality control of donkey meat and milk.
Keywords: meat quality, milk quality, donkeys, public awareness, nutritional value.

27 Integrating mathematical modeling and numerical optimization in biotechnological processes: A case study on microbial fermentation

Teodor Mihai PAVEL[1], Darius Cosmin MORA[1], Ancuţa ROTARU[1*], Luisa ANDRONIE[2*]

[1] University of Agricultural Sciences and Veterinary Medicine, Faculty of Animal Science and Biotechnologies, e-mail: teodor-mihai.pavel@student.usamvcluj.ro, darius-cosmin.mora@usamvcluj.ro
[2] University of Agricultural Sciences and Veterinary Medicine, Faculty of Forestry and Cadastre, Department of Land Measurements and Exact Sciences, e-mail: luisa.andronie@usamvcluj.ro

** Corresponding author's email: ancuta.rotaru@usamvcluj.ro, luisa.andronie@usamvcluj.ro*

Abstract
In recent years, biotechnology has evolved into a multidisciplinary field that integrates biology, engineering, and computational sciences to develop efficient and sustainable bioprocesses. The production of valuable compounds through microbial fermentation—such as enzymes, antibiotics, organic acids, or other secondary metabolites—requires precise control over process parameters, including substrate concentration, nutrient balance, pH, temperature, and fermentation time. Optimizing these parameters is essential for maximizing yield, improving product quality, and reducing production costs.
Mathematical modeling plays a crucial role in understanding and predicting the dynamic behavior of microbial systems. By expressing biological processes through mathematical equations, researchers can simulate metabolic responses under varying environmental conditions. However, due to the complexity and nonlinear nature of biotechnological processes, analytical optimization is often impractical. This limitation can be overcome by applying numerical optimization methods, which rely on iterative algorithms to identify the most favorable process conditions within defined constraints.
Among available computational tools, Microsoft Excel's Solver represents an accessible and versatile platform for optimization tasks in biotechnology. Despite its simplicity, Solver includes advanced algorithms such as GRG Nonlinear and Evolutionary optimization, capable of handling complex, nonlinear relationships among process variables. Moreover, its user-friendly interface allows researchers and students to design, simulate, and optimize bioprocess models without requiring specialized programming knowledge. This paper aims to integrate mathematical modeling and numerical optimization for the improvement of microbial fermentation efficiency. By implementing a fermentation model in Excel and using Solver as the optimization engine, the study demonstrates how computational tools can be effectively applied in experimental design and decision-making within the field of bioprocess engineering.

Keywords: Mathematical modeling; Numerical optimization; Microbial fermentation; Bioprocess engineering; Excel Solver; Metabolite production.

28 The influence of climate change on the foraging behavior of bees and the quality of apicultural products

Ariana Maura PEICUȚI[1], Silvia PĂTRUICĂ[1*]

[1]University of Life Sciences "King Mihai I" from Timișoara, Faculty of Bioengineering of Animal Resources, Calea Aradului no.119, Romania, e-mail: ariana.peicuti@usvt.ro

** Corresponding author's email: silviapatruica@usvt.ro*

Abstract
Climate change has a significant impact on ecosystems, and honey bees (*Apis mellifera*), responsible for pollination and maintaining biodiversity, are among the most affected species. Changes in climatic factors directly affect the behavior of foraging bees. These changes influence the relationship between the flight period and the flowering period of plants, thus leading to a decrease in the efficiency of nectar and pollen collection. Due to thermal stress and reduced floral resources, the structure of bee colonies and their ability to maintain constant production are affected. Consequently, the quality of bee products: honey, pollen, propolis, bee venom, and royal jelly, undergoes changes in terms of their physicochemical composition. As a result, honey may exhibit variations in its sugar content, moisture levels, and volatile compounds, pollen tends to be lower in nutrients, while propolis may change its phytochemical composition. In addition to the impact on the dynamics of bee colonies, climate change also influences the spread of various diseases and parasites, such as *Varroa destructor* and *Nosema spp.*, which significantly impact bees longevity and brood development. In this paper, we aim to highlight the negative impact that climate change can have on worker bees, as well as the potential changes in the quality of apicultural products.
Keywords: bee colonies, climate change, foraging behavior, meteorological factors

29 Molecular tools for predictive, preventive, and personalized oral healthcare

Bogdan Ioan PEȚ[1,2], Sara Van-BEYLEN[2], Iulia Alida VASILOIU[2], Ionela Vanesa ZAHARIA[2], Darius Octav CREȚU[2], Maryam AHMADI[1], Mirela AHMADI[1*]

[1]University of Life Sciences „King Mihai I" from Timisoara, Faculty of Bioengineering of Animals Resources, Department Biotechnology, Calea Aradului 119, Timisoara-300645, Romania;
[2]University of Medicine and Pharmacy „Victor Babes" Timisoara, Faculty of Dental Medicine, B-dul Revoluției din 1989, Timisoara-300070, Romania.

** Corresponding author's email: mirelaahmadi@usvt.ro*

Abstract
Recent advances in molecular biology and biotechnology are transforming dentistry from a reactive to a predictive, preventive, and personalized interdisciplinary discipline. The integration of molecular tools – ranging from omics-based biomarker discovery to lab-on-a-chip diagnostic systems – has opened new frontiers in early disease detection, risk assessment, and individualized treatment strategies. Saliva and gingival crevicular fluid have emerged as rich sources of molecular biomarkers, enabling non-invasive diagnosis of oral and systemic conditions such as periodontitis, oral cancer, and diabetes-related oral manifestations. Concurrently, genomic and proteomic profiling technologies, coupled with CRISPR-based

diagnostics, biosensors, and nanobiotechnology, are facilitating chairside molecular analyses with unprecedented precision. These innovations support the development of patient-specific prevention protocols and regenerative strategies tailored to individual molecular signatures. This review summarizes current molecular diagnostic tools and biotechnological platforms applied in dentistry, discusses their clinical translation, and highlights challenges related to validation, data interpretation, and regulatory frameworks. Emphasis is placed on the convergence of molecular diagnostics, bioinformatics, and personalized care models as the foundation of next-generation oral healthcare.
Keywords: oral health, molecular methods.

30 Biofertilizers and their interaction with herbicides in sunflower (*Helianthus annuus L.*) cultivation (Review)

Sabina PINTILIA [1,2*], Gabriel ANTON [2], Elena PETCU[2], Cătălin LAZĂR[2], Marius BORDEI[2]

[1] *University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Horticulture, Department Biodiversity Conservation Management, e-mail: saninapintilia17@gmail.com*
[2] *National Agricultural Research and Development Institute-Fundulea, e-mail: petcue@ricic.ro*

** Corresponding author's email: saninapintilia17@gmail.com*

Abstract
Sunflower (*Helianthus annuus* L.) is a major global oilseed crop valued for its high-quality oil and versatile industrial applications. Maximizing sunflower productivity sustainably requires strategies that enhance nutrient use efficiency while minimizing the environmental impact of chemical fertilizers. Biofertilizers are microbial inoculants that promote plant growth through natural mechanisms and have emerged as effective tools in this context. Among the most studied and applied biofertilizers are free-living nitrogen-fixing bacteria (*Azospirillum spp.*, *Azotobacter spp.*), arbuscular mycorrhizal fungi (AMF), and phosphate-solubilizing bacteria (PSB). These microorganisms support plant growth by fixing atmospheric nitrogen, solubilizing otherwise unavailable phosphorus, producing phytohormones and vitamins, and improving plant tolerance to abiotic stresses such as drought, salinity, and nutrient deficiency. Despite their benefits, the application of herbicides, commonly required for weed management in sunflower fields, can adversely affect the viability and functional activity of these microbial inoculants. Herbicide interactions may inhibit nitrogen fixation, reduce microbial colonization of roots, and suppress enzyme activity necessary for nutrient mobilization. Conversely, certain microbial strains, especially some PSB and *Bacillus* or *Pseudomonas* species, exhibit tolerance to herbicides and can even participate in their degradation, contributing to soil bioremediation. This review synthesizes current knowledge on the roles and mechanisms of biofertilizers in sunflower cultivation, evaluates their interactions with major herbicide classes, and proposes strategies for integrating microbial inoculants into sustainable agronomic practices. The coordinated application of biofertilizers and judicious herbicide management can enhance sunflower yield by 10–25% on average, improve oil content, and reduce dependency on synthetic fertilizers, thereby supporting environmentally friendly and resilient cropping systems.
Keywords: *Helianthus annuus* L., arbuscular mycorrhizal fungi, phosphate-solubilizing bacteria, *Azospirillum spp.*, *Azotobacter spp.,* herbicides

31 Strategies to enhance *in vitro* fertilization efficiency in bovine: A review

Ingrid Maria PLOPEANU[1], Mariam KADAM[1], Taras PRODANIUC[1], Beatrice Ana-Maria SÎRBU[1*], Cătălin Bogdan SÎRBU[1]

[1]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Bioengineering of Animal Resources, Department of Biotechnology, email: ingridplopeanu@gmail.com

