
***"YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH IN
APPLIED LIFE SCIENCES"***

***Section - "Young people and scientific research in Animal Husbandry and
Biotechnology"***



UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" from TIMIȘOARA

***"Young People And Multidisciplinary Research In Applied
Life Sciences"***

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***Section: Young people and scientific research in Animal Husbandry and
Biotechnology***

**FACULTY OF BIOENGINEERING OF ANIMAL RESOURCES
TIMIȘOARA, 2023**



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1 BIOFERTILIZERS: A SUSTAINABLE SHIFT FROM CONVENTIONAL FERTILIZERS - AN OVERVIEW

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Abstract

The past century's agricultural progress, notably characterized by fertilizer utilization, have brought unprecedented crop yields and emergent challenges. While synthetic fertilizers spearheaded global food security, their ecological and health implications have become evident. As we look towards the future, issues like diminishing returns, soil degradation and concerns about the environmental impact of synthetic fertilizer have called for sustainable alternatives for delivering these nutrients and increasing crop yields. This review delves into the opposite narratives of synthetic fertilizers and their bio-derived counterparts, accentuating their potential in sustainable agriculture. The review illuminates the transformative role of biofertilizers - organic substances with living microorganisms in soil fertility through the lens of microbial free living and symbiotic relationships. The assessment seeks to chart a scientifically informed path toward sustainable agriculture practices in an era demanding ecologically responsible solutions.

Keywords: Biofertilizers, sustainable agriculture, living microorganisms, symbiosis, fertilizing bacteria

2 MICROBIAL BIODEGRADATION ALCHEMY OF PLASTICS: AN OVERVIEW OF MECHANISMS, ENZYMATIC PROCESSES, AND ENVIRONMENTAL IMPLICATIONS

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Abstract

Plastics have increasingly dominated our material landscape due to their widespread use. With the surge in the production and distribution of plastic products, the threat of global plastic pollution has escalated. This issue has increasingly alarmed environmental researchers due to the pronounced negative impacts on flora and fauna. As research efforts intensify worldwide, there is encouraging advancement in pinpointing and comprehending microorganisms capable of breaking down these plastics. The recent

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studies depicted microbial entities that stand out for their remarkable capabilities in tackling plastic waste. Among these are bacteria from the genera *Ideonella*, *Pseudomonas*, *Bacillus* and *Brevibacillus*, as well as fungi, especially those from the genera *Aspergillus* and *Penicillium*, which have showcased promising results in degrading plastics. This scholarly review aims to clarify the lasting understanding concerning the biodegradation of polymeric materials. We delve into the different roles of specific microorganisms adept at plastic degradation, highlighting the enzymatic mechanisms they employ. Our exploration further encompasses the processes these microorganisms utilize to convert intricate polymer chains into foundational monomers, which subsequently have potential reintegration into various biochemical pathways.

Keywords: Plastic, biodegradation, plastic-decomposing microorganisms, polyethelene, polypropylene, PVC, polystyrene

3. A SHORT OVERVIEW OF *CLOSTRIDIUM PERFRINGENS*: RELEVANCY, TOXINOTYPES, CLINICAL IMPACTS, AND THE CHALLENGES OF BIOFILM FORMATION

**Mara-Georgiana Haralambie^{1†}, Alina Țărnă^{1†}, Aurelia Coroian¹, Ana-Maria-Cristina
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Abstract

C. perfringens, a ubiquitous bacterium, is implicated in a series of recent outbreaks across Europe, reflecting its significance in public health. The organism manifests different clinical presentations in both human and animal hosts. In the realm of veterinary science, its pathogenesis in species such as poultry, cattle, swine, and equines is of particular concern due to the economic implications stemming from morbidity and mortality rates. The enterotoxins produced by this bacterium is the primary cause of symptoms like watery diarrhea, abdominal pains, and cramps in humans, and leads to conditions such as clostridial myonecrosis and necrotic enteritis in animals. A important aspect of its virulence strategy is its ability to form biofilms. These sophisticated microbial assemblages confer an augmented resistance against environmental challenges and antimicrobial interventions. This review consolidates information about *C. perfringens* outbreaks in Europe, mode of infection, pathogenesis in various animals, associated clinical symptoms, and the nuances of its biofilm formation. The present literature synthesis could provide valuable insights for forthcoming preventive and therapeutic initiatives.

Keywords: *Clostridium perfringens*, infection and pathogenesis, toxinotypes, clinical manifestations, biofilm formation

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**4. - MOLECULAR DOCKING STUDY ON THE INTERACTIONS OF MYCLOBUTANIL
ENANTIOMERES WITH ENZYMES BELONGING TO SOIL MICROORGANISMS**

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Abstract

The use of pesticides, although needed to protect crops and increase production, represents an environmental and human health issue. Myclobutanil is a chiral triazole fungicide widely used for the protection of crops against fungal diseases. This study focused on molecular docking regarding the interactions of the enantiomers of myclobutanil with enzymes belonging to soil microorganisms in order to assess the possible enantioselectivity of the interactions. In our study we have taken in consideration the enzymes: (i) dehydrogenases belonging to *Aspergillus fumigatus* and to *Rhizobium leguminosarum*; (ii) phosphatases belonging to *Aspergillus niger* and to *Rhizobium leguminosarum*; (iii) proteases belonging to *Aspergillus clavatus* and to *Rhizobium leguminosarum*; (iv) catalases belonging to *Komagataella pastoris* and to *Rhizobium meliloti*; (v) ureases belonging to *Aspergillus fumigatus* and to *Rhizobium leguminosarum*. Molecular docking outputs showed that both enantiomers of myclobutanil were able to bind to the active sites of dehydrogenases, phsosphatases and proteases, with higher interacting energies observed for (*S*)-myclobutanil, the enantiomer known to be less active against target organisms but having a higher toxicity against non-target organisms. The results of our study confirm the need to implement better management practices regarding the use of myclobutanil by using the enantiomer that is most effective on target organisms and less toxic to non-target organisms.

Keywords: molecular docking, myclobutanil, soil enzymes, soil microorganisms.

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**5 PRELIMINARY INVESTIGATIONS REGARDING THE RELEASE OF ANTIMICROBIAL
PEPTIDES FROM CHITOSAN-BASED FILMS**

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Abstract

The aim of this study was to investigate the release of nisin from chitosan-based materials, developed for use as possible wound-dressing materials, considering the need for new antibacterial compounds in the biomedical fields. Chitosan is a versatile polymer often used as a matrix for delivering different antibacterial compounds. Nisin is known for its antimicrobial properties, intensely used as a food preservative and more recently used for its wound healing properties, being one of the most investigated antimicrobial peptides. Using chitosan's film-forming capacities, nisin-loaded films were developed. The release of nisin from chitosan matrix was monitored for 72 hours at different pH values, ranging from acidic to neutral, values corresponding with different skin lesions, and determined spectrophotometrically at 230 nm. Furthermore, the degradation of chitosan-nisin films, in different solutions (PBS – as control, PBS-Lysozyme and SBF) was monitored for 4 days, by determining the weight loss of the films. The results obtained showed a slow release of nisin from chitosan-based films, with a high release rate in the first four hours, continuing with a sustained release up until 72 hours. Based on pH, the higher amount of nisin was released at acidic pH, which was expected as chitosan becomes soluble in acidic media. Regarding the degradation studies, chitosan-nisin films were degraded only in lysozyme solution, with a weight loss ranging from 6 to 9% by the fourth day. The results obtained showed that chitosan-based films are a suitable matrix for the delivery of nisin, therefore such polymer-based materials can be considered as potential candidates in the biomedical industry.

Keywords: chitosan, nisin, polymeric materials, antimicrobial peptide

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6 - STUDY ON THE TECHNIQUES USED IN THE SELCTION OF ABERDEEN ANGUS BREEDING BULLS AT NATIONAL LEVEL

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Abstract

In recent years, the beef cattle sector has registered a favorable upward trend on national level, with the entry of our country into the European Union. This growth was influenced by a number of favorable factors such as: the lack of labor force, european and national subsidies, cereal productive potential, the share of natural pasture areas, the price of meat and live animals, the transition of consumers to meat wich is obtained in growing conditions of semi-extensive and extensive systems. Aberdeen Angus breed has the largest share of the total beef cattle population on national level. Romanian Aberdeen Angus Association is the non-governmental entity, whose purposes are the monitoring of the quantitative and qualitative evolution of the breed, as well as managing the heerdbook. Considering the major importance of the bulls in the manifestation of the selection pressure in a breeding program into a population, it is unanimously necessary to monitor and select all the bulls, before their use in breeding or artificial insemination. This paper work will study the techniques used for the selction of breeding bulls (*pedigree, performances and estimating breeding values of the ancestors, own performances and estimating breeding values, structural soundness, body condition score, body measurements, DNA profile or parentage, individualization*) from Aberdeen Angus population and their current situation on national level.

Keywords: *Aberdeen Angus, Romania, breeding bull, estimating breeding value, selection.*

7 - INFLUENCE OF MASTITIS ON MILK QUALITY AND PRODUCTION IN CATTLE: A REVIEW

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Abstract

Mastitis is an inflammatory response of the mammary glandular tissue caused mainly by bacterial pathogens. Considered one of the most serious diseases of the udder, mastitis causes animal welfare problems and is a major food safety and security concern, creating a serious economic problem in the dairy industry due to reduced milk production and milk quality. In addition to the increase in the number

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of somatic cells, which is the key parameter, from a normative point of view, in many countries of the Globe in the evaluation of milk quality, a number of other components, such as proteins, fats, lactose, milk sugar, the level of calcium ions and potassium, undergoes a series of changes. Thus, the five important milk proteins: κ - casein; α - casein; β - casein; β - lactoglobulin and α - lactalbumin show decreases in concentration directly proportional to the degree of advancement of the infection. The decrease in the level of casein, the main milk protein, is accompanied by the increase in the level of low-quality whey proteins, which affects the flavor and composition of the milk.

