UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" from TIMIŞOARA

"Young People And Multidisciplinary Research In Applied Life Sciences"

November 21 – 22, 2023

Section: Animal Science and Biotechnology

FACULTY OF BIOENGINEERING OF ANIMAL RESOURCES

TIMIŞOARA, 2024

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ANAMARIA ROXANA MARTIN[1,2]*, MIRCEA CHITU[3], TIBERIU IANCU[1,2]

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Abstract Globally, enough food is produced to provide every man, woman and child with more than 2.300 kilocalories per day, which is more than enough. The Sustainable Development Goals (SDGs) require that all nations fulfill 17 broad development goals by the year 2030 but the prospects are not at all good and humanity is not on track to the targets on any of the nutritional indicators established on the 2030 Agenda for Sustainable Development.
Bearing in mind this aspects, in this research paper we aimed to establish the situation of food insecurity, respectively of severe food insecurity which is one extreme of the scale at the global level, on specific global regions and in adition we will highlight the causes that led to these inappropriate situations in the most vulnerable global regions.
Keywords: food insecurity, hunger, undernourisment

2 ASSESSMENT OF THE QUALITY OF COW COLOSTRUM OBTAINED IN THE FIRST DAYS AFTER CALVING

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Abstract
For a newborn calf, colostrum is the first and most vital food. Colostrum has an increased proportion of components transferred directly from the mother's blood. A newborn calf's health, productivity, and longevity depend on the type and amount of colostrum they receive initially. By measuring the colostrum's physico-chemical components and refractive index on the Brix scale, the study sought to assess the colostrum's quality during the first five days following calving. The concentration of IgG in

bovine colostrum was estimated with a portable and easy-to-use refractometer, and its concentration varied significantly from day two. According to the studies, IgG levels significantly dropped after calving, going from an average of 35 brix on the first day to 10 brix on the fifth. Although its components vary greatly, colostrum up until day five has a higher concentration of lipids, proteins, and dry matter—all of which are vital for the newborn.

Keywords: newborn calves, cow, colostrum quality.

3 RESEARCH ON THE USE OF THYME AS A PROPHYLACTIC ALTERNATIVE IN GASTROINTESTINAL DISORDERS IN CATTLE

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Abstract

Thyme is a plant from the Mediterranean region, which belongs to the family Lamiaceae, used over time in the treatment of respiratory ailments, digestive ailments, and other diseases. This study presents the prophylactic and therapeutic properties of thyme extract in relation to certain gastrointestinal disorders in cattle. Early-life intestinal disorders in cattle are linked to a number of long-term effects, including a reduction in the severity of both pathogenic and non-pathogenic diarrhea, a slowdown in growth, and a decrease in milk production during the first lactation, all of which result in significant financial losses. Because of its high concentration of thymol and carvacrol, which have exceptional antibacterial, antioxidant, and anti-inflammatory properties, thyme is used in both conventional medicine and phytopharmaceutical preparations. Therefore, the purpose of this review is to provide current information on the role of thyme in the homeopathic treatment of gastrointestinal disorders in dairy cattle.

Keywords: cattle, gastrointestinal disorders, Thyme, prophylactic alternative.

4 STUDY OF FATTY ACIDS COMPOSITION OF MUSCLE AND ADIPOSE TISSUES FROM MANGALITSA BREED

Bianca-Petruţa POPA (TIHINIUC-POPA)[1], Elena-Oana ROSCA (PARFENIE)[1], Constantin NISTOR[1], Mălina-Andreea DĂNCIUG (ROTARU)[1], Benone PĂSĂRIN[1]

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Abstract
In the past, consumers preferred well marbled meat, very rich in fat intramuscular, which was very important in prepartion of grilled meat from the Anglo-Saxon areas. The lower content of saturated fatty acids and the higher proportion of unsaturated fatty acids are advantageous especially for the human nutrition. Due to the ratio between linoleic and linolenic acids, the oxidation capacity is lower, which reduces the risk of rancidity. Slaughtering the pigs at a lower weight (90-115 kg) is reducing the fat content of the meat and and it's having a significant impact on the protein content from gammon and ham, as well as on the fatty acids composition.Comparing the composition in fatty acids from back and belly fat, back fat contained more saturated fatty acids and les monounsaturated fatty acids. Stearic acid content which determines fat hardness was higher in back fat.
Keywords: acid, content, fat, meat

5 ANALYSIS OF MEAT QUALITY FROM MANGALITSA BREED

Bianca-Petruţa POPA (TIHINIUC-POPA)[1], Elena-Oana ROSCA (PARFENIE[1]), Constantin NISTOR[1], Mălina-Andreea DĂNCIUG (ROTARU)[1], Benone PĂSĂRIN[1]

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Abstract
The Mangalitsa breed is known as being one of the most popular breeds from Europe, having excellent properties regarding the taste, the marbling and the very reduced amount of cholesterol.
In the last years, more information about meat quality has become available and especially about the fat of Mangalitsa pigs from Romania, according to which their meat is also very suitable for obtaining dried products and for the popular grill. Also, this breed has become popular in Spain, Switzerland, Austria and Germany. In this study, meat and fat quality were examined for 22 Mangalitsa pigs. Compared to the German Saddlepack breed, also considered fat, the German Landrace breed has the meat darker in color, the fat is whiter and intramuscular fat content in meat and the backfat thickness are considerably higher.
The high amount of intramuscular fat and its fine and equal dispersion are favorable in terms of palatability (flavor, juiciness and tenderness) and overall, it is considered an excellent quality.
Keywords: cholesterol, pig, fat, color, intramuscular

6 EVALUATION OF TECHNOLOGICAL COMPLIANCE, SENSORY ATTRIBUTES, AND VEGETABLE PROTEIN ADDITIVES IN PORK PATE PRODUCTS ON THE ROMANIAN AGRI-FOOD MARKET

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Abstract
Pâté-style canned products are obtained by finely processing and mixing pork, fat, liver, and various spices. This study aims to evaluate the technological compliance of three types of pâté with current regulations regarding lipid, water, protein content, pH, salt, nitrates, and protein additives. We analyzed three pork pâté producers from Romania, identified by codes A, B, and C. Each product batch underwent both sensory evaluations and physicochemical analyses. The evaluation revealed that, among the three types of pâté, product C was favored by consumers, appreciated for several superior qualities, highlighted by its distinctive color, resembling well-cooked liver, intense aroma, and homogeneous consistency. Following the physicochemical analysis, it was found that samples from batches A and C fell within the maximum allowable limits, while samples from batch B recorded a protein content of 8.1%, below the minimum threshold of 9%.
Keywords: meat products, vegetable protein, sensory evaluations, physicochemical analyses, ph

7 THE INCLUSION OF SORGHUM IN THE DIET OF FARMED COMMON CRAP (*CYPRINUS CARPIO L.*)

Mălina-Andreea DĂNCIUG (ROTARU), Bianca-Petruţa TIHINIUC-POPA, Benone PĂSĂRIN

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Abstract
The present study investigated the effects of sorghum inclusion in carp (Cyprinus Carpio) diets on growth, blood parameters, meat composition, microbiota în carp. Experimental diets with varying sorghum contents were fed to carp with an initial body weight of 50 g. The diets were tested for the presence sorghum in the diet. In particular at 30%, sorghum completely replaced corn and barley. Inclusion of sorghum reduced final body weight and growth, especially in the R4 group with 30% sorghum. However, other physiological parameters such as feed requirement, specific growth rate and organ index were not affected. Carp meat protein content and salt increased with increasing sorghum inclusion rate. In addition, there was a positive correlation between sorghum concentration and malondialdehyde levels and a negative correlation with glutathione levels, indicating a breakdown of antioxidant defense mechanisms and an increase in oxidative stress.
Keywords: common carp, sorghum, growth, diets.

8 THE USE OF GRAPE POMACE IN FEEDING COMMON CARP (*CYPRINUS CARPIO* L.)

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Abstract
This study investigated the effects of incorporating grape pomace into fish diets on the growth performance, physiological parameters, and biochemical composition of carp (Cyprinus carpio L.). A total of 100 carp, with an average initial weight of 50 g, were reared in a recirculating aquaculture system. They were divided into a control group, fed with a diet containing 0% grape pomace, and two experimental groups (R1 and R2), fed with diets containing 5% and 10% grape pomace, respectively.
The experiment lased for ten weeks, results revealed that most growth parameters were not significantly affected by grape pomace inclusion. The biochemical evaluation of carp meat confirmed considerable variations in moisture, fat, protein, salt and collagen. Furthermore, the oxidative repute evaluation indicated that grape pomace supplementation modulates oxidative strain and lipid peroxidation pathways in carp, improving their antioxidant defenses and ordinary health.
Keywords: grape pomace, carp, aquaculture, diets,

9 INFLUENCE OF RAM ON BODY WEIGHT EVOLUTION OF LAMBS FROM TSIGAI BREED - RUSTY VARIETY IN THE PERIOD FROM BIRH UP TO 7 MONTHS

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Abstract
The present study was conducted to determine the effect of ram and sex on growth performances of Tsigai lambs – rusty variety from birth to 7 months. The birth weight, weight at 28 days, weaning weight and weight at 7 months were observed on 98 female and 88 male lambs coming from 10 rams' groups.
The overall highest mean weight of lambs at 7 months was 37.29 kg and the smaller 30.15 kg, and between sex, the highest mean weight was 41.50 kg recorded by male lambs from Tsigai breed, while to female was 29.09 kg. No statistical differences were found ($p>0.05$) between the offspring of the rams' groups with regard at body weight at 7 months, but the total average gain and daily average gain was significantly affected by sex and ram ($p<0.00$).
Keywords: growth performances, lambs, ram, Tsigai

10 THE EFFECT OF CHROMIUM, NICKEL AND LEAD NITRATE ON *LEMNA MINOR*

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Abstract
A study was conducted on the nitrate salts of three potentially hazardous metals (chromium, nickel, and lead), detailing their ecotoxicological impacts on the test aquatic organism, the common duckweed (*Lemna minor*). Two types of tests were carried out: a common duckweed growth inhibition test and a test to determine some biochemical parameters (fresh weight, chlorophyll content, concentration of reducing sugars and proteins). The first test involved testing five different concentrations of the three nitrate salts