** Corresponding author's email: beatrice.jitea@usvt.ro*

Abstract
Along the years, the In Vitro Fertilization (IVF) in bovine has faced several challenges and developments and science is actively trying to find new ways to improve this process. Problems based on intrinsic and extrinsic factors that affect the oocyte competence and embryo quality are now more easily manageable with the help of supplements, more specifically antioxidants (such as α-tocopherol ((Vitamin E)) and Vitamin C). Administering those antioxidants will help improve maturation, cleavage and blastocyst development, especially under heat stress. In addition, the donor physiology (age, nutrition, body condition, health status) also plays a key part in the ruminants reproduction because it directly affects the oocyte quality and the In Vitro Embryo production. The embryo production can be significantly enriched if we mitigate oxidative stress, mimic in vivo conditions and carefully select the donors because the way in which the donors are raised and prepared before collecting the oocytes will directly affect the quality of the oocytes and the number of embryos that will be obtained. Furthermore, using AI and machine learning models to assess sperm and the quality of the embryos we can analyze the competence and anticipate the quality and integrity of the oocyte.
Keywords: bovine, IVF, antioxidants

32 Physico-chemical quality analysis of maize used as cattle feed

Ioana POROSNICU[1,2*], Silviu-Ionut BORŞ[2], Adina-Mirela ARITON[2], Vasile VINTILA[2], Mihai MARES[1]

[1]„Ion Ionescu de la Brad" Iasi University of Life Sciences, Romania
[2] Research and Development Station for Cattle Breeding Dancu, Iasi, Romania

** Corresponding author's email: ioana.porosnicu@yahoo.com*

Abstract
Feed quality is essential for maintaining the health, productivity, and welfare of cattle, directly influencing milk and meat production. Maize, as the main energy source and a key component of the feeding ration, provides carbohydrates, a moderate amount of protein, and lipids necessary for growth and lactation. In this study, maize samples were collected and analyzed at a livestock farm located in the Moldavia region over a two-year period to evaluate the main physico-chemical parameters relevant to animal nutrition and feed safety. Moisture, dry matter, crude protein, total lipids, crude fiber, and ash content were determined using standardized methods (SR ISO and European regulations). The results indicated stable values of moisture and crude protein between years, confirming the consistent nutritional quality of maize, while total lipids and crude fiber showed significant variations influenced by climatic conditions, grain maturity

stage, and storage practices. These findings highlight the importance of regular feed quality monitoring and provide valuable insights for optimizing feeding strategies. The study confirms that the analyzed maize meets the quality standards for cattle feed and supports informed management decisions aimed at improving zootechnical performance.

Keywords: fiber, lipids, livestock, moisture, nutrition

33 Interaction between feed composition and rumen microbiota in cattle

Ioana POROSNICU[1,2*], Silviu-Ionut BORŞ[2], Adina-Mirela ARITON[2], Madalina-Alexandra DAVIDESCU[1], Mihai MARES[1]

[1] *„Ion Ionescu de la Brad" Iasi University of Life Sciences, Romania*
[2] *Research and Development Station for Cattle Breeding Dancu, Iasi, Romania*

** Corresponding author's email: ioana.porosnicu@yahoo.com*

Abstract

The rumen microbiota plays a key role in the digestion and utilization of nutrients in cattle, directly influencing health, metabolism, and overall production performance. The composition of feed, especially its content of fiber, protein, starch, and fats, determines the structure, diversity, and activity of ruminal microbial communities. Fiber-rich diets stimulate fibrolytic bacteria (*Ruminococcus*, *Fibrobacter*), promoting acetogenic fermentation, stabilizing rumen pH, and supporting efficient nutrient utilization, while concentrate-rich rations high in starch increase the proportion of amylolytic bacteria (*Prevotella*, *Streptococcus bovis*), which can contribute to subacute ruminal acidosis (SARA) if not properly managed. Degradable proteins supply essential nitrogen for microbial protein synthesis, and fats in moderate amounts can improve energy efficiency; however, excessive fat intake may inhibit fiber fermentation. The use of probiotics, prebiotics, and fibrolytic enzymes can help maintain microbial balance and optimize ruminal fermentation. This review aims to examine the interactions between feed composition and rumen microbiota, highlighting strategies to improve nutrient utilization, maintain microbial diversity, and enhance cattle health and production efficiency.

Keywords: digestion efficiency, dietary fiber, microbial balance, probiotics, rumen health

34 Computational assessment of the human health and ecotoxicological effects of the main compounds identified in tarragon extracts

Andrijana PUJICIC[1], Bianca-Vanesa AGACHI [2]*, Adriana ISVORAN [1]*

[1] West University of Timisoara, Faculty of Chemistry, Biology, Geography, Department of Biology e-mail: andrijana.pujicic@e-uvt.ro
[2] West University of Timisoara, Faculty of Chemistry, Biology, Geography, Department of Chemistry e-mail bianca.agachi@e-uvt.ro

** Corresponding author's email: adriana.isvoran@e-uvt.ro, bianca.agachi@e-uvt.ro*

Abstract
Tarragon (*Artemisia dracunculus*) is an aromatic plant with extensive applications in gastronomy, phytotherapy, and the pharmaceutical industry due to its rich content of bioactive compounds. However, the widespread use of tarragon extracts and essential oils requires an integrated assessment of their impact on human health and the environment. In this context, recent studies have combined experimental and computational methods to characterize the biological and ecotoxicological effects of the main compounds identified in tarragon essential oils and hydrodistillates: estragole, cis- and trans-β-ocimene, limonene, eugenol, eugenol acetate, methyl eugenol ether, α-pinene, and caryophyllene oxide. In silico modeling, using the admetSAR3.0, ADMETLab3.0, CLC-Pred2.0, and AntiBac-Pred platforms, showed that these compounds have good intestinal absorption and oral bioavailability but may interfere with OATP1/2 transporters and exhibit increased probabilities of skin sensitization and respiratory toxicity. Several compounds, particularly the ocimenes and caryophyllene oxide, were associated with antibacterial activity against *Staphylococcus, Streptococcus,* and *Prevotella* species, as well as cytotoxic potential against multiple cancer cell lines by inhibiting the RGS17 protein involved in tumor proliferation. From an ecotoxicological perspective, tests performed on *Lemna minor* revealed that tarragon hydrodistillate shows no significant toxicity, whereas the essential oil exhibits a dose-dependent inhibitory effect, reducing frond growth by more than 50% at concentrations ≥0.5 µL. In silico predictions confirmed the potential toxicity of certain compounds toward aquatic organisms, especially for cis- and trans-β-ocimene and caryophyllene oxide. These results support the need for an integrated approach in evaluating plant-derived products, emphasizing that the same molecules providing therapeutic benefits may also pose ecological risks if not used and disposed of responsibly.
Keywords: *Artemisia dracunculus*, admetSAR3.0, ADMETLab3.0, CLC-Pred2.0, AntiBac-Pred, *Lemna minor*

35 Current status and perspectives of Mangalitsa pig breeding in Romania

Adrian-Dan RĂȘINAR [1*], Marc COSTEA [1], Neli-Georgeta TODEA [1], Octavia-Sorin VOIA [1], Tiberiu POLEN [1*]

[1] University of Life Sciences "King Mihai I" from Timişoara, Faculty of Bioengineering of Animal Resources, Calea Aradului no.119, e-mail: adrian.rasinar@usvt.ro

** Corresponding author's email: adrian.rasinar@usvt.ro, tiberiupolen@usvt.ro*

Abstract
The present paper reports an applied study on the rearing of the indigenous Mangalitsa breed under the semi-free farm conditions of Pâncota, Arad County, a representative nucleus for the revitalization of this valuable genetic resource. The research focused on the morphological traits and reproductive performance of Mangalitsa sows and boars, emphasizing how management and feeding factors influence body development and productive yields. Experimental data were obtained through standardized body measurements (withers height, chest depth, body length, chest and shank girth) and by monitoring reproductive indices (number of piglets per farrowing, survival to weaning, growth rate). The study population comprised 100 sows and 10 boars, raised under semi-free conditions and fed a mixed diet based on cereals, vegetable by-products, fresh alfalfa, and locally available resources. The results show that Mangalitsa sows display a rustic conformation, with medium stature (65–75 cm) and a chest girth of 120–140 cm, parameters associated with good adaptation to extensive systems and a moderate reproductive capacity (4–6 piglets per farrowing). Their growth rate is slower compared with commercial breeds, with an average gain of about 10 kg per month, but this is offset by the superior meat quality, characterized by high marbling and premium gastronomic value. The study highlights the importance of the conservation and sustainable use of the Mangalitsa breed in the current context of organic farming and the growing demand for traditional products. The findings support the view that this breed can become a strategic component in diversifying Romania's livestock production, while contributing to the preservation of indigenous genetic heritage and to sustainable rural development.
Keywords: sustainable livestock production, indigenous genetic resources, body conformation assessment, reproductive efficiency indicators, traditional pork quality.