Keywords: mastitis, composition of milk, dairy production, cattle, pathologies

8. RISKS OF TRANSMISSION OF INFECTION WITH SPECIES OF THE GENUS TRICHOPHYTON FROM ANIMALS TO HUMANS

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Abstract

Trichophytosis (ringworm) is included in the category of dermatomycoses or superficial mycoses, being a fungal infection, produced by a microscopic fungus of the genus *Trichophyton*. Since in recent decades an increase in the incidence of trichophytosis has been observed in humans and susceptible animals, either with asymptomatic or symptomatic evolution, a more detailed knowledge of the important sources of transmission of this disease from animals to humans is still required, for the adoption of more effective parasitological surveillance measures for this dermatophytosis. In this sense, it is necessary to know some aspects related to the morphology, the epidemiological implications and the correct establishment of the diagnosis, but also the choice of effective therapeutic protocols to prevent, treat and combat this dermatomycosis in animals and humans. In this regard, a growing interest has been given in recent years to pets that represent a permanent risk of human contamination, but the evolution of this disease in farm animals cannot be neglected.

Keywords: Trichophytosis, dermatomycoses, fungal infection, *Trichophyton*

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**9. STUDY ON MILK PRODUCTION AND REPRODUCTION OF ROMANIAN SPOTTED
COWS ACCORDING TO FARM SIZE AND OWNERSHIP**

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Abstract

Researches were carried out on Romanian Spotted cows from 233 farms in Arad County that performed in control year 2021/2022. The aim of the study was to highlight the differences for milk production and reproduction for different farm sizes and juridic ownership of farms. Data was collected from the official performance control: juridic ownership, farm size, number of lactations in year 2021/2022, average days in milk, average milk production (milk yield, fat and protein yields and percentages), age at first calving, calving interval, and days dry. From the ownership point of view 3 categories were found: commercial company (SC), legal physical person (PFA) and individual person (PF). According to farm size, the farms were divided into 3 categories: up to 10 cows (small), between 11 and 25 cows (medium) and over 25 cows (large). Average number of lactations was significantly higher in SC than in PFA and PF (42.3 vs. 7.6 and 6.5, respectively, $p < 0.05$). Maturity equivalent (ME) milk production in SC was 7355 kg milk with 4,60% fat and 3,63% protein obtained during 384 DIM. Compared to this, EM milk yield was 25% lower ($p < 0.001$) in PFA and PF, with the same content of fat and protein. Reproduction indices were not influenced significantly ($p > 0.05$) by the farm ownership. Average number of lactations per farm was significantly higher in large farms than in medium and small farms (49.7 vs. 13.7 and 5.7, respectively, $p < 0.001$). ME milk production was not influenced significantly ($p > 0.05$) by the farm size, being by only 5-10% lower in small and medium farms compared to large farms. Except for age at first calving that was significantly higher in medium vs. large farms (899.3 vs. 849.1, $p < 0.05$), the other reproduction indices were not significantly influenced by the farm size. In conclusion, we could say that farm ownership and size had some influence on milk and reproduction performance of dairy cows in studied farms

Keywords: cows, farm ownership, farm size, milk production, reproduction indices, Romanian Spotted

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**10. - STUDY ON MILK PRODUCTION OF ROMANIAN SPOTTED COWS FROM
HUNEDOARA COUNTY ACCORDING TO FARM OWNERSHIP**

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Abstract

Researches were carried out on Romanian Spotted cows from 255 farms in Hunedoara County that performed in control year 2021/2022. The aim of the study was to highlight the differences for milk production among different juridic ownership of farms. Data was collected from the official performance control: juridic ownership, number of lactations in year 2021/2022, average days in milk, average milk production (milk yield, fat and protein yields and percentages) per total, standard and maturity equivalent (ME) lactations. From the ownership point of view 3 categories were found: commercial company (SC), legal physical person (PFA) and individual person (PF). Average number of lactations was significantly higher in SC than in PFA and PF (37.5 vs. 7.3 and 6.3, respectively, $p < 0.001$), as well as DIM (380.3 vs. 343.1 and 336.4, respectively, $p < 0.05$). Milk production in SC was 7044.7 kg with 4.55% fat and 3.62% protein per total lactation; 6339.5 kg with 4.56% fat and 3.26% protein per standard lactation; and 7315.1 kg with 4.55% fat and 3.60% protein per ME lactation. Compared to these productions in SC, milk yields obtained in PFA and PF were about 20 to 30% lower ($p < 0.001$), while fat and protein contents remained unchanged ($p > 0.05$). In conclusion, we could say that farm ownership had an influence on milk yield, as well as DIM and number of lactations per farm.

Keywords: cows, milk production, farm ownership, Romanian Spotted

**11. STUDY ON MILK PRODUCTION OF ROMANIAN SPOTTED COWS ACCORDING TO
THE SECTION OF THE HERD BOOK**

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Abstract

The study was carried out on farms and animals enrolled in the performance control and registered into the herd book of the Romanian Spotted breed in Romania. Milk production data was obtained from 8372 farms, as farm average of cows registered in either principal and supplementary section of the herd book. Milk production data comprised of milk yield and fat and protein content per maturity equivalent lactation, as well as number of lactations per farm per herd book section. The factors were herd book section (principal and supplementary) and association that is carrying out the performance control in the farm. A total of 26 associations were identified, as well as some that were not enrolled in any association,

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but were enrolled in the herd book association. Cows that were registered in the main section of the herd book produced 6638.06 kg milk with 3.93% fat and 3.30% protein. The milk production of cows registered in the supplementary section of the herd book was 12% significantly lower ($p < 0.001$) than that of cows from main section, except for the fat and protein content, which were similar ($p > 0.05$). Association had a significant ($p < 0.001$) effect on the average milk production per farm, varying from 5288.4 kg in A18 to 8903.8 kg in A19. Also, there was a significant interaction ($p < 0.001$) on milk production between the section of herd book and association. In some associations the milk production of cows registered in the supplementary section was higher than that of cows registered in the main section.

Keywords: associations, cows, herd book, milk production, Romanian Spotted

12 STUDY ON GROWTH PERFORMANCE OF ABERDEEN ANGUS CALVES IN FARM IN GORJ COUNTY

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Abstract

Researches were carried out in a private beef farm in Gorj County, on Aberdeen Angus youngstock. Data was collected from the official performance control services and consisted of the live body weight of calves at birth, 7 months (weaning) and 12 months of age. Based on this data, average daily gain and growth coefficient were calculated. In order to study the effect of calf sex on the growth performance the body weight data was modelled using four biological equations: Richards, Brody, Gompertz and von Bertalanffy. Because the Brody model gave the best estimates these were used in further analyses. For the whole Aberdeen Angus population, the average body weight was 32.9 kg at birth, 192.5 kg at weaning (7 months) and 301.9 kg at 12 months of age. The growth coefficient was 4.93% at birth, 30.42% at weaning and 52.78% at 12 months of age, from adult body weight. Average daily gain was 893.2 g from birth to weaning and 841.7 g from weaning to yearling. Calf sex had a significant influence on growth of Aberdeen Angus youngstock. Thus, at birth the males were 4.3% heavier than females, at weaning the body weight was similar in both sexes, while at 12 months of age females were about 26% heavier than males. In conclusion, we could say that in the studied farm female calves showed a higher precocity than males, showing a higher rate of growth, especially after weaning.

Keywords: Aberdeen Angus, calves, growth

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**13. – STUDY ON MILK AND REPRODUCTION PERFORMANCE IN ROMANIAN
SPOTTED COWS ACCORDING TO FARM SIZE AND COUNTY**

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Abstract

Researches were carried out on farms and animals enrolled in the performance control and registered into the herd book of the Romanian Spotted breed in Romania. Milk production and reproduction indices data was obtained from 8375 farms. Milk production data comprised of milk yield and fat and protein contents per maturity equivalent (ME) lactation. Reproduction indices analysed were age at first calving, days dry and calving interval. The studied factors were farm size and county where the farm is located. According to farm size, the farms were divided into 3 categories: up to 21 cows (small), between 21 and 50 cows (medium) and over 50 cows (large). ME production in large farms were on average 6469.7 kg milk, 239.0 kg fat and 205.6 kg protein. In medium and small farms, the milk yield was significantly ($p < 0.05$) lower by 7% and 8.5%, respectively. Fat yield was not significantly influenced by the farm size, while protein yield was significantly lower in medium farms than in large farms (by 10 kg, $p < 0.01$). Age at first calving and days dry were not influenced by farm size, while calving interval was 4 days longer in large farms than in medium and small farms ($p < 0.05$). Milk yield was significantly influenced ($p < 0.05$) by the county, varying from 4728.0 kg in Ilfov County to 12802.3 kg in Tulcea County. Also, there was an effect of county ($p < 0.05$) on reproduction indices in Romanian Spotted cows.

Keywords: Aberdeen Angus, calves, growth

**14. - THE EFFECTS OF TRIAZOLE FUNGICIDES ON COMMON DUCKWEED ENZYMES. A
MOLECULAR DOCKING APPROACH**

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Abstract

Triazole fungicides are applied to various crops for the treatment of fungal diseases. This enables these fungicides to reach the aquatic environment, being able to exert ecotoxic effects on the present aquatic organisms. The aquatic macrophyte, *Lemna minor*, also known as the common duckweed, is such an organism. It can interact with triazole fungicides by uptake, which can thus exert various effects on some

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plant enzymes at a molecular level. For the assessment of these potential effects, three model protein sequences with available 3D structures were considered in this study: ribulose-1,5-bisphosphate carboxylase/oxygenase (RuBisCo), glutathione peroxidase (GPX) and glutathione S-transferase (GST). Flutriafol, metconazole, myclobutanil, tebuconazole, tetraconazole and triticonazole were the studied fungicides, their effects on the selected enzymes being studied through molecular docking using SwissDock program. Results showed that not all six fungicides bound in the active site of all three protein sequences. GST was the only enzyme in the active site of which all six studied fungicides could bind. Regarding GPX, only the fungicides flutriafol, myclobutanil and tetraconazole could bind in the active site, while in the case of RuBisCo, only tetraconazole could bind in the active site of this enzyme. Tetraconazole was the only studied triazole fungicide that could bind in the active site of all three assessed enzymes. The studied triazole fungicides can thus influence the interaction of the respective enzymes with their specific substrates, potentially leading to the inhibition of their enzymatic activity. Experimental studies are to be carried out to confirm/deny the predictions of the modeling made in this study.

