University of Agronomic Sciences
and Veterinary Medicine of Bucharest
Faculty of Animal Productions
Engineering and Management

International Conference
"Agriculture for Life, Life for Agriculture"

BOOK OF ABSTRACTS

Section 3

ANIMAL SCIENCE

2026
Bucharest

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GENETICS
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ASSESSMENT OF THE GROWTH ABILITIES OF LAMBS FOR MARKET REALIZATION FROM BULGARIAN SHEEP BREED FOR WOOL AND MEAT

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Abstract

The aim of the study is to assess the growth abilities of lambs until weaning of the Northeastern Bulgarian Fine-fleece breed. The animals are the property of the Scientific Center for Agriculture - Targovishte. Four groups were formed, which included 15 lambs - singles and 5 twins of both sexes. The live weight trait was recorded at birth, at 10 days, 30, 70 and 90 days. It was found that the lambs of this breed show good growth abilities until weaning. Female lambs reached an average of 24.471 kg, and males - 23.091 kg at 90 days. The average daily gain of lambs ranged from 0.148 kg to 0.306 kg for females by periods and from 0.156 kg to 0.342 kg for male lambs. The highest gain was achieved by lambs of both sexes in the period 70-90 days. The results show a good potential for compensation in the growth of lambs born as twins. The total gain achieved by twin lambs in 90 days was only 10.04% lower than singles in females, but 2.38% higher in male lambs.

Key words*: average daily gain, lambs, live weight, Northeastern Bulgarian Fine-fleece sheep breed, sex, type of birth.*

REVEALING THE GENETIC NATURE OF FERTILITY IN ASSAF SHEEP VIA *GDF9* AND *ABCG2* GENE POLYMORPHISMS

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Abstract

The Assaf sheep breed was chosen by many farmers in Bulgaria due to the fact that it combines hereditary qualities from the two parent breeds - East Friesian and Awassi, which makes it most suitable for both milk and meat production. The study aimed to establish the presence or absence of a genetic relationship between fertility and the polymorphism of the GDF9 and ABCG2 genes in Assaf sheep breed in Bulgaria. The analysis of the GDF9 and ABCG2 loci in the studied population revealed moderate levels of genetic diversity, with both markers showing the presence of two alleles and three genotypes. The slight heterozygote deficits observed at both loci are not statistically significant and are therefore unlikely to reflect ongoing inbreeding or directional selection. The maintenance of Hardy-Weinberg equilibrium for both GDF9 and ABCG2 suggests that the population is genetically stable with respect to these markers, supporting their reliability for future association or selection studies. No statistically significant differences in fertility were found between the individual genotypes of the GDF9 gene (AA-1.17; AG-1.27 and GG-1.43) as well as for the ABCG2 gene (DD-1.33; ID-1.41 and II-1.21).

Key words*: Assaf sheep, fertility, GDF9 and ABCG2 genes, genetic polymorphism.*

ESTIMATION THE GENETIC PARAMETERS FOR PRODUCTIVE LONGEVITY IN CHAROLAISE BREED

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Abstract

The aim of this study was to estimate breeding values and genetic parameters for functional longevity in Charolais cattle using survival analysis with a Weibull proportional hazards model. Data consisted of records from 1,817 Charolais beef cattle provided by the Romanian Breeding Association for Beef Cattle. The pedigree included 4,149 animals: 1,676 cows, 656 bulls, and 1,817 cows with performance records. The mean productive longevity in the Charolais breed was 32.522 ± 0.408 months. Estimated breeding values for productive longevity ranged from −0.273 to 0.193, and the heritability for this trait was 0.099. Productive longevity plays an important economic role in the profitability of beef cattle farms. Given the important economic impact of productive longevity on beef cattle farm profitability, these results support the inclusion of functional longevity in selection objectives for Charolais cattle.

Key words*: productive longevity, breeding values, genetic parameters, beef cattle.*

COMPARATIVE STUDY ON CONFORMATION TRAITS OF COWS IN ROMANIAN SPOTTED, TYPE SIMMENTAL AND MONTBELIARDE BREEDS

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Abstract

The aim of this study was to compare the results obtained for genetic evaluation of conformation traits in Romanian Spotted, type Simmental breed with the results obtained from Montbeliarde breeds. The data of conformation traits were from Romanian Breeding Association Romanian Spotted, Simmental type. The model used for determination the genetic parameters was multi-trait animal model with Choleski transformation, simultaneous diagonalization analysis. In this study, 18 conformation traits were analyzed. The pedigree for Romanian Spotted, type Simmental consisted in 1601 cattle, 650 cows, 273 sire and 678 cows with performances and for Montbeliarde, 177 cattle, 67 cows, 41 sire and 69 cows with performances. The mean score for conformation traits in Romanian Spotted, type Simmental ranged between 3.89 and 6.79 and for Montbeliarde breed between 3.93 and 7.20. The heritability for conformation traits scores was from 0.09 to 0.26 in Romanian Spotted, type Simmental and for Montbeliarde were from 0.25 to 0.73. Improvement the conformation traits increases the profitability of farms.

Key words*: conformation traits, genetic parameters, multitrait animal model.*

GENETIC PARAMETERS FOR LITTER SIZE IN PROLIFIC BREED PALAS SHEEP

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Abstract

The aim of present study was to estimate the genetic parameters for litter size in Prolific Breed Palas sheep with individual animal model. The data consists in records of 170 ewes at first parity, 142 ewes at second parity and 63 ewes at third parity. The pedigree consisted in 345 sheep: 131 ewes, 44 rams and 170 ewes with performances at first parity. The data were from Research and Development Institute for Sheep and Goat Breeding Palas. The mean for litter size was at first lambing 1.347±0.036, at the second parity 1.458±0.041, at the third parity 1.587±0.066. The absolute breeding values of sheep at first lambing for litter size were from -0.073 to 0.122. The relative breeding values for the best sheep were from 115.04 to 136.434. The heritability for litter size in Prolific Breed Palas sheep was 0.080. The estimation of sheep breeding values allows the choice the best sheep for litter size in Prolific Breed Palas sheep for reproduction and the genetic parameters are necessary in the breeding program of sheep breed.

Key words*: breeding values, genetic parameters, individual animal model, number of lambs.*

GENETIC PARAMETERS ESTIMATION FOR ULTRASOUND MEASUREMENTS IN PALAS MERINO SHEEP BREED

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Abstract

The study purpose was to estimate the breeding values and the genetic parameters for ultrasound measurement traits in Palas Merino sheep breed using Individual animal model for selection. The pedigree was consisted of 132 sheep: 45 ewes, 26 rams and 61 lambs with performances. Ultrasound measurements were conducted on 61 lambs at 4.5 months on Longissimus Dorsi muscle, a very good indicator of meat quality. Live weight was 30.81 kg. Ultrasound parameters were measured in two points (3rdand 4th lumbar vertebrae and at 12 rib). The means obtained were for subcutaneous back fat (1.98; 1.98 mm), muscle depth (21.18; 21.48 mm), eye muscle area (9.01; 9.12cm^2) and muscle perimeter (120.96; 121.12 mm). The breeding value for body weight at 4.5 month was ranged between -2.73 and 3.49. The breeding values for ultrasound parameters obtained for subcutaneous back fat thickness ranged between -0.167 and 0.264; muscle depth -1.552 and 1.452; eye muscle area -0.599 and 0.663; muscle perimeter -5.187 and 4.571. Heritability for body weight was 0.37, back thickness 0.27, muscle depth 0.33, eye muscle area 0.22 and for muscle perimeter was 0.24.

Key words*: breeding value, genetic parameters, sheep, ultrasound.*

COMPARATIVE STUDY ON LIFETIME NUMBER OF CALVES ON LIMOUSINE AND CHAROLAIS BREEDS

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Abstract

The aim of this study was to compare the results obtained using individual animal in the genetic evaluation of the lifetime number of calves in the Limousine and Charolais breeds. The breeding values and genetic parameters for the lifetime number of calves for the Limousine and Charolais breed were estimated. Data consisted of records of 507 cattle from Limousine and 1817 cattle from the Charolais breed from the Romanian Breeding Association for Beef cattle. The pedigree consisted in 1197 cattle from Limousine breed: 484 dams, 206 sires, and 507 cows with records, 4149 cattle from Charolaise breed: 1676 cows, 656 bulls, and 1817 cows with performances. The mean for the lifetime number of calves was 4.165 ± 0.041 for the Limousine breed and 2.501 ± 0.025 for the Charolais breed. The breeding values for the lifetime number of calves in the Limousine breed ranged between -0.199 and 0.152, and in the Charolaise breed ranged from -0.212 to 0.156. The heritability for the productive lifetime number of calves was in the Limousine breed was 0.079 and 0.080 in the Charolais breed. The lifetime number of calves influenced the profitability of farms.

Key words*: lifetime number of calves, breeding values, genetic parameters, individual animal model, survival analysis.*

PARTIAL RESULTS REGARDING THE ESTIMATION OF GENETIC PARAMETERS OF PRODUCTION TRAITS IN THE TURCANA BREEDS

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Abstract

The aim of this study was to estimate the genetic parameters of production traits in the Țurcană sheep breed, considering its four main varieties: Belă, Breazǎ, Bucălae and Oacheșă. The research was carried out on a total of 4,837 ewes belonging to the Association of Țurcană Sheep Breeders "Păstorul" Arad. The analyzed traits included birth weight, weaning weight and milk yield. Statistical analysis was performed using classical descriptive statistics and the BLUP methodology applied to a sire model, in order to estimate heritability and genetic correlations among traits. The results revealed significant phenotypic differences among varieties, with the Oacheșă variety showing superior performance for birth weight and milk yield, while Breazǎ and Oacheșă recorded the highest weaning weights. Heritability estimates indicated moderate genetic control for all analyzed traits, with higher values for weaning weight in the Belă variety. Genetic correlations between traits were generally low to moderate, suggesting limited correlated responses to selection. These findings support the implementation of differentiated breeding programs adapted to each variety of the Țurcană breed.

Key words*: genetic parameters, heritability, milk yield, Țurcană sheep, varieties.*

MANAGEMENT OF GENETIC RESOURCES IN LIPIZZANER BREED NUCLEI AT SÂMBĂTA DE JOS AND BECLEAN STATE STUDS

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Abstract

The conservation of the Lipizzaner horse in Romania depends on breeding systems that maintain genetic variability while respecting established selection traditions. This paper analyzes the management of genetic resources in two Romanian state-owned Lipizzaner breeding nuclei, Sâmbăta de Jos and Beclean, by comparing current practices with those applied in earlier periods. The study is based on a critical synthesis of scientific literature and the examination of stud farm documentation, breeding regulations, and technological norms. Emphasis is placed on reproductive organization, the use of pedigree records, and practical measures aimed at maintaining genetic diversity. A comparative approach highlights continuities and changes in breeding objectives and management strategies over time. The findings identify strengths and operational constraints influencing population structure and long-term viability within the Romanian state stud farm system.