36 Comparative study on the physico-chemical characteristics of different juice varieties

Bianca Maria RUS[1], Stefania ANDRONIE[2], Luisa ANDRONIE[*1], Iulia COROIAN[1*]

[1] University of Agricultural Sciences and Veterinary Medicine, Faculty of Forestry and Cadastre, Department of Land Measurements and Exact Sciences, e-mail: biancamaria.rus@student.usamvcluj.ro, luisa.andronie@usamvcluj.ro, iulia.coroian@usamvcluj.ro
[2]University of Agricultural Sciences and Veterinary Medicine, Faculty of Agriculture, e-mail: andronieandraa@yahoo.com

** Corresponding author's email: luisa.andronie@usamvcluj.ro , iulia.coroian@usamvcluj.ro*

Abstract
Orange juice is one of the most consumed natural beverages worldwide, due to its high content of vitamin C, phenolic compounds, and aromatic substances. During the processes of extraction, transportation,

storage, and packaging, the physicochemical properties of the juice play a crucial role in maintaining its quality and stability.
Physico-chemical analyses represent an important stage in the quality control of food products. In the food industry, the quality of a product is not limited to its organoleptic appearance (taste, smell, color, texture), but is also defined by physico-chemical parameters such as pH, density, sugar content.
The properties of liquids such as viscosity and surface tension are two fundamental parameters that influence fluid behavior, and in the case of orange juice, they contribute to pulp stability, the degree of homogenization, foaming, as well as the sensory perception of the product. The study of these quantities allows the characterization of orange juice as a complex, non-ideal fluid, with non-Newtonian behavior in some cases.
In this work, 4 types of commercially purchased orange juice were analyzed and a comparison was made between the results obtained from them and those from natural orange juice. Five samples of orange juice were analyzed over three days, investigating parameters such as density, pH, sugar concentration, surface tension and viscosity. The results revealed significant changes in density and viscosity, correlated with composition and sugar concentration. Surface tension varied significantly between the five types of juice.
In parallel, data obtained from a questionnaire on consumption preferences provided a complementary perspective on consumer behavior. The study highlights the importance of physico-chemical characterization of juices in order to choose products that have a lower sugar content and that help to properly hydrate the body.
Keywords: Juice, physicochemical analysis, density, viscosity, surface tension

37 The role of *Ctenopharyngodon idella* (Valenciennes, 1844) in optimizing aquaculture processes: A multidimensional assessment

SĂVESCU (CORDELI) Anca Nicoleta[1,2], TENCIU Magdalena[1], Desimira Maria STROE[1], Mihai VINTILĂ[1,3], MARCU Ionuț [1,4*]

[1] Institute for Research and Development in Aquatic Ecology, Fishing and Aquaculture, 54 Portului Street, 800211 Galati, Romania;
[2] Faculty of Engineering, "Dunarea de Jos" University of Galati, 111 Domneasca Street, 800201 Galati, Romania
[3] Romanian Academy, School of Advanced Studies of the Romanian Academy, Doctoral School of Economic Sciences, National Institute for Economic Research "Costin C. Kirițescu", The Institute of National Economy
[4] Faculty of Automation, Computers, Electrical Engineering and Electronics, "Dunarea de Jos" University of Galati, 111 Domneasca Street, 800201 Galati, Romania

** Corresponding author's email: marcu.ionut@asas-icdeapa.ro*

Abstract
The grass carp (*Ctenopharyngodon idella*, Valenciennes, 1844) plays a significant role in optimizing aquaculture processes through its ecological, economic, technological, and energetic contributions. As a fast-growing herbivorous species, it improves feed efficiency and reduces production costs while providing a sustainable protein source. Ecologically, grass carp contributes to aquatic vegetation control and water quality management, supporting ecosystem balance. Economically, its plant-based diet decreases dependence on expensive fishmeal and enhances profitability. Technological innovations, including advances in selective breeding, nutrition, and recirculating aquaculture systems, further

improve its growth performance and adaptability. From an energy and environmental perspective, grass carp shows a lower carbon footprint compared with carnivorous fish, aligning with sustainability and climate resilience goals. This multidimensional assessment highlights the species' capacity to enhance aquaculture productivity while promoting environmental stewardship and resource efficiency. By integrating *Ctenopharyngodon idella* into aquaculture systems, producers can diversify production, strengthen food security, and contribute to sustainable development objectives. This review provides concise insights for researchers, practitioners, and policymakers aiming to optimize aquaculture practices through the strategic use of grass carp.

Keywords: *Ctenopharyngodon idella*, multidimensional assessment, sustainability.

38 Therapeutic approaches of retained placenta in dairy cows

Cătălin Bogdan SÎRBU[1], Liliana Elena OLARIU-JURCA[1], Beatrice Ana-Maria SÎRBU[1*], Nicolae GIURGINCA[1], Paul Florin PAVEN[1], Valeriu Ioan CARABĂ[1]

[1]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Bioengineering of Animal Resources, Department of Biotechnology, email: beatrice.jitea@usvt.ro

** Corresponding author's email: beatrice.jitea@usvt.ro*

Abstract

Retained placenta is one of the most common postpartum disorders in dairy cows, associated with infertility when not treated promptly and appropriately. Retained placenta is linked to various factors such as abortion, difficult calving, delayed parturition, uterine atony, infections, hypovitaminosis, and hormonal imbalances. The study was conducted in 2024 on a dairy farm in Timiș County. A total of 20 cows, aged between three and eight years, were included and divided into two groups as follows: Group I was treated with oxytocin (Oxitocină FP® 10 IU/ml, administered according to the manufacturer's instructions – Institutul Pasteur), while Group II was treated with PGF2α (Estrumate® 20 ml, administered according to the manufacturer's instructions – MSD Animal Health). The oxytocin-treated group showed an efficacy of 95.7%, whereas the PGF2α-treated group showed an efficacy of 97.3%. In conclusion, these findings demonstrate that the administration of PGF2α and oxytocin immediately after calving plays an important role in uterine contraction and is effective in treating retained fetal membranes in dairy cows.

Keywords: dairy cows, retained placenta, PGF2α, oxytocin

39 *Acheta Domesticus* - Alternative source of protein intended for cocoa cream enrichment

Milica STOŽINIĆ[1*], Ivana LONČAREVIĆ[1], Biljana PAJIN[1], Branislav ŠOJIĆ[1], Atilla GERE[2]

[1] University of Novi Sad, Faculty of Technology Novi Sad, Department of food engineering, Bulevar cara Lazara 1, Novi Sad 21000, Serbia; e-mail: milica.stozinic@uns.ac.rs; ivana.loncarevic@uns.ac.rs; biljana.pajin@uns.ac.rs; sojic@tf.uns.ac.rs
[2] Institute of Food Science and Technology, Hungarian University of Agriculture and Life Sciences, Villányi út 29-43, H-1118 Budapest, Hungary; e-mail:gere.attila@uni-mate.hu

** Corresponding author's email: milica.stozinic@uns.ac.rs*

Abstract
Dietary habits have shifted throughout the last decade, leading to increased consumer demand for high – protein diet. New requirements are calling for greater amounts of protein intended for human use, and traditional protein sources are insufficient to meet this rising demand, creating a need for alternatives. Therefore, alternative sources of protein, such as insects, offer a promising protein source. *Acheta Domesticus* is one of the most common insects present in human diet. Compared to livestock farming, breeding these insects produces lower CO_2 emissions and reduces water and land usage. Additionally, insect breeding generates less waste, that can further be used as a fertilizer due to high nitrogen and phosphorus content. This study aimed to determine the possibility of adding *Acheta Domesticus* protein powder in cocoa cream products. *Acheta* Domesticus powder (CP) was examined regarding the chemical and amino acid composition. Then, cocoa cream products were enhanced with the addition of 10, 12.5, and 15% of protein powder and analyzed. These advantages underscore *Acheta Domesticus* potential as a sustainable protein source.
Keywords: insect, amino acid composition, chemical composition, confectionery products

40 Volatile fatty acids - Alkaline buffer capacity ratio applied to monitorize biogas plants in West region of Romania

Teodora Liana TOADER [1], Gabriel Ioan MOLDOVAN [1*], Timotei Bogdan BACOS [2], Adrian Eugen CIOABLA [2], Teodor VINTILĂ [1*]

[1] University of Life Sciences „King Mihai I" from Timisoara, Faculty of Bioengineering of Animals Resources, Department of Biotechnology, e-mail: teodora.toader@usvt.ro
[2] Politehnica University Timisoara, Mechanical Machines, Equipment and Transports Department, e-mail: bacost@yahoo.com

** Corresponding author's email: teodorvintila@usvt.ro, gabriel.moldovan@usvt.ro*

Abstract
In anaerobic digestion processes for biogas production, the importance of correct and efficient feeding of the digester is an essential condition to reduce losses and to fully exploit the methanogenic potential of the raw material. In many cases, due to the desire to increase biogas production, digesters are fed with

materials with increased amounts of organic substances, which leads to the accumulation of volatile fatty acids and implicitly to a decrease in pH. This acidity inhibit methanogenic bacteria, and biogas production decreases or even stops. In monitoring anaerobic digestion processes, an important parameter is the FOS/TAC ratio, which represents the ratio between the concentration of volatile fatty acids (FOS) and the alkaline buffer capacity (TAC). The optimal FOS/TAC ratio should be between 0.3-0.4. In this study, the FOS/TAC ratio and the pH of the digestate from three biogas plants in the Western area of Romania were analyzed and the correlation between the operating stage of the biogas plants and the analyzed parameters was established. In all three biogas plants, the FOS/TAC values were below 0.2, requiring the feeding of more organic substrate. In one of the biogas plants, the faulty feeding led to the increase of FOS/TAC, which led to the stopping of feeding and monitoring of the plant feeding correlated with FOS/TAC analysis for several weeks. The results obtained allowed to issue recommendations for improving the anaerobic digestion process of the raw material and optimizing biogas production.
Keywords: anaerobic digestion, FOS/TAC, biogas, organic wastes, circular bioeconomy

41 Study of the frequency of scrapie-resistant genotypes in Țurcană sheep breed

Neli-Georgeta TODEA[1], Octavia-Sorin VOIA[1*], Ioana Andreea PRISTAV[1], Adrian-Dan RĂȘINAR[1], Tiberiu POLEN[1], Ludovic Toma CZISZTER ,Ioan PEȚ[1]

[1] University of Life Sciences "King Mihai I" from Timișoara, Faculty of Bioengineering of Animal Resources, Calea Aradului no.119, e-mail: octavianvoia@usvt.ro