Keywords: triazole fungicides, common duckweed, molecular docking.

15 - LANOLIN - A VALUABLE NATURAL PRODUCT OBTAINED FROM SHEEP WOOL

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Abstract

The by-products from various animal breeding technologies have always been a challenge for the farmer. Thus, the wool resulting from sheep shearing has become a little-used by-product, but it can be capitalized and used in various fields such as medical-pharmaceutical, cosmetics, textile, and the field of chemical industry. One of the valuable components of sheep's wool is lanolin - which is a wax, namely a long-chain saturated fatty acid esterified with sterols. Chemical composition of lanolin includes different sterol esters with various sterols (cholesterol, lanosterol, dihydrolanosterol) and isomeric forms of acid moieties (normal, iso and anteiso). Lanolin can be used as a raw material in various technologies and can be obtained through various extraction methods, including classic extraction methods with organic solvents, and also supercritical fluids (as carbon dioxide-acetone). The use of lanolin has given great results in the pharmaceutical field (ointments for wounds and nipple; baby cream; sunscreen), cosmetic (lip, heel, and hand balms), as well as in obtaining high-quality PVC products, which improve decomposition temperature replacing other high toxic raw additives (like lead).

Keywords: lanolin, sheep wool, chemical structure, usage

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16 - EXPERIMENTAL DESIGN FOR EVALUATION OF PHYSIOLOGICAL ACTIVE SUBSTANCES ADMINISTRATION ON THE CHERRIES FRUIT QUALITY

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Abstract

The fruit's quality reflects the tree's health, which has most of its biochemical processes concentrated in the leaves. Thus, if we administrate some biologic-active substances during the phenophase of fruit growth and development, we could evaluate the physiological and metabolically effects of some key processes, considering laboratory assays from leaves and fruits. Regarding the evaluation of these processes, an experimental design was thought out, taking into consideration trees from cherry orchards, from two different locations in Croatia. Administration of some bio-stimulators and chemicals during the phenophase of cherry growth and development affects the cherry's quality and production, processes which could be evaluated by different laboratory tests of oxidative stress assessment. The present paper proposes an experimental trial and some analytical laboratory tests: total content of polyphenols, chlorophyll, carotene, evaluating the oxidative stress status in leaves relating to the effect of administration of few chemical supplements: CaO, proline, salicylic acid, and a biostimulator based on *Ascophyllum nodosum* L. extract, on cherry production in Zadar County: Ninski Stanovi and Murvica, Croatia.

Keywords: biologic-active, cheery, tree, leaves, laboratory tests

17- IS STEROIDS ADMINISTRATION BENEFICIAL FOR HORSES?

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Abstract

Steroids are man-made synthetic compounds, which replicate different hormones. Frequently, these compounds are used for accelerate the development of muscular mass, enhance the appetite, and also for different medical conditions of animals. Steroids work by blocking the body's main inflammatory cascade at a high level, reducing the production of many inflammatory mediators and also the action of inflammatory cells. This slows down the organism's response and reduces body-wide inflammation, as well as the local effects of swelling, redness, itchiness, irritation, and pain. Different synthetic steroids

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have been derived from the basic molecular model of cortisone. The most common injectable steroids used in equine veterinary practice are dexamethasone, methylprednisolone acetate, triamcinolone acetate, and betamethasone. Each of these have different effects, potency and duration of action. In equine veterinary medicine steroids are commonly used for a multitude of conditions including allergic skin conditions, airways disease, anaphylaxis, brain and spinal cord injury, autoimmune diseases and shock. Oral medications are often given when long-term treatment is needed. The aim of this review paper is to present the potential use of steroids in horses as treatment of different medical conditions, considering the incrimination of doping in horses participating in various sports competitions.

Keywords: steroids, horses, medical conditions

18 AN IDENTIFICATION OF METASTASIS REGULATORS IN CHICKEN (*GALLUS GALLUS*) SARCOMA CELL LINES USING TRANSCRIPTOMICS DATA

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Abstract. Rous sarcoma virus (RSV), which is an oncovirus, can cause sarcoma and consequently induce malignant tumors in chicken (*Gallus gallus*). Research into molecular factors that regulate the tumor-inducing ability are essential to develop prevention and curation methods against RSV. In this study, we aimed to determine candidate genes contributing to the formation of tumors through a transcriptomic analysis in R programming with GSE42516 and GSE15141, which are microarray expression dataset in GEO-NCBI database. We conducted differential expression analysis among a total of 8 metastatic samples and 5 non-metastatic samples, starting from data normalization, then creating model matrixes for pairwise comparisons and using eBayes function to calculate the log fold change values and significance level of all genes (p -value). As a result, in GSE42516, we identified 295 significant (p -value ≤ 0.05) differentially expressed genes (DEGs), with 195 downregulated genes ($\log_{2}FC \leq -1$) and 190 upregulated genes ($\log_{2}FC \geq 1$). While in GSE15141, a greater list of DEGs was extracted, with 1444 downregulated genes and 1314 upregulated genes. Top 5 DEGs retrieved in GSE42516 were *TTC32*, *DHRS7*, *RARB*, *RSPO3*, *C1QB* and *RBM24*, *TOM1L1*, *LIPI*, *HINTW*, *C20orf59* were found in GSE15141. Enrichment GO (in this case, biological process - BP) analysis revealed that the DEGs are mainly enriched in *heterochromatin assembly*, *negative regulation of megakaryocyte differentiation* and *endocytosis*. The identified genes may have a vital role in elucidating the molecular metastasis mechanisms and developing effective strategies against sarcoma virus.

Keywords: RSV, candidate genes, R, differential expression analysis, p -value, metastasis

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19 EFFECTS OF COCCIDIOSIS ON THE WELFARE, GROWTH PERFORMANCE, CARCASS AND MEAT QUALITY OF BROILERS

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Abstract

Avian coccidiosis, an infection caused by protozoa *Eimeria* spp., compromises broiler welfare and production performance, increases susceptibility to bacterial infections and leads to substantial economic and production losses upon the poultry industry. Therefore, the objective of this study was to determine the impact of a mixed coccidiosis (*Eimeria acervulina*, *Eimeria maxima*, *Eimeria tenella* and *Eimeria necatrix*) challenge on oxidative stress biomarkers, performance indices, carcass and meat quality of broilers. In total, 100 Ross 308 male broilers were randomly allocated to two treatments (5 replicates, 10 birds/pen) including healthy broilers (fed only with basal diet) and broilers fed basal diet with coccidiosis challenge (orally gavaged at 15 days of age with live oocysts of a hundredfold dose of a commercial vaccine). To determine oxidative stress biomarkers, blood samples (*v. subcutanea ulnaris* and *v. brachialis*) from six sacrificed broilers from both groups were collected on day 21, 28 and 35. Body weight was recorded on day 0, 7, 14, 21, 28 and 35, while average daily weight gain (ADWG), average daily feed intake (ADFI) and feed conversion ratio (FCR) were recorded on day 21, 28, and 35. The following carcass quality traits were measured: hot carcass weight, cold carcass weight, breast weight, leg (thigh and drumstick) weight and back and pelvis weight. In addition, the subsequent meat quality indicators were measured in breast and thigh muscle: pH and temperature; instrumental colour, water-holding capacity and basic chemical composition. Broilers challenged with coccidiosis had higher ($p < 0.05$) concentrations of catalase, superoxide dismutases, glutathione-S-transferase and malondialdehyde at all sampling days, suggesting impaired antioxidant defense and induction of oxidative stress. In addition, the same group of broilers had a higher ($p < 0.05$) ADFI on day 21 and 35, as well as a higher ($p < 0.05$) ADWG and body weight on day 35. Healthy broilers had higher ($p < 0.05$) hot carcass weight, cold carcass weight and breast weight, but a lower weight of back and pelvis, indicating better carcass quality in animals free from *Eimeria* spp. In addition, healthy broilers produced better ($p < 0.05$) meat quality in terms of higher water-holding capacity (lower drip and thawing loss in breast and thigh muscle) and less yellow colour (lower b^* value in breast muscle). Chemical composition of meat obtained from healthy broilers was better ($p < 0.05$) in terms of higher content of dry matter, ash and protein in breast muscle, indicating higher nutritional value of meat in individuals free from coccidiosis.

In conclusion, the presence of coccidiosis in broilers resulted in impaired welfare, poor performance indices and lower carcass and meat quality. Considering high economic losses in primary production and meat industry, more research is necessary to determine the possible use of different natural anticoccidial substances against the *Eimeria* spp. in broilers, and their influence on welfare indicators, growth performance and carcass and meat quality.

Keywords: broilers, carcass quality, coccidiosis, meat quality, performance, welfare

Acknowledgements: The study was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Contract number 451-03-47/2023-01/200143).