Key words*: breeding nuclei, conservation genetics, genetic resources management, Lipizzaner horse, state stud farms.*

STUDIES ON REPRODUCTIVE AND PRODUCTIVE PERFORMANCE OF CARPATHIAN YOUNG GOATS

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Abstract

Goat farming of the Carpathian breed represents an important sector of Romanian animal husbandry and establishing the optimal moment for introducing female replacement stock into reproduction is essential for valorizing the biological potential of this breed. The aim of this study was to evaluate the influence of age at first mating on the productive and reproductive performance of Carpathian primiparous goats. The research was carried out on a group of 150 primiparous goats, divided into three experimental lots according to age at first mating (Lot 1: 7-8 months, Lot 2: 12-13 months and Lot 3: 17-18 months) and monitored over five consecutive lactations (2021-2025). Compared to Lot 1, milk production was approximately 10.0% higher in Lot 2 and 23.1% higher in Lot 3, while the difference between Lot 3 and Lot 2 was 11.9%. Overall, the results highlight differences among lots in terms of milk production level, confirming the importance of reproductive management in shaping productive performance in Carpathian primiparous goats.

Key words*: goat, primiparous, milk, quantity, performance.*

ESTIMATION OF GENETIC PARAMETERS FOR LINEAR TYPE TRAITS AND SELECTION INDEX IN ROMANIAN BLACK AND WHITE DAIRY CATTLE

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Abstract

This paper presents the results of a study on the estimation of genetic parameters for exterior traits in the Romanian Black and White (BNR) cattle breed. Sixteen linear type traits and a composite Exterior Selection Index (ESI) were analysed in a population of n = 2,956 cows, evaluated using the standard linear description methodology on the 1-9 scale applied by the General Association of Cattle Breeders of Romania (A.G.C.T.R.). Descriptive statistics revealed high means for skeletal traits (stature: $\bar{X}$ = 8.888 ± 0.007; CV% = 4.43%) and elevated variability for limb and teat traits (chest width: CV% = 28.72%; hock angle: CV% = 26.53%). Heritability estimates obtained by REML, using a sire model (BLUP), ranged from h^2 = 0.10 (stature) to h^2 = 0.63 (rump width - pin bones), with a general mean of $h^2 \approx 0.18$. ESI recorded a mean of 85.544 ± 0.057 and a heritability of h^2 = 0.17. Results are broadly consistent with estimates reported in the international literature for Holstein-type breeds, with the notable exception of rump width - pin bones, which exceeded reference intervals (h^2 = 0.25-0.38), suggesting superior genetic potential for improving this trait in the analysed BNR population. The study provides baseline data for the development and optimisation of national genetic improvement programmes for BNR breed conformation.

Key words*: exterior selection index, genetic parameters, heritability, linear type traits, Romanian Black and White cattle, selection.*

ASSOCIATION STUDY FOR GENETIC VARIANTS LINKED WITH REPRODUCTIVE TRAITS IN ROMANIAN SPOTTED CATTLE

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Abstract

In this work, we performed a targeted candidate-gene association study to identify genetic variants linked with reproductive traits in cattle. We investigated the relationship between 348 SNPs on Axiom BovMDv3 SNP array and the following reproductive traits in cattle: calving interval (CI), gestation length (GL), age at first calving (AFC), artificial inseminations to conception (A2C), presence of twins (TW) and history of abortions (AB). The dataset included reproductive information of 587 Romanian Spotted and Romanian Brown cattle. Poisson regression was applied to test associations for CI, GL, A2C, and AFC phenotypes, whereas TW and AB traits were examined using logistic regression. The results indicate significant associations between certain SNPs and fertility-related traits. The genes SPRY1, ILDR1, SLC24A4, TANC2, LOXL2, and SLC24A4 showed the strongest associations with CI, with extremely small p-values even after correction for multiple testing. In addition, SNPs on the ACOXL, SLC4A4, ABCC9, DDR2 and TANC2 genes were significantly associated with AFC. Our findings suggest that these genes are promising candidates for future studies aimed at elucidating the mechanisms influencing bovine fertility.

Key words*: association study, candidate gene, cattle, reproductive traits.*

RESEARCH ON THE ESTIMATION OF GENETIC PARAMETERS FOR PRODUCTION AND EXTERIOR TRAITS IN SUBPOPULATIONS OF THE ȚURCANĂ BREED

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Abstract

The purpose of this work is to estimate the genetic parameters for the production and exterior traits of the 4 lines of the Turcana breed. The research was carried out on a herd of 16,196 Țurcana sheep, structured on the 4 lines, of which: Belă, Breazã, Bucălae and Oacheșă. 7 exterior traits were analyzed (conformation, wool quantity, wool length, milk yield, weight at 60 days, weight at 120 days and average daily gain). For the estimation of the genetic parameters (Heritability and Genetic Correlation) the BLUP methodology was used. The heritability values recorded values from 0.116 (weight at 60 days in Bucălae), to 0.475 for milk yield (Belă). The values of genetic correlations achieved the full range of values, in the interval [-1, +1], with variations depending on the pair of characters and the population analyzed. Heritability and genetic correlation are useful parameters for substantiating the improvement programs of the analyzed populations.

Key words*: genetic parameters, exterior characters, production characters, BLUP.*

ECOSANOGENESIS OF THE ECOTYPES OF THE TURCAN BREED IN THE EXPANSIONIST EVOLUTIONARY CONTEXT OF THE STRUCTURE OF SHEEP BREEDS IN ROMANIA

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Abstract

The aim is to present trends in the evolution of sheep flocks and the opportunities of the Turcan breed in the formation of new local genetic ecotypes. The research was carried out using official data from the Pedigree Registers of the Turcan breed and data managed by the competent state authority in the field.
The data on the evolution of the Turkana sheep flocks registered in the pedigree registers, the situation of the registered female flocks were analyzed. The statistical data demonstrate a constant evolution of the flocks and especially of the breeding flocks, from one year to the next, visible in all the associations owning the Turcan breed. Thus, 2054450 heads were registered in breed registers for 2020 and 2072900 heads in registers in 2024. Through a demanding selection and improvement of the breed, over the years, the heterosis effect has brought an added genophenotopic-individual, local, populational value, with phenotypic and productive differences. Thus, following the improvement programs described above (for milk, meat), the Turcan breed has contributed to the formation of reproductively isolated ecotypes and with considerable genetic purity.

Key words*: selection, sheep herds, ecotypes, Turcan breed, pedigree registers.*

EFFECT OF CONTROLLED MILK FEEDING SYSTEMS ON GROWTH PERFORMANCE OF GOAT KIDS UNTIL WEANING

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Abstract

The duration of milk intake under artificial feeding conditions depends on the method of feeding, age, sex, and individual characteristics of the animals. The present study investigates the effect of artificial milk feeding using nipple buckets on goat kids reared in pens without their dams. The experiment was conducted under controlled feeding conditions and included goat kids from the Anglo-Nubian, Bulgarian White Dairy, and Toggenburg breeds.Throughout the study, the body weight development of the animals was monitored from birth until the weaning period (90 days). Key productive parameters were evaluated, including live body weight, average daily gain, growth rate, and related growth indicators. Differences in feeding behavior and adaptation to artificial milk feeding were identified depending on genotype and sex.The obtained results allow an objective assessment of the effectiveness of controlled artificial milk feeding systems and the degree of adaptation of goat kids to this feeding regime.

Key words*: breed, feeding, goat kids, growth, weight gain.*

EVALUATION OF BREEDING MEASURES TO IMPROVE SCRAPIE RESISTANCE IN THE BULGARIAN ILE DE FRANCE POPULATION

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Abstract

The Ile de France is one of the French meat sheep breeds introduced in Bulgaria. Genotyping of the prion protein gene (PRNP) is essential for establishing the genetic background related to scrapie susceptibility and resistance, and allowing for informed breeding decisions to reduce the risk of disease outbreak. The present study aimed to determine allele and genotype frequencies of PRNP in the current population of Ile de France in Bulgaria. Polymorphisms at codons 136, 154, and 171 were analyzed by Sanger sequencing of 94 samples from nine flocks, located in different regions of the country. Three PRNP alleles were identified, with ARR being the most frequent, showing an allele frequency of 0.96. The ARR allele was detected in all analyzed flocks. The most common genotype was ARR/ARR (93%), followed by ARR/ARQ (5%). A VRQ allele was detected in two animals, representing the first report of this allele in the Ile de France breed in Bulgaria. The obtained results provided an overview of the current PRNP situation in the studied breed.

Key words*: genotype, resistance, scrapie.*

RESEARCH ON THE GENETIC DETERMINISM OF A GLOBAL SELECTION INDEX, BASED ON THE CONSIDERATION OF PRODUCTION AND TYPE TRAITS IN THE ROMANIAN BLACK AND WHITE CATTLE

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Abstract

*The purpose of this paper was to estimate the genetic determinism of a global seletion index in order to increase the genetic progress in the Romanian Black and White Cattle population. The study was done using a data set of 3709 daughters at first lactation, belonging to 1085 sires, raised in 192 herds. Three milk production traits (milk yield, fat yield, protein yield) and sixteen type traits were analised. Genetic parameters were obtained with REML-Sire model, using R software. The first partial index (MPI) was build as product of breeding value for each individual trait pondered with 0.5, 0.25 and 0.25 weight. The second partial index (TTI) was built taking into account four cathegory with the following with the following weights: the type of milk (0.15), body development (0.20), legs (0.25) and udder (0.40). The global selection index (GSI) was estimated on the two partial indexes, taking int accound different weight (GSI=w1*MPI+w2*TTI). The first weight (w1) varried between 0.7 and 0.9 and w2 was as 1-w1.*

Key words*: selection index, production traits, type traits, blup, sire model.*

ASSESSING SINGLE NUCLEOTIDE POLYMORPHISMS ASSOCIATED WITH MEAT TENDERNESS IN THE CALPASTATIN GENE IN ROMANIAN SPOTTED CATTLE (SIMMENTAL TYPE)

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Abstract

Key attributes assessed in determining meat quality include tenderness, juiciness, aroma and flavor, all of which contribute to the overall sensory experience and consumer satisfaction. Among these attributes, tenderness is the most highly valued by consumers and is often the primary target for improvement, influencing both production practices and pricing. Calpastatin (CAST), an endogenous inhibitor of calpains (CAPN), plays an important role in post-mortem meat tenderization. To assess the genetic potential for meat tenderness in Romanian Spotted cattle, 101 animals were genotyped for two meat tenderness-associated mutations in the CAST gene, specifically, a C>G substitution in intron 5 (g.98533962) and an A>G substitution in the 3'UTR (g.98579663). Genetic variation and pairwise linkage disequilibrium between two loci were analyzed to evaluate the informativeness of these polymorphisms for animal genotyping. The observed genetic patterns are consistent with a mixed breed population and provide a basis for integrating additional palatability related markers in multi locus genotyping approaches for selecting animals with improved meat quality traits.