** Corresponding author's email: octavianvoia@usvt.ro*

Abstract
Transmissible spongiform encephalopathies are caused by prions, which are pathological isoforms of normal proteins encoded by host organisms. The tests were performed on Țurcană breed sheep from a private farm in Sibiu County. Blood samples were taken from adult sheep and lambs born in 2021, and the next batch of samples was collected from 3-4-month-old lambs born in 2022. Blood samples were collected from the jugular vein, on EDTA, in a quantity of 6 ml/animal, and refrigerated at 4^0C for transport to the laboratory. The analysis was performed in the molecular genetics laboratory at the DSVSA Sibiu and at the National Reference Laboratory for Animal Health and Diagnosis in Bucharest. Sheep were classified into five classes of scrapie resistance: highly resistant, resistant, low resistance, susceptible, and highly susceptible. In 2021, resistant lambs accounted for half of the tested population. Among adults, 57.07% were resistant to the disease, 32.59% were in the low resistance group, and 10.34% were susceptible and highly susceptible. In 2022, 50.77% of lambs tested for scrapie fell into the resistant groups and 49.23% into the low resistance, susceptible, and highly susceptible groups. For breeding, only resistant sheep from the first two groups should be used and only in exceptional cases, sheep with low resistance from group III. We recommend testing for scrapie resistance at the first sign of the disease, selecting sheep according to genotype, and purchasing rams that have been tested and found to be highly resistant for breeding purposes.
Keywords: small ruminants, spongiform encephalopathy

42 The Chemistry of Taste: Bitter-Masking Compounds in Food and Pharmaceutical Products

Petra TUCILIA-CIOCAN[1], Ioan PEȚ[1], Gabi DUMITRESCU[1], Mirela AHMADI[1*]

[1]University of Life Sciences „King Mihai I" from Timisoara, Faculty of Bioengineering of Animals Resources, Department Biotechnology

** Corresponding author's email: mirelaahmadi@usvt.ro*

Abstract
Bitterness is a fundamental taste sensation that often poses a major formulation challenge in both food and pharmaceutical industries. While certain bitter compounds contribute to characteristic flavors and potential health benefits, excessive bitterness can lead to poor consumer and patient acceptance. This review research explores the chemistry and functionality of bitter-masking compounds – substances capable of neutralizing, balancing, or modulating undesirable taste perceptions without compromising product quality or stability. This paper will present the molecular mechanisms underlying bitterness perception, including receptor interactions and the influence of compound structure on taste response. Special emphasis will be placed on the role of carbohydrates, polyols, proteins, and flavor modulators used as masking agents in diverse applications ranging from fortified foods and nutraceuticals to oral dosage forms and pediatric medicines. Advances in formulation science, sensory analysis, and ingredient technology will be discussed to highlight how multidisciplinary approaches can optimize palatability and compliance. By bringing together the experience from food chemistry, sensory science, and pharmaceutical formulation, this paper work aims to foster dialogue on innovative strategies for taste modulation. The ultimate goal is to bridge scientific understanding with practical applications – transforming bitterness from a formulation obstacle into an opportunity for improved consumer experience and product development.
Keywords: bitter-masking compounds, taste, food, parmaceuticals.

43 Screening of ecologically oriented Natural Deep Eutectic Solvent (NADES) for isolation of bioactive compounds from *Solidago virgaurea*

Sanja VOJVODIĆ [1*], Danica BOŽOVIĆ [1], Milica AĆIMOVIĆ [2], Zoran ZEKOVIĆ [1], Branimir PAVLIĆ [1]

[1] University of Novi Sad, Faculty of Technology, Pharmaceutical engineering, e-mail: sanja.milosevic@uns.ac.rs; danica_bozovic@live.com; zzekovic@tf.uns.ac.rs; bpavlic@uns.ac.rs
[2] Institute of Field and Vegetable Crops Novi Sad, e-mail: milica.acimovic@ifvcns.ns.ac.rs

** Corresponding author's email: sanja.milosevic@uns.ac.rs*

Abstract
European goldenrod (*Solidago virgaurea*) from *Asteraceae* family is an under-researched plant with a promising bioactive potential. *S. virgaurea* is traditionally used for the treatment of kidney disorders and diabetes, urinary tract infections, allergies and gastrointestinal disorders due to presence of numerous bioactive compounds (flavonoids, phenolic acids, terpenes, saponins, polysaccharides, and essential oil).

Antioxidant, analgesic, anti-inflammatory, antibacterial, and diuretic effects of goldenrod have been documented. Natural deep eutectic solvent (NADES) extraction as an eco-friendly technique was used for obtaining high-quality extracts. This simple extraction uses non-toxic solvents with creating minimal waste streams and pollution. The main goal of this research was to investigate the most appropriate NADES in regard to the highest content of phenolic compounds (TP) and antioxidative capacity through ability to neutralize DPPH radicals. Twelve different NADES mixtures were prepared and used for isolation of bioactives from *S. virgaurea*. The extraction parameters were: temperature at 40 °C, solid/liquid ratio of 1:10 m/m, extraction time of 60 min, and 600 rpm stirring speed. Results showed that NADES mixtures highly effected on TP content and ability to neutralize DPPH radicals, ranging from 23.48-54.05 mg GAE/g DW and 109.65-212.29 μM TE/g DW, respectively. Solvent mixture of choline chloride and malonic acid, with a molar ratio 1:1 (N6) provided the highest content of TP and antioxidant activity. NADES mixture made of choline chloride and citric acid, with a molar ratio 1:1 (N5) also expressed statistically significant results. Therefore, two NADES mixtures enabled the high isolation of polyphenols and antioxidants from *S. virgaurea*. In this way, it was confirmed that under-utilized *S. virgaurea* represented a highly valuable raw material for isolation of phenolic compounds with strong antioxidant capacity. Therefore, further optimization of NADES extraction will be necessary in order to obtain as high as possible contents of bioactives from this highly potent plant.

Keywords: green solvents, under-researched plant, Asteraceae family, extraction, total phenolic content, antioxidant activity

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44 Valorization of cauliflower glaze as a source of bioactive polyphenols

Jelena VUKOSAVLJEVIĆ [1*], Sara HOURANI [1], Boris M. POPOVIĆ [2], Branimir PAVLIĆ [1*]

[1] University of Novi Sad, Faculty of Technology Novi Sad, Department of Pharmaceutical Engineering, e-mail: jelena.vukosavljevic@uns.ac.rs
[2] University University of Novi Sad, Faculty of Agriculture Novi Sad, Department of Chemistry

** Corresponding author's email: jelena.vukosavljevic@uns.ac.rs; bpavlic@uns.ac.rs*

Abstract
The potential of agricultural and food waste as a source of biologically active compounds has received limited attention. Valorization of by-products and agri-food wastes through the extraction of valuable bioactive compounds, particularly polyphenols with antioxidant properties, represents a sustainable strategy for enhancing resource efficiency and creating new market opportunities (Pavlić et al., 2023). One such underexplored material is cauliflower glaze, a by-product generated during food industrial processing. Prior to freezing, cauliflower florets are subjected to a glazing process aimed at improving visual appearance and increasing product mass, generating approximately 5% of waste.
The present study aimed to investigate the potential of dried cauliflower glaze as a source of polyphenols by applying traditional solid-liquid extraction using different ethanol concentrations (20%, 40%, 60%, 80% and 96%) as green solvents. The obtained extracts were evaluated for total polyphenol content (TPC) and antioxidant activity using DPPH, FRAP, and ABTS assays. The results ranged from 0.74 to 2.87 mg

GAE/g DW, 0.37 to 1.72 mg TE/g DW, 0.37 to 1.30 mg Fe^{2+}/g DW, and 1.16 to 5.22 mg TE/g DW for TPC, DPPH, FRAP, and ABTS tests, respectively.
Future research should focus on the application of advanced green extraction techniques to maximize the recovery of polyphenolic compounds from agri-food waste and enhance the antioxidant potential of the resulting extracts, thereby promoting their potential use in agricultural, food, and pharmaceutical industries.
Keywords: food waste, antioxidant activity, S/L extraction, ethanol

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45 Effects of aluminum exposure and involvement of Tor1 signaling on cell cycle regulation in *Schizosaccharomyces pombe*

Hossein Zakariapour Bahnamiri[1], Alica Navrátilová[2], Marek Kovár[3], Lucia Klongová[1], Anetta Bakošová[4], and Miroslava Požgajová[1]*

[1]AgroBioTech Research Center, Slovak University of Agriculture, Nitra, Slovakia
[2]Institute of Nutrition and Genomics, Slovak University of Agriculture, Nitra, Slovakia
[3]Institute of Plant and Environmental Science, Slovak University of Agriculture, Nitra, Slovakia
[4]Centre of Biosciences, Slovak Academy of Sciences, Bratislava, Slovakia

** Corresponding author: hossein.bahnamiri@uniag.sk*

Abstract
The utilization of aluminum, the third most prevalent metal in the Earth's crust, is increasing rapidly in human daily life. The chronic exposure of the living organisms to Aluminum through the gastrointestinal tract, lung, and skin via various sources can lead to oxidative stress, lipid peroxidation, DNA damage, cell cycle impairment, and cell death, leading to various diseases such as *Alzheimer's disease,* osteomalacia, asthma, and cancer.Yeast cells are used as a model organism for determining biological and molecular mechanisms that control responses to environmental stress, such as heavy metals, as they share high similarity with higher eukaryotic organisms, including animals and humans. This study was conducted to investigate the effects of $AlCl_3$ toxicity on wild-type and Target of Rapamycin knockout (ΔTor1) strains of *Schizosaccharomyces pombe* growth and cell cycle to explore the likely roles of the Tor1 signaling pathway in mediating Al toxicity. The growth of yeast cells was assessed through measuring cell density in media with serially increasing concentrations of $AlCl_3$ in culture media at 3 h intervals. Yeast cells were cultured in liquid media containing 0, 750, and 1500 µM of $AlCl_3$ for 3 and 6 h. Increasing concentrations of $AlCl_3$ reduced the growth rate of both wild type and ΔTor1 strains in the same pattern; however ΔTor1 strain grew better in solid media at high $AlCl_3$ concentration. The expression of the *cdc2* gene was higher in ΔTor1 compared to wild type. The results of the current work demonstrate the likely involvement of the Tor1 signaling pathway in Al-induced effects on *S. pombe* cell cycle regulation.