(chromium nitrate, nickel nitrate and lead nitrate) from the point of view of their ecotoxicity on duckweed, while the second test involved testing three concentrations of each nitrate. The results demonstrated that chromium and nickel nitrate had toxic effects on the duckweed at the highest concentrations tested, while lead nitrate did not affect the test plant at the five concentrations tested. The fresh weight of the plants was negatively influenced by all three tested metals at high concentrations. Regarding the chlorophyll content, the higher test concentrations induced a decrease in this parameter, except for lead nitrate. The concentration of reducing sugars was decreased only at the high concentration of chromium nitrate. Chromium and lead nitrate induced decreased protein concentration at the highest concentrations tested, while nickel nitrate induced the same effect at the lowest concentration tested. The results indicated that the toxicity of the three studied nitrates on common duckweed (*L. minor*) can be ranked as follows: $Ni(NO_3)_2$ > $Cr(NO_3)_3$ > $Pb(NO_3)_2$, nickel nitrate having moderate toxicity, while chromium and lead nitrate being practically non-toxic.
Keywords: ecotoxicity, *Lemna minor*, nitrates, chromium, nickel, lead

11 BIOREPRODUCTIVE VARIATION IN POPULATIONS OF FRESHWATER MUSSEL *ANODONTA CYGNEA* DEPENDING ON THE AQUATIC ENVIRONMENT IN WHICH THEY GROW

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Abstract
The freshwater clams Anodonta Cygnea are part of the aquatic population of the 3 studied fishponds. The control pond (Bm) is similar in characteristics to their natural rearing environment, pond 1 (B1) is populated with uniform fish stock in terms of age, weight and species variation, and pond 3 (B3) is similar to pond 1 in terms of populations and characters mentioned above, but the difference is that here a platform of 8 floating fishponds is introduced, where polyculture rearing of fish aged II summers is carried out. The variations in the growth of the clams are visibly influenced by the specific characters of the studied ponds, thus in the control pond the bivalves had a weaker growth rate, in the second pond they had visibly higher values compared to the control version, in terms of total weight and standard lengths recorded. In pond number 3 (B3), characters such as total weight, standard lengths, shell mass and internal contents were compared with the two variants studied, so that the best results were obtained in pond 3 where integrated multitrophic aquaculture is applied.
Keywords: aquaculture, aquaculture products, IMTA, pond, sustainability, swan mussel, waste.

12 INVESTIGATION OF THE IMPACT OF SEQUENCE MUTATIONS ON THE STRUCTURAL PROPERTIES AND STABILITY OF P-GLYCOPROTEIN

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Abstract

P-glycoprotein is an energy-dependent transporter protein that functions as an efflux pump within the ATP-binding cassette (ABC) transporter family, encoded by the human ABCB1 gene. It consists of 1280 amino acids, with the N-terminal and C-terminal regions each comprising 610 amino acids that are 43% identical. The active site of the protein includes 60 amino acids. P-glycoprotein plays a crucial role in translocating xenobiotics from the intracellular to the extracellular space and is expressed in nerve, kidney, liver, intestinal, testicular, and placental cells. It also reduces the accumulation of drugs in multidrug-resistant cells.

Within the 1280 amino acid sequence of P-glycoprotein, 27 missense mutations have been identified. Based on these mutations, analyses were conducted on both the local profiles of hydrophilicity and flexibility, as well as the structural stability of P-glycoprotein. The local profiles of hydrophilicity and flexibility were compared between the wild-type protein and its allelic variants using the ProtScale tool. A crystallographic file from Protein Data Bank with an experimentally validated and comprehensive amino acid sequence was selected, identified by the PDB code 7A65. To ensure a complete analysis of the effects of identified missense mutations, the AlphaFold model with the code AF-P08183 was also employed. Effects of mutations on the stability of P-glycoprotein were examined using the online server DynaMut.

Following an analysis of the regional hydrophilicity of P-glycoprotein as influenced by observed mutations, it was determined that these mutations lead to an increase in hydrophilicity and enhanced flexibility. In the evaluation of stability variations induced by amino acid mutations in the P-glycoprotein structure, both stabilizing and destabilizing effects were noted. However, it was observed that destabilizing mutations predominantly outweigh stabilizing ones, as evidenced both in the experimentally determined structure and in the AlphaFold model.

P-glycoprotein is critically important for health as it facilitates the absorption, transport, and elimination of xenobiotics. Amino acid mutations that alter the hydrophilicity and flexibility of P-glycoprotein can impact its capacity to interact with specific molecules. Additionally, the functionality of proteins is closely tied to their structural integrity and stability. Such modifications may create challenges in accurately dosing medications that are substrates for P-glycoprotein. Therefore, both destabilizing mutations in P-glycoprotein and the changes in hydrophilicity and flexibility could potentially compromise its ability to carry out its physiological functions.

Keywords: P-glycoprotein, missense mutations, local hydrophilicity, structural stability

Acknowledgement: This work was funded by the project PN-IV-P8-8.3-PM-RO-FR-2024-0056, Modulation of membrane transporters by therapeutic molecules.

13 PLANTS AS NATURAL DEFENDERS AGAINST MYCOTOXINS CONTAMINATION IN AGRICULTURE

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Abstract
Through a variety of biological and chemical processes, plants play a significant role in preventing mycotoxin contamination in agriculture. Some plants produce natural antifungal compounds, such as phytoalexins, which inhibit the growth of pathogenic fungi responsible for mycotoxins. Also, certain plants help control fungi by changing the growing environment, influencing factors such as soil pH, humidity, and temperature, conditions that can prevent their development. The antifungal qualities of cultivated, aromatic, or medicinal plants like oregano *(Origanum vulgare)*, thyme *(Thymus vulgaris)*, and rosemary *(Rosmarinus officinalis)* are frequently researched. In addition, plant-fungus interactions in the soil can reduce fungal infections and, by implication, mycotoxin contamination. In practice, plants can be used in agricultural management strategies to minimize contamination risks, such as crop rotation or choosing plants that are more resistant to fungal attack. Therefore, by incorporating them into ecological practices and sustainable farming systems, plants can help lower the exposure of humans and animals to mycotoxins in addition to aiding in the control of fungi.
Keywords: antifungal plants, agriculture, bioactive compounds, mycotoxins

14 SEASONAL VARIATIONS IN AFLATOXIN B_1 LEVELS IN CORN AND WHEAT: A OBSERVATIONAL STUDY

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Abstract
Aflatoxin B_1 is considered the most toxic aflatoxin, produced by fungi of the genus *Aspergillus*, which can contaminate corn and wheat, especially in conditions of humidity and high temperatures, leading to toxic effects on human and animal health. In order to guarantee that the final product has a lower level of aflatoxin contamination, aflatoxin B_1 in food and feed is strictly regulated by maximum limits. Therefore, regular monitoring is essential to protect public health and ensure the stability of the agricultural market.

Analysing the amount of aflatoxin B_1 in samples of corn and wheat from a farm in northeastern Romania was the aim of this study. In two time periods, such as autumn-winter and spring-summer, thirty feed samples (seven wheat and twenty-three corn) were examined. Following the statistical analysis, we observed that there were differences between the two forage samples studied ($P < 0.05$) and also between the aflatoxin B_1 content recorded between two periods taken into account ($P < 0.001$). The results of this observational study demonstrate that aflatoxin B_1 varies by feed and season.
Keywords: aflatoxin B_1, corn, statistical analysis, seasonal variation, wheat.

15"THE CIRCULAR ECONOMY AS AN ECOLOGICAL SOLUTION. PERCEPTIONS AND PARTICIPATION IN SUSTAINABLE PRACTICES AMONG YOUTH"

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Abstract
The circular economy has become an essential concept in environmental protection and sustainable development strategies. This paper explores the impact of the circular economy on the environment, focusing on individuals' perceptions of recycling and sustainable practices in the fashion industry. The study uses a questionnaire to assess respondents' level of familiarity with the circular economy, their motivations for participating in upcycling workshops and their interest in adopting an eco-friendly lifestyle. The results show that, although there is a medium level of awareness of the circular economy, the interest in active involvement in sustainable practices is high. The paper highlights the need for education and promotion of the circular economy, in order to stimulate a transition towards an efficient use of resources and reduction of environmental impact.
Keywords: circular economy, sustainable practices, recycling, upcycling workshops, environmental awareness.

16 APPLICATION OF ARTIFICIAL INTELLIGENCE AND PREDICTIVE ANALYSIS IN PLANT PHYSIOLOGY TEACHING AND RESEARCH

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Abstract
Artificial Intelligence (AI) and predictive analysis are transforming plant physiology education and research. These technologies allow for the efficient analysis of large datasets, improving our understanding of complex plant processes and their responses to environmental factors. In education, AI-driven tools create personalized learning experiences, helping students grasp challenging concepts in plant physiology through interactive and adaptive learning environments. Predictive models provide researchers with insights into plant behavior under various conditions, enabling better crop management and sustainability practices. This research explores the integration of AI and predictive analysis in plant physiology, focusing on their impact on both teaching and research. Key findings suggest that these technologies not only improve academic outcomes but also foster interdisciplinary collaboration. However, challenges such as data quality, ethical concerns, and the complexity of biological systems must be addressed. Future prospects for AI in plant physiology include enhanced experiment design, data management, and the development of more comprehensive educational frameworks. By leveraging AI and predictive analytics, the field of plant physiology can embrace new methods of exploration, pushing the boundaries of scientific discovery and education.
Keywords: knowledge economy, sustainable development, environmental protection, innovation, economic growth.