Key words*: CAST gene, cattle breed, meat quality, SNPs (Single Nucleotide Polymorphisms).*

THE GENETIC STRUCTURE INFLUENCE OF LACTOPROTEINS ON MILK AND DAIRY PRODUCTS IN KARAKUL SHEEP

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Abstract

Research was conducted in a Karakul farm evaluating the influence of the K-casein locus genotype on the physicochemical parameters of milk and dairy products obtained: cheese, whey, and urda. Three experimental groups were selected. The first group included 22 ewes carrying the AA alleles at the K-casein locus. The second group consisted of 6 ewes with the AB alleles, while the third group included one ewe (No. 2014024) carrying the BB alleles (out of three ewes with this genotype identified in entire flock). Results on cheese yield in sheep with BB alleles in K-casein locus of lactoproteins was 35.3%, compared with 34.6% in those with the AA alleles and 34.1% in those with the AB alleles. Thus, the cheese yield of BB genotype ewes exceeded that of AB genotype ewes by 1.2% and that of AA genotype ewes by 0.7%. The water content of the cheese ranged from 58.0% to 58.6%. The highest fat content was recorded in the group of ewes with the BB alleles (29.9%), followed by those with the AA alleles (26.4%) and the AB alleles (24.8%).

Key words*: alleles, curd and whey cheeses, genetic polymorphism, chemical composition of milk.*

CYTOGENETIC SCREENING OF ROMANIAN BOVINE BREEDS

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Abstract

As well as the cytogenetic investigation is a tool that could be used in the genetic improvement programmes of bovine, this paper is a review about the cytogenetic screening performed in the last 15 years on 889 cows and 317 buffaloes of different breeds, raised in Romania. The karyotype study was carried out by using the short-term blood cell culture and as a result abnormalities of chromosomal structure and number were identified in 131 cows and 51 buffaloes. The effects of the abnormal configurations were represented by reproductive activity disorders, congenital and developmental malformations, freemartinism and aneuploid-heteroploidy of sex chromosomes. The necessary prophylaxis recommendations have been released for all carriers of chromosomal abnormalities.

Key words*: buffalo, cattle, chromosomal abnormalities, congenital malformations, reproductive disorders.*

GOAT BREED DISTRIBUTION IN ROMANIA: A TERRITORIAL AND STRUCTURAL ANALYSIS

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Abstract

This study analyzes the distribution of Romania's main goat breeds – Carpathian, Banat White, French Alpine, Saanen, Anglo-Nubian, and Murciano-Granadina – by correlating territorial data with geographic and farm-type factors. Based on CAPRIROM records and breed improvement programs, only counties with over 100 registered animals per breed were selected to ensure statistical relevance. Results show that rustic native breeds dominate in mountainous areas and semi-subsistence farms, being well adapted to local conditions. In contrast, dairy-specialized breeds are more frequent in lowland counties, particularly in commercial and semi-intensive farms. Positive correlations with altitude and negative correlations with goat density highlight the geographic influence on breed distribution. The findings support the need for differentiated policies: conserving local breeds in traditional areas while promoting modern farms to capitalize on high-performance dairy breeds. The data provide a foundation for targeted breeding programs and sustainable development of Romania's goat sector.

Key words*: breed distribution, farm typology, genetic diversity, goat breeds, Romania, rural development.*

EVALUATION OF REPRODUCTIVE PERFORMANCE AND TECHNOLOGICAL EFFICIENCY IN SOWS FROM DIFFERENT MATERNAL BREEDS AND GENETIC LINES UNDER INTENSIVE PRODUCTION CONDITIONS

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Abstract

This study assesses the productive and reproductive performance of imported pig genetic lines under intensive farming conditions in the Republic of Moldova. A retrospective analysis was conducted using production records from commercial herds collected between 2017 and 2024, comprising over 50,000 farrowings. Evaluated parameters included piglets born alive, stillbirth rate, number of piglets weaned per sow, fertility rate. Comparative analyses were performed among major genetic lines and hybrids (YL(F1), LL, LW, TT, YY, and their derivatives) and across sow parity classes. The results revealed a significant improvement in reproductive performance over time, with the mean number of piglets born alive increasing from 13.8 to above 15.0 per farrowing, accompanied by a progressive reduction in stillbirth rates after 2020. The YL(F1) hybrid exhibited superior adaptability and productivity, achieving more than 36 weaned piglets per sow per year and fertility levels exceeding 94%. Peak reproductive efficiency was observed at parities 3-5, while performance declined notably beyond the seventh farrowing. Certain genotypes (LW and YYL) showed increased mortality and reduced adaptation to local conditions. These findings support evidence-based optimization of breeding programs and genetic selection under region-specific production environments.

Key words*: race, maternal line, fertility, weaned pigs, weaning weight.*

THE EVOLUTION OF THE INSTRUMENTAL INSEMINATION TECHNIQUE OF HONEY BEE QUEENS: THE CONTRIBUTIONS OF WATSON, LAIDLAW, AND COBEY

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Abstract

Instrumental insemination of Apis mellifera queens represents a major advancement in apicultural genetic selection, enabling precise control over mating. The article examines the methodological evolution from Lloyd Watson's first successful demonstration (1920s), using a capillary syringe and stereo microscope; to Harry Laidlaw's key discovery (1944) regarding the vaginal valve bypass and the introduction of CO_2 anesthesia, and up to modern instruments developed by Susan Cobey (UC Davis), including precision syringes, pulsed CO_2 regulators, and integrated microscopes. Through comparative tables and performance charts improvements in precision (8-10 µL semen, or 6-8 million spermatozoa) and genetic efficiency are highlighted (fixing the desire traits).

.***Key words**: Instrumental insemination, Watson, Laidlaw, Cobey.*

SESSION
NUTRITION

THE INFLUENCE OF THE QUANTITATIVE AND QUALITATIVE COMPOSITION OF FEED PROTEIN AND MICROELEMENT CITRATES IN THE DIETS OF LAYING CHICKENS ON THEIR PRODUCTIVITY

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Abstract

This study presents results of research on metabolic processes in laying hens under different quantitative and qualitative compositions of dietary protein combined with bioelement citrates and enzyme supplements. The aim of the study was to improve digestible protein utilization, reduce feed conversion, and minimize environmental emissions while maintaining high productivity and egg quality. The experiment evaluated the effect of including "Proglyot" sunflower protein concentrate, high-protein (46%) feed yeast, and replacing a mineral premix containing Zn, Mn, Fe, Cu, Co, Se, and I in inorganic salt form with their citrate analogues in diets for Lohmann Brown laying hens. At the same time, crude protein content in the feed was reduced from 17% to 15%. The optimized diet positively affected laying performance and egg quality parameters. Egg production increased by 4.9%, while egg mass increased due to a 2.4% rise ($p<0.01$) in the relative mass of egg white with stable yolk mass. Eggshell strength improved by 5% ($p<0.05$) and was associated with blood calcium and phosphorus levels. Yolk protein content increased by 14% ($p<0.05$), indicating improved dietary protein utilization, while total lipid content slightly increased without changes in cholesterol level.

Key words*: egg production, egg quality, laying hens, protein concentrate.*

EFFECTS OF PROBIOTIC-FORTIFIED MULBERRY LEAVES ON IBV POLYVOLTINE *Bombyx mori* SILKWORM PRODUCTIVITY

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Abstract

This study assessed the effects of whey-supplemented mulberry leaves on larval development and cocoon traits in IBV polyvoltine Bombyx mori. A total of 300 fifth-instar larvae were randomly allocated into three dietary groups (100 larvae each): control fed mulberry leaves (C), C with 3% whey (CW3), and C with 5% whey (CW5). Larval growth and silk gland weight were recorded, and cocoon parameters were measured post-spinning. Silkworms fed CW5 treatment significantly increased larval weight (p=0.04) and showed a tendency to increase silk gland weight (p=0.07). Cocoon, shell, and pupal weights also tended to improve in the CW5 group (p).

Key words*: B. mori, cocoon traits, larval development, silk gland, whey.*

ENHANCEMENT OF NAPIER GRASS SILAGE QUALITY AND AEROBIC STABILITY USING *Lactobacillus* spp.

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Abstract

This study investigated the effects of Lactobacillus spp. on Napier grass silage quality, dry matter loss (DM loss), and aerobic stability. The experiment employed a 3 × 3 factorial design in a completely randomized design (CRD), with three levels (0, 1×10^5, and 1×10^6 cfu/g fresh weight) of Lactobacillus buchneri and Lactobacillus plantarum. The silage was ensiled for 24 days. The following parameters were analyzed: DM loss, fermentation characteristics, nutritive values, fiber fractions and anaerobic microbial profiles. Subsequently, the silage was exposed to air for 2, 4, and 6 days to determine aerobic stability characteristics and microbial profiles. The results showed that the highest inoculation LB level improved silage aerobic stability but increased DM loss and negatively affected fermentation quality. However, co-inoculation with the highest levels of both lactic acid bacteria resolved the DM loss problem and improved overall fermentation quality while maintaining enhanced aerobic stability compared with sole inoculation of LB. In conclusion, co-inoculation with the highest levels of lactic acid bacteria improved dry matter recovery, fermentation quality, and aerobic stability of Napier grass silage.

Key words*: aerobic stability, Lactobacillus buchneri, Lactobacillus plantarum, Napier grass, molasses.*

BIOCHEMICAL PROFILE OF GOAT COLOSTRUM FERMENTED WITH VARIOUS MICROBIAL CONSORTIA

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Abstract

Fermentation has been increasingly explored as a strategy to enhance the functional potential of goat colostrum by increasing the availability of bioactive compounds; therefore, this study investigated the effects of different microbial consortia and fermentation conditions on the biochemical profile of goat colostrum. In this study, goat colostrum was fermented using different microbial consortia, including artisanal kefir grains, kefir-yeast co-cultures, kombucha, and kefir-kombucha combinations. Fermentation was performed at two temperatures (30°C and 37°C) for 48 and 72 h. The fermented products were evaluated in terms of acidification, total protein content, total polyphenol content, and antioxidant activity. The results showed that fermentation parameters significantly influenced the biochemical profile of goat colostrum. Higher protein concentrations were obtained in kefir-based fermentations, while kombucha-containing consortia led to increased polyphenol content and antioxidant capacity. These findings highlight the potential of controlled fermentation to obtain value-added colostrum-based functional products.