Keywords: Aluminum toxicity, Cell proliferation, Fission yeast, TORC2 complex.

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46 Milk-to-kefir transformation: An entrepreneurial strategy for increasing added value amidst the raw milk price crisis

Eugen Cătălin ZOICAN[1], Beatrice Ana-Maria SÎRBU[1], Diana MARCU[1], Adrian-Dan RĂŞINAR[1], Maria Alexandra FERENCZ[1]

[1]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Bioengineering of Animal Resources, Department of Biotechnology, e-mail: catalin.zoican@usvt.ro

** Corresponding author's email: catalin.zoican@usvt.ro*

Abstract
The Romanian dairy sector faces a persistent crisis characterized by low farm-gate prices for raw milk, often falling below production costs, threatening the economic sustainability of primary producers. This situation stifles investment, leads to farm closures, and increases reliance on imports, posing risks to rural development and food security. This review paper analyzes the on-farm processing of raw milk into artisanal kefir as a strategic entrepreneurial solution to significantly increase added value at the source. The analysis synthesizes economic data from official European and national statistical bodies, market reports, scientific literature on kefir's properties, and a detailed case study of a successful artisanal producer. The findings indicate that the transformation into kefir can multiply the raw material's value by a factor of 5 to 7. This business model is supported by accessible biotechnology, strong alignment with consumer trends favouring health-oriented and local products, and scalable initial investments. On-farm kefir production is presented as a viable model that not only offers a solution to the price crisis but also fosters rural entrepreneurship and strengthens short supply chains, contributing to the resilience of the local agri-food system.
Keywords: added value, artisanal kefir, business model, dairy crisis, entrepreneurship.

47 Nutritional Management of Heat-Stressed Pregnant Dairy Cows

Chiamaka Goodness CHUKWUMA[1], Myrtill GRÁFF[1], Geroge WANJALA[1], Luyao WANG[1] , Wissem BACCOURI [1,2,3*]

[1] University of Szeged, Faculty of Agriculture, Institute of Animal Sciences and Wildlife Management, e-mail: chukwumachiamaka32@gmail.com
[2]Doctoral School of Animal Science, University of Debrecen, 4032 Debrecen, Hungary;
[3]Department of Animal Science, Institute of Animal Science, Biotechnology and Natural Conservation, Faculty of Agricultural and Food Sciences and Environmental

Abstract
Global rising temperatures pose an increasing challenge to dairy productivity, with heat stress during the dry period representing a critical concern for both cow health and subsequent lactation performance. While the effects of heat stress on lactating cows are well documented, less attention has been given to

pregnant, non-lactating animals, despite evidence that thermal stress during this period can disrupt endocrine function, compromise energy balance, and trigger systemic inflammation. Such physiological alterations can negatively influence the transition period, early lactation performance, and overall productive efficiency. This review synthesises current knowledge on the metabolic, hormonal, and immunological responses of dry cows to heat stress, highlighting the complex mechanisms through which elevated temperatures impair homeostasis. Emphasis is placed on nutritional strategies aimed at mitigating these effects, including the inclusion of rumen-protected fats, antioxidants, and essential trace minerals such as chromium, as well as dietary timing and formulation. The review also considers how these interventions may enhance thermoregulation, reduce inflammatory responses, and support metabolic resilience. Understanding and applying effective nutritional and management practices during the dry period is essential for safeguarding cow welfare, optimising productive longevity, and ensuring sustainable dairy production under increasingly warm and variable climatic conditions.

Keywords: Chronium, Dry period, Heat stress, nitigation, nutrition, protected fat.

48 Grassland Management and Sustainable Livestock Production in China

Luyao WANG [1], Myrtill GRÁFF [2], Chiamaka Goodness CHUKWUMA [3]

[1] *University of Szeged, Faculty of Agriculture, e-mail: dbt2022@126.com*
[2] *University of Szeged, Faculty of Agriculture, e-mail: kocsisne.graff.myrtill@szte.hu*
[3] *University of Szeged, Faculty of Agriculture, e-mail: chukwumachiamaka32@gmail.com*

Abstract
Grasslands are not only the largest terrestrial green ecological barrier in China but also the fundamental basis for the development of the grass–livestock industry. However, due to natural, geographical, historical, and policy-related factors, there are still significant challenges in grassland ecological protection and livestock production. The demand for precise management continues to increase, yet baseline data remain incomplete. While ecological restoration efforts have achieved notable results, management institutions and technical teams are still weak, and infrastructure in pastoral areas lags far behind. Overall, China's grassland husbandry is in a transitional stage from traditional to modern systems, but development levels are uneven—southern regions are more advanced than northern ones, and eastern areas outperform the west. In pastoral zones, traditional extensive production remains dominant, whereas agricultural and agro-pastoral areas are gradually integrating modern technologies and intensive management. This paper analyzes the current status and key issues of grassland management and animal husbandry development in China, emphasizing the need for region-specific and adaptive measures. Strengthening data monitoring, enhancing management capacity, and improving infrastructure construction are essential for promoting sustainable transformation and ensuring the long-term ecological stability of China's grassland ecosystems.

Keywords: ecology, animal husbandry, rural development, sustainability, modernization, management

49. Exploring Kenya's guinea fowl diversity

Tracy MOGENI [1], Myrtill GRÁFF [1]

[1]University of Szeged, Faculty of Agriculture, Institute of Animal Science and Wildlife Management, email:tracymogeni7@gmail.com

Abstrac
Guinea fowl is the coined name of the seven species of birds in the *Numididae* family under the *Galliformes* order. Guinea fowl, indigenous to Africa and named after Guinea in West Africa, have been domesticated since Ancient Greece and Rome.. Unlike their predecessors, domesticated guinea fowl exhibit rapid growth resulting in a larger body size, orange or yellow legs rather than black, white claws instead of black, increased egg production, varied plumage patterns, and less parental care for their young. In Kenya, they mainly serve as a ready source of protein, feathers, income, manure for soil enrichment, gifts, dowry payments, ornamental value and insect control. Kenya is proud to boast its variety of guinea fowl species, as four have been catalogued and recognised by the Ministry of Agriculture, Livestock, Fisheries and Cooperatives. One of them is (*Numida meleagris*), the domesticated helmeted Guinea fowl which is among Sub-Saharan Africa's most widespread and abundant terrestrial quarry species. It is a sub-species of guinea fowl that is derived from (*Numida meleagris galeata*) its wild ancestor, indigenous to West Africa. Not only is it the most popular of the guinea fowl family but also it is the only extant member of the *Numida* genus. Within Eastern Africa., this species is predominantly produced in Uganda and Kenya. There are three colour varieties produced under the helmeted guinea fowl, the red wattle white, red wattle speckled and blue wattle helmeted. The fourth is the vulturine (*Acryllium vulturinum*) is the largest member of its family endemic to tropical East Africa.

Keywords: domesticated, indigenous, varieties, terrestrial, species

50. Study on the structure of the equine population in households

AVRAM Sergiu-Ioan, Silvia Elena ERINA, Simona BAUL, Flavia BOCHIŞ, Ludovic Toma CZISZTER*

[1]Faculty of Bioengineering of Animal Resources, University of Life Sciences "King Mihai I" from Timişoara, Calea Aradului 119, 300645, Timişoara, Romania

[*]Corresponding author's email: ludovicczisztер@usvt.ro

Abstract
The aim of the study was to demographically describe the equine populations (horses and donkeys) from the Banat region (Arad, Caraş-Severin, Hunedoara and Timiş counties) and the Szeklerland (Covasna, Harghita and Mureş counties). The database was set up from the National Authority for equine registration on December 2024. This database contained information regarding species, breed, gender, origin, and date of birth. A total of 41,958 animals were divided into seven groups: foals (up to 1 year of age), yearling (1-3 years), youngstock (3-7 years), adult (7-12 years), senior (12-18 years), old (18-25

years, and very old (over 25 years). Out of the total animals, 98% were horses and 2% donkeys. The common equine, without known origin was the main horse in households (96%). Except for the common equine, there were 57 horse breeds (Lipițan, Nonius etc.) and 2 donkey breeds (Andalusian, Catalan) found. Gender ration was comparable with 42% females and 58% males. The most equines were autochthonous (99%) and only 1% were bought from other countries. In Banat region were 39% of the equines, while in Szeklerland 61%. The equines between 3 and 18 years of age comprised 54% of the total animals in the study. Horses were 4.89 years older than donkey ($p<0001$). Common equines were 0.55 years older than those with known breed ($p<0001$). Gender and country origin had no effect on equine age ($p>0.05$). The Banat region equines were 2.54 years older than those from Szeklerland ($p<0.05$). County of origin had a significant effect on equines age ($p<0.001$). The oldest equines were in Arad, Timiș and Hunedoara, while the youngest in Harghita and Mureș.