17 RESEARCH ON THE PSYSICOCHEMICAL AND MICROBIOLOGICAL QUALITY OF SOME PORK PRODUCTS OBTAINED THROUGH TRADITIONAL METHODS

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Abstract
Pork products obtained through traditional recipes are considered healthy products, with superior sensory and nutritional characteristics compared to those produced in a conventional system, which is why they are highly appreciated by consumers. Therefore, the physicochemical and microbiological

examination of pork products is used to assess the safety and hygiene level of the products, using principles and methods based on laboratory analyses. This paper presents the results of the physicochemical and microbiological examination of five types of pork specialties: smoked pork tenderloin, roasted pork pastrami, smoked pork belly, smoked pork loin, and smoked and roasted pork neck, all during their shelf life. The products are made in small processing units, following authentic, traditional recipes. It was found that the analyzed samples are microbiologically compliant and safe for human consumption. The physicochemical indicators comply with current legislative requirements, standing out due to a lower water content and being richer in protein. The quality of the raw materials is the foundation of a safe final product.
Keywords: safety, traditional products, hygiene

18 COMPARATIVE STUDY ON THE NUTRITIONAL LABEL AND INGREDIENTS LIST OF PORK SAUSAGES PRODUCED IN CONVENTIONAL SYSTEMS

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Abstract
In Romania, the consumption of pork-based products ranks high among consumer preferences because, in most cases, they do not require prior thermal processing. By consuming them, the energy and the necessary nutrients required by a person throughout the day are provided.
Ten types of pork sausages produced in conventional systems were purchased to analyze the list of ingredients used in their manufacture, as well as the nutritional label, focusing particularly on the salt and protein content, as well as the fat proportion. The study also examined whether producers comply with current legislation regarding product labeling and the application of hygiene and sanitation standards concerning the use of food additives.
Following the study, it was found that salt is present in proportions of 1.7-4.5%, protein between 17-26%, and fat content between 37-41%. No use of food additives not permitted by current legislation was identified.
Keywords: label, pork sausage, ingredients

19 EFFECT OF *RHODOTORULA GLUTINIS* YEAST X MULBERRY LEAVES ON MORPHO -PRODUCTIVE CHARACTERISTICS OF IBA POLYVOLTINE BREED OF SILKWORM *BOMBYX MORI* L.

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Abstract
The mulberry leaves are the sole feed for the silkworm *Bombyx mori* L. The use of yeast has a great impact in the development of the morpho-productive parameters as shown in other studies and the results may differ by silkworm breed and the day of administration of the yeast. The objective of this study consists in evaluating the IBA silkworm performance, a polyvoltine breed, fed with mulberry leaves +/- *Rodotorula glutinis* yeast. The morpho-productive performances were determined during the trial in the 5th instar, at 1st, 5th, 7th and 9th days. A total of 300 larvae were distributed randomly in 3 groups (100 larvae/group, 2 replicates each one): 1. C group fed mulberry leaves; 2. E1 fed C diet and yeast (1x10^{7}); 3. E2 fed C and yeast (1x10^{9}). Mulberry leaves treated with *R. glutinis* yeast, irrespective of concentration and days of measurements, had a positive influence on the morpho-productive parameters of IBA breed larvae (weight and average daily gain). The silk gland weight and cocoons traits (weight of the pupae, weight of raw cocoon and longitudinal and transversal axes) were superior in experimental diets.
Keywords: diet, IBA, mulberry leaves, *Rhodotorula glutinis*, silkworms.

20 DNA TESTING METHODOLOGY FOR THE EVALUATION OF SUSCEPTIBILITY TO SCRAPIE IN TSURCANA SHEEP

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Abstract
Scrapie, first reported in the 18th century, has led to considerable economic losses by affecting the livestock industry. This disease is a transmissible spongiform encephalopathy that mainly affects sheep and goats and is caused by the accumulation of prion protein in an abnormal form (PrP^{Sc}) in the nervous system of animals. The identification of genetic polymorphisms in the PRNP gene has allowed the development of effective genetic tests for the detection of susceptibility to Scrapie. In many European countries, these tests are being used to select resistant animals, thereby reducing the risk of spreading the

disease in sheep flocks. The method applied in this research to identify susceptible or resistant genotypes to Scrapie in sheep, applies DNA tests made from biological samples such as hair, blood and other tissues. By analysing polymorphisms in the PRNP gene at codons 136, 154 and 171, the animals were classified into five different risk categories. Early genotyping of sheep at the PRNP locus allows rapid selection of genotypes conferring resistance to this disease, thus contributing to improving the genetic resistance of sheep breeds.

Keywords: genetic susceptibility, molecular-assisted selection, PRNP gene, Sanger sequencing, Scrapie control

21 INCUBATION PARAMETERS IN THE TRANSYLVANIAN NAKED NECK BREED FOLLOWING SUPPLEMENTATION WITH VITAMIN E AND SELENIUM

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Abstract
The importance of the Transylvanian Naked Neck breed is highlighted not only from an economic standpoint but also from a cultural perspective, due to its adaptability to maintenance conditions and its robustness. The two nutrients, vitamin E and selenium, support the biological processes involved in reproduction and organism development, making them essential. Introducing these nutrients in the context of bird egg incubation can positively influence incubation parameters and hatch rates. The biological material consisted of birds from the Transylvanian Naked Neck breed, which were divided into two groups. The experimental group received a supplement of vitamin E and selenium in their drinking water. Supplementation with vitamin E and selenium improved egg weight, hatch percentage, and chick weight at hatching.

Keywords: Transylvanian Naked Neck, selenium, vitamin E, incubation parameters.

22 THE EFFECT OF SOME FOOD SOURCES ON THE PRODUCTION OF *ENCHYTRAEUS BUCHHOLZI* (GRINDAL)

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Abstract
Grindal worms are an important food source in aquaculture and aquarism. They are obtained with a relatively low production cost and the possibility of contamination with different pathogens is avoided compared to harvesting from nature. The aim of the work is the use in the feed of grindal worms of two

recipes of wet feed based on milk 92% and wheat flour 8%, (Lots C1-C5) compared to milk 84%, egg 10% and flour 6% (Lots E1- E5) on the development of grindal biomass grown on a substrate represented by ground moss in a volume of 400 cm3 with 84% humidity. Feeding and harvesting were performed once a day. The weighing was carried out with a precision of 0.01 g. Following the research, we found that groups E2-E5 achieved a significantly higher biomass production ($p \leq 0.05$) by 1.53 grams per day, compared to groups C2-C5, with the exception of group E1, where an insignificant increase was found ($p \geq 0.05$) compared to C1. Feed conversion was superior in the experimental groups compared to the control groups by 10.2 %. The production of grindal biomass per cm3 of substrate in groups E1-E5 was significantly higher (0.232 g, compared to control groups C1-C5, which had an average of 0.209 g/cm3).
Keywords: food sources, biomass, grindal worms (*ENCHYTRAEUS BUCHHOLZI*).

23 THE INFLUENCE OF THE HENS' HOUSING SYSTEM ON SOME PHYSICOCHEMICAL CHARACTERISTICS OF EGGS

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Abstract
Eggs are an important source of protein and nutrients for humans. Consumed rationally, they constitute a real stimulant of metabolic functions in the body, contributing to increasing resistance to disease and strengthening the nervous system. The quality of eggs concerns the nutritional factor, the microbiological one but also the toxic one, as it is known that the bioaccumulation of metals with toxic potential represents an extremely high risk for the health of consumers.
The aim of this work was to measure the influence of hens' housing systems on the egg mass, on the weight and the content of minerals and metals of their shells and of the internal components of eggs. The eggs used in the study came from commerce and were produced in Romania. They were collected from two hens' housing systems, in improved batteries and in an ecological system. The weight of the whole eggs and the weight of the egg components were not significantly influenced by the housing system of the laying hens. The levels of the elements Fe, Zn, Se, Cu, Mn, Ni assayed in the samples of eggs collected from the improved batterie housing system were higher than in the samples from the ecological system. Of all the heavy metals with high toxicity, only Cd and Hg were detected in insignificant quantities in the shells, Hg in very low concentrations in the internal components of the analysed eggs.
Keywords: Eggs, minerals, metals, housing system

24 THE POLYPHENOLS – BIOACTIVE COMPOUNDS

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Abstract
Polyphenols are molecules with biological activity, present in many foods such as fruits and vegetables, tea and coffee, but they are also found in wine and chocolate. Polyphenols are known for their potentially positive effects on health. Their bioactivity is exhibited by antioxidant and anti-inflammatory activity, cardiovascular and neurodegenerative protection, anticancer properties, modulating effects on the gut health, improving memory, reducing the risk of diabetes, Alzheimer's, etc.
The biological activity of polyphenols is correlated with their complex structure. As the name implies, polyphenols are molecules with several phenolic groups. The phenolic groups are hydroxyl groups linked to the aromatic rings and have the ability to donate protons or electrons and reduce the reactive oxygen containing species. The polyphenols have the ability to form complex molecules with metals, thus helping to reduce the oxidative stress. The structural characteristics of polyphenols make them to interact with free radicals, proteins, but also with enzymes, highly selective protein biocatalysts, essential in the functioning of living organisms. The polyphenol content and the antioxidant activity can be assayed, in the laboratory, by spectrophotometric methods.

25 A MOLECULAR DOCKING ANALYSIS ASSESSING THE POSSIBLE ENANTIOSELECTIVITY OF THE INTERACTIONS OF FLUTRIAFOL STEREOISOMERS WITH SOIL ENZYMES

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Abstract
Flutriafol, with the IUPAC name 1-(2-fluorophenyl)-1-(4-fluorophenyl)-2-(1,2,4-triazol-1-yl)ethanol, is a systemic fungicide that is applied to combat diseases in many types of crops, turf, and ornamental plants. Flutriafol has one chiral carbon and two enantiomers, (*R*)- and (*S*)-flutriafol. Specific scientific literature contains little information regarding the environmental effects of the enantiomers of flutriafol. It was shown that, usually, the (*R*) isomer reveals greater activity against some fungal species and also greater acute toxicity to earthworms and algae. This study focuses on the implementation of molecular docking to evaluate the possible enantioselectivity of the interactions of the two stereoisomers of flutriafol with soil enzymes. Molecular docking study revealed that both enantiomers were able to bind to the active sites of

dehydrogenases and phosphatases. The average value of the interaction energy observed for (*R*)-flutriafol with dehydrogenases was −7.85 kcal/mol, compared to −7.45 kcal/mol for the interaction of (*S*)-flutriafol with these enzymes. Similarly, the interaction energy obtained for the interaction of (*R*)-flutriafol with phosphatase was −9.16 kcal/mol, compared to −9.04 kcal/mol for the interaction of (*S*)-flutriafol with this enzyme.

Keywords: (*R*)-flutriafol, (*S*)-flutriafol; soil dehydrogenase, soil phosphatase

Acknowledgements: This research was funded by a grant from the Ministry of Research, Innovation, and Digitization, CNCS/CCCDI-UEFISCDI, project number PN-III-P1-1.1-PD-2019-0255, within PNCDI III.