**20 PRELIMINARY INVESTIGATIONS REGARDING THE ANTIBIOFILM EFFECT OF
CHITOSAN-BASED BIOMATERIALS**

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Abstract

The purpose of this study was to assess the antibiofilm effect of chitosan-based materials, including chitosan films (Chi), as well as chitosan-nisin films at concentrations of 5 mg/mL (ChiN5) and 10 mg/mL (ChiN10). Chitosan, a natural polymer, finds applications in tissue engineering and regenerative medicine, either alone or in combination with other polymers. Current research seeks to improve chitosan-based materials for wound healing, bone, and cartilage regeneration. Before proceeding with experiments to evaluate the antibiofilm properties of chitosan-based materials, preliminary tests were conducted to measure the antibacterial and antibiofilm effects of nisin on three selected bacterial strains. Monitoring took place at 24 and 48 hours to observe if the antibacterial effect depends on exposure time. The efficacy of nisin was determined through Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) methods. To investigate the antibiofilm potential of chitosan-based materials, a static bacterial biofilm cultivation method was utilized. Bacterial biofilm on chitosan materials was visualized using the TTC assay, and the impact of chitosan films on biofilm formation in wells was assessed using the Crystal Violet staining method. The results revealed that the nisin solution exhibited a pronounced antibiofilm effect against both Gram-positive and Gram-negative bacteria. However, concerning the antibiofilm effect of chitosan-based biomaterials, the findings showed that none of the chitosan-based films completely inhibited bacterial biofilm formation due to slow release of nisin from their structure. These preliminary results serve as a launching point for further research into the antibiofilm properties of chitosan-based materials, contributing to the understanding of the intricate interaction between chitosan-based biomaterials and bacterial biofilm formation, thereby paving the way for the development of innovative therapeutic strategies to combat biofilm-associated infections.

Keywords: chitosan, biofilm, nisin, antibacterial

21 THE EFFECT OF MDA6 HERBICIDE ON SOIL MICROBIOTA

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Abstract

The application of herbicides in agricultural crops can have an adverse influence with qualitative and quantitative changes on the microbial populations of the soil, by changing the enzymatic activities at the soil level, a fact due to the herbicide concentrations applied, the physico-chemical and behavioral characteristics of the herbicide at the level of different types of ground Enzyme activities are considered indicators of soil quality assessment in case of possible contamination, enzyme activities are early indicators that indicate soil degradation when herbicides are not applied. The enzymatic activities of the soil most frequently determined in studies to assess the possible contamination with herbicides are hydrolases. In the present study, the effect of the MDA6 herbicide was monitored for 28 days, whose active substance is 2.4% D acid from dimethyl amine salt, with a concentration of 660 g/l, frequently applied in straw crops (wheat crops). During the experimental period, 5 enzyme activities: catalase, dehydrogenase, urease, phosphatase and protease, were determined at 7-day intervals. In the same way, the quantitative analysis of the micropopulation of bacteria and fungi from the soil samples treated with 3 concentrations of MDA6 herbicide was carried out. The results obtained in the experimental study showed an inhibitory effect of the herbicide MDA6 on the investigated enzymes, those activities showing a tendency to return after 28 days. Microbial communities of bacteria and fungi registered imbalances depending on the tested herbicide concentration, the effects of returning to normal values being identified after 28 days after administration.

Keywords: soil, enzymatic activity, bacteria, fungi

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**22 – ANALYSIS OF THE EFFECT OF THE HERBICIDE MDA6 ON THE SOIL
MICROORGANISM COMMUNITY**

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Abstract

Intensive agriculture in recent years has determined an application with an ever-increasing rate of herbicides to control and combat weeds in agricultural crops, the final role being that of increasing productivity. Herbicides have an important role in modern agriculture, but when used on a large scale, their toxicity, mobility and persistence can lead to their action as pollutants in the soil, groundwater, and the environment in general. In this study, we evaluated the effects of the herbicide MDA6 on the activities of some hydrolytic enzymes and on the populations of microorganisms present in the soil, considering experiments on soil samples maintained under laboratory conditions for 28 days. The herbicide MDA6 contains as active substance 2,4 D dimethyl amine salt in a concentration of 825 g/l, the applied dose being the one corresponding to corn crops. Results obtained from experimental studies, evidence of dose-dependent inhibitory effect of MDA6 against dehydrogenase, catalase, phosphatase, protease and urease activities. In the case of the communities of bacteria and fungi in the analyzed soil samples, the obtained results reveal a dose-dependent behavior of the populations of microorganisms in the solution treated with MDA6. Colonies of microorganisms register a slight increase after the application of MDA6 herbicide compared to the control soil samples, the increase being reduced when the double dose of herbicide is applied.

Keywords: soil, enzymatic activity, microorganism

**23 ASSESSMENT OF THE EFFECT OF FLUROXIPIR ON THE MICROBIAL ACTIVITY
OF THE SOIL**

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Abstract

Pesticides are widely used in agricultural crops, with the increase in the use of pesticides, the problem of their possible effects on soil, water, air pollution, contaminating different links of the trophic chain, arises. The population size, enzymatic activity and biodiversity of certain systematic and physiological groups of

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microorganisms can serve as bioindicators of the changes that occur in the soil after herbicide application. Tomigan is a selective herbicide, used in the fight against annual and perennial dicotyledonous weeds in grass crops and corn, whose active substance is Fluroxipir which belongs to a chemical group of herbicides (pyridine-carboxylic acids) in a concentration of 250 g/l. The evaluation and monitoring of the effect of this herbicide on the soil was carried out based on the determination of the enzymatic activities in the soil and the community of bacteria, respectively fungi in the treated soil under laboratory conditions. The enzymatic activities determined at the soil level were: dehydrogenase, urease, catalase, phosphatase and protease, and microbiological analyzes allowed the determination of the number of CFU / g soil of the bacteria and fungus. Monitoring was carried out over a period of 28 days from the moment of application of the herbicide. The results obtained in the experimental study showed an inhibitory effect of the tomigan herbicide on the enzymatic activities analyzed, the action being dependent on the herbicide dose applied and the exposure time. The effect of inhibiting the development of the community of bacteria and fungi in the soil was also highlighted, the effects being more obvious with the increase in the dose of herbicide applied. Tomigan can affect the function and enzymatic activity of the soil, but without significant changes if the recommended dose is followed. The increase in the dose causes imbalances in the metabolic activities at the soil level, and on the community of bacteria and fungi, with subsequent effects on soil fertility.

Keywords: tomigan, soil, enzymatic activity, bacteria

24 INCREASING THE NATURAL PRODUCTIVITY OF FISH PONDS BY APPLYING THE IMTA CONCEPT FOR EFFICIENT USE OF NATURAL RESOURCES

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Abstract

Aquaculture operates according to a principle of rational use of nature's trophic base, being in strict correlation with the biological period of growth and development of the fish stock in an area unit. In practice, the period during which the biological material is developing (polyphagy period) is exploited on the one hand, and the period during which the food spectrum is differentiated on the other. This gives polyculture particular advantages over monoculture, thus broadening the possibilities for exploiting the natural food base, when the biological material populated has a different food spectrum. Expanding the food base of ponds leads to increased final productivity. At present, aquaculture farming technologies are based on a feeding system based on the use of live feed as well as granular feed. Increasing natural productivity is an essential element in making production costs more efficient, but also for the welfare of fish stocks, which develop more harmoniously when the proportion of feed available to the fish is varied.

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Obtaining micro and macro food is necessary for increasing the natural productivity of ponds and for sustainable exploitation of the aquatic environment.

The paper is a rationale for the protocol of obtaining live food from rearing ponds, and through repeated attempts I have tried to realize the most efficient way to maintain and extend the life cycle of zooplankton and phytoplankton

Keywords: ponds, manure, IMTA, valorify, productivity, aquatic organisms

25 - COMPARATIVE BIOMETRICAL AND FOLLICULAR STUDY IN PIG OVARY

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Abstract

Assisted reproduction techniques in farm animals are mostly based on an ovarian overstimulation that results in obtaining a large number of immature oocytes that must be matured in vitro if they are to be used later in the in vitro fertilization process. The in vitro maturation process of oocytes is a complex one, being influenced by several factors, the most important being the size of the harvested ovarian follicles. Porcine ovaries are a biological material frequently used in studies that analyze follicular development processes, oocyte maturation in close connection with the stages of the estrus cycle. Ovarian follicles and their degree of development represent the point of departure in obtaining good quality oocytes, capable of being used in in vitro fertilization processes. The present study aims to identify the possible correlations between some biometric parameters and the degree of development of the follicles in the ovaries of pigs harvested after slaughtering the animals. The study was carried out on a number of 36 ovaries from 2 slaughters that were carried out in different stages of the estrus cycle, grouped into two experimental groups. In the laboratory, 3 biometric parameters weight (g), length (mm) and width (mm) were determined, respectively they were identified, photographed, numerically quantified and analyzed to establish the type of ovarian follicle. Based on the determinations made, we can conclude that the number of follicles and their type is changed in the ovaries of the two experimental groups, these two parameters are closely related to the stage of the estrous cycle and do not cause significant changes in the biometric parameters studied - weight, length, width.

Keywords: preantral follicle, antral follicle, estrus, biometric parameters

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26 PHYTOREMEDIATION OF LAND POLLUTED WITH NON-RECYCLABLE PLASTIC

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Rezumat

The ability of soybean and vetch plants to stimulate the degradation of low-density polyethylene (LDPE) in soil was tested in the vegetative experiments under laboratory conditions. It was shown that the presence of LDPE strips in soil had no toxic effects on either of the plants, and that, in the case of soybeans, it stimulated plant growth. It has been shown that soybeans and vetch can stimulate the degradation of LDPE depending on the particularities of the soil and the presence of plant growth stimulating factors. The vetch plants were relatively more effective in stimulating the LDPE degradation in case of unpolluted soil, collected from the forest. Soybean plants were relatively more efficient under polluted soil conditions and lead to the highest rate of LDPE degradation (2.3% in 39 days) - in the variant with seed bacterization by *Rhizobium japonicum* RB-06. The ability to ensure a significant degradation of LDPE, under the real toxic conditions of polluted soil, highlighted the perspective of soybean plants for the development of phytoremediation procedures of lands polluted by non-recyclable plastic and other contaminants.