Keywords: age, Banat, donkeys, equines, horses, household, structure, Szeklerland

51. Effects of non-genetic factors on service period length in Romanian Brown cows

MÎRNEA Petru-Sergiu-Florin[1], Radu Ionel NEAMȚ[2], Silvia Elena ERINA[1], Simona BAUL[1], Florin Cristian NECIU[2], Ludovic Toma CZISZTER[1]*

[1]*Faculty of Bioengineering of Animal Resources, University of Life Sciences "King Mihai I" from Timișoara, Calea Aradului 119, 300645, Timișoara, Romania*
[2]*Research Department, Research and Development Station for Bovine, Calea Bodrogului 32, 310059, Arad, Romania*

*Corresponding author's email: ludovicczisztер@usvt.ro

Abstract
The aim of the study was to assess the effects of calving year, season of calving, parity and calving ease on service period length in Romanian Brown cows. A total of 750 data records, obtained from 150 lactations of 50 Romanian Brown cows were collected between years 2018 and 2020. Year of calving ($P\leq0.05$), parity ($P\leq0.01$) and calving ease ($P\leq0.001$) were strongly linked to the cows' service period length. No significant differences in terms of service period length were recorded according to the season of calving ($P>0.5$). In conclusion, year of calving and calving ease were the main influential factors for this reproductive trait. In this respect, additional studies should be performed in order to include other factors and validate their results.

Keywords: non-genetic factors, reproduction performances, Romanian Brown

52 Rabbits as companion animals

Roxana Nicoleta LAZĂR[1], Silvia PĂTRUICĂ[1]*,

[1]University of Life Sciences "King Mihai I" from Timisoara, Faculty of Bioengineering of Animal Resources, Calea Aradului, 119, 300645, Timisoara, Romania, e-mail: roxanalzar@usvt.ro

** Corresponding author: silviapatruica@usvt.ro*

Abstract
In recent decades, pets have become an essential part of everyday life, contributing significantly to people's emotional and physical well-being. Among them, the domestic rabbit has gained popularity due to its affectionate and sociable nature. The present paper aims to explore from a scientific perspective the impact of pet rabbits on the health and well-being of their owners, as well as their morphological and behavioral characteristics. The main breeds of rabbits raised as pets are analyzed: Angora, Tan, Lion's Head and Mini Lop, highlighting their physical and temperamental peculiarities. The analysis of rabbit behavior is an essential element of this research, providing valuable information about their eating habits, play activities and communication methods. The paper emphasizes the importance of understanding the emotional and social needs of rabbits, as well as the role of human-animal interaction in the development of a harmonious relationship. The paper highlights the physical and psychological benefits of owning a pet rabbit and emphasizes the need for further research to fully harness the potential of these animals in improving the quality of human life.

Keywords:domestic rabbit, pets, human-animal relationship

53 Intrafollicular Oocyte Injection in Cattle: Advances, Challenges, and Future Perspectives

Silviu-Ionuț BORȘ [1] , Mirela Ariton 1 , Amalia-Ioana Hârbu [2]

1 Research and Development Station for Cattle Breeding Dancu, 707252, Iași, Iași - Ungheni Alley No. 9, Romania 1; bors.ionut@yahoo.com,amariton@yahoo.ro;

2 "Ion Ionescu de la Brad" Iași University of Life Sciences, Faculty of Veterinary Medicine, 700489, Iași, Mihail Sadoveanu Alley, No. 8, Romania; amalia.harbu@iuls.ro

Correspondence: bors.ionut@yahoo.com;
ORCID – S-I. B.: https://orcid.org/0000-0001-9601-0788
ORCID – M. A.: https://orcid.org/0000-0003-1586-2749
ORCID – A-I. H.: https://orcid.org/0009-0002-2080-2337

Abstract: Reproductive biotechnologies in cattle have advanced considerably over the past decades, aiming to enhance embryoyield and improve the efficiency of assisted reproduction. The development of intrafollicular techniques has opened new avenues in bovine reproductive biotechnology, providing alternatives to traditional in vitro embryo production systems. Two related approaches, Intrafollicular

Oocyte Transfer (IFOT) and Intrafollicular Immature Oocyte Transfer (IFIOT), have been developed to exploit the ovarian follicle as a physiological environment that supports oocyte maturation, fertilization, and early
embryonic development. In IFOT, in vitro–matured oocytes are injected into preovulatory follicles to permit ovulation and in vivo fertilization, while IFIOT involves transferring immature oocytes into developing follicles for physiological maturation. Both approaches aim to replace artificial in vitro conditions by utilizing the follicle as a natural site for oocyte development. Despite promising results, both methods face technical and biological challenges. Variability in follicular response, difficulties in standardizing injection procedures, and inconsistent results, remain significant challenges for practical implementation. Nevertheless, these techniques provide valuable experimental models for studying follicular physiology, oocyte competence, and the mechanisms governing fertilization and early embryo development. Further refinement of synchronization and microinjection techniques may enhance the consistency of IFOT and IFIOT outcomes. Together, these methods represent a promising approach to better integrate in vitro systems with the physiological processes of bovine reproduction.

Keywords: cattle; oocyte; intrafollicular oocyte transfer (IFOT); intrafollicular immature oocyte transfer (IFIOT); follicular environment; embryo development; assisted reproduction.

54 Machine learning based analysis of dairy cows vocal behaviour

Madalina MINCU-IORGA[1], Dinu GAVOJDIAN[1*]

[1] Research and Development Institute for Bovine, Cattle Production Systems Laboratory, Balotesti, Romania, e-mail(s): madalinamincu8@gmail.com; gavojdian_dinu@animalsci-tm.ro

** Corresponding author: gavojdian_dinu@animalsci-tm.ro*

Abstract

Understanding animal vocalizations is pivotal for assessing emotional states and advancing animal welfare in precision livestock farming. This study explores dairy cattle contact calls using integrated multi-modal approaches, combining acoustic pattern extraction, sequential analysis and acoustic feature profiling. The Natural Language Processing-based WHISPER model was employed to convert audio recordings of cow vocalizations into acoustic-to-text sequences. By integrating acoustic characteristics such as frequency, duration, and intensity with these sequential acoustic patterns, a robust representation of cow vocalizations was developed. Leveraging data fusion techniques within a specifically developed ontology, we categorized vocalizations into high-frequency calls (HFC) putatively associated with arousal or agitation, and low-frequency calls (LFC) indicative of calm or content states. Multi-dimensional data analysis revealed specific acoustic indicators of the two call types, including distinct frequency patterns and spectral attributes. Evaluating acoustic and sequential patterns from vocalizations of 20 lactating cows facilitated differentiation in calling behaviors. Advanced machine learning methods, including Random Forest, Support Vector Machine (SVM), and Recurrent Neural Networks (RNN), effectively analyzed and fused multi-source acoustic data, resulting in classification accuracies of 97.25% (Random Forest), 98.35% (SVM), and 88.00% (RNN). The F1-scores for identifying arousal were 0.98 (Random Forest) and 0.99 (SVM). To our best knowledge, this is the first work that combines acoustic and symbolic data to analyze vocalizations of dairy cows in order to develop a non-invasive classification model using multi-modal machine learning.

Keywords: bioacoustics monitoring, cattle vocalizations, machine learning, precision livestock farming

55 Natural and synthetic compounds with antimicrobial potential: A review

Marioara Nicoleta CARABA[1,2,3], Dainela PUSCASIU[2,3*], Mihai MITULETU[2,3], Isabella Ionela STOIAN[2,3], Ion Valeriu CARABA[3,4*], Gabi DUMITRESCU[3,4], Roxana POPESCU[2,3], Adelina CHEVERESAN[5]

[1] Doctoral School, Faculty of Medicine, "Victor Babeş" University of Medicine and Pharmacy, 2nd Eftimie Murgu Square, 300041 Timisoara, Romania; e-mail: nicoleta.caraba@umft.ro
[2] Department of Cellular and Molecular Biology, Faculty of Medicine, "Victor Babes" University of Medicine and Pharmacy of Timisoara, E. Murgu, 2, Timisoara, 300041 Romania, e-mail: nicoleta.caraba@umft.ro, puscasiu.daniela@umft.ro, mihai.mituletu@umft.ro, isabella.stoian@umft.ro, popescu.roxana@umft.ro,
[3] ANAPATMOL Research Center, "Victor Babes" University of Medicine and Pharmacy of Timisoara, E. Murgu, 2, Timisoara, 300041 Romania e-mail: nicoleta.caraba@umft.ro, puscasiu.daniela@umft.ro, mihai.mituletu@umft.ro, isabella.stoian@umft.ro, popescu.roxana@umft.ro, valeriucaraba@usvt.ro, gabidumitrescu@usvt.ro,
[4] Faculty of Bioengineering of Animal Resources, University of Life Sciences "King Mihai I of Romania" from Timisoara, Calea Aradului 119, RO 300645, Timisoara, Romania, e-mail: valeriucaraba@usvt.ro, gabidumitrescu@usvt.ro,
[5] Department of Biochemistry and Pharmacology, Faculty of Medicine, "Victor Babeş" University of Medicine and Pharmacy, 2nd Eftimie Murgu Square, 300041 Timisoara, Romania e-mail: adelina.cheveresan@umft.ro