Key words*: antioxidant activity, fermentation, goat colostrum, microbial consortia, polyphenols.*

EVOLUTION OF PROTEIN METABOLISM AND BODY MASS OF QUAILS UNDER THE INFLUENCE OF PHYTOMICROBIAL ADDITIVE OMEPOL 30

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Abstract

This research presents the effects of phytomicrobial additive OMEPOL 30 on markers of protein metabolism in blood serum and the evolution of body mass of laying quails. A total of 150 quails were divided into groups: control group and two experimental groups with 50 birds in each one. The control group was fed with basic combined feed, the experimental groups – with basic combined feed supplemented with 0.25 and 0.5% of additive during 71 days. The results indicated that the product was well tolerated by laying quails, strengthening their health status. In addition, modulation of protein metabolism was inferred from changes in marker parameters: the significant increase ($p<0.01$) of total proteins, albumin and creatinine in the experimental groups, as well as the tendency to increase urea and decrease uric acid in the blood, which attested to the intensification of protein metabolism. In conclusion, we can mention that tested product improves metabolic health of quails, which was also proven by stopping the loss of body mass of birds during intensive egg laying.

Key words*: additive, creatinine, quail, protein, urea.*

EFFECTS OF OMEPOL 30 ADDITIVE ON TRYPSIN-ANTITRYPSIN SYSTEM, ENDOTOXICOSIS AND EGG PRODUCTION OF QUAILS

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Abstract

This publication presents the results of investigations carried out on 150 Japanese quails (Coturnix japonica). Investigations aimed to highlight the anti-stress and adaptive properties of phytomicrobial additive OMEPOL 30 and bioproductive potential of the quails. All three groups of birds received similar housing, veterinary and feeding conditions, the differences consisted in OMEPOL 30 adiminstration in the doses of 2.5 and 5.0 g/kg, for the experimental groups. During 10 weeks, the quails were monitored, eggs from each group were collected, the blood samples were taken for investigations at the beginning of the study, on the 35th day and the 71st day of the experiment from 5 quails randomly from each group. The tested product was well tolerated by the quails. The biochemical investigations highlighted a decrease of trypsin in the blood, as well as balanced the activity of the trypsin-antitrypsin system. In the experimental groups were found decreases in endotoxicosis indicators, such as molecules with average molecular weight and necrotic substances. Egg production indicators had higher values in the experimental groups compared to control.

Key words*: egg production, endotoxicosis, feed additive, quail, trypsin.*

ENHANCING THE MORPHO-PRODUCTIVE TRAITS OF ROMANIAN *Bombyx mori* SILKWORM BREED THROUGH YEAST-ENRICHED DIET

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Abstract

The objective of this study was to assess the influence of dietary yeast supplementation on the morpho-productive performance of Bombyx mori (Galben Centurat Băneasa breed) during the 5th instar. A total of 300 larvae were randomly assigned to three groups, (two replicates each): 1) C group fed fresh mulberry leaves; 2) an experimental group E1 fed C diet and yeast at a concentration of 1×10^{7} CFU/mL; and 3) an experimental group E2 fed C and yeast at a concentration of 1×10^{9} CFU/mL. Larval measurements were taken on 1st, 5th, 7th, 9th days of the trial, and silk gland weight at 5th, 7th, 9th days. The higher yeast concentration (E2) significantly enhanced larval weight (by 4.8% vs. C; 1.69% vs. E1) (P = 0.04), and larval length (by 1.9% vs. C; 1.04% vs. E1) (P = 0.03). E2 group exhibited significant increase of silk gland in D9 compared with D5 by 2.45%. In conclusion, yeast supplementation enhances the nutritive value of mulberry leaves and improves larval performance without affecting cocoon quality.

Key words*: cocoon, diet, mulberry leaves, silk gland, yeast.*

DIET WITH APPLE POMACE IS ABLE TO COUNTERACT OXIDATIVE STRESS IN SPLEEN OF PIGLETS EXPERIMENTALLY CONTAMINATED WITH *Escherichia coli* LIPOPOLYSACCHARIDE DURING POST- WEANING PERIOD

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Abstract

The spleen plays an essential role in the immune and circulatory system, contributing to the body's defense against infections through the filtering of blood-borne pathogens and antibody production. Oxidative stress, the imbalance between free radicals and antioxidants can affect spleen causing inflammation, cell damage and at the long-term different spleen disorders. In the present study we investigated the effect of a diet including apple pomace to mitigate the oxidative stress and the impairment of antioxidant enzymes (catalase-CAT, superoxide dismutase-SOD and glutationperoxidase-GPx) activity in piglets after weaning experimentally challenged with E. coli lipopolysaccharide (LPS), a well-known inducer of oxidative stress and inflammation. Twenty-four piglets were randomly allocated to four experimental diets: group 1 and 2 received a normal diet for postweaning period while group 3 and 4 received a diet including 5% of apple pomace. In the day 20 with 24h before slaughtering the groups 2 and 4 were challenged with LPS at 80µg/kg b.w. In the day 21 piglets were slaughtered and samples of spleen were collected to determined oxidative and antioxidative stress markers. Results showed that E. coli LPS produced a significant increase of lipid, protein and DNA oxidation and reduce antioxidant enzymes activity. Apple pomace alone did not stimulate splenic antioxidant enzyme activities, but in LPS-challenged piglets, the diet with apple pomace attenuated partially the reduction in SOD, CAT, and GPx activity as well as the increase of oxidative markers, suggesting a protective effect on antioxidant defences under inflammatory oxidative conditions.

Key words*: apple pomace, oxidative stress, piglets, post-weaning.*

PHYTOCHEMICAL POTENCY, ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY OF PATCHOULI LEAVES AS A SOURCE OF PHYTOGENIC FEED ADDITIVES IN BROILER

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Abstract

This study was conducted with the aim to investigate the potency of Petchouli leaves (Pogostemon cablin Benth) as a source of phytogenic feed additives for broiler. The screening methods were performed using phytochemical screening, antibacterial assay against Escherichia coli, antioxidant assay, and proximate analysis. The result showed that plant material extracted with 50% ethanol in water, contain flavonoid, tannin, saponin, and quinone. This compound can play a role as an antioxidant agent. An antioxidant activity (% inhibition) of Pethouli leaves is 44 ppm. There is antimicrobial activity either by microdilution or diffusion method. Proximate analysis showed, Petchouli leaves contain 9.84% moisture, 15.78% ash, 17.63% crude protein, 5.22% extract ether, 18.96% crude fiber, and 3958 kcal kg^{-1} metabolizable energy. From this study can be concluded that based on content of nutrition, antioxidant activity, and antibacterial activity, Petchouli leaves can be used as a source of phytogenic feed additives in broiler ration.

Key words*: phytochemical, antimicrobial activity, antioxidant activity, phytogenic feed additives, petchouli leaves.*

THE POTENTIAL OF MINT (*Mentha* spp.) AS A FUNCTIONAL FEED ADDITIVE IN POULTRY NUTRITION

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Abstract

The powerful antioxidant, antibacterial, and anti-inflammatory qualities of mint, a commonly grown herb, are attributed to its abundance of bioactive chemicals, particularly essential oils (such as menthol, menthone, and limonene), flavonoids, and phenolic acids. Because of its calming, digestive, and carminative properties, mint has long been employed in both traditional human medicine and the culinary arts. Its use in animal nutrition is becoming more popular as a sustainable substitute for artificial growth boosters. The potential to improve nutritional absorption, boost appetite, strengthen the immune system, and promote intestinal integrity are just a few of the many health advantages of poultry. Studies indicate that dietary mint supplementation can enhance growth performance, improve feed conversion ratio, and elevate the quality of poultry products while reducing pathogen burden in the gastrointestinal system. In order to optimise the inclusion levels of various mint preparations (such as dried leaf, essential oil, and extract) for sustainable and efficient application in contemporary poultry production systems, this abstract emphasises the need for additional research.

Key words*: broiler, essential oils, mint, phytobiotics, poultry.*

YEAST IN BROILER DIETS: ITS EFFECTS ON GROWTH PERFORMANCE AND CARCASS QUALITY

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Abstract

This study investigated the effects of dietary inclusion of wine yeast (Saccharomyces cerevisiae, strains used in winemaking) on growth performance, carcass quality, and economic efficiency in broiler chickens. Broilers were fed diets containing different levels of wine yeast, and parameters such as body weight gain, feed intake, feed conversion ratio and carcass traits were evaluated. The results showed that appropriate inclusion of wine yeast improved growth performance, enhanced feed efficiency and led to better carcass quality compared to the control group. Analysis indicated potential cost benefits when partial substitution of conventional protein sources was applied. These findings demonstrate that wine yeast can be used as a functional and sustainable feed additive in broiler diets, supporting both productivity and animal health, while contributing to more efficient and environmentally friendly poultry production.

Key words: *broilers, wine yeast, feed additive, growth performance, carcass quality, sustainable protein.*

EVALUATION OF SLAUGHTER PERFORMANCE AND CARCASS TRAITS IN POULTRY FED *Hermetia illucens* - BASED DIETS

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Abstract

The rising demand for sustainable protein sources in poultry production has highlighted insects as promising feed alternatives. This study assessed the effects of dietary inclusion of Black Soldier Fly (BSF) larvae on slaughter performance and carcass traits in broilers. Birds were assigned to a control group and three experimental groups receiving 2.0%, 3.5%, or 5.0% Hermetia illucens larvae meal. Haematological and biochemical parameters remained within physiological ranges, indicating normal health and metabolic status. Experimental lines showed improved carcass composition, with increased breast muscle weight, progressive sternum growth, and enhanced thigh and shank musculature. Combined hip and thigh weights and shank muscle mass were higher in experimental groups. These results demonstrate that BSF larvae can be safely incorporated into broiler diets, supporting growth, carcass yield, and meat quality. Furthermore, the experimental lines exhibited superior muscular development and carcass traits, suggesting their higher suitability for meat production. The findings highlight the potential of insect-based diets to enhance sustainable poultry production without compromising animal health or product quality.

Key words*: Black soldier fly, Hermetia illucens, broiler chickens, carcass traits, slaughter performance.*

THE USE OF MEDICINAL PLANTS-BASED PHYTOACTIVE SUBSTANCES AS ALTERNATIVE INPUTS IN CATTLE FORAGE AND TREATMENT

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Abstract

Medicinal plants are used throughout the world both to treat diseases and to maintain the general health of both humans and animals. The aim of this work is to analyze the trends for research on the use of medicinal plants and extracts for the health of cattle. A structured analysis was performed in the Web of Science database with a combination of keywords, which enabled the assessment of multiple bibliographic networks with VOSviewer. Due to antibiotic-resistant microorganisms, attempts are being made to use medicinal plants with immunostimulant, antimicrobial, antifungal, and anti-inflammatory effects to sustain the animal by strengthening natural defense mechanisms. Most medicinal plants contain alkaloids, minerals, vitamins, flavonoids, saponins, which contribute to numerous physiological processes in the animal body. By supplementing the rations of cows with phytoactive substances, there is a visible improvement in the defense mechanism, digestibility of nutrients and an increase in milk production. These approaches can be used to partially or complete replacement of conventional treatments and have a dual role for both the health of the animal and increased yield of main products.