26 AN OVERVIEW OF ADVANCED USE OF ESSENTIAL OILS FOR POULTRY HEALTH AND DISEASE MANAGEMENT

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Abstract
In this review, we discuss how essential oils (EOs) can be used in poultry farming as a sustainable alternative to conventional practices. The study brings to focus the industry's most urgent issues: antibiotic resistance and improved health, pushing for alternative solutions. Given their antimicrobial, antioxidant and growth promoting capability, EOs are highlighted as potential substitutes with their rich composition of terpenes and phenolics. The review approach how EOs promote poultry health with regard to growth promotion, improving immune function and enhancing feed conversion ratios. It further examines their impact on gut health, disease resistance, and the potential to elevate product quality. The integration of EOs into poultry practices is presented as a strategy to mitigate environmental challenges. We aimed to provide a review of the biological mechanisms behind the efficacy of EOs in managing diseases and promoting health in poultry, against a backdrop of various pathogens.
Keywords: Biological mechanisms, disease management, essential oils, poultry production, antibiotic alternatives

27 SYNERGISTIC ANTIOXIDANT EFFECTS OF METAL NANOPARTICLES AND POLYPHENOLS IN ALLEVIATING INFLAMMATORY BOWEL DISEASE

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Abstract
Oxidative stress, caused by the accumulation of reactive oxygen species (ROS), is associated with the initiation and progression of inflammatory bowel disease (IBD). This pathology is characterized by intestinal inflammation and the appearance of epithelial lesions. Numerous studies in animal models have suggested that ROS underlie this pathology. Although various treatment methods have been investigated, these lesions remain difficult to treat. As the excessive use of drugs inevitably causes side effects, new methods of developing the therapeutic effect have been attempted. Researchers have fabricated nanoparticles (NPs) with anti-inflammatory potential, liposomes or polymers containing the active substance in the centre of molecular structure. The only drawback of these structures is the need for more accurate knowledge of the beneficial and toxic dose. Various metal and metal oxide NPs, including copper, zinc oxide, and magnesium, have anti-inflammatory properties. Using organic sources for NPs synthesis avoids toxic chemicals, making the process more eco-friendly and cost-effective. Additionally, the gradual release of active substances from these NPs can help minimize side effects. This review aims to provide insights into the antioxidant capacity of NPs with metals and polyphenols as possible therapeutic alternatives for IBD while also addressing future concerns and perspectives in this area of research.
Keywords: antioxidants, inflammation, nanoparticles, nanotechnology, oxidative stress, polyphenols

28 THE OCCURRENCE OF LEAD AND CADMIUM IN LIVER AND GILL SAMPLES OF GIBEL CARP

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Abstract
Heavy metals are major water pollutants and pose a serious threat to human health. In freshwater ecosystems, they accumulate in sediments, water, and the aquatic food chain. This study was aimed to investigate lead and cadmium accumulation in the liver and gills of the Gibel carp (*Carassius gibelio*), an omnivorous species that burrows into sediment during winter. Forty-four samples were collected from Begečka jama (BJ) and a pond near Subotica and then analysed by atomic absorption spectrometry.

Median lead levels in liver samples were 263.1 µg/kg in BJ (47.38–669.1 µg/kg) and 228.3 µg/kg in Subotica (22.77–862.2 µg/kg), with no significant difference between locations ($p>0.005$). However, lead levels in gills differed significantly between locations ($p<0.005$), with BJ samples showing a median of 398.5 µg/kg (211.8–612.6 µg/kg) compared to Subotica's 228.4 µg/kg (86.85–367.4 µg/kg), likely due to the gills' role in water filtration. Cadmium remained below the LOQ in all tissues except seven liver samples from BJ (15.82–401.7 µg/kg). The results indicate considerable contamination of fish tissues samples with lead. On the other hand, cadmium levels did not appear to be challenging. Further research should include testing other fish tissues (e.g. muscles) and different fish species.

Keywords: AAS, fish, heavy metals, Serbia

Acknowledgement:
This work was financially supported by the Horizon Europe project Danube Region Water Lighthouse Action - DALIA (project number 101094070).

29 ADMINISTRATION OF HORMONAL PREPARATIONS FOR THE PURPOSE OF INDUCING AND SYNCHRONIZING ESTRUS

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Abstract
Reproductive management in sheep farms is based on the use of biotechnological methods that allow increasing reproductive potential. The management of reproductive function in sheep involves the implementation of zootechnical and organizational measures: induction and synchronization of estrus, ovulation control, induction of superovulation, artificial insemination, embryo transfer, etc. Induction and synchronization of estrus in sheep during the non-breeding period is important as it contributes to the efficient improvement of reproductive performance in sheep by: shortening the estrus interval, increasing the gestation rate and birth rate, and shortening the time interval between generations. In sheep farms where increasing lamb production is the main objective, estrus synchronization is the main factor that: minimizes the effects of seasonal factors on reproduction, extends the breeding season, adjusts the lamb delivery time, shortens the lambing cycle, allows two to three lamb deliveries every 2 years, contributing to a low economic cost of reproduction, while increasing the number of lambs and, implicitly, obtaining economic benefits. To induce and synchronize estrus in the non-breeding period in sheep, various hormonal treatments have been developed to influence the reproduction cycle of sheep. When choosing the scheme and method of administration, the breeding season and the time of year must be taken into account, since prostaglandins are administered during the breeding season, while other hormones such as progesterone, equine chorionic gonadotropin (eCG), human chorionic gonadotropin (HCG), pregnant mare

serum gonadotropin (PMSG) are administered in the non-breeding period. The hormonal treatments applied determine different manifestations in the female reproductive system depending on the functional state of the organs, but also on the general hormonal state of the animal. Also, the effectiveness of these hormonal treatments is closely linked to the health of the animal, the breed, the climatic conditions and the way the animals are raised on farms. At this time, it is considered that there is insufficient data on the mode of action of hormonal preparations, the identification of effective methods of inducing and synchronizing estrus in sheep in the non-breeding period represents an important direction of scientific research, but also a problem of interest for sheep breeding.

Keywords: reproductive efficiency, ovine, gonadotropins

30 ELECTROCHEMICAL PROFILES AND WATER CONTENT IN DIFFERENT HONEY VARIETIES FROM WESTERN BALKAN COUNTRIES

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Abstract

Honey, as a sweet and nutritionally rich substance, occupies a special place in agricultural production. From a chemical point of view, it contains over 200 important compounds for the normal functioning of metabolic processes, which together make up the dry matter of honey (e.g., minerals, organic acids, phenolic compounds, vitamins such as niacin, riboflavin, pyridoxine, etc.). In addition to dry matter, honey also contains a certain percentage of water. Honey has multiple important aspects: It is used in medicine and pharmacy due to its therapeutic and antibacterial properties and is additionally recommended for inclusion in the daily diet. Therefore, special attention should be paid to quality control and microbiological safety. Electrical conductivity, measured with a conductometer, represents the content of mineral substances and indirectly indicates the botanical and geographical origin of honey, as well as its clarity. This parameter is among the standard measures used in honey quality control, owing to the fact that honey beside the amount of different compounds, contains minerals that can dissociate into ions in aqueous solution and thus conduct electrical energy. Through the use of a pH meter, the pH value of the samples was also determined, which is correlated with the organic acids in honey. The water content is also one of the major parameters that indicates its microbiological stability and affects its viscosity. Its value is not constant, but varies depending on the storage conditions (air humidity). Water content was determined using a refractometer whose principle of operation is based on the refraction of light that passes through a sample of honey, which is applied to the appropriate tile on the instrument. Among the samples analyzed, rapeseed honey showed an average conductivity of 160.67 µS/cm, a pH of 4.09, and a water content of 18.13%. Meadow honey had higher conductivity at 532.37 µS/cm, a pH of 4.03, and 16.17% water content. Linden honey had the highest conductivity at 636.75 µS/cm, with a pH of 4.11 and 16.78% water. Acacia honey displayed the lowest conductivity 146.23 µS/cm, a pH of 4.04, and a water content of 16.15%. These results show the importance of electrochemical profiling in differentiating types of honey and ensuring quality standards.

Keywords: Honey, water, electrochemical conductivity, pH,

31 IMPROVING SAUSAGE QUALITY WITH BUCKWHEAT FLOUR

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Abstract
In the context of continuous progress in the food industry, achieving high-quality finished products is no longer just an objective but has become a necessity for consumers and to meet market expectations. The technological, chemical, and biochemical processes applied to raw materials for their transformation into quality finished products inevitably lead to substantial changes in their chemical composition, directly affecting their nutritional value. Plant-based raw materials are used in the production of functional, dietary, and prophylactic foods for children, and one of the options is buckwheat flour. Buckwheat is rich in vitamins, minerals, and starch, and it is notable for its protein and fiber content compared to wheat. It also has a protein structure with high biological value and is gluten-free. This study examines the use of buckwheat flour in meat products, focusing on its impact on the physico-chemical, technological, and organoleptic properties of sausages. Therefore, the partial replacement of pork fat with plant-based protein can be recommended for producing healthier sausages with a balanced fatty acid profile and optimal sensory properties.
Keywords: food industry, buckwheat flour, meat products, sausages, chemical composition.

32 EFFECT OF SLAUGHTERING YEAR ON THE BEEF PRODUCTION INDICES IN ABERDEEN ANGUS BREED

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Abstract
At the abattoir, beef carcasses must be classified according to the EU and national regulations. The aim of the study was to assess the effect of slaughtering year on the beef indices recorded at the abattoir for Aberdeen Angus (AA) cattle. The data was collected from a private abattoir that is slaughtering AA purebred and hybrid cattle of all ages. Information was collected for years 2021, 2022, and 2023 and consisted in animal gender, birth and weighing dates, breed, age at slaughtering, liveweight, category (V, Z, A, B, C, D, and E), killing out percentage, carcass weight, left and right semi-carcass weights, carcass conformation, and carcass fat coverage. For an easy computation of data, the carcass classification was numerically transformed as follows: -P=1, P+=2, -O=3, O+=4, R=5, and U=6. A one-way ANOVA model was

used in STATISTICA software to find the effect of year of slaughtering on the following traits: age at slaughtering (months), liveweight at slaughtering (kg), killing our percentage (%), total carcass weight (kg), left semi-carcass weight (kg), right semi-carcass weight (kg), conformation class, and fat coverage (1-low, 2-slight, 3-average, 4 high, 5-very high). Age at slaughtering significantly ($p<0.001$) increased with year from 20.06±0.415 months in 2021 to 21.11± 0.252 in 2022 and 26.16±1.555 months in 2023. Liveweight at slaughter increased significantly ($p<0.001$) from year to year, being 579.78±5.558 kg in 2021, 601.17±1.618 kg in 2022 and 622.02±4.980 kg in 2023. Killing out percentage significantly ($P<0.001$) decreased by year from 56.77±0.304% in 2021 to 54.56±0.079% in 2022 and 52.62±0.287% in 2023. This resulted in a similar ($p>0.05$) carcass weight according to year of slaughtering, taking values between 329.28±3.521 kg in 2021 and 327.50±3.433 kg in 2023. The same trend was observed in the weight of left and right semi-carcasses. The carcass conformation class was just below R in all studied years, but there was a significant ($p<0.05$) decrease in year 2023 (4.66±0.100) compared to years 2021 (4.83±0.060) and 2022 (4.87±0.019). Carcass fat coverage was average to high in all years, but there was a significant higher fat coverage ($p<001$) in year 2022 (3.45±0.019) compared to years 2021 (3.35±0.064) and 2023 (3.07±0.095). In conclusion, we can say that age and liveweight at slaughtering of AA cattle increased by year, while killing out percentage decreased. Carcass weight remained unchanged from year to year. Carcass conformation and fat coverage were different according to year and were satisfactory as values for AA cattle.