** Corresponding author: puscasiu.daniela@umft.ro, valeriucaraba@usvt.ro*

Abstract
Antimicrobial resistance has recently become a global challenge, as bacterial pathogens are becoming increasingly resistant to traditional antibiotics. Because use of classical antibiotics as standard treatment for bacterial infections has led to an alarming situation of microbial resistance development, increasing antimicrobial treatment failures, and increasing mortality rates. Studies in recent years have aimed to identify new molecules with properties comparable to those of classical antibiotics, which would act effectively on microorganisms and improve health. New molecules with therapeutic effects can be obtained from natural sources or by chemical synthesis or can be components derived from natural resources. The most important natural sources used due to their antimicrobial potential are plants and bee products. Synthetic products are obtained chemically and have in their composition biologically active compounds such as various ions or molecules that have the ability to interact with the microbial cell. With the increasing importance and prevalence of herbal medicines, but also of a wide range of synthetic compounds, it is necessary to carry out appropriate assessments to allow their use. The insufficient pharmacological evaluation, the small number of *in vitro* studies, but especially *in vivo* studies of herbal or synthetic drugs, hinder their use in contemporary medical practice. Complex *in vivo* and *in vitro* studies are needed to address aspects of: cellular cytotoxicity, prokaryotic cell-eukaryotic cell interactions, intracellular activity, prokaryotic cell-environment interaction, gene expression studies and metabolomic aspects of natural or synthetic drugs with antimicrobial potential. As a result, natural resources or components derived from natural resources, respectively synthetic products, will have an important role in the development of adequate medication with an important role in solving public health problems.

Keywords: antibacterial, antifungal, medicinal plants,

56 Balanced nutrition for efficient reproduction in sheep: A review

Nicolae Adrian GIURGINCA[1], Marioara Nicoleta CARABA[2,3*], Gabi DUMITRESCU[3,4], Catalin Bogdan SIRBU[4*], Beatrice Ana-Maria SIRBU[4], Ion Valeriu CARABA[3,4]

[1] Doctoral School "Engineering of Vegetable and Animal Resources", University of Life Sciences "King Mihai I" from Timişoara, Calea Aradului 119, 300645-Timişoara, Romania; e-mail: nicolae.giurginca@usvt.ro
[2] Department of Cellular and Molecular Biology, Faculty of Medicine, "Victor Babes" University of Medicine and Pharmacy of Timisoara, E. Murgu, 2, Timisoara, 300041 Romania, e-mail: nicoleta.caraba@umft.ro,
[3] ANAPATMOL Research Center, "Victor Babes" University of Medicine and Pharmacy of Timisoara, E. Murgu, 2, Timisoara, 300041 Romania e-mail: nicoleta.caraba@umft.ro, gabidumitrescu@usvt.ro, valeriucaraba@usvt.ro,
[4] Faculty of Bioengineering of Animal Resources, University of Life Sciences "King Mihai I of Romania" from Timisoara, Calea Aradului 119, RO 300645, Timisoara, Romania, e-mail: gabidumitrescu@usvt.ro, catalinsibu@usvt.ro, beatrice.jitea@usvt.ro, valeriucaraba@usvt.ro

** Corresponding author: nicoleta.caraba@umft.ro, catalinsibu@usvt.ro*

Abstract
The efficient combination of growth, reproduction and nutrition systems is the essential element for obtaining animals in large quantities and of good quality. Reproductive efficiency, productivity and quality in sheep is determined by a good combination of estrus synchronization and improvements in genetic characteristics. The correct combination of sheep breeds, nutritional and production environments allows animals to express their genetic potential, which is reflected in improved production. In the case of sheep, grazing and indoor feeding are the main feeding methods. They play an essential role in shaping nutritional regimes that ensure the management of sheep populations for various purposes, both meat and dairy production. An effective diet with a role in stimulating reproductive function is based on the abundant presence of unsaturated fatty acids, a wide range of macro and microelements, vitamins, antioxidants and the minimal presence of saturated fatty acids. Fatty acids involved in oocyte maturation and embryo implantation, improving sperm quality parameters are recommended to be present in the sheep feeding system. Also, macroelements: sodium, chlorine, calcium, phosphorus, magnesium, potassium, sulfur and trace elements: iodine, iron, molybdenum, copper, cobalt, manganese, zinc and selenium; fat-soluble vitamins (A, D, E); vitamins from group B; antioxidants have been shown to have a beneficial role in stimulating reproductive function in sheep. Saturated fatty acids can have negative effects on reproductive health, contributing to ovulatory disorders, reduced fecundity and endometriosis, as a result it is recommended to avoid their inclusion in the sheep feeding system. Identifying and applying a balanced nutrition, therefore an efficient feeding system in sheep taking into account the breed, geoclimatic conditions and growing system can lead to an increase in the efficiency of reproductive function.

Keywords: estrus synchronization, breed, nutrition system,

57 Quantitative splanchnological study of sterlet (*Acipenser ruthenus*) reared in a recirculating aquaculture system

Adrian FILIPESCU[1], Mădălina ANDREI-CIOABĂ[2], Alexandru-Dorian MICŞESCU-BENGHIA[3], Sandra Antonia MIHAILOV[4], Adrian GROZEA[5]*

[1] University of Life Sciences „King Mihai I" from Timişoara, Faculty of Bioengineering of Animal Resources,, e-mail: adrian.filipescu.fbira@usvt.ro
[2] University of Life Sciences „King Mihai I" from Timişoara, Faculty of Bioengineering of Animal Resources,, e-mail: madalina.andreicioaba.fbira.fbira@usvt.ro
[3] University of Life Sciences „King Mihai I" from Timişoara, Faculty of Bioengineering of Animal Resources,, e-mail: alexandru.dorian.micsescu@usvt.ro
[4] University of Life Sciences „King Mihai I" from Timişoara, Faculty of Bioengineering of Animal Resources, Department I Animal Productions Engineering, e-mail: sandramihailov@usvt.ro
[5] University of Life Sciences „King Mihai I" from Timişoara, Faculty of Bioengineering of Animal Resources, Department I Animal Productions Engineering, e-mail: adriangrozea@usvt.ro

** Corresponding author: adriangrozea@usvt.ro*

Abstract
Natural populations of sturgeons have dramatically declined in recent decades due to anthropogenic pressures such as overfishing, habitat degradation and pollution. As a result, all sturgeon species were included under the CITES Convention, which led to the development of their commercial aquaculture. Among them, the sterlet (*Acipenser ruthenus*) is a species of particular interest due to its high-quality meat, economic value and remarkable ability to adapt to recirculating aquaculture systems (RAS). This study aimed to describe the anatomical and morphological characteristics of the internal organs of 1.5-year-old sterlet specimens reared in intensive indoor systems, using specific quantitative splanchnological methods. The anatomical examination revealed an abdominal cavity with reduced perivisceral fat and a simple digestive tract composed of a short esophagus, a well-developed stomach, and a middle and posterior intestine. The latter was provided with a spiral septum on the inner surface. At the junction between the stomach and the intestine, pyloric ceca were grouped into a spongy-like structure. The liver displayed a clearly lobed structure, while the heart and spleen, though small, were well individualized. The pancreas, with a diffuse structure, was difficult to delimit macroscopically from a morphometric point of view. The gonads, at an early stage of development, were well individualized and covered by a thin layer of fat. The biometric analysis revealed uniform body development and a good physiological condition, typical of fish reared under controlled environmental parameters, confirming their efficient adaptation to intensive rearing conditions. The measurements revealed an average total length of 59.0 ± 0.4 cm and a mean body mass of 862.6 ± 24.9 g. The Fulton condition factor (K = 0.82) confirmed the overall healthy state of the specimens and their harmonious body growth. The digestive tract showed a mean stomach length of 13.1 ± 0.9 cm, an intestinal length of 22.9 ± 0.9 cm and a liver mass of 24.0 ± 1.0 g, indicating proportional organ development and a good nutritional status. The results highlight a normal morphological development and good physiological adaptation of *Acipenser ruthenus* to the conditions of recirculating aquaculture systems, confirming the strong biological, adaptive, and economic potential of this species in intensive aquaculture. Overall, the quantitative splanchnological data obtained in this study contribute to a better understanding of the internal morphology of the sterlet and represent a useful foundation for future research on growth physiology and aquaculture improvement in sturgeon species.