Keywords: low density polyethylene, LDPE, non-recyclable plastics, soil pollution, soil phytoremediation, soybeans, vetch, rhizobia

27. RELATIONSHIPS OF THE NUTRITIONAL VALUE AND FATTY ACID CONTENT IN SERBIAN PORK SAUSAGES

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Abstract:

This research was done with the aim of determining and comparing the nutritive value (energy value, fat, protein, carbohydrates, sugars, salt) and fatty acids in Tyrolean sausage (coarsely chopped sausage) and artisanal sausage (finely chopped sausage). The tested samples were produced on the territory of the Republic of Serbia and were analyzed in five replicates, with mean values shown. The research showed that the energy value, the content of total fat and saturated fatty acids is significantly higher in artisanal sausage, while the protein content is higher in Tyrolean sausage. The content of carbohydrates, sugar and sodium chloride is similar in these two sausages. When examining fatty acids, significant differences were

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observed in C18:2 cis (n6), C22:1 n9, C22:2 (n-6), n-6/n-3, fat g/100 g and mg n-3 PUFA. The obtained results represent the information of the obtained products on the basis of nutritional, sensory characteristics as well as the value of the index of fatty acid composition to the requirements demanded by consumers who are concerned about their health.

Keywords: Artisanal sausage, Tyrolean sausage, nutritive value, fatty acids

28 COMPARATIVE STUDY ON MORPHOPRODUCTIVE MEAT PERFORMANCES IN BUCKLING GOAT HYBRIDS BETWEEN THE BOER AND CARPATINA BREEDS

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Abstract

In Romania, research on enhancing meat production in goats through hybridization is sparse, with studies being conducted primarily at R.D.I.S.G.B. Palas Constanta. This study aims to highlight the benefits of crossbreeding the Carpatina and Boer breeds in terms of all morphoproductive indices. The objective is to develop a Romanian goat breed tailored for meat production, which is well-suited to Romanian conditions. In this regard, the research focuses on analyzing the main morphoproductive indicators of the newly created R1 (75% Boer x 25% Carpatina) and F1 (50% Boer x 50% Carpatina) populations compared to the Carpatina breed (control group). The body weight was 12.87% higher in R1 hybrids (75% Boer x 25% Carpatina) compared to the F1 group (50% Boer x 50% Carpatina) and 17.67% higher compared to Carpatina breed kids. The average daily weight gain in kids during the fattening period was 130.80g (Carpatina breed) and 185.30g (R1 hybrids). The difference between the R1 and F1 study groups was 17.85% concerning the average daily gain, and the F1 hybrid group achieved an average daily gain that was 20.21% higher compared to the Carpatina breed kids. The specific energy and protein consumption in the R1 and F1 hybrid groups were lower than in the Carpatina breed kids. The experimental slaughters revealed superior qualities in hybrid kids compared to those of the Carpatina breed.

Keywords: buckling, goats, hybrids, meat, new breed

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29 RESEARCH OF THE MORPHOPRODUCTIVE AND REPRODUCTIVE PERFORMANCES OF PALAS MILK BREED

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Abstract

The creation of a sheep breed with high milk production was necessary to meet the growing demand for dairy products and derivatives in the national market. Thus, the Research and Development Institute for Sheep and Goat Breeding Palas - Constanta initiated a complex crossbreeding program, carried out for over 20 years, between Palas Merino sheep with rams from specialized breeds, resulting the creation of Palas Milk Breed.

Approved in 2010, with a genetic composition consisting of 55% genes of East Friesian breed, 35% genes of Palas Merino breed and 10% genes of Awassi breed, this is the first Romanian sheep breed specialized in milk production, being particularly adapted to lowland areas with a dry climate.

Reproductive indices recorded (average fertility of 91.96% and average prolificacy of 133.33%) and the average total milk production, which varies between 147.8 and 208.06 kg, depending on lactation, demonstrate the productive superiority of the Palas Milk Breed, this breed being able to contribute to increasing the incomes of breeders and their interest in raising sheep.

Keywords: milk, morphoproductive, reproductive, sheep

30 DEVELOPING THE POTENTIAL OF MICROBIAL AGENTS FOR SUSTAINABLE PLANT DISEASE CONTROL: INSIGHTS FROM RECENT RESEARCH

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Abstract

The use of microorganisms for biological pest management has attracted a lot of attention recently in agricultural research. The management of plant diseases using microbial agents, such as fungal endophytes and other biocontrol agents, has seen recent advances, which are summarized in this study. We explore the various methods by which these microbial agents fight plant diseases and improve plant health, drawing on a number of abstracts and research. The use of fungal endophytes in plant protection has received a lot of attention. These organisms, which are present in all plants, have proven their capacity

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to promote plant health and defend hosts from pathogens. They have the extra benefit of internal colonization, which lessens environmental sensitivity, making them a potentially viable substitute for chemical pesticides. According to what is now known about these mechanisms, endophytic fungi use a variety of tactics, such as competition, antibiosis, mycoparasitism, and induced resistance, to reduce pathogen activity and support plant defense. The study also investigates the utilization of beneficial bacteria as biocontrol agents, such as *Trichoderma*, *Bacillus* species, and *Pseudomonas*. These agents have a variety of ways to attack, such as antibiosis, inducing host resistance, and nutritional competition. Since these interactions are intricate and tightly controlled, it is crucial to comprehend how they work in order to effectively control disease. The security issues brought up by the usage of microbial insecticides were also explored. While the possibility for the generation of hazardous metabolites has led some to doubt their safety, we contend that such worries frequently disregard the ecology of microorganisms and their advantageous contributions to agro-ecosystems. When used correctly, microbial biocontrol is a safe and environmentally friendly technology. This study emphasizes the need for more investigation into the mechanisms, interactions, and safety of microbial agents in order to manage plant diseases sustainably. We can open the door to a more environmentally responsible and sustainable method of plant disease control by comprehending and utilizing the many techniques used by these microbes.

Keywords: Microbial agents, biological pest control, fungal endophytes, *Trichoderma*, *Bacillus*, *Pseudomonas*, plant disease management, biocontrol safety, ecological impact.

31 IDENTIFICATION AND CHARACTERIZATION OF THE CHEMICAL COMPOUNDS RESPONSIBLE OF THE BIOLOGICAL ACTIONS OF *ARTEMISIA VULGARIS* AND *ARTEMISIA DRACUNCULUS*

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Abstract

The genus *Artemisia* L. is part of the Asteraceae family and includes approximately 500 species worldwide. In Europe, the genus *Artemisia* includes 57 species, and in Romania the presence of 16 species was observed. There is a long history of the use of *Artemisia* species in traditional medicine worldwide for treating numerous diseases such as: gastrointestinal problems, wounds, inflammatory diseases, menstrual pains, headache, malaria and intestinal parasites. In cooking, *Artemisia* species are used to give a particular flavor to food. Several studies also mention several toxicological effects of these plants when used in high quantities: neurotoxicity and liver injuries. Among these species, we focused our attention on *Artemisia vulgaris* and *Artemisia dracunculus* and identified the organic compounds that are found in higher quantities in these plants and are responsible for their use in medicine and food, but also for their toxicity. The identified compounds are: ascorbic acid, 17 α -ethynylestradiol, caffeic acid, 1-methoxy-4-(2-propenyl)benzene, nerol, maltose, thujene, and methyleugenol. These compounds usually have low molecular weight, small number of hydrogen bond donors and acceptors and some of them are highly

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hydrophobic. These properties can be correlated with the biological activity and toxicity of investigated *Artemisia* species.

Keywords: *Artemisia vulgaris*, *Artemisia dracunculus*, chemical compounds, biological activity

**32 MOLECULAR DIAGNOSIS OF C.619C>T MUTATION IN THE CLN5 GENE
IN *CANIS LUPUS FAMILIARIS***

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Abstract

Neuronal ceroid lipofuscinoses (NCLs) are a group of rare genetic disorders that affect the nervous system, and molecular research aims to distinguish them from other diseases such as transmissible lysosomal storage diseases, mucopolysaccharidosis and gangliosidosis.

Canis lupus familiaris is a suitable candidate model for researching NCL conditions due to its strong genomic similarity with the human homolog.

The target of the study is to identify the c.619C>T mutation in the CLN5 gene among Amstaff, Husky, Romanian Shepherd, French Bulldog, and Terrier breeds. The PCR-RFLP procedure was utilized to pinpoint the mutation, while the restriction products were separated through agarose gel electrophoresis to determine the genotypes.

Keywords: CLN5 gene, lipofuscinosis, mutation, NCL, PCR-RFLP

**33 THE DYNAMICS OF COW POPULATION BREEDS REARED IN FĂGET
MICROREGION, TIMIȘ COUNTY, BETWEEN THE YEARS
2008-2023**

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Abstract

The study was carried out on cows from the breeds reared in Făget microregion (Traian Vuia, Dumbrava, Fârdea, Făget, Margina and Pietroasa) in Timiș County. The evolution of the number of cows during the period 2008-2023 was monitored and divided into 4 groups, each with a duration of 5 years. The data originated from the National System of Animal Identification and Registration (SNIIA). Decreases in the number of cows were observed from 2008 to 2023 for the following breeds: Romanian Spotted (from 2397 heads to 1135 heads), Romanian Black and White (from 104 heads to 44 heads), Brown Schwyz (from 571 heads to 36 heads), and Holstein-Friesian (from 94 heads to 29 heads). Increases during this period were recorded for the following breeds: Limousin (from 40 heads to 137 heads), Aberdeen Angus (from 25 heads to 372 heads), and Steppe Grey (from 58 heads to 115 heads). The breeder's interest in meat production is obvious for crossbreeds (hybrids), whose number has increased from 220 heads to 654

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heads, during the same time frame. In the last 2 years, the Murray Grey breed (22 heads) has been introduced in Făget, a breed that was not found anywhere else in Romania before.