Keywords: Aberdeen Angus, age at slaughtering, beef production indices, carcass, year.

33 STUDY ON THE BEEF CARCASS BREAKDOWN IN ABERDEEN ANGUS HYBRID COWS

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Abstract

After having a productive life of 6 years (6 calves) beef cows end up at slaughterhouse, becoming edible meat for humans. For turning a live cow into edible meat, butchers remove the hide, head, feet extremities and internal organs converting it into a carcass. The aim of the study was to study the breakdown in meat cuts of the carcass in Aberdeen Angus (AA) cows. Two cows were sacrificed in a private authorised abattoir. Then, each carcass was divided into constituent parts. Weighing was carried out before killing and after bleeding, as well as for each meat cut. The killing out percentage was calculated by dividing the carcass weight to live weight. Also, other parts of the live cows were weighed, such as liver, hide, kidneys, heart, tongue, etc. Carcass cuts were grouped in three meat quality classes. AA cows liveweight was on average 625 kg, out of which 50 kg (8%) was blood, and 330.5 kg was carcass (killing out percentage 52.9%). Thus, the non-carcass weight was 47.1% of the warm dead cows (244.5 kg). This was made of hide 54 kg, internal organs plus suet 156.5 kg, cannons 10.6 kg, head 21 kg and tail 2.4 kg. The weight of commercially useful internal organs was: 17 kg rumen, 2.75 kg heart, 6.45 kg lungs, 6.9 kg liver, 1.2 kg kidneys, and 1 kg spline. Front cannons and hooves were heavier than hind ones (3.25 and 2.55 kg vs. 2.55

and 2.20 kg). Out of the 330.5 kg carcass 47.3% were first quality cuts (156.48 kg), 27.1% second quality cuts (89.67 kg) and 25.6% third quality cuts (84.35 kg). First quality meat was made of the following cuts: top round (82.5 kg, 52.7%), beef chop (59.0 kg, 37.7%), striploin (8.8 kg, 5.7%), and tenderloin (6.1 kg, 3.9%). Second quality meat comprised the following cuts: ribs (54.0 kg, 60.2%), flank (22.5 kg, 25.1%), shoulder (10.2 kg, 11.4%), brisket (2.97 kg, 3.3%). Third quality meat cuts were made of the following: throat (29.0 kg, 34.4%), neck (25.0 kg, 29.6%), fore and hind shanks (11.8 kg, 14.0%), and beef for chopping (18.55 kg, 22.0%). In conclusion, we could say that the killing out percentage was below the value for beef cattle, but satisfactory for a hybrid. The first quality meat represented the highest percentage of AA cow's carcass, out of which the most important cut was top round (24.8% of the total carcass).

Keywords: Aberdeen Angus hybrid cows, carcass breakdown, killing out percentage, meat cuts.

34 STUDY ON GROWTH PERFORMANCE OF ABERDEEN ANGUS AND HYBRID CALVES IN COMMERCIAL FARMS

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Abstract

Ability of Aberdeen Angus cattle (AA) to perform in various farm conditions could be measured by the growth performance of young stock as well as age and weight of calves when they leave the farm. The aim of the study was to study the growth performance of AA purebred and hybrid calves in commercial farms in Bihor and Mehedinţi counties, Romania. Data for 94 calves was collected from the official performance control and consisted on the birth and selling liveweight, total gain and average daily gain of caves, as well as the age cattle were sold from the commercial farm. The following factors were taken into account: calf sex (male and female), county (Bihor and Mehedinţi), and genotype (AA purebreds and hybrids). Factorial ANOVA model was used in STATISTICA software. Neither factor had a significant effect ($p>0.05$) on studied traits, although some differences were observed. Probably the variability was very high due to a low number of individuals. For instance, the birth weight in male calves was higher than in female calves (30.5±0.85 vs. 28.2±0.61 kg), but at the time of selling females were heavier than males (295.0±22.57 vs. 284.0±15.38 kg), due to a higher average daily gain (865.1±44.20 vs. 791.3±33.96 g). Calves from Mehedinţi County were sold 32.4 days later from the farm (316.7±21.78), were 2.1 kg heavier at birth and 15.3 kg at the time they left the farm, but the average daily gain was 35.2 g lower than those from Bihor County (28.3±0.60 kg, 285.7±22.34 kg, and 849.6±44.29 g, respectively). AA hybrid calves left the commercial farms 45.3 days earlier than AA purebred calves (298.8±24.20 vs. 344.1±20.56 days). With a similar birth weight, AA purebred calves were 43.4 kg heavier at selling time from the farm, having a 32.5 g higher average daily gain than AA hybrids (263.2±18.83 kg and 816.9±33.14 g, respectively). In conclusion, we could not find significant differences of calf sex, county and genotype on the age at selling,

birth and selling live weight and average daily gain, mainly due the reduced number of individuals. More research is needed in this respect.
Keywords: Aberdeen Angus, calves, county, growth performance, hybrids, sex.

35 COMPUTATIONAL EVALUATION OF THE COMPOUNDS IDENTIFIED IN THE HIGHEST CONCENTARTION IN THE ESSENTIAL OIL OF *ARTEMISIA DRACUNCULUS*

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Abstract
Artemisia dracunculus (tarragon) is a perennial plant, used in traditional medicine and the food industry. The plant is known to have beneficial effects on health, such as: antibacterial, antifungal, antiseptic, carminative, anti-inflammatory, antipyretic, anthelmintic, etc. The aim of this study was to identify the compounds in the highest concentration in the essential oil of *Artemisia dracunculus* and evaluate their biological activity using ADMETlab3.0 and admetSAR3.0 programs. Compounds were identified by gas chromatography-mass spectrometry method using a Shimadzu QP 2010 Plus instrument (Columbia, SC, USA). The compounds identified in the largest quantity are: estragole, cis-beta-ocimene, trans-beta-ocimene, D-limonene, eugenol methyl ether, eugenol acetate, eugenol, caryophyllene oxide. With the help of the PubChem database, the SMILES formulas of the chemical compounds were identified, which were later used to evaluate the biological activity of each individual compound. The results obtained showed us that trans-beta-ocimene can be carcinogenic and hepatotoxic. Eugenol can inhibit glycoprotein P and that it is carcinogenic. Eugenol methyl ether, eugenol acetate, D-limonene, Cis-beta-ocimene, caryophyllene oxide and estragole can produce respiratory toxicity and can be carcinogenic. Most chemical compounds are considered inhibitors of organic anion and cation transporters.
Keywords: *Artemisia dracunculus,* ADMETlab3.0, admetSAR3.0, biological activity

36 ADAPTATION OF MURRAY GREY COWS TO THE CLIMATIC CONDITIONS OF THE FĂGET REGION, TIMIŞ COUNTY, ROMANIA

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Abstract
This study explores, for the first time in Romania, the adaptation, biologic parameters, reproductive and productive performances of the Murray Grey cows to the climatic and environmental conditions of the Făget Region, Timiş County, Romania. Murray Grey is a beef cattle breed originating from Australia, created between years 1905 and 1917 within the superior valley of the Murray River. Introduction of new breeds thar are better adapted to environment and had a higher productivity, represents a solution to the efficiency improvement of the beef production industry. Within these circumstances Murray Grey breed, acknowledged for its adaptability and excellent meat quality, had been imported for the first time in Romania in year 2021 in the Făget Region. Rearing this breed in a temperate continental climate, with mediterranean and oceanic influences, having annual rainfall of about 600 mm, with moderate winters (-3°C) and hot summers (+35°C) and hilly relief, opens new perspectives for cattle husbandry development in Romania. Within this study biologic parameters and general health status evaluations were carried out. Also, live weight and growth potential of animals was monitored, as well as reproduction efficiency and behaviour were assessed. In the same time studies were carried out to monitor the adaptation of the breed to the high temperatures during summer and to the pasture conditions, as well as disease resistance. Murray Grey cows adapted well to the high summer temperatures, being capable to cope with the heat and maintaining their metabolic efficiency even during heat stress due to their silver-grey colour of the coat. No major signs of stress were observed that were caused by high temperatures, while the feed consumption was stable during the whole warm season. The average daily gain in calves was 1,2 kg during the pasture season, which confirms the adaptability of this breed to the feed resources available on the pastures from this area. Reproduction efficiency was high, fertility rate was over 90%, and calvings were eutocic, without major complications. Animals had a good resistance to the common diseases, such as nodular dermatitis, babesiosis. Their immune system efficiently responded to the preventative vaccinations and treatments. Further, there were only isolated cases of respiratory or digestive conditions, indicating a good compatibility of this breed with the local environment from the Făget Region. The meat quality was recognized for the high marbling degree and fine texture, placing the Murray Grey individuals among the best options for beef production of premium quality. This classification could contribute to the development of the beef production industry in hilly areas of Romania.
Keywords: beef production, climate adaptation, cows, Făget Region, growth performance, Murray Grey, reproduction.