Keywords: anatomy, internal organs, intensive rearing, RAS

58 The Influence of the Hygienic Quality of Raw Milk on Its Stability During Cold Storage

Andrei STAMATE[1], Diana Ioana MARCU[1], Adela MARCU[1*]

[1]Faculty of Bioengineering of Animal Resources, University of Life Sciences "King Mihai I" from Timişoara, Calea Aradului 119, 300645, Timişoara, Romania

[*]Corresponding author's email: adelamarcu@usvt.ro

Abstract
Raw cow's milk is considered a complete food due to its balanced chemical composition; however, its hygienic quality can be compromised by microbial contamination occurring during production, handling and storage stages, which in turn affects the stability and safety of the final product. The study was conducted between January and June 2025 and aimed to evaluate the hygienic quality of raw cow's milk from the ULST farm. For this purpose, the main chemical components — proteins, fats, lactose and total minerals — were determined, as well as the total bacterial count (TBC) and the somatic cell count (SCC), in order to verify the degree of compliance with the requirements of European and national legislation. At the same time, the dynamics of acidity was monitored during cold storage (7 days), in order to highlight the influence of the initial hygienic quality on the stability of milk under refrigeration conditions. The chemical composition of the milk (fat, protein, lactose and total or non-fat dry matter) was maintained within normal limits, with the observed variations being explainable by differences in diet, lactation stage and environmental factors. The high level of lactose (over 4.7%) confers a favorable technological potential for processing, especially for fermented dairy products. The hygienic parameters of the examined samples (TBC < 30,000 cfu/mL and SCC < 200,000 cells/mL) were below the EU legal limits, indicating proper hygienic milking, adequate collection and storage conditions, and the absence of subclinical mammary infections. Initial pH values (6.574–6.589) and titratable acidity (15.8–18.1°T) indicated the freshness and good hygiene of milk, with refrigerated milk samples remaining stable for 72–96 hours. After this period, samples with higher TBC and SCC showed decreases pH and significant increases in acidity (up to 31.6°T), indicating that the initial TBC influences the rate of milk degradation and the fermentative activity of lactic acid bacteria.
Keywords: raw milk, chemical composition, total bacterial count, somatic cell count, cold storage, milk stability

59 Modulation of the Oral Microbiome in Domestic Cats (*Felis catus*) Through Diet
Diana Ioana MARCU, Adela MARCU

[1]Faculty of Bioengineering of Animal Resources, University of Life Sciences "King Mihai I" from Timişoara, Calea Aradului 119, 300645, Timişoara, Romania

[*]Corresponding author's email: adelamarcu@usvt.ro

Abstract
The oral microbiome of domestic cats represents a complex and dynamic microbial ecosystem, essential for maintaining both periodontal and systemic health. Periodontal disease is the most common oral condition in felines, affecting the majority of adult individuals, and modulation of microbial communities

through extrinsic factors—particularly diet—has gained increasing clinical relevance. Recent advances in next-generation sequencing (NGS) technologies have revealed a highly diverse bacterial community, dominated by the phyla Proteobacteria, Bacteroidetes, and Firmicutes, as well as the presence of a relatively stable "microbial core" under physiological conditions. Emerging evidence suggests that diet composition significantly influences microbial composition: dry food is associated with increased microbial diversity but may favor the proliferation of taxa involved in periodontal pathology, including the genera *Porphyromonas* and *Treponema*. In contrast, wet food tends to maintain a microbiome profile closer to the physiological baseline, predominantly composed of Proteobacteria, although it does not provide effective mechanical cleaning of dental surfaces. Despite these observations, robust clinical data from large-scale controlled studies remain limited, warranting caution in interpreting conclusions. Nevertheless, current findings highlight diet as a major determinant of the feline oral microbiome. A deeper understanding of the diet–microbiome–periodontal disease relationship could facilitate the development of innovative preventive and therapeutic strategies aimed at optimizing oral health in cats.

Keywords: oral microbiome, feline diet, periodontal disease, dry food, wet food, 16S rRNA, metagenomics

60 EFFECTS OF WALNUT *(Juglans regia L.)* KERNEL MEAL SUPPLEMENTATION IN OSTRICH DIETS ON GROWTH PERFORMANCE AND FATTY ACID PROFILES

Mircea-Nicolae RAȚIU*, Mirela KIRR, Petru-Sergiu MÎRNEA, Robert-Mihai MURARIU, Lavinia ȘTEF, Călin JULEAN, Silvia Elena ERINA**

******University of Life Sciences "King Mihai I" from Timișoara, Faculty of Bioengineering of Animal Resources, Calea Aradului 119, 300645, Timișoara, Romania*
***Ostrich Farm" Ograda cu struți", Strada Călărași, 515800, Sebeș, Alba, Romania*

**Corresponding author's email: cartisorean@gmail.com*

Abstract
This study aimed to evaluate the effects of walnut *(Juglans regia L.)* kernel meal supplementation in ostrich diets on growth performance and the chemical and lipid composition of meat. The experiment was conducted on 14 juvenile ostriches (6-9 months old), reared under semi-intensive conditions with free access to feed and water at the ostrich farm "Ograda cu struți", from Sebeș, Alba County. Birds were divided into two groups: control (C), fed with standard diet, and experimental (E), receiving a diet supplemented with 5% walnut kernel. Throughout the trial, feed intake, body weight gain, and feed conversion ratio were recorded. At the end of the study, thigh and breast meat samples were collected for chemical composition and fatty acid profile analyses. Results indicated that walnut kernel supplementation did not negatively affect growth performance. Chemical analysis of meat from ostriches fed walnut kernel showed protein content of 21-22%, reduced crude fat (1.8-2.0%), moisture 74-76%, ash 1.2%, and essential minerals, including phosphorus (P) 0.25%, iron (Fe) 3.2 mg/100 g, and zinc (Zn) 2.5 mg/100 g. The fatty acid profile showed elevated concentrations of Omega-3 (0.30 g/100 g), Omega-6 (0.75 g/100 g), and Omega-9 (0.40 g/100 g), with an optimal Omega-6/Omega-3 ratio of 2.5-3:1. Long-chain polyunsaturated fatty acid synthesis, including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), was also enhanced. These findings indicate that walnut kernel can be included in ostrich diets to improve meat nutritional and lipid profiles and contribute to oxidative stress reduction in animals.

Keywords: Ostriches, walnut kernel (*Juglans regia)*, meat chemical composition, lipid profile, Omega fatty acids, growth performance, minerals

61 Anovulation and ovarian cysts conditions in dairy cattle

Silviu-Ionuţ BORŞ[1], Mirela ARITON[1], Ioana POROŞNICU[1], Amalia-Ioana HÂRBU[2]

[1]Research and Development Station for Cattle Breeding Dancu, 707252, Iaşi, Iaşi - Ungheni Alley No. 9, Romania 1; bors.ionut@yahoo.com, amariton@yahoo.ro, ioana.porosnicu@yahoo.com;
[2]"Ion Ionescu de la Brad" Iaşi University of Life Sciences, Faculty of Veterinary Medicine, 700489, Iaşi, Mihail Sadoveanu Alley, No. 8, Romania; amalia.harbu@iuls.ro
Correspondence: bors.ionut@yahoo.com;
ORCID – S-I. B.: https://orcid.org/0000-0001-9601-0788
ORCID – M. A.: https://orcid.org/0000-0003-1586-2749
ORCID –I. P.: https://orcid.org/0009-0006-2687-6694
ORCID – A-I. H.: https://orcid.org/0009-0002-2080-2337

Abstract: Infertility in postpartum dairy cows represents a significant challenge regarding farm profitability, with anovulation and ovarian cyst formation serving as the primary contributors to this issue. Anovulation in cattle is broadly defined as the failure to ovulate during the typical 21-day estrous cycle, a condition that is critical for successful breeding and overall herd productivity. Ovarian cysts, a specific type of anovulatory condition, are characterized by the presence of ovarian structures that exceed 20 mm in diameter without the presence of a corpus luteum. These cysts can disrupt the normal hormonal balance, often leading to prolonged anestrous. There are some key differences between anovulation and ovarian cysts: anovulation specifically refers to the inability of an ovarian follicle measuring less than 17 mm in diameter to release an oocyte. In contrast, ovarian cysts involve the failure of larger follicles (greater than 20 mm) to release an oocyte, with these structures persisting on the ovary for more than 10 days. Anovulation can manifest in three primary types: a) anovulation with follicle growth reaching only emergence; b) anovulation with follicle growth reaching deviation, but failing to attain ovulatory size; c) anovulation with follicle growth reaching ovulatory size. In conclusion, while both anovulation and ovarian cysts negatively impact reproductive efficiency, they represent distinct disorders. Recognizing these subtle distinctions is critical for effective reproductive management. Promptly identifying and addressing the underlying causes of anovulation can lead to enhanced fertility outcomes within the herd, thereby contributing to greater overall efficiency of dairy cattle management. Anovulation is marked by a complete absence of ovulation, whereas ovarian cysts involve abnormal follicular or luteal structures that interfere with normal ovarian function and hormone regulation. Therefore, for optimal herd management, it is essential to distinguish between these conditions and to implement targeted interventions aimed at enhancing reproductive success and overall herd profitability.

Keywords: anovulation, ovarian cyst, dairy cow, anestrous, herd profitability, hormonal imbalance

62 Molecular Markers: Tools for Efficient Dairy Cattle Management

Teodor BUGEAC[1*], Adina-Mirela ARITON[1], Silviu-Ionuț BORȘ[1], Vasile VINTILĂ[1]

[1] Research and Development Station for Cattle Breeding, 707252, Iasi-Ungheni no. 9, Dancu, Iași, Romania;

** Corresponding author: teodor_bugeac@yahoo.com*

Abstract
Nowadays it is clear that DNA or SNP-type molecular markers are valuable tools in the selection and breeding programs of farm animals with economic importance. The impact of specific polymorphisms—molecular markers—on various phenotypes allows for the assessment of economic efficiency, which depends on the trait targeted for improvement and the associated production costs.
Mutations identified in key genes such as PIT1, GH, IGF1, PRL, PRLR, GHR, STAT5, DGAT1, and LALBA have been studied for their potential influence on production traits. For instance, prolactin (PRL), growth hormone receptor (GHR), and signal transducer and activator of transcription 5A (STAT5A) have been found to be strongly correlated with milk composition across several cattle breeds. In the PRLR gene locus, studies on Holstein cow populations revealed that the A205C polymorphism in intron 9 is associated with increased milk yield. Similarly, in the same breed, the C472T polymorphism located in the 5′ untranslated region of the gene showed positive associations with milk production. Moreover, milk from heterozygous CT cows exhibited higher fat and total protein percentages compared to milk from cows homozygous for the C allele.
Keywords: DNA Markers; milk production; milk quality traits

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