Keywords: cows, breeds, Murray Grey, dynamics of cow breeds, Făget microregion

34 PARITY AS A FACTOR INFLUENCING THE AVERAGE PERCENTAGE OF FAT AND PROTEIN IN BUFFALO MILK

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Abstract

The study was carried out on 208 buffaloes reared for milk production from two farms: Farm 1 - 117 heads (Vinga, Arad County) and Farm 2 - 91 heads (Făget, Timiș County), included in the official performance control for milk in the Romanian Buffalo Breeders Association, Șercaia, Brașov County. Periodic milk production controls were carried out, determining the percentage of fat and protein over the course of 8 lactations. In Farm 1, the highest fat percentage in buffalo milk was observed in lactation L8 (8.85%), with the fat percentage gradually decreasing until L1, when it was 7.35%. In Farm 2, the highest fat percentage in buffalo milk was also in lactation L8 (8.27%), decreasing to 6.99% by lactation L1. In Farm 1, the highest protein percentage was recorded in lactation L5 (4.89%), and the lowest in lactation L2 (4.70%). In Farm 2, the highest protein percentage was determined in lactations L1 and L5, both at 4.88%, while the lowest was in lactation L8, reaching a value of 4.67%.

Keywords: buffalo, fat percentage, milk, parity, protein percentage

35 PHYTOCHEMICAL COMPOUNDS OF HORSERADISH WITH POTENTIAL APPLICATION IN BIOTECHNOLOGY

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Abstract

Horseradish (*Armoracia Rusticana*), is an edible plant from the *Basicacea* family. Horseradish is a very rich source of vitamins and minerals (vitamin C, vitamin B6, calcium, iron, magnesium, potassium), enzymes, isothiocyanates, glycosylates, flavonoids, pigments, oils, etc. Horseradish through its bioactive compounds provides antibacterial, anti-inflammatory and anti-carcinogenic properties. The biologically active compounds extracted from roots and leaves of horseradish can find applications in the food, pharmaceutical, chemical and agrochemical industries. Extraction from plant sources is a complex field involving various techniques to successfully obtain essential compounds and substances from live or dried plants. For the extraction of biologically active compounds, aqueous buffer systems are used (in a neutral,

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weakly basic environment - monosodium phosphate-disodium phosphate buffer solution, in an acidic environment citric acid-disodium phosphate buffer solution), organic solvents (tetrahydrofuran, benzene, methyl alcohol, etc.), eutectic solvents (ChCl: urea, ChCl: acetamide, ChCl: ethylene glycol, etc.), supercritical solvents (CO₂). Regardless of the solvent used, it must be nontoxic, biocompatible, biodegradable, and sustainable. The obtained extract must be analyzed for biologically active compounds using specific instrumental analysis methods (chromatographic analyses, spectrophotometric analyses, electrophoretic, etc.).

Keywords: horseradish, phytochemical compounds, extraction, biotechnological applications

36 ASSESSMENT OF THE EFFECTS OF CHITOSAN-BASED BIODEGRADABLE FILMS ON THE ACTIVITY OF SOME SOIL ENZYMES AND ON THE SOIL MICROBIAL COMMUNITY

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Abstract

The objective of this study was to investigate the effect of biodegradable chitosan-nisin films on soil health by monitoring the effect on the activity of some enzymes found in soil (dehydrogenase, phosphatase and urease) and by assessing the effect on soil bacterial community over a period of 34 days. Chitosan-based polymeric materials are widely used in various applications; therefore, it is inevitable that they will become waste products. Assessing the biodegradability of such materials gives a better understanding on how we can develop a sustainable waste management. The result of our study showed that chitosan-based films, do not affect the soil bacterial community, as chitosan and chitin by-products are known to represent carbon sources for microorganisms. Chitosan-nisin films did not affect the enzymatic activity, monitored at different intervals, over a period of 34 days. Given the results we obtained, chitosan-nisin films may be used in several applications, such as biodegradable packaging or wound dressings, and due to their good biodegradability, they represent a safe alternative for the environment as well.

Keywords: Chitosan, nisin, polymeric films, biodegradability

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**37 IMPACT OF ARTIFICIAL INSEMINATION BIOTECHNOLOGY
IN CATTLE BREEDING**

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Abstract

Artificial insemination (AI) is one of main interest research area in biotechnology, being widely used in cattle breeding, having a significant impact on the animal industry. AI facilitates the rapid dissemination of superior genetics within the cattle population, leading to genetic improvement, enhancing the cattle quality, increasing production efficiency, and reduces the risk of disease transmission between animals. Also, application of AI biotechnology has a positive result in optimizing breeding schedules and synchronize the reproductive cycles of cows, resulting in more efficient and predictable production cycles. Diversity of breeding programs allows breeders to create breeding programs tailored to specific goals, whether they are focused on milk production, meat quality, disease resistance, or other traits. AI prevents and reduces the risk of inbreeding, which is crucial for maintaining genetic diversity and preventing the expression of undesirable recessive traits in cattle populations. Other advantages of AI is improved record keeping, enhanced reproductive management and labour efficiency, with real economically benefits, preserving and conserving the genetics of endangered cattle breeds. The main goal of this paper is to present the advantages of AI in cattle breeding, with bio-socio-economic impact, being considered a critical tool in modern cattle production systems, contributing to the overall sustainability and efficiency of the industry.

Key words: cattle, artificial insemination, genetic improvement

**38 NATURAL EGG YOLK PIGMENTATION – A SOLUTION FOR
NUTRITIONAL VALUE AND CONSUMERS PREFERENCES**

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Abstract

Eggs are animal products with high nutritional quality, both for humans and animals, while eggshells could be a very important source of calcium for plants as well as bio-fertilizers. However, in recent years, consumers are not only looking for nutritional quality, but also certain special organoleptic properties,

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and in the case of eggs, the colour of the shell or the yolk is an interesting topic for certain categories of consumers. Because yolk pigments are important in the final colour, we have to take into consideration that birds cannot biosynthesize pigments, and have to come from feed. Natural pigments come from the feed plan, and most of them have nutritional and medical properties, like antioxidants or vitamins. But sometimes the results are not exactly expected, being unpredictable or disappointing because we are not sure about the quantity of pigments ingested, absorbed, and found in the yolk; and we have to increase the nutritional quality of eggs having in the same time the pigmentation persistence to the final products at the same level, for all the availability period. The aim of this work was to identify the natural pigments that we can use for egg yolk pigmentation, taking into consideration birds characteristics!

Keywords: egg yolk, pigmentation, nutritional value

**39 THE CRITICAL ROLE OF NANO-BIOTECHNOLOGY IN CARDIOVASCULAR
DISEASE MANAGEMENT**

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Abstract

The population's health condition is a critical problem that concerns people with these conditions and has implications on a large scale, involving various related fields (e.g., medicine, nutrition, biotechnologies, pharmacists, and others). Regarding world health statistical evaluation, over 7% of total deaths have a cardiovascular cause (mostly ischemic heart disease), In Europe, Romania is the leader in mortality due to cardiovascular diseases (CVD) with more than 100 deaths at 100,000 people, compared to Europe average of 44 deaths at 100,000 people. In Romania, CVDs are the first cause of death, with more than 55% of all deaths, and one people die every 30 minutes of CVD. Due to these strong arguments, there is a fundamental need for early diagnosis and treatment, and here nano-biotechnology engineering comes with innovative solutions! Nanosensors, magnetic nanoparticles, perfluorocarbon nanoparticles, nanolipoblockers, encapsulated drugs in biodegradable nanoparticles, nanofibers, and nanodevices, are just a few of the diagnostic and treatment tools in a new generation of medical management of CVD.

Keywords: cardiovascular disease, nano-biotechnology, diagnostic, treatment

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40 FROM AROMA TO AGRICULTURE: ESSENTIAL OILS AS GAME CHANGERS IN POULTRY INDUSTRY

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Abstract

This review examines using essential oils (eos) as an alternative approach in poultry farming to clarify their beneficial roles. The discussion introduces current challenges within the poultry industry, from antibiotic resistance and environmental concerns, setting the context for natural feeding strategies. Eos are characterized by diverse bioactive compounds such as terpenes and phenolics, known as powerful alternatives due to their strong antimicrobial, antioxidant, and growth-stimulating properties. Their chemical composition and biological activities can offer insights into their mechanism of action in bird species, specifically poultry. In the context of poultry production, the review underlines how eos enhance growth performance, support immune responses, and improve feed efficiency. Their role in modulating gut health, boosting disease resistance, and potentially improving product quality was also discussed herein. Combining these natural substances into poultry farming can address the growing environmental concerns. In this overview, we focus on essential oils as a novel and progressive option in poultry farming, aiming to harmonize environmental sustainability with agricultural efficiency.

Keywords: Essential oils, biological effects, poultry industry, broilers, beneficial effects

41 THE KEY ROLE OF LUCIFERASE IN FUNGAL BIOLUMINESCENCE

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Abstract

Bioluminescence is possible due to a very special enzyme: luciferase – a photoprotein with the role of an oxidative enzyme that uses luciferin as a substrate. Lately, luciferases are more and more used in biotechnology, for gene reporters, and for bioluminescence in imaging investigations (like microscopy). Luciferin is the key compound in a chemical reaction between luciferase with oxidized luciferin forming oxyluciferin, producing light, a process named bioluminescence. There are many bioluminescent organisms, like bioluminescent marine species, bacteria, and fungi. In this paper, we review some general information about bioluminescence, and also about bioluminescent fungi found in temperate and tropical geographical areas. Until now, we found more than 112 species of bioluminescent fungi, most of them from *Agaricales (Basidiomycota)* order, and one from *Xylariales* order. These bioluminescent fungi emit a

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continuous phosphorescent green light at 520-530 nm wavelength in both mycelia and fruit bodies, or only in mycelia and young rhizomorphs, or only in spores, or only in sclerotia. All bioluminescent fungi are white rot fungi, which can metabolize lignin, especially from wood! These fungi are characterized the bioluminescence as an oxygen-dependent biochemical mechanism that provides protection against antioxidation and reactive oxygen species produced during wood development in decay.