37 MAKE CAPON, SAVE NATIVE CHICKEN BREEDS

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Abstract
The biggest task of the poultry sector is to supply the population with cheap and healthy products, so that farmers can make economic production. In addition to mass production, the market also needs special products that can be considered as curiosities. Modern breeds and hybrids have nowadays pushed traditional old breeds out of production, so we need to look for ways of producing these breeds that will enable us to keep them in production and thus contribute to keeping them more economically. One solution could be the production of special products. In order to maintain our universities elite stock of Speckled Hungarian Chicken, we are looking for opportunities to obtain other sources of income by producing salable products in addition to state support. In our work, we want to revive an old, forgotten method of producing capon, a special, saleable curiosity product from our indigenous chickens.
Keywords: capon, gene preservation, native chicken, special product

38 EDDIBLE INSECTS AS ADDITIVES IN MEAT PRODUCTS – BENEFITS AND CHALLENGES

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Abstract
To expand knowledge within this area and potentially determine direction of future research, the aim of this review paper was to provide information about benefits and challenges based on currently available scientific literature on edible insects as additives in meat products.
In the last few years, research has been carried out on the reformulation of meat products using the flour of edible insects (crickets, grasshoppers, mealworms, black soldier fly larvae) in different concentrations, as an additive or a substitute for different ingredients in meat products. It was established that the addition of insect flour (crickets, grasshoppers, mealworms, black soldier fly larvae) can lead to changes in the physio-chemical characteristics (darker colour, increased hardness and springiness, lower cohesiveness) and chemical composition (higher protein content, changes in amino acid and fatty acid composition). Lower concentrations of insect flour (2 – 5%) as an additive in cooked sausages, improved nutritional value (proteins and amino acid content) while negative effects on sensory properties (darker color and springiness) were minimal. It was determined that flour from adult insects is much better than flour made from larvae, due to larvae having much lower nutritional value. Different studies were

conducted to explore the use of insect flour as meat replacer in sausages. Improvement in nutritional value was noticeable in all experiments, apart from ones that used insect larvae. Most successful products were those with lower concentration of insect flour (1.5 – 2% cricket flour replacing 5-7.5% of pork meat) where nutritional value was improved while only slight changes in sensory properties (darker color) were determined. No changes in microbiological status or water activity were found. The main problems that occurred during experiments are very high cooking loss, rubber-like consistency and darker color (especially when darker insect flour is added to lighter meat products). Mealworm flour as replacer for pea powder in pâtés significantly increased nutritional value; however, even lower concentrations of flour affected the colour, making it dark brownish. During sensory analysis of all products, darker colour is always described as a negative product characteristic, and it presents the main reason why consumers refuse to buy or consume the insect-based products. Therefore, to ensure the best acceptability of reformulated products, it is necessary to improve processing of the insects and determine an adequate ratio in the raw material composition to obtain a product that is most similar in sensory characteristics to conventional meat products that consumers are used to and enjoy consuming.

Keywords: acceptability, edible insects, meat products, nutritional value, safety concerns, sensory properties

Acknowledgements: *The study was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Contract number 451-03-66/2024-03/200143), by the Municipality of Bogatić, Republic of Serbia and by General Association of Bogatić Entrepreneurs.*

39 THE INFLUENCE OF FERMENTED RED LENTIL FLOUR ON DOUGH CHARACTERISTICS AND BREAD QUALITY

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Abstract
The research aimed to investigate the influence of adding red lentil flour to wheat flour in bread-making on fermentation properties, rheological behavior, and bread quality. Including fermented lentil flour in bread formulation has significant nutritional effects, but its successful implementation in technology poses a challenge and requires a good understanding of how flour functionality and the level of substitution impact bread quality. One way lentils have been used as an ingredient in the food industry is in the form of flour, which is commonly used as a thickening agent, gelling agent, and/or stabilizer in a wide range of food products due to its functionality. In fact, like other legume flours, lentil flour possesses good functional properties (e.g., solubility, emulsification, gelling, foaming properties, water and oil absorption capacity), which can enhance and control food attributes through various mechanisms. The use of lentil flour in baking (bread, cakes, biscuits, pasta) and other products (sauces, soups, dairy, and

meat products) is gaining attention from food technologists and the industry, as well as popularity among consumers, due to its good and balanced nutritional composition.
This study investigated the technological properties of lentil flour obtained after fermentation with lactic acid bacteria (*Lactobacillus genus*) and then dried with hot air. This treatment method for lentil seeds was chosen because it increases protein solubility, enhances protein emulsification capacity, improves water absorption in dough, strengthens the gluten network, and leads to greater extension resistance during dough fermentation. In this context, rheological and fermentative properties of the dough, as well as bread quality from wheat and fermented lentil flour mixtures, were analyzed. The replacement percentages of wheat flour type 650 with fermented lentil flour were 0, 2, 6, and 10% (g/g). Dough rheological properties were monitored using a Haake Mars 40 rheometer. A F4 reofermentometer was used to assess dough fermentation, and a Perten texturometer was employed for bread texture evaluation.
Lentil flour in dough has the property of creating a three-dimensional structure by interacting with gluten, providing superior properties compared to regular dough. This was demonstrated by analyzing the behavior of viscous and elastic moduli, through the indicators G' and G'', which highlighted the superior effect of fermented lentil flour. The amount of gas produced was significantly higher when lentil flour was used in the dough, and dough development was positively influenced by the functional components of lentil flour. From a sensory perspective, the bread was appreciated by consumers, receiving favorable scores for samples with 2% lentil flour addition. The elasticity of the bread crumb increased in samples with 2-4% lentil flour addition.
Keywords: fermentation, rheology, texture, dough, sensory properties.

40 NEW INGREDIENT FOR FAT REDUCTION IN THE PREPARATION OF BAKERY PRODUCTS. RHEOLOGICAL, TEXTURAL, AND SENSORY CHARACTERIZATION

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Abstract
In the food industry and especially in the bakery and pastry industry, the use of margarine remains indispensable, because it ensures the preservation of the sensory qualities appreciated by consumers. The effects of consuming hydrogenated fats on health is a vast topic that is still under research. Replacing with a healthy and chemically safe alternative and keeping the organoleptic properties area of application of our research. In this study, oleogels are presented as a healthy alternative to saturated fats, replacing margarine in well-known pastry products - muffins. Oleogels are unique semi-solid materials consisting of a network of structuring molecules that trap oil in liquid form, resulting in a gel-like texture. Oleogels were obtained using hemp seed (HO) and sunflower seed (SO) oils and carnauba wax (CW) as an oleogelating agent. The percentages of wax added to the oil for oleogelation were 0%, 7% and 11%. The muffin dough was obtained by replacing 100% of margarine with 10% oleogel. The rheological results on the muffin dough in which oleogel was incorporated showed an increase in the elastic modulus as well as the viscous modulus. The texture of oleogel muffins showed characteristics similar to margarine muffins. The hardness and elasticity of the muffins showed similar values to the muffins obtained with margarine.

From a sensory point of view, the hemp oleogel muffins presented a bitter user taste and a specific smell, which led to the oil obtaining lower scores from the tasters. These results demonstrated that oleogels based on sunflower oil and hemp oil using carnauba wax as an oleogel agent can be used as margarine substitutes to reduce the consumption of saturated and trans fats in pastry products from fluid dough, while maintaining while the functional and sensory properties offered by solid fats.
Keywords: fluid dough, muffins, rheology, texture, sensory properties

41 UTILIZATION OF IPBS MARKERS FOR *Ambrosia artemisifolia* L. ECOTYPES EVALUATION

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Abstract
Ambrosia artemisifolia L. is a wild plant native to North America. It was introduced to Europe in the 19th century. It causes damage in agriculture by reducing the quantity and quality of production as well as respiratory problems and allergic reactions in humans. In Slovakia, the occurrence of ragweed was first recorded at the monitoring station in Žilina. It is widespread mainly in southern Slovakia. In this study, 37 samples of adult plants of ragweed collected from three localities in southern Slovakia, namely Balvany, Veľký Horeš and Malá nad Hronom were used. Up-to date only a few molecular data are available for *Ambrosia artemisifolia* L. genome, thus the aim of the study was the analysis of genetic variability and inter-retrotransposon based polymorphism in the set of studied ecotypes. Using the iPBS 1880 primer, the total number of amplified fragments was 136 with sizes ranging from 110 to 1315 bp. For the iPBS 2079 primer, the total number of amplified fragments was 108 with sizes ranging from 159 to 888 bp. Using the iPBS primer 2274, 114 fragments were produced with sizes ranging from 270 to 1467 bp. Based on constructed dendrograms, the marker 1880 provided the most dictinctive profiles that separated the most of the analysed ragweed ecotypes.
Keywords: ragweed, iPBS polymorphism, variability

Acknowledgement: This study was founded by project VEGA 1/0467/22 Biologická regulácia alergénneho peľu ambrózie palinolistej (*Ambrosia artemisiifolia*).

42 EFFECT OF POLYSTYRENE MICROPLASTICS ON VIABILITY AND TESTOSTERONE PRODUCTION OF TM3 LEYDIG CELLS *IN VITRO*.

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Abstract
Microplastics (MPs) are characterized by diameters smaller than 5 mm. The spread of microplastic particles in the human environment is ubiquitous and thus can be found in rivers, sediments, sewage, sand beaches, soil, and also in drinking water. Additionally, MPs have the ability to transition through the food chain from lower to higher nutritional levels, endangering human health in the process. All together, increased concentrations of MPs have been shown to have negative impacts on mammals, including decreased feeding activity, body condition, oxidative damage, intestinal barrier malfunction, inflammation, neurotoxicity, energy disruption, and last but not least, reproductive toxicity. Industrialization, which leads to a considerable release of synthetic, frequently hazardous xenobiotics (such as microplastics and pesticides) into the environment, is linked to the notable decline in the reproductive rate, reflected by the decline in gamete quality. Male mice's testicles and sperm may be affected by polystyrene microplastics (PS-MP), which is apparent by a decline in the quantity of spermatogenic cells, a disruption in their structure, and a decrease in the activity of enzymes linked to sperm metabolism. In our study, we used polystyrene microplastics as a treatment addition for the TM3 Leydig cell line (derived from immature mouse Leydig cells). After cell cultivation, we added distinct concentrations of polystyrene microplastic particles (5; 10; 20; 40; 80; 100; 200; 400; 800 µM; mg/L). Viability tests consisted of AlamarBlue and MTT assays. After the results of the cell viability, we used the ELISA method to evaluate testosterone production. Metabolic acivity assay (AlamarBlue) shown significant results in group treated with 400 µM mg/L (*P<0,05), 5 µM mg/L (**P<0,01), and 800 µM mg/L (***P<0,001). The levels of a cell's group viability fluctuated in accordance with concetration. The second metabolic activity assay (MTT) showed a significant increase in TM3 cells treated with PS-MP in groups of 5; 10, and 20 µM mg/L (***P<0,001). On the other hand, the group treated with 400 µM mg/L showed a significant decrease in metabolic activity (**P<0,01). The same result was proved by the experimental group treated with 800 µM mg/L (***P<0,001). Production of testosterone after 24 hours of treatment showed a significant decrease and lower levels of produced hormone in groups treated with 20; 40; 100 µM; mg/L (*P<0,05); 200 µM; mg/L (**P<0,01); and 80; 400; 800 µM; mg/L (***P<0,001). Experimental groups showed a biphasic effect in viability tests when % of control viability went from increased levels (lower concentrations) to a significant decrease in groups treated with higher concentrations (400; 800 µM; mg/L). Our results also proved reproductive toxicity of PS-MP. Production of testosterone after 24 h treatment was significantly decreased in all experimental groups. The reproductive toxicity of these substances, which are highly widespread in the human environment, creates a complex problem, and therefore more attention should be paid to this issue.
Acknowledgments: The research was financially supported by projects 05-GA-SPU-2024, APVV-20-0218, APVV-19-0243, VEGA 1/0207/23, KEGA 023SPU-4/2022.
Keywords: polystyrene microplastics, Leydig cells, testosterone