Key words*: active substances, defense mechanism, animal health, type of action, multiple benefits.*

RESEARCH ON THE USE OF PUMPKIN SEED CAKE AS AN ALTERNATIVE FEED RESOURCE IN DAIRY COW NUTRITION

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Abstract

The use of alternative feed resources in dairy cattle nutrition is increasingly important for promoting sustainable and cost-effective production systems. This study investigates the dietary inclusion of pumpkin seed cake (PSC), an oil-extraction by-product, as an alternative feed ingredient for dairy cows. The objective was to evaluate its potential effects on milk yield, composition, and fatty acid profile, as well as general animal health. Cows were fed PSC-based diets under practical farm conditions, with daily monitoring of milk production and sampling for laboratory analysis. Special attention was given to changes in milk quality, particularly in relation to beneficial fatty acids that contribute to improved nutritional value. This work aims to assess the feasibility of integrating PSC into dairy rations not only to diversify feed sources in ruminant nutrition but also to support improvements in milk quality through enhanced lipid composition.

Key words*: alternative feed resources, dairy cows, fatty acids, milk, pumpkin seed cake.*

RESEARCH ON BIOPRODUCTIVE PERFORMANCE OF GROWING-FINISHING PIGS FED WITH ALTERNATIVE VEGETABLE SOURCES

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Abstract

The paper aimed to present the evolution of bioproductive parameters in growing-finishing pigs (Landrace and Pietrain hybrid) subjected to different nutritional regimes involving local vegetable protein and energy sources. The research, part of the personal contributions (Chapter 5), involved three experimental groups (LC, E1, E2) where soybean meal was partially replaced with peas (15%) and flaxseed meal (8%), and cellulose levels were adjusted using alfalfa meal (5%). The data have been processed into the following indicators: body weight, average daily gain (ADG), and feed conversion ratio (FCR). During the analyzed period, it was observed that the inclusion of these alternative sources maintained high growth rates, with final weights reaching approximately 107.85-110.45 kg. As a conclusion, the partial replacement of traditional protein sources with local alternatives like peas and flaxseed represents a viable solution for optimizing pig nutrition without compromising bioproductive performance.

Key words*: pigs, peas, flaxseed, body weight, average daily gain.*

IMPACT OF DIETARY FLAXSEED AND PEAS ON THE FATTY ACID PROFILE AND LIPID HEALTH INDICES OF PORK FROM LANDRACE × PIETRAIN CROSSBREEDS

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Abstract

The research aimed to investigate the potential of bio-fortifying pork meat with Omega-3 fatty acids by using alternative feed sources in Landrace and Pietrain crossbreeds. The experimental study involved 36 finishing pigs divided into three groups: a control group (LC) fed a standard soybean-corn diet, and two experimental groups (E1, E2) where soybean meal was replaced by peas (15%) and flaxseed (8%), with E2 additionally receiving alfalfa meal (5%). Meat samples from the Longissimus dorsi muscle were analyzed for fatty acid composition using gas chromatography. The results indicated a significant increase ($p < 0.001$) in alpha-linolenic acid (ALA) content in both experimental groups compared to LC. Most importantly, the n-6/n-3 ratio was reduced from 16.58 in the control group to below 6.0 in the E1 and E2 groups. These findings demonstrate that nutrition can effectively transform pork from Landrace x Pietrain crossbreeds into a functional food with enhanced lipid health indices, meeting modern consumer health requirements.

Key words*: Landrace, Pietrain, omega-3, fatty acids, meat quality, n-6, n-3 ratio.*

RESEARCH CONCERNING EFFECTS OF ANTIOXIDANT FEED ADDITIVES ON BROILER PERFORMANCE AND MEAT QUALITY

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Abstract

Feed additives are widely used in broiler farms to support intestinal health, reduce oxidative stress, and optimize productive performance and meat quality. The study was designed to evaluate the impact of administering these products, either individually or in combination, on broiler chickens. The experiment was conducted over a period of 42 days in a commercial farm, with four groups: control, Enterohelp, NutriCool, and Enterohelp + NutriCool. The parameters analyzed included body weight dynamics and growth rate, feed intake and mortality, slaughter yield, the weight of dissected anatomical regions, and internal organ weights. Meat quality was assessed by measuring water, protein, fat, mineral, amino acid, and fatty acid content, as well as caloric value. Economic indicators, including the European Efficiency Factor (EEF) and the European Broiler Index (EBI), were also evaluated. Results showed that Enterohelp improved intestinal health, NutriCool reduced oxidative stress and enhanced meat yield and quality, while the combination of both products produced the best results across all categories. It is concluded that combined administration represents an effective strategy to maximize productive performance, meat quality, and economic efficiency in broiler production.

Key words*: broiler chickens, feed additives, growth performance, meat quality, economic efficiency.*

ESTIMATES OF METHANE EMISSIONS FROM DAIRY CATTLE BASED ON MANURE MANAGEMENT SYSTEMS

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Abstract

This paper aimed to estimate methane (CH_4) emissions from manure produced by dairy cattle in Romania between 2016 and 2025. Data on the dairy cattle population were obtained from the National Institute of Statistics, while manure-related greenhouse gas (GHG) emissions were estimated using Tier 2 methodologies provided by the International Panel on Climate Change Guidelines (IPCC, 2019). Gross energy intake (GE), digestible energy (DE), and volatile solid excretion (VS) were calculated using national reference values, while the methane-producing capacity (B_0) and methane conversion factors (MCF) were based on IPPC (2019) default values. At the national level, methane emissions from dairy cattle manure decreased from 6.618 Gg CH_4 yr^{-1} (165.455 t CO_2-eq) in 2016 to 6.054 Gg CH_4 yr^{-1} (151.350 t CO_2-eq) in 2025. These results indicate a gradual reduction in methane emissions, mainly driven by the decline in dairy cattle numbers, and highlight the importance of accurate country-specific data for improving greenhouse gas inventories and supporting effective mitigation strategies in the dairy sector.

Key words*: dairy cattle, manure management, methane emissions.*

AN ANALYSIS OF THE OWNER`S DECISION-MAKING ROLE IN DOG AND CAT NUTRITION FROM A PSYCHOSOCIAL, ECONOMIC, AND SCIENTIFIC PERSPECTIVE

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Abstract

One of the most accessible and effective ways to support the well-being of pets is to pay close attention to their nutrition, which has led to a significant increase in pet owners` awareness and demands regarding the food they feed their pets. Although the first scientifically based nutritional recommendations for dogs and cats appeared in the mid-1980s, they were not officially standardized until 2006, with the publication of Nutrient Requirements of Dogs and Cats by the National Research Council. The literature consistently highlights a discrepancy between owners` perceptions of `healthy` nutrition and the physiological reality of animals, a discrepancy emphasised by the process of humanisation of pets. This paradigm shift has contributed to the development of an extremely dynamic and segmented market, but has also generated significant nutritional risks associated with misinformation and the projection of human needs onto animal physiology.

Key words*: pet food, companion animal nutrition, pet owner perception, nutritional guidelines, animal physiology.*

MICROBIOLOGICAL SAFETY OF PROTEIN FEED RAW MATERIALS IN THE FARM-TO-FORK CHAIN

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Abstract

This study evaluated the microbiological safety of soybean and sunflower meals within the "Farm-to-Fork" chain at a Romanian feed mill over two consecutive years. A total of 185 analyses were conducted at reception and from stock to quantify yeast and mold contamination. Results showed high compliance, with mean fungal loads (400-553.3 cfu/g) remaining significantly below reference literature averages (865-1,040 cfu/g) and representing only 8% of the safety threshold. Sunflower meal exhibited higher vulnerability, with a 2,000 cfu/g peak in the first year leading to the rejection of 4.7% of batches. While Aspergillus remained the dominant genus (>60% prevalence in stock), a marked decline in Penicillium was observed in the second year. The 100% positivity rate in second-year stock samples (mean 528.5 cfu/g) underscores the dynamic nature of storage. These findings demonstrate that while protein meals harbor endemic microflora, rigorous reception protocols and controlled storage are essential for mitigating latent toxigenic risks in animal feed production.

Key words*: food safety, soybean meal, yeasts and molds, feed safety.*

TRADITIONAL VERSUS INDUSTRIAL DAIRY PRODUCTS: A COMPARATIVE ANALYSIS OF COMPOSITION, NUTRITONAL VALUE AND QUALITY

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Abstract

This study compares traditionally produced and industrially manufactured dairy products to identify objective differences in composition and nutritional value and to examine how these differences relate to consumer perceptions reported in the scientific literature. The analysis is grounded in a technological distinction between traditional and industrial production methods and focuses on dairy products originating from the South-Muntenia region. The methodology is based on physicochemical and microbiological analyses conducted in collaboration within an accredited laboratory, targeting parameters relevant to nutritional quality, product composition, and food safety. Particular attention was paid to indicators of nutritional value, alongside microbiological profiles that reflect differences in processing technologies. The results show clear and measurable differences between traditional and industrial dairy products in terms of nutritional and compositional characteristics, suggesting that the way these products are made has a direct influence on their final quality. These findings are discussed in relation to ongoing academic debates on the perceived nutritional value and naturalness of traditional foods, helping to clarify where consumer perceptions are supported by analytical evidence and where they may be overstated or incomplete.

Key words*: microbiological quality, processing technologies, consumer perception, traditional versus industrial foods.*

THE ROLE OF L-HISTIDINE IN BROILER PRODUCTIVE PERFORMANCE, IMMUNITY, AND MEAT QUALITY

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Abstract

L-histidine is an essential amino acid involved in protein synthesis, acid-base regulation, antioxidant protection, immune function and skeletal muscle metabolism in broiler chickens. Interest in histidine has increased because modern broiler genotypes have high breast muscle accretion, while reduced-protein feeding programs require precise amino acid supply. Histidine is also a precursor of carnosine and anserine, histidine-containing dipeptides abundant in poultry muscle that contribute to pH buffering, free-radical scavenging and oxidative stability of meat. This review evaluates current scientific evidence regarding dietary L-histidine and related carnosine precursors in broilers, with emphasis on productive performance, immune and antioxidant status, carcass traits, breast meat quality and practical feed formulation. The literature indicates that histidine supply influences muscle dipeptide deposition and may support growth, feed conversion, breast yield, meat oxidative stability and tolerance to metabolic stress. However, responses depend on genotype, age, sex, dietary protein level, amino acid balance, beta-alanine availability and environmental conditions. Therefore, histidine should be considered both an indispensable amino acid and a functional nutrient in precision broiler nutrition.