Keywords: bioluminescence, luciferin, fungi,

**42 BLOOD SUGAR AND PROTEIN LEVELS IN THE MILK OF DAIRY CATTLE BASED
ON THEIR PHYSIOLOGICAL STATE**

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Abstract

This study aimed to determine the correlations between blood glucose levels, milk protein levels, and the physiological status of cows in four categories within the Research and Development Unit for Cattle Farming in Dancu, Iași (pregnant cows aged between 4-6 years; cows aged 3-5 years, in the 3rd and 5th month of gestation, and were clinically healthy; cows aged 5-6 years, at 48 hours postpartum, and clinically healthy; cows aged 4-6 years, in the 3rd month of lactation, with subclinical mastitis). The results revealed blood glucose values ranging from 28.81 ± 7.15 mg/dl to 50.34 ± 10.31 mg/dl, which are within the normal range for the physiological state of the cows in these groups. The protein percentage ranged from 2.71% to 7.29%, with the lowest value observed in cows with subclinical mastitis and the highest in those in the colostrum period; these results indicate normal values for their specific stages. The findings demonstrate that the studied parameters align with the physiological state of the analysed cows. Overall, the results underscore the importance of metabolic monitoring and the enhancement of housing conditions for dairy cows in this unit.

Keywords: cattle, glucose, blood, protein, milk

**43 BIOREMEDIATION OF HEAVY METAL-POLLUTED WATERS BY ASSESSING THE
EFFICIENCY OF ACUMULATION OF COPPER IN SELECTIVE STRAINS OF
RECOMBINANT MICROORGANISMS**

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Abstract

The goal of this study was to use several genetically engineered bacteria and yeasts in the bioremediation process to treat synthetic water with high copper content. Several genetically altered strains of *Saccharomyces cerevisiae* (EBY100, INVSc1, BJ5465, and GRF18), *Pichia pastoris* (X-33, KM71H), *Escherichia coli* (XL10 Gold, DH5 α , and six types of BL21 (DE3)), as well as *Escherichia coli* BL21 (DE3) OverExpress expressing two different peroxidases were used to determine the efficiency of copper ions accumulation. Studies on many yeast and bacterial strains have shown that bacteria are viable at copper concentrations up to 2.5 mM while yeasts are viable at doses up to 10 mM. Optical emission spectrometry using inductively coupled plasma analysis (ICP-OES) revealed that the tolerance of bacterial strains on plates containing 1 mM copper was lower than the tolerance of yeast strains at the same copper concentration. The *E. coli* BL21 RIL strain had a copper accumulation efficiency that was 1250 times more efficient than the control strain (4.79 mg/L of culture adjusted at an optical density of 1.00). *S. cerevisiae* BJ5465 was the most efficient at accumulating copper out of the six yeast strains tested, doing more than 400 times more than the negative control strain. Furthermore, *E. coli* cells that internally expressed recombinant peroxidase from *Thermobifida fusca* were able to accumulate copper 400 times quicker than cells that produced periplasmic recombinant peroxidases.

Keywords: bioremediation, heavy metals, copper, yeast, bacteria

1. Vulpe C.B., Matica M.A., Kovacevic R., Dascalu D., Stevanovic Z., Isvoran A., Ostafe V., Menghiu G., Int. J. Mol. Sci., 2023, 24:7575.

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**44 A2 MILK - ADVANTAGES AND CHALLENGES IN THE MANUFACTURING
OF DAIRY PRODUCTS**

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Abstract: A2 milk is characterized by a difference in amino acid at position 67 of the β -casein polypeptide chain, which releases much smaller amounts of bioactive opioid peptide β -casomorphin 7 upon digestion. Milk consumption leads to discomfort due to the presence of A1 beta-casein protein. A2 milk is the preferable alternative for people with mild lactose intolerance or lactose sensitivity because it doesn't include A1 protein, which is thought to be kinder to the digestive system. The need for healthy and minimally processed dairy products, the growing awareness of dairy-related sensitivities, and the growing interest in organic and natural food options are some of the major reasons driving the expansion of the A2 milk market. The purpose of this review is to present the advantages and challenges of using A2 milk in the manufacturing of dairy products.

Keywords: bovine milk, A2 milk vs A1, dairy products.

**45 THE RELATIONSHIP BETWEEN THE NUMBER OF SOMATIC CELLS AND THE
CASEIN CONTENT OF COW'S MILK**

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Abstract

Proteins constitute a significant portion of milk's nutritional value, with the average amount of protein in liquid milk being 3.5%. In the process of fabrication of cheese, milk caseins are essential because these create the form of the gel network that entraps the other constituents. Somatic cell count has been regarded by many dairy producers' a crucial factor in programs that compensate farmers for producing milk of the highest quality. The presence of bovine mastitis is typically indicated by a higher number of somatic cells, which also alters the milk's physical, microbiological, and chemical composition. This study follows the relationship between the number of somatic cells and the content of casein in cow milk.

Keywords: Bovine, milk, number of somatic cells, casein.

**46 NEW PERSPECTIVES ON BODY CONDITION SCORING USED AS A TOOL IN DAIRY
CATTLE MANAGEMENT**

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Abstract

The dairy cow frequently experiences periods of high metabolic demand, and the overall efficiency of these animals depends on the proper management of body fat. The need of effectively controlling body fat resulted in the development of the "body condition score," a system for assessing body fat and, to a limited extent, muscle tissue, and is an evaluation acknowledged by animal scientists and farmers as being a simple technique that can significantly contribute to good husbandry and management of dairy cattle. Assessing the body condition of dairy cows through the BCS system is a management tool used to maximize milk production and improve the efficiency of reproductive activity, allowing at the same time to reduce the incidence of metabolic diseases and diseases associated with parturition. Traditionally, estimation of BCS is made by observing and touching cow. Over the past few years, automated BCS methods have been developed for efficiency and repeatability, with a more reliable, less time-consuming means of estimating energy reserves in animals. Using technology to design management based on the variability in individual animal responses has the potential to increase efficiency and make interventions for animal welfare more effective. Precisely speaking, precision livestock farming (PLF) is the application of technology to measure and manage livestock at the individual animal level in real time in order to maximize the contribution to production.

Keywords: Body Condition Scoring (BCS), dairy cattle, health and welfare, nutritional management, reproductive management.

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**47 PRECISION LIVESTOCK FARMING – USING DAIRY MANAGEMENT INFORMATION
SYSTEM AFIMILK IN DAIRY FARMS**

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Abstract

Due to the significant fluctuation in milk prices, energy costs, and feed prices in recent years, dairy farms have been subject to a broad range in profit levels. Using a real-time management informational system for each individual cow will be a helpful technique to monitor activities on modern dairy farms. The effectiveness of a cattle management information system used in a cattle farm from N-E Romania is described in this paper. The management system enables the farmer to make decisions based on the reports it provides, regarding the milk yield and electrical conductivity obtained in the milking parlour, the health and fertility of the cows based on data recorded by the pedometer attached to the cow's leg. Findings suggest that the system AfiMilk supports precision agricultural concepts and increases the performance of the cows and the efficiency of milk production and offers important data to support decision making, such as for breeding programs, nutrition and animal welfare. Dairy farms which adopt smart technologies may increase their competitiveness in the market and diversify the products they sell.

Keywords: dairy cattle, dairy farm management, management system. precision livestock farming,

**48 EFFECTS OF CORIANDER (*CORIANDRUM SATIVUM*) ON THE CHEMICAL
COMPOSITION OF THE MUSCLE IN BROOK TROUT (*SALVELINUS FONTINALIS*)**

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Abstract

Brook trout (*Salvelinus fontinalis*) are commonly found in many salmonid farms in Romania due to their good adaptation to intensive farming conditions in cold waters. While several studies have demonstrated the positive effects of coriander (*Coriandrum sativum*) on various fish species, there is a scarcity of research findings concerning the effects of coriander or other phyto-additives on the meat quality of brook trout. Most studies have focused on rainbow trout instead. Hence, the primary objective of the present study was to investigate the impact of incorporating coriander seed powder into the diet on the chemical composition of brook trout's epaxial muscle following a 106-day experimental feeding period. Coriander seed powder was incorporated into the fish feed at three different concentrations: 2%, 3%, and 4%. A total of 360 juvenile brook trouts were divided into four groups, including the control group and

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three other experimental groups, each receiving a specific concentration of dietary coriander powder. Each experimental variant was tested in triplicate. At the end experiment, the epaxial muscle's chemical composition (crude protein, crude fat, dry matter, moisture and mineral-ash content) was evaluated. The results obtained indicated that the inclusion of coriander in the diet of brook trout significantly influences the chemical composition of the epaxial muscle, influencing both the protein and fat content, as well as the levels of moisture and ash levels.

Keywords: brook trout, coriander, *Coriandrum sativum*, muscle quality, phyto-additives, *Salvelinus fontinalis*

49 SIZING OF A BIOGAS PLANT IN THE TEACHING FARM OF ULST

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Abstract

The size of a biogas plant can be established according to the energy requirement of the consumer and depending to the type, quantity and characteristics of the available feedstock biomass. While the energy need of the consumer can be evaluated by analysing the energy consumed on one-year period, or more accurate as the average consumption of the last three years, the biogas potential production of the available biomass suitable for anaerobic digestion need to be assessed in laboratory. In this research, a biogas plant have been sized by analysing energy consumption in the campus of University of Life Sciences "King Mihai I" from Timisoara (ULST) and by analysing in laboratory the (bio)methane production potential of the biomass available in the teaching farm or ULST. This study recommends the development of an anaerobic digestion technology having as main components two digesters and a cogeneration of heat and power unit of 100 kW installed power. This study represent the base for assessing the feasibility to design, construct and operate an anaerobic digestion technology for the production of biogas and the cogeneration of electricity and thermal energy within the ULST campus and teaching farm.