43 THE ROLE OF ZINC OXIDE NANOPARTICLES IN THE MODULATION OF MOVEMENT CHARACTERISTICS OF BULL SPERMATOZOA

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Abstract
Zinc oxide (ZnO) nanoparticles have gained significant attention in reproductive biology due to their unique physicochemical properties and potential applications in enhancing gamete functionality. This study investigates the effect of ZnO nanoparticles in modulating the motility characteristics of bull spermatozoa, which are critical for successful fertilization. Given the importance of spermatozoa motility in agricultural and veterinary practice, understanding the interactions between ZnO nanoparticles and spermatozoa could provide insight into new strategies to improve reproductive efficiency in cattle. We used computer-assisted sperm analysis (CASA system) for accurate determination of motility, to evaluate the effect of different concentrations (1000; 500; 250; 125; 62.5; 31.2 and 15.6 µg/ml) of zinc oxide nanoparticles (ZnO NP) on parameters such as total motility (MOT, %), progressive motility (PRO, %) and velocity curved line (VCL, µm/s) of bull spermatozoa at 37°C in time 0h, 3h and 5h. Pure saline served as a control, and the experimental concentrations of ZnO NPs were diluted also in saline. Ejaculate (Slovak Biological Services, Lužianky) was added to the prepared solutions in a ratio of 1:50. After 3 hours, a significant decrease ($P<0.001$) of MOT was observed at 500 and 1000 µg/ml compared to the control. However, after 5 hours we recorded a significantly higher ($P<0.05$) MOT at 62.5 µg/ml compared to the control. Concentrations of 500 ($P<0.001$) and 1000 ($P<0.0001$) µg/ml ZnO NP caused a significant decrease in MOT after 5 hours. A similar trend was also observed for PRO when the addition of 500 ($P<0.01$) and 1000 ($P<0.001$) µg/ml ZnO NPs caused a decrease after 3 hours compared to the control. The beneficial effect of ZnO NPs was most evident after 5 hours when we observed a significant increase in PRO compared to the control at a concentration of 15.6 ($P<0.05$), 31.2 and 62.5 ($P<0.01$) µg/ml ZnO NPs. The addition of 1000 µg/ml ZnO NPs caused a significant decrease ($P<0.05$) in PRO after 5 h compared to the control. The addition of 1000 µg/ml ZnO NP caused a significant decrease ($P<0.01$) in VCL after 5 hours compared to the control. The results of our experiments show that the addition of 31.2 and 62.5 µg/ml ZnO NPs has a beneficial effect on the motility characteristics of bull spermatozoa. On the other hand, concentrations of 1000 and 500 µg/ml ZnO NPs were cytotoxic. Our findings suggest that it is necessary to elucidate the mechanistic pathways by which ZnO nanoparticles affect spermatozoa motility, thus contributing to the broader discourse on nanotechnology in the field of reproductive health. Work was supported by project VEGA 1/0698/22, 1/0083/21, KEGA 035SPU-4/2023, APVV-16-0289, and APVV-21-0168.
Keywords: nanoparticles ZnO, bull spermatozoa, CASA system, motility

44 SELENIUM - MERCURY MOLAR RATIOS IN BLOOD SERUM OF COMMON CARP (*CYPRINUS CARPIO*) IN ASSOCIATION WITH BODY METRICS

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Abstract
The aim of this study was to quantify the selenium and mercury levels in the blood serum of common carp (Cyprinus carpio) and to observe their interrelationship and effect on the physical parameters of the fish. The hypothesis of this study was to calculate the molar ratio of the concentrations of the elements and to identify possible correlations with the total length (TL) and weight (W) of the fish. The quantification of the elements was performed using the ICP-OES method. The physical parameters of the fish were acquired in situ at the time of sampling by a specialized expert. The total length was 471.43 ± 19.09mm, and weight was 2048 ± 335.9g. Selenium, as a bioactive essential element contrasted with mercury, a non-essential toxic element, act in antagonistic ways in the body, with selenium being able to neutralize the toxic effects of mercury by cross-reacting with each other and forming non-toxic compounds such as tetraselendimercuric complex (HgSe), known as tiemannite. Studies have reported that when the molar ratio of Se:Hg is > 1, the protective effects of selenium are manifested. In our study, we worked with 15 fish samples and were able to detect mercury in all samples but selenium in only 7, the other values were below the detection limit (LOD). Based on the calculated molar ratios, the arithmetic mean of the values was 244.72±101.15. Subsequently, statistical analyses were performed using Graphpad Prism 8.1; correlation analysis and linear regression. However, based on the statistical results, we did not confirm statistically significant correlations, which is probably attributed to the low number of samples evaluated in which we were able to measure the quantity of selenium.
This study was supported by The Ministry of Education, Research, Development and Youth of the Slovak Republic under the project VEGA 1/0571/23. This work was also supported by the Slovak Research and Development Agency under the contract No. APVV-21-0168.

Keywords: common carp, selenium, mercury, Se:Hg molar ratio, blood serum, body metrics

45 ECOTOXICOLOGICAL EFFECTS OF COPPER AND MANGANESE COMPOUNDS ON BIOCHEMICAL PARAMETERS IN *LEMNA MINOR*

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Abstract
Heavy metals are possible aquatic contaminants that are frequently used in a variety of industries. Copper and manganese are heavy metals whose ecotoxicological impacts on aquatic ecosystems must be identified. This study examined the ecotoxicological effects of copper and manganese chlorides and sulfates on various biochemical parameters of the aquatic plant common duckweed, *Lemna minor*. A growth inhibition test was conducted, followed by the preparation of two types of extracts. The biochemical parameters of interest were evaluated from these extracts, including chlorophyll content, reducing sugars and protein concentration, as well as the enzymatic activity of catalase and guaiacol peroxidase. The results highlighted that copper chloride and copper sulfate reduced chlorophyll content compared to manganese chloride and manganese sulfate. The concentration of reducing sugars was not strongly influenced by any tested compound. Protein concentration was low compared to the negative control at the higher tested concentrations of copper chloride and sulfate and manganese sulfate. Catalase activity was decreased at all tested concentrations of copper chloride, while the other three tested compounds reduced catalase activity at the higher tested concentrations. Enzymatic activity was reduced by the highest tested concentration of the four compounds of interest regarding guaiacol peroxidase, with copper chloride also reducing enzymatic activity at the lower tested concentrations. These results emphasize a potential ecotoxic effect of copper and manganese chloride and sulfate on *Lemna minor* plants, effects reflected in some biochemical parameters.
Keywords: ecotoxicity, biochemical parameters, copper, manganese, *Lemna minor*

46 EXPLORING THE BIOTECHNOLOGY APPLICATIONS AND TECHNIQUES OF SPHERIFICATION

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Abstract
Spherification, a culinary technique from molecular gastronomy, is finding innovative applications in biotechnology. Originally used to create semi-solid spheres with liquid interiors for gourmet dishes, spherification involves sodium alginate and calcium ions to form a gel-like membrane around a liquid center. This technique has promising uses in drug delivery, where encapsulating medications within gel spheres allows for controlled release and targeted treatment. For tissue engineering, spherification can encapsulate cells, providing protection and controlled integration into tissues, useful in pharmaceutical and medical domains. Additionally, biocatalysis benefits from encapsulating enzymes or microorganisms, enhancing their activity and stability for industrial processes. In food biotechnology, spherification improves the stability and bioavailability of nutrients, creating functional foods with health benefits. Despite challenges in stability and scalability, spherification offers precise control and versatility, making it a valuable tool in modern biotechnology.
Keywords: biotechnology, spherification, alginate.

47 SILVER IODIDE IN BIOTECHNOLOGY: INNOVATIONS AND CHALLENGES

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Abstract
Silver iodide (AgI) plays a crucial role in biotechnology, with applications that go beyond its traditional use in cloud seeding. Its potent antimicrobial properties make it indispensable in medical settings, where it is used in wound dressings and as coatings for medical devices to prevent infections and promote healing. In the realm of diagnostic imaging, silver iodide is utilized in X-ray films and advanced imaging techniques due to its sensitivity to light and radiation. Furthermore, silver iodide nanoparticles are being

developed for biosensors that can rapidly detect pathogens and environmental pollutants, enhancing both medical diagnostics and environmental monitoring. In nanotechnology, these nanoparticles are being explored for targeted drug delivery systems, offering precise treatment with reduced side effects. However, the widespread use of silver iodide faces challenges such as potential toxicity, high costs, and the risk of microbial resistance. Ongoing research aims to optimize its antimicrobial efficacy, develop biocompatible alternatives, and enhance its applications in drug delivery and diagnostics, ensuring that silver iodide continues to advance biotechnology effectively and safely.
Keywords: biotechnology, gold, silver, nanomaterials.