Key words*: amino acid metabolism, antioxidant capacity, broiler chickens, carnosine, L-histidine.*

DIETARY INCLUSION OF *Tenebrio molitor* MEAL AS AN ALTERNATIVE PROTEIN SOURCE AND ITS EFFECTS ON BROILER DIGESTIVE ORGANS

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Abstract

The increasing cost of conventional feed ingredients has encouraged the use of alternative protein sources in poultry nutrition. One promising ingredient is Tenebrio molitor meal, which has high protein content and a favorable amino acid profile. This study aimed to evaluate the effects of dietary inclusion of Tenebrio molitor meal on digestive organ performance and intestinal morphology of broiler chickens. The experiment was conducted using a Completely Randomized Design (CRD) with four dietary treatments of 0% (control), 5%, 10%, and 15% inclusion levels. Parameters observed included relative weights of digestive organs and intestinal morphology, such as villus height and crypt depth. Data were analyzed using analysis of variance (ANOVA) followed by the Least Significant Difference (LSD) test at a 5% significance level. The results indicated that low to moderate inclusion levels did not negatively affect digestive organ development and tended to improve villus structure. However, high inclusion levels caused morphological changes that may reduce nutrient absorption efficiency. It was concluded that Tenebrio molitor meal can be used as an alternative feed ingredient in broiler diets at appropriate inclusion levels without impairing digestive organ performance.

Key words*: broiler chickens, Tenebrio molitor meal, digestive organs, alternative protein source.*

EFFICIENCY OF USING LOCAL FEED RESOURCES IN TURKEY HYBRID NUTRITION

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Abstract

Feeding represents a key determinant of productive efficiency in turkey production systems, directly influencing growth performance, production costs, and overall sustainability. This study evaluated several dietary formulations designed for an interline turkey hybrid developed within the gene bank of INCDCSZ Brașov. The diets were optimized in terms of nutrient levels and incorporated local feed resources (peas, maize, wheat, sunflower meal) alongside medicinal plants with immunostimulatory potential (nettle, garlic, calendula). The results showed that balanced formulations based on local raw materials and supplemented with 2-4.5% medicinal plants ensured an optimal balance between productive performance, animal health, and economic efficiency. These feeding strategies also reduced reliance on imported feed ingredients and limited vulnerability to market price fluctuations. Although the average unit cost of the feed increased moderately, economic analysis indicated that the potential biological and preventive health benefits may partially compensate for these additional costs.

Key words*: economic efficiency, feed conversion ratio, local feed resources, medicinal plants, turkey hybrids.*

CHEMICAL COMPOSITION AND BIOLOGICAL ACTIVITIES OF THYME (*Thymus vulgaris*) AND TEA TREE (*Melaleuca alternifolia*) ESSENTIAL OILS

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Abstract

Essential oils are explored as natural alternatives to synthetic additives because of their diverse biological activities and potential use in poultry production. This study evaluated the chemical composition and in vitro biological properties of thyme (Thymus vulgaris) essential oil (TEO) and tea tree (Melaleuca alternifolia) essential oil (TTEO) as potential bioactive candidates for broiler nutrition. Gas chromatography–mass spectrometry (GC–MS) analysis showed that TEO was dominated by thymol (52.84%), whereas TTEO was characterized mainly by terpinen-4-ol (37.14%). Antimicrobial activity against Escherichia coli, Salmonella typhimurium, Listeria monocytogenes, and Clostridium perfringens assessed by broth microdilution and disc diffusion assays, showed stronger inhibition by TEO, MICs of 7.5 µg/mL against S. typhimurium and C. perfringens, while TTEO exhibited MICs of 7.5 µg/mL against L. monocytogenes and C. perfringens, 15 µg/mL against S. typhimurium, and 62.5 µg/mL against E. coli. Antioxidant activity, determined by the DPPH assay, was higher for TEO (65.48% at 0.09 mg/mL), whereas TTEO reached 56.02% at 17 mg/mL Both oils showed modest anti-inflammatory effects and relevant in vitro bioactivity, with thyme oil showing superior antimicrobial and antioxidant performance.

Key words*: antimicrobial activity; DPPH radical scavenging; GC–MS profiling; Melaleuca alternifolia essential oil; phytogenic feed additives, Thymus vulgaris essential oil.*

ASSESSMENT AND CLASSIFICATION OF MINERAL OIL CONTAMINATION IN FEED AND MILK IN RELATION TO LEGISLATIVE BENCHMARKS

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Abstract

Contamination of animal feed and food with mineral oil hydrocarbons (MOH), particularly the MOSH (saturated) and MOAH (aromatic) fractions, is becoming an increasingly important issue for food safety due to the absence of harmonized and binding legislative limits at the European level. This study aims to assess and classify MOH contamination in animal feed and milk in relation to current legislative benchmarks, combining a literature-based approach with an applied analysis. Different relevant references were reviewed to evaluate the current regulatory framework and its limitations. In addition, 32 feed samples and 16 milk samples collected from farms in North-Eastern Romania were analyzed for MOSH and MOAH contamination levels using previously validated LC-GC-FID methodology. The results were assessed in relation to existing guideline values and further interpreted through hypothetical regulatory scenarios. A classification framework for contamination levels was proposed, highlighting a high proportion of non-compliant samples. The findings emphasize the need for legislative measures and improved monitoring across the entire agri-food chain.

Key words*: mineral oil, food safety, legislative benchmarks, contamination.*

COMPARISON OF ENERGY PROTEIN BALANCE IN RATION ON HEMATOLOGICAL VALUES AND LIPID PROFILE IN SENTUL MALE CHICKENS IN CAGE AND LITTER SYSTEMS

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Abstract

This study aims to analyze the comparative effects of energy-to-protein ratios in feed on hematological parameters and lipid profiles of male Sentul chickens reared in cage and litter housing systems. The research employed a Completely Randomized Design (CRD) with three protein levels (13%, 15%, and 17%) at a constant metabolizable energy content of 2750 kcal/kg. Each treatment included six replicates across two different rearing systems. Observed parameters included erythrocyte count, leukocyte count, hematocrit value, as well as HDL and LDL levels. Findings indicate that higher protein levels in the diet tend to elevate hematocrit values and HDL concentrations, accompanied by increased LDL levels. The litter system exhibited higher leukocyte responses compared to the cage system. It can be concluded that the energy-protein ratio in feed influences the physiological condition of Sentul chickens.

Key words*: energy-protein balance, Sentul chicken, hematology, HDL, LDL, housing system.*

INFLUENCE OF TURMERIC ON GROWTH PERFORMANCE AND INTESTINAL HISTOMORPHOMETRY IN BROILERS

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Abstract

Natural herbal products are increasingly recognized as effective alternatives to antibiotic growth promoters, improving growth performance and disease resistance in livestock and poultry. Curcumin, a lipophilic polyphenol derived from the rhizomes of Curcuma longa, has been highlighted for its beneficial effects, making it a promising feed additive. This study evaluated the effects of dietary turmeric supplementation on growth performance in broilers, as well as selected histomorphometric parameters, including intestinal villus height, villus width, villus surface area, and crypt depth. A total of 24 male Ross 308 broilers were assigned to two treatments over 42 days: a control group receiving a basal diet and an experimental group fed the same diet supplemented with 1% turmeric powder. The results showed that turmeric supplementation significantly increased villus height, width, and surface area ($p<0.001$). These structural changes enhanced the absorptive capacity of the intestinal mucosa and improved nutrient transport, leading to significant increases in body weight, feed intake, and feed conversion ratio ($p<0.05$). Overall, the findings indicate that turmeric can be used as a natural alternative to conventional growth promoters in broiler production.

Key words*: Chicken meat, growth promoters, intestinal morphology, turmeric.*

CONTROL OF *Eriochloa villosa* (Thunb.) Kunth, AN EMERGING THREAT TO SILAGE CROPS: A POT CULTURE STUDY

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Abstract

Eriochloa villosa, an invasive Poaceae weed species, is an increasingly problematic pest in agricultural fields. In this study, the efficacy of 19 herbicide treatments applied in three replicates as formulations in various application rates and presence or absence of adjuvants was evaluated against E. villosa in an outdoor pot trial located in Giarmata, Romania. Three visual assessments were carried out every week after the single post-emergence application and inferential statistical analyses showed significant effects of treatments, assessment dates and their interactions ($p < 0.001$). Efficacy increased over time for most treatments, although those based on Propaquizafop, Clethodim and Cycloxydim provided the highest control, several variants already reaching total control by the second assessment, for both homologated rates as well as higher doses. Quizalofop-P-ethyl and Fluazifop-P-butyl also provided high control, while the others only reached a moderate amount of control. Our findings indicate that out of the tested formulations, those based on ACCase inhibitors performed the best, showing promising option for management strategies of E. villosa, although field trials are still needed to further investigate their effect in natural conditions.

Key words*: Chemical control, post-emergence, treatment performance, Poaceae, phytotoxicity.*

POST-EMERGENCE CONTROL OF *Eriochloa villosa* (Thunb.) Kunth IN SILAGE CORN

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Abstract

Weed interference in agricultural fields poses an important challenge globally due to direct competition with vulnerable crops such as corn. Our study is focused on the chemical control of Eriochloa villosa, commonly known as the woolly cupgrass, an emerging invasive Poaceae species in Romania that germinates in waves and was reported to significantly reduce corn yield. We conducted a post-emergence experimental trial in which six commercial formulations were tested against E. villosa at maximum rates in a field located near Buzas, Timis County, Romania. In this practical screening, three visual assessments were carried out and data statistically analysed. Our findings revealed that treatments, assessments dates and their interactions were significant, and treatments based on Tembotrione 44 g/l and Mesotrione 75 g/l + Nicosulfuron 30 g/l provided the best results, with over 90% control 24 days after the application, while other treatments provided only moderate control. The inclusion of these treatments is immediately applicable in agricultural field management strategies by farmers and other specialists, and the results establish an important foundation for future research of E. villosa.