Keywords: anaerobic digestion, biogas plant, feasibility, plant sizing

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**50 EVALUATION OF THE GENETIC COMPATIBILITY BETWEEN THE BLACK-HEADED
GERMAN AND THE TURCANĂ BREED**

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Abstract

The production of hybrid lambs for meat depends on the ability to find the most favourable crossbreeding combinations between native and specialized breeds. The aim of this study was to assess the compatibility of the breeding stock, the growth performance up to 3 months of age and the survival rate of Black-headed German (paternal) x Turcana (maternal) hybrid lambs compared to Turcana lambs. Meat production control was carried out with the help of sheep weighing platforms Inscale Platform Scale EOE 150 K 100 X, at 10 o'clock on each control day. The hybrid lambs came from single (A, n=7) and double (B, n=8) lambings and the Turcana lambs from single lambings (C, n=10). The body weight was significantly higher ($p \leq 0.05$) in A than in C at birth, at one month of age and at weaning, as well as in B than in C at weaning. No significant differences ($p > 0.05$) were recorded between the two groups in terms of sheep reproduction indices, lactating capacity of ewes and survival rate of lambs.

Key words: sheep, Black-headed German, Țurcană, genetic compatibility

51 EFFECTS OF MYCOTOXINS ON THE HEALTH STATUS OF DAIRY CATTLE

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Abstract

The purpose of this study is to highlight some aspects regarding the effects of mycotoxins on the health status of dairy cattle. Fungi producing mycotoxins are very common and can grow on many nutrient substrates and of course in very varied climatic conditions. It is estimated that a quarter of the crops present worldwide are to a large extent contaminated with mycotoxins and the economic consequences are quite serious. Because of large amounts of mycotoxins, crops are destroyed or used as animal feed, leading to poor animal development or death. It is known that if the crops used for feed are contaminated then products like milk and meat will contain mycotoxins or biotransformation products, unfortunately. Regarding the effects of mycotoxins on ruminants, the complexity of developing specific animal studies should be investigated, as there is a multitude of effects that cause confusion.

Keywords: cattle, effects, fungal genera, mycotoxins

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52 **A BRIEF STATISTICAL ANALYSIS REGARDING THE FAT CONTENT OF MILK
OBTAINED FROM THE HOLSTEIN AND SIMMENTAL BREEDS**

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Abstract

The purpose of this paper was to carry out a short statistical analysis on the fat content of milk from two breeds of cattle from a farm in the Moldavian area. 30 milk samples were analyzed, more precisely 23 from the Holstein breed and 7 from the Simmental breed in two periods, such as the cold season (autumn-winter) and the warm season (spring-summer). It is known that these breeds are among the best breeds of cows for milk, the first being considered the most productive in the world, and the second the best breed of cows for farms in Romania. The Holstein breed is a highly specialized breed for milk production, while the Simmental breed is a dual purpose breed selected for both meat and milk production. Following the statistical analysis, it can be seen that there were significant differences between the two breeds of cattle studied and also between the milk fat content recorded in the cold season compared to the fat content recorded in the warm season. The value of P was less than 0.0001, confirming the heterogeneity of the data recorded in the two seasons. The main conclusion is that for the total experiment, the data are significant ($\alpha=5\%$).

Keywords: breeds of cows, fat content, milk, season

53 **INFLUENCE OF NATURAL PIGMENTS ON EGG QUALITY AND YOLK COLOUR
INTENSITY -A REVIEW**

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Abstract

Eggs are a great source of animal protein that are rich in fatty acids, selenium, B vitamins, provitamin A, amino acids, and folic acid. Egg quality and yolk colour are important attributes for consumers. They associate a higher intensity colour of yolk with a healthy egg which is rich in nutrients. Because hens are unable to synthesise pigments, they must come from feed mixtures. Furthermore, the synthetic colorants are added to laying hens diets to improve the yolk colour intensity. However, human health received more attention in the last time, so, the consumers are attracted by natural coloured eggs. Carotenoids are the

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most numerous and widespread group of pigments in nature. They are a class of widely distributed pigments that include red, yellow, and orange colour. Numerous studies have examined the use of carotenoids, particularly yellow carotenoids, in animal feed, which aid to make egg yolks more orange in colour. They are found in different plants, microalgae, bacteria, fungi and have various biological functions, including increasing production, antioxidant, anti-inflammatory, antibacterial and immunomodulator role. For practical purposes, the cost of carotenoids from natural sources needs to be considered.

The objective of this review was to summarise the recent findings in available literature data on the supplementation with natural pigments based on marigold and calendula flowers and paprika extracts for egg quality and yolk colour pigmentation which are preferred over pigments of synthesis, due to their costs and biodisponibility.

Key words: marigold flowers; paprika powder extract; carotenoids; yolk colour; laying hens

54 IN VITRO ANTI PROLIFERATIVE EFFECTS OF *OCIMUM BASILICUM*

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Abstract

The identification of some therapy methods based on the use of active biological compounds from natural products, which reduce the incidence of adverse reactions, is a current concern. The buthanolic and acetonitrile extracts of *Ocimum basilicum*, with concentrations ranged between 5mg/ml and 40mg/ml, were tested *in vitro* to establish their cytotoxic potential on some cancer cell lines: Caco2, HepG2 and K-562. Also, the studies evaluated the biocompatibility analysis of the compounds on healthy cell lines: MSC-mesenchymal STEM cells and HDFA-human fibroblasts. Evidence of the antiproliferative potential was achieved by the MTT test. The extracts showed different effects depending on the concentration applied and the cell line. Thus, both extracts did not show a cytotoxic effect on normal cell lines and the leukemic cell line, the antiproliferative effect was evident on Caco2 and HepG2 cell lines, being more obvious for the buthanolic extract compared to the one in acetonitrile.

Keywords: basil, buthanolic extracts, acetonitrile extracts, antiproliferative potential

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**55 USE SUPPLEMENTARY FEEDINGS ON BEE COLONY DEVELOPMENT
AND VENOM PRODUCTION**

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Abstract

The paper presents the influence of the use of supplementary feedings on the development of bee colonies and venom production. We evaluated the venom production during harvests of rapeseed, acacia and sunflower. The research was carried out in the apiary of the Faculty of Bioengineering of Animal Resources within the ULST. The biological material was represented by 40 colonies of bees (*Apis mellifera carpatica*), divided into 8 experimental groups, each group consisting of 5 colonies with equal strength and a queen of the same age. During the spring, bee colonies were fed sugar syrup into which we introduced probiotic products and/or essential oils. Counting of brood cells was performed at 7, 14 and 21 days during supplementary feeding. At the end of the additional feeding period, as well as during rapeseed, acacia and sunflower harvests, venom was collected using the BeeWhisper v.5.1 venom collector, model 2016. Following additional feedings with Lacium, Colobiotic, Enterolactis Plus probiotic products and thyme, oregano, basil essential oils, an average increase of 19,244 brood cells was observed, the best results being observed in the case of thyme essential oil. Regarding venom production, the best results were observed in the case of additional feedings with the products used.

Keywords: Bee colonies, supplementary feeding, brood, venom production

**56 DYNAMICS OF SEVERAL MORPHOLOGICAL TRAITS IN
SHAGYA ARABIAN BROODMARES**

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Abstract

The study aimed to present the dynamics of the height at withers, heart girth, and cannon girth of Shagya Arabian broodmares included in the Rădăuți stud's broodstock between 1989 and 2018. The purpose was to observe the population's evolution over time, considering that the breeding objectives included increasing the average values of these measurements, which were followed in ranking activities. The average height values ranged between 154.3 ± 0.261 cm (2012) and 154.80 ± 0.258 cm (2002 and 1994). The minimum average value of the thoracic girth was recorded in 1992 (176.2 ± 0.885 cm), and the maximum was in 1989 (177.1 ± 0.777 cm). The average values of the cannon girth registered the

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minimum in 1998 at 18.7 ± 0.19 cm and the maximum in 1989 at 18.9 ± 0.70 cm. Comparing the results with the breeding objectives (height at withers of 156 cm, heart circumference of 176 cm, and cannon girth of 19.5 cm), it was observed that only the heart girth had the targeted value. This highlights the importance of continuing the breeding process to achieve all the desired objectives.

Keywords: Shagya Arabian, broodmares, height, heart girth, cannon girth

57 EXPLORING THE CELLULAR REPRODUCTION MECHANISM AND ITS IMPACT ON DISEASES AND MALIGNANCY

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Abstract

The objective of this review is to investigate the mechanism of cellular reproduction, which gives rise to new cells, as well as the potential for cellular damage, disease, and malignancy. All living entities are composed of cellular structures, which serve as the fundamental units of life. Each individual cell is equipped with a plasma membrane, which functions as a barrier separating its internal constituents from the surrounding external environment. The cell cycle comprises four distinct phases, namely G1, S, G2, and M phases. Throughout each phase of the cell cycle, the many organelles and components inside the cell collaborate harmoniously to facilitate precise replication and division of the initial genetic information. In the event of an error occurring in the course of this phases, cellular structures have the potential to incur harm, acquire diseases, or develop malignancies. The proliferation and replication of these aberrant cells frequently persist autonomously, resulting in the formation of substantial cell clusters that may pose a threat, contingent upon the specific genes impacted. Damage can arise from various external factors, including but not limited to environmental pollutants, pathogenic agents, radiation, and genetic mutations occurring inside cellular DNA. Understanding the cell cycle and abnormal cell formation is essential for scientific study and cancer treatment.

Keywords: cells, cell cycle, DNA replication, genes, mutations, cancer

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