48 SWEET SCIENCE: HOW BIOTECHNOLOGY IS SHAPING THE FUTURE OF EDIBLE 3D PRINTING

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Abstract
Biotechnology innovations play an important role in developing sugars and sugar substitutes used in 3D printing edible decorations. Traditional sugar, derived from cane or beet, is being increasingly supplemented with biotechnologically engineered alternatives that offer improved functionality, sustainability, and customization for 3D food printing. Through microbial fermentation, biotechnology enables the production of sugar substitutes like erythritol, xylitol, and isomalt, which are ideal for printing due to their unique properties such as lower melting points, enhanced stability, and resistance to crystallization. Enzymatic modifications refine sugars' texture, viscosity, and crystallization behavior, optimizing them for precise printing and creating smoother, more intricate edible designs. Additionally, biotechnology facilitates the development of biodegradable and eco-friendly sugar-based materials, addressing concerns about food waste and environmental sustainability. Fortified sugars and biopolymers are also engineered and transformed to incorporate health benefits, such as added fiber, vitamins, and probiotics, opening new possibilities for functional, personalized food prints. Overall, biotechnology is not only improving the quality and versatility of sugar in 3D food printing, but also enabling the creation of more sustainable, customized, and health-conscious edible decorations that push the boundaries of culinary artistry.
Keywords: biotechnology, sweet, 3D decorations.

49 TOWARDS SUSTAINABLE BIOTECHNOLOGY: GREEN SYNTHESIS TECHNIQUES FOR GOLD AND SILVER NANOPARTICLES

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Abstract
The nanomaterial industry, essential for various technological and biomedical applications, faces significant environmental and biocompatibility challenges due to the toxic chemicals and hazardous waste from conventional synthesis methods. Green synthesis offers an eco-friendly alternative, utilizing biological materials such as plant extracts, microorganisms, and biopolymers. Plant extracts from leaves, fruits, roots, and bark provide natural reducing and stabilizing agents, while microbial synthesis involves bacteria, fungi, and algae for metal ion reduction and nanoparticle stabilization. Biopolymers like chitosan, cellulose, and starch further enhance sustainability and biocompatibility. The biological materials used in green synthesis significantly influence the size, shape, and surface characteristics of nanoparticles. Characterization techniques like TEM, SEM, XRD, FTIR, and DLS are employed to assess these properties. Green-synthesized gold and silver nanoparticles exhibit enhanced biocompatibility and unique properties, including strong antimicrobial activity, making them suitable for medical applications such as devices and treatments. Their small size and functionalization capabilities also support effective drug delivery, while gold nanoparticles' optical properties are beneficial for imaging and diagnostics. In the food industry, Gold Chef sets the standard for edible gold and silver, ensuring compliance with stringent food safety regulations and international standards. This eco-friendly approach addresses environmental and health concerns, promoting sustainable nanomaterial production and unlocking new biomedical applications.
Keywords: biotechnology, gold, silver, nanomaterials.

50 SYMBIOTIC BIOTECH SOLUTIONS: FUNGAL CONTRIBUTIONS TO SOIL IMPROVEMENT AND PLANT HEALTH

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Abstract
Fungi are essential in modern biotechnologies for improving soil quality due to their ability to decompose organic matter, fix nitrogen, and improve soil structure and fertility. By decomposing plant and animal

remains, fungi contribute to the formation of humus, which increases the soil's ability to retain water and nutrients. Mycorrhizae, which form symbiotic relationships with plant roots, are essential for efficiently absorbing water and nutrients. Certain species of fungi stimulate plant growth by releasing compounds that improve nitrogen fixation, a crucial nutrient for plants. In addition, fungi are used to bioremediate soils contaminated with toxic chemicals, such as heavy metals, pesticides, and hydrocarbons, through enzymatic processes that convert toxic compounds into less harmful or harmless forms. Fungi also play an important role in combating plant pathogens, such as Trichoderma, which is used to control root diseases caused by other pathogenic fungi by colonizing plant roots and producing antibacterial and antifungal substances. Notable examples of fungi used in soil improvement biotechnologies include Trichoderma spp, Phanerochaete chrysosporium, Glomus spp., and Aspergillus spp. for the decomposition of organic matter and in composting processes. The use of fungi in these biotechnologies is a sustainable and effective practice for increasing soil health and fertility.

Keywords: fungi, soil improvement, plant health, biotechnology.

51 STUDY ON EMBRYONIC DEVELOPMENT IN STERLET (*ACIPENSER RUTHENUS*)

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Abstract

Sterlet (*Acipenser ruthenus*) is a sturgeon that hold an important place in aquaculture, being a species that can be raised both outdoors in fishponds and indoors in recirculating aquaculture systems (RAS). Knowledge of this species' biology has enabled the development of breeding technology in RAS; however, it is not yet fully optimized, and certain aspects of the technological process still require improvement. One of these is related to the artificial reproduction in order to produce the sterlet larvae. The aim of this study was to highlight the particularities of the embryo development in the sterlet during incubation, the studied embryos being obtained from sterlet breeders raised exclusively in the RAS. Eggs and sperm were collected during the 2024 breeding season, following the stimulation of ovulation and spermiation with a pituitary suspension prepared from carp pituitary glands. After fertilization, the eggs were incubated at an average temperature of 17.3°C in a Zuger jar. Embryonic development was monitored by taking at regular time intervals 20 - 30 eggs from the incubator and studying them with a stereo magnifier. Embryonic development was staged as follows: the zygote period (0-2h 15'), the cleavage period (2.5-9 h), the blastula period (9-17 h), the gastrula period (17-32 h), the neurula period (32 -44 h), the organogenesis (44-100 h) and the hatching period (100-124 h). The main features observed were recorded, photographed and described.

Keywords: sterlet, embryo, embryonic development

52 QUANTITATIVE SPLANCHNOLOGY STUDY ON EUROPEAN CATFISH (*SILURUS GLANIS*) RAISED IN RECIRCULATING AQUACULTURE SYSTEMS

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Abstract
European catfish (Silurus glanis) is a species with considerable economic potential in aquaculture due to its adaptability and superior meat quality. The development of intensive breeding technologies has allowed the increase of production efficiency, making this species a viable choice for recirculating aquaculture systems (RAS) that have increased significantly in recent years in Europe and beyond. The aim of the study was to highlight the anatomical peculiarities of the internal organs of European catfish raised in an intensive, closed-space recirculating aquaculture system (RAS), examining both morphological characteristics and quantitative splanchnology. Five male catfish, aged 2 years and 10 months, were studied. Among the results obtained, it was noted that the fish raised in the RAS up to the age of slaughter did not accumulate perivisceral fat, and the segments of the digestive tract were reduced in size, likely due to a diet based on granulated compound feed. Thus, it can be said that the intensification of European catfish production has led to notable changes in the structure and function of internal organs, particularly within the digestive system, as a result of the feeding regime based on granulated dry feed. The particularities observed especially in the digestive tract reflect the adaptive responses of the fish to the environmental conditions and rearing practices used in intensive aquaculture.
Keywords: European catfish, RAS, quantitative splanchnology, anatomy

53 CUTTING-EDGE BIOMATERIALS IN DENTISTRY: A BIOTECHNOLOGICAL PERSPECTIVE

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Abstract
Biotechnology has significantly advanced the field of dentistry, offering innovative biomaterials that enhance dental treatments and improve patient outcomes. One notable advancement is the use of

hydroxyapatite and bioactive glass, which mimic the natural mineral components of teeth and bones, promoting better integration with the body's tissues. These materials are commonly used in bone grafts, dental implants, and coatings for implants, providing a foundation for successful dental restorations. Tissue engineering has also made significant strides with the development of collagen-based and polycaprolactone (PCL) scaffolds. These scaffolds support the growth and regeneration of dental tissues, facilitating the repair of periodontal structures and aiding in dental pulp regeneration. Stem cell therapy, leveraging dental pulp stem cells (DPSCs) and periodontal ligament stem cells (PDLSCs), further enhances regenerative dentistry by enabling the growth of new dental tissues, potentially leading to whole-tooth regeneration in the future. Biotechnologically derived growth factors and biologics, such as platelet-rich plasma (PRP), platelet-rich fibrin (PRF), and bone morphogenetic proteins (BMPs), are being incorporated into dental treatments to accelerate healing and promote bone growth. Additionally, antimicrobial peptides and proteins, like lysozyme and lactoferrin, are integrated into dental materials to reduce infection risks and improve the longevity of dental restorations. Furthermore, biodegradable and smart materials, including chitosan and responsive polymers, are being developed for controlled drug delivery and enhanced wound healing in dental applications. Genetically engineered proteins, such as recombinant human collagen and amelogenin, are also making headway in tissue regeneration and enamel repair. Overall, biotechnology is revolutionizing dentistry, providing more effective, biocompatible, and patient-specific treatment options that significantly enhance the quality of dental care.

Keywords: biomaterials, dentistry.

54 HAEMATOLOGICAL PROFILE AND LIVER FUNCTION INDICES OF BROILER CHICKENS FED GROUNDNUT ROSELLE AND BAOBAB SEED CAKE DIETS WITH AND WITHOUT MULTIENZYMES SUPPLEMENTATION

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Abstract
Major challenge with use of non-conventional feed ingredients is their antinutrients composition, that can affect nutritional and health status of domesticated animals. Haematological values and liver enzymes present in their blood cells are used to detect these changes. The study was designed to analyze haematological profile and liver function indices of broiler chickens fed groundnut, roselle and baobab seed cake diets partly substituting soya bean cake, with and without enzymes supplementation. A total of 352 and 330 Cobb 500 day old broiler chicks, were allocated to four and five dietary treatments with maize-soya bean cake diet as control. Trial 1 contained groundnut cake (GNC), roselle seed cake (RSC) and baobab seed cake (BSC), while Trial 2 were fed BSC and RSC with and without multienzymes, all in a completely randomized design, at 20% inclusion level for 49 days. Data collected were analyzed using analysis of variance while means were separated using Least significant difference. The result in Trial 1 showed a significant ($P<0.05$) difference in level of basophils across the treatments with no significant ($P>0.05$) effect in all the parameters tested for liver function test, except alkaline phosphatase (ALP) which was lower in birds fed BSC but was comparable to birds in control group. Heamatological profile

and liver function indices of birds were not significantly (P>0.05) affected with dietary inclusion and multienzymes supplementation in Trial 2. It was concluded that inclusion of GNC, RSC and BSC in broiler chickens diet at 20% did not affect their health and nutritional status.S
Keywords: antinutrients, broiler chickens, haematological, liver, seed cakes

ISSN: 2821-4285
ISSN - L: 2821-4285