Key words*: weed suppression, chemical control, phytotoxicity, post-emergence, Poaceae.*

OPTIMIZING POST-EMERGENCE HERBICIDE PROGRAMS FOR RAGWEED (*Ambrosia artemisiifolia*) AND ASSOCIATED BROADLEAF WEEDS IN SUNFLOWER

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Abstract

Ambrosia artemisiifolia is one of the most problematic weeds in sunflower cultures, with major agronomic, environmental and public health implications. A post-emergence, double application experimental field trial was conducted in western Romania in a tribenuron-tolerant sunflower hybrid. The control of Halauxifen-methyl and Halauxifen-methyl+Tribenuron-methyl mixtures with or without the adjuvant isodecyl alcohol ethoxylate against A. artemisiifolia, Cirsium arvense, Persicaria maculosa and Hibiscus trionum was visually evaluated during five assessment dates. Crop phytotoxicity was evaluated as well, which remained low and transient throughout the trial. Treatment efficacies were species-dependent and against A. artemisiifolia, a single application of halauxifen-methyl at 1 L/ha achieved the highest efficacy, reaching complete control at 14 and 50 days after application. In contrast, halauxifen-methyl at 1 L/ha+tribenuron-methyl at 45 g/ha+90% isodecyl alcohol ethoxylate at 0,1 % V/V consistently provided the strongest and most consistent suppression of C. arvense, P. maculosa, and H. trionum, while simultaneously remaining among the most efficient treatments against ragweed. These findings indicate that optimized post-emergence herbicide treatment can provide effective broadleaf weed management in Tribenuron-tolerant sunflower while maintaining acceptable crop safety.

Key words*: halauxifen methyl, tribenuron methyl, sunflower, chemical weed control, herbicide efficacy.*

SESSION REPRODUCTION, PHYSIOLOGY, ANATOMY

STUDY OF THE CORRELATION BETWEEN MORPHOLOGICAL INDICATORS OF EGGS AND EXTERIOR PARAMETERS IN LAYING HENS OF TWO BREEDING LINES AND THEIR SURVIVABILITY

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Abstract

The relationship between productive and exterior features and the survival of two breeding lines of laying hens population was studied. A direct correlation was established between two groups of features: 1 - exterior (density, color and shine of feathers; shape, size, color of the comb; height of the legs); 2 - morphological parameters of eggs (shape, size, condition of the cuticle, color of the shell and yolk, condition of the protein). Hens with dense black-pearl and zoz-like plumage, an elongated rose-shaped comb and high legs laid teardrop-shaped eggs of medium size, with a glossy shell, a large bright yolk, and a transparent dense protein. Their survival was 100%. Hens with red and white-black plumage (preserved 95%) had a leaf-shaped or rose-shaped comb, shorter legs and laid larger eggs (including round ones, with weak polar differentiation), dull and poorly mineralized shells, with smaller yolk and a larger zone of thinned protein. Hens with leaf-shaped combs laid fewer number of eggs that had defects in the shell texture in hot conditions.

Key words*: correlation, exterior indicators, laying hens, morphological parameters of egg, survivability.*

INFLUENCE OF SYMBIOTIC ON PRODUCTIVITY, MORPHOLOGICAL INDICATORS OF EGGS, PROLONGATION OF THE PRODUCTION CYCLE AND SURVIVAL OF LAYING HENS OF THE LOHMANN BROWN CROSS

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Abstract

The effect of a symbiotic from a mixture of probiotic and prebiotic (lyophilized cultures of Lactobacillus plantarum and Bifidobacterium adolescentis), inulin, lactose, fructose and starch on egg production, its prolongation, morphological indicators of eggs and survival in Lohmann Brown crossbred hens was studied. A positive effect of the use of the symbiotic in experimental hens of the second phase of laying on the following indicators was established: group laying (100%); prolongation and rhythmicity of egg laying, correction of violations of the texture and pigmentation of the shell with the achievement of their stable quality parameters, the formation of a strong subshell membrane, bright and large yolks, and a conditioned protein part. In the control group, defects in the shell texture were observed in 45-60% of eggs and cessation of egg production in a third of the population. In the experimental chickens, stable egg laying of conditioned eggs, and in individual individuals - mega-eggs (weighing up to 85-93 g) was maintained for up to 2.5-3 years. The survival rate of the experimental group chickens was 95.6%, the control group - 60%.

Key words*: egg production prolongation, hens, Lohmann Brown**, morphological parameters of eggs, survivability, symbiotic.*

EFFICIENCY OF USING ESTRUS SYNCHRONIZATION PROTOCOLS IN DAIRY COWS

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Abstract

As well as estrus synchronization programs have the role of increasing fecundity at the farm level, our experimental study was carried out during 2024-2025, on a herd of 111 dairy cows, with the aim of testing the efficiency of these protocols. Four groups were formed: group A consisting of 31 cows synchronized with OvSynch; group B consisting of 35 heads synchronized with OvSynch+PRID; group C consisting of 24 cows synchronized with d-cloprostenol and group D consisting of 21 cows inseminated on a spontaneous estrus cycle. The fecundity index, the services per conception rate, the calving to first services interval and the service period was monitored. Gestation control was performed with a portable ultrasound device, 30 days after insemination. The obtained results showed that the percentage of pregnancies was +8.61% in group A; +9.53% in group B; +16.67% in group C compared to group D. The analysis calving to first service interval shows that significant differences were recorded between groups of cows A - D ($p<0.05$; $p=0.03866$). Our findings support the implementation of hormone synchronization protocols to improve reproductive management in dairy herds.

Key words*: conception rate, dairy cows, OvSynch, reproductive performance.*

STUDY OF THE MILK YIELD OF KARAKACHAN SHEEP RAISED IN THE CENTRAL STARA PLANINA REGION

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Abstract

The aim of the present study was to monitor the dynamics of milk production and changes in the physicochemical composition of milk throughout the lactation period of the autochthonous Karakachan sheep breed. The animals were reared in the Central Stara Planina region. During the study period, the ewes were kept under a barn-and-pasture system (combined housing and grazing) with continuous access to water. The investigation was carried out from 2022 to 2025 and included 264 ewes of various ages. Milk yield during the 90-day milking period (May–July) was determined using the AS method of ICAR. Mean daily yield, depending on the lactation phase, ranged from 0.52±0.01 L in the first control period to 0.21±0.01 L in the third control period. The mean 90-day milk yield was 33.41 L. Average values for fat content and dry matter (DM) increased with advancing days of lactation, whereas mean concentrations of protein, lactose and solids-not-fat (SNF) decreased.

Key words*: Karakachan breed, milk yield, physicochemical composition, sheep.*

REPRODUCTIVE PERFORMANCE OF WAGYU AND ABERDEEN ANGUS RECIPIENTS AFTER EMBRYO TRANSFER IN BULGARIA

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Abstract

This study evaluated reproductive performance in Wagyu cows under a pasture-based system with reproductive biotechnologies, including embryo transfer. Conducted from 2022 to 2025 on a farm in Palitsi village, Elena municipality, Bulgaria, the study included two groups: 36 Wagyu × Wagyu recipients (including imported heifers and their offspring) and 27 Aberdeen Angus heifers receiving Wagyu embryos. In the first group, mean calving intervals (CI) were 396 days for the first calving and 383 days for the second, showing a trend toward shorter intervals and greater stability after the first calving (CV: 21.37% vs. 11.07%). These values are comparable to or more favourable than reported data for Wagyu. In the second group, age at first calving was analysed and found to be influenced by breed, management, and reproductive technologies, while CI was not assessed due to the absence of subsequent lactations. In conclusion, calving interval and age at first calving are key reproductive traits in selection programs for beef cattle. Combining reproductive biotechnologies with optimized herd management enhances reproductive efficiency, productivity, and economic profitability.

Key words*: Aberdeen Angus, age at first calving, calving interval, embryo transfer, Wagyu.*

IMPORTANCE OF RELATIONSHIP BETWEEN FERTILITY AND LACTATION FOR SUSTAINABILITY OF DAIRY FARMING

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Abstract

Data from 192 dairy cows with the mean lactation number of 2.51 (1 to 10) were subjected to descriptive statistics to evaluate lactation and fertility parameters. The mean days in milk (DIM, lactation stage) was 170 for lactating cows (N=172), excluding dry cows (N=20, 10.42%). Cows were housed in early fresh (N = 21, DIM = 20), late fresh (N = 17, DIM = 48), peak (N = 50, DIM = 107), mid lactation (N = 44, DIM = 246), and late lactation (N = 40, DIM = 294) paddocks. Dry cows were housed in far-off (N = 13) and close-up (N = 7) paddocks. The average milk yield was 33.18 L/head/day. The percentage pregnant and inseminated cows were 46.97 and 26.77%. Herd program required to synchronize cows within 70 days postpartum. Avoiding hypocalcemia and ketosis during early postpartum, while strictly providing comfort, cows were expected to achieve pregnancy at peak milk production paddocks. In conclusion, achieving greater than 50% pregnant cows within 180-200 DIM ascertains sustainability of dairy farming.

Key words*: fertility, lactation, sustainability, days in milk, pregnant cow percentage.*

THE INFLUENCE OF POLYPHENOLS EXTRACT FROM NETTLE (*Urtica dioica)* ON THE MINERAL ANTIOXIDANT STATUS IN THE BLOOD SERUM OF BREEDING ROOSTERS AND ITS ROLE IN THE PROPHYLAXIS OF OXIDATIVE STRESS

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Abstract

Excessive oxidative stress in the body causes various types of cellular and tissue damages, which subsequently influences the functioning of the body`s organs and systems. Some micronutrients act as antioxidants, functioning as cofactors for various antioxidant enzymes. The involvement of minerals in biological processes to block and prevent the formation of reactive oxygen species are of major importance in detoxifying the body at the cellular level. Deficiency of micro- and macronutrients can cause oxidative stress, and oxidative stress inevitably affects the cellular metabolism of tissues and the body as a whole. This study was conducted to evaluate changes in major antioxidant micronutrients in the blood serum of breeding roosters. To maintain protective mechanisms against oxidative stress, the presence of antioxidant microelements is necessary, which directly or indirectly affect enzymatic and non-enzymatic defense mechanisms. Given the complexity of oxidative stress and its harmful effects on health, this paper aims to provide updated information on the mechanisms involved in the role of mineral antioxidants in protecting living organisms from oxidative factors and preventing the occurrence of disorders caused by oxidative stress.

Key words*: antioxidants, antioxidant status, minerals, oxidative stress.*

LACTATION PERFORMANCE OF PRIMIPAROUS AND MULTIPAROUS HOLSTEINS IN ROBOTIC MILKING SYSTEM

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Abstract

This experiment was conducted to evaluate performance parameters of first and second lactating cows in the robotic milking system. Data from the first lactating cows (n = 124) and the second lactating cows (n = 57) were subjected to descriptive statistics and regression analysis. The mean DIM, milk yield, entrance to the robotic parlor, and compound feed consumption in the parlor were 222 days, 28.0 L, 2.89 times, and 2.97 kg for primiparous Holsteins and 121 days, 36.7 L, 2.89 times, and 3.99 kg for multiparous cows, respectively. Entrance to robotic milking unit did not change as lactation advanced. Each entry was associated with increases in milk yield by 8.1 L and 1.00 kg compound feed consumption within the unit. In summary, the more entrance to the robotic milking unit, thereby the more feed consumption, increases milk yield in the robotic milking system.

Key words*: parity, robotic milking system, lactation.*

STUDY OF THE DYNAMICS OF COLOSTRUM COMPOSITION IN GOATS FROM THREE BREEDS DURING THE FIRST 24 HOURS AFTER PARTURITION

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Abstract

The analysis of the effects of parity and type of parturition on colostrum quality expands existing knowledge. It provides a basis for a deeper understanding of the physiological mechanisms that determine its composition. These factors, together with breed, influence the concentration of biologically active components and the dynamics of their variation in colostrum, which is of major importance for the survival and viability of newborns, as well as for the optimization of herd management. Colostrum is the first secretion of the mammary gland after parturition and plays a crucial role in supplying energy, nutrients, and passive immunity in mammals. Its composition is dynamic and undergoes significant changes during the first 24 hours postpartum. In the present study involving three goat breeds - Anglo-Nubian, Bulgarian White Dairy, and Toggenburg - the most pronounced changes were observed in protein, fat, and dry matter content. This article provides a foundation for future research in the fields of neonatal physiology and dairy herd management.

Key words*: colostrum, Goats breed, parity, physicochemical parameters, type of parturition.*

THE INFLUENCE OF POLYPHENOLS FROM NETTLE EXTRACT ON IRON METABOLISM AND SOME MICROELEMENTS THAT PARTICIPATE IN MAINTAINING IRON HOMEOSTASIS

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Abstract

Iron is integrated into metabolic processes, cell growth and proliferation, while also being an essential cofactor of the mitochondrial respiratory chain, the Krebs cycle and DNA synthesis. Maintaining iron homeostasis in the body has always been in the sights of researchers at different levels of organization and composition of living organisms, its role can be determined by the biological functions of some proteins that contain this biometal, such as hemoglobin and myoglobin, enzymes involved in biological oxidation processes, enzymes that neutralize ROS and maintain redox balance in the body. At the same time, the excess of iron is associated with cytotoxic effects, which are caused by the peculiarities of iron, as a metal with variable valence, to trigger chain reactions of free radical formation, which lead to lipid peroxidation (LPO) of biological membranes, toxic damage to proteins and nucleic acids. Therefore, the content of this microelement is strictly regulated, which allows us to talk about iron homeostasis. The purpose of this paper is to familiarize with new scientific results of iron homeostasis under the influence of polyphenols extract from nettle.

Key words*: antioxidants, iron homeostasis, iron overload, oxidative stress, plant extracts.*

VARIATIONS OF THE AMINO ACID SPECTRUM IN THE BLOOD PLASMA OF THE ROOSTER DURING THE SPERMATOGENESIS CYCLE

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Abstract

The purpose of this study is to highlight the response to experimental interventions by investigating of variations in the amino acid content in the blood plasma of roosters under the influence of biologically active compounds. The latter were obtained from the composition of sea buckthorn and red onion through techniques and methods of analysis (extraction, spectrophotometry). Blood samples from three groups of roosters were analyzed: control, experimental I and experimental II after a 30-day period of ration supplementation with biologically active compounds. Were determined 26 amino acids and their conformational states and 2 amino acid derivatives on the AAA-339 analyzer. The analysis of amino acid content in the blood plasma of roosters during the spermatogenesis cycle reveals significant changes in the amino acid profile between control and experimental groups ($p<0.05$). Changes in concentrations of essential, non-essential and specific amino acids suggest that experimental interventions may influence amino acid metabolism. The results contribute to the understanding of some metabolic mechanisms involved in spermatogenesis of birds.

Key words*: amino acids, blood plasma, reproductive potential, rooster, spermatogenesis.*

EVALUATION OF *Rosa canina* AS A NATURAL SOURCE OF VITAMIN C: IMPACT OF THE FORM OF ADMINISTRATION ON ERYTHROPOIESIS AND RENAL FUNCTION IN ROSS 308 BROILER CHICKENS

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Abstract

This study evaluated the effect of Rosa canina (rosehip) as a phytogenic supplement on the haematological profile of Ross 308 broiler chickens raised at the university experimental farm between July and August 2025. The experiment included a control group and two treatment groups, which received Rosa canina aqueous infusion (G1), and Rosa canina extract (G2) respectively, both administered via drinking water. Haematological parameters, specifically haemoglobin and haematocrit, were monitored and recorded at 7, 14, 21, 28 and 35 days of age. Erythropoietic stimulation was consistently observed in the treated groups compared to the control group. At 14 days of age, G1 showed a marked attenuation of anaemia, with individual haemoglobin values reaching 14.7 g/dL, increased compared to the 10.2 g/dL value obtained from the control group. At 35 days, G2 exhibited a pronounced haematological response attributed to enhanced vitamin C intake. The results also indicate variability in physiological responses, highlighting the need for further research to optimise dosage and forms of administration.

Key words*: phytotherapy, Rosa canina, haematological indicators.*

BETWEEN TASTE AND WELFARE: METABOLIC PROFILE AND HISTOLOGICAL ASPECTS OF COMMON DUCKS (*ANAS PLATYRHYNCHOS*) FATTENED FOR CONSUMPTION

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Abstract

Forced fattening of ducks (Anas platyrhynchos) is a zootechnical practice used to obtain fatty liver (commercially called foie gras) and duck fat. Forced fattening raises important issues regarding animal welfare, being considered by many specialists to be an intensely stressful and invasive method. In this study, metabolic and histological changes were analyzed in a population of forced-fattened common ducks. Serum protein (TP, ALB, GG, BUN, CR), lipid (TL, TRY, CHOL), carbohydrate (BG), enzymatic (AST, ALT, ALP, GGT, TSB, DBI, LDH, á-AMY, LIP, CK) and mineral (P, Mg) profiles were analyzed. The final results showed very significant differences between the initial and final values of the metabolic profiles, sometimes with the blood-brain barrier being overcome. Histological analyses also demonstrated pronounced, even degenerative, tissue structural changes.

Key words*: blood-brain barrier, ducks, forced fattening, stress, welfare.*

MORPHOMETRIC CHARACTERISTICS OF HAIR IN REPLACEMENT HEIFERS OF THE ZNAMIANSKY TYPE OF THE POLISSYA BEEF BREED DEPENDING ON THE SEASON AND FEEDING LEVEL

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Abstract

This study presents data on the morphometric characteristics of the hair of heifers of the Znamiansky type Polissya beef breed depending on the season and feeding level: group I (control group, normal feeding level, 1.57), group II (low feeding level, 1.46), group III (intensive feeding level, 1.75) and group IV (moderately intensive feeding level, 1.64). The interaction between feeding level and season significantly influenced the morphometric characteristics of hair in heifers of all groups. The hair of heifers in group III, regardless of the season, was significantly longer, denser and heavier than that of heifers in the other groups. In all groups, guard hairs predominated in the hair structure. In winter, an increase in the proportion of down was recorded in all groups, which helped protect the animals from the cold.

Key words*: beef replacement heifers, feeding level, hair, seasonal differences.*

PASSIVE IMMUNE TRANSFER IN CHAROLAIS CALVES IN RELATION TO COLOSTRUM IGG QUALITY

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Abstract

Passive immunity is essential for neonatal calf survival because calves are born agammaglobulinemic due to the synepitheliochorial placenta. This study evaluated passive immune transfer in Charolais calves by assessing colostrum quality based on immunoglobulin G (IgG) concentration. Sixteen colostrum samples were collected within six hours postpartum and analyzed using optical refractometry (Brix) and zinc sulfate precipitation. Refractometry revealed Brix values ranging from 17% to 25%, with a mean of 20.38%. Accordingly, 25% of samples were classified as high quality (>22% Brix; >50 mg/mL IgG), 69% as moderate quality (18-22% Brix; 40-50 mg/mL IgG), and 6% as low quality.

Key words*: brix refractometry, colostrum quality, calf, zinc sulphate test.*

ACCELERATED LAMBING SYSTEMS IN SHEEP BREEDING: CHALLENGES AND MANAGEMENT OPPORTUNITIES

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Abstract

Accelerated lambing systems, such as achieving three lambings within two years, are used to improve reproductive efficiency in sheep production. These systems reduce the interval between lambings and increase lifetime productivity, particularly in specialized meat breeds such as Suffolk and Texel. This review summarizes published studies on accelerated reproductive strategies in sheep, focusing on management requirements and breed-specific responses. Key aspects discussed include estrus synchronization, control of reproductive seasonality, nutritional management, and animal welfare under intensive breeding conditions. Available evidence indicates that Suffolk sheep generally adapt well to accelerated lambing systems, while Texel sheep may show certain limitations due to stronger seasonal breeding patterns. The success of accelerated lambing depends on appropriate reproductive management, balanced nutrition, and continuous monitoring of animal welfare.

Key words*: accelerated lambing, sheep reproduction, Suffolk, Texel.*

LIVE ESTROUS FEMALE VERSUS PHEROMONAL STIMULATION: A COMPARATIVE ASSESSMENT OF CANINE SEMEN COLLECTION OUTCOMES

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Abstract

This pilot descriptive study compared manual semen collection outcomes in sexually experienced adult male dogs collected either in the presence of a live intact female in estrus (n = 3) or using isolated estrous pheromones sampled from an estrous female (n = 3). Outcome measures included ejaculation latency (time from stimulus exposure to ejaculation), ejaculate volume, semen pH, and macroscopic appearance (color, odor). Inferential statistical analysis was not performed because of the small sample size; results are presented descriptively. Median (range) ejaculation latency was shorter in the live-female group at 3:00 min (2:52-3:37) than in the pheromone group at 4:35 min (4:18-5:02). Mean ejaculate volumes were similar between groups - 3.93 mL (SD 2.70) for live-female stimulation and 4.03 mL (SD 2.85) for pheromone - only stimulation. Semen pH values were broadly comparable between groups, and all ejaculates were milky-white and odorless. These findings indicate that pheromone - only stimulation can induce ejaculation and produce grossly comparable ejaculates under low-stress conditions, although ejaculation latency was longer. Given the small parallel-group design, use of a single pheromone donor, and absence of objective sperm-quality parameters, results are preliminary. Further research using larger crossover designs and comprehensive fertility endpoints is warranted.

Key words*: dogs, ejaculate, pheromones, semen collection.*

GROWTH HORMONE LEVELS IN LAMBS OF THE BULGARIAN DAIRY SYNTHETIC POPULATION ACROSS FOUR FARMS: A MIXED-MODEL APPROACH

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Abstract

The aim of the present study was to evaluate the levels of somatotropic hormone (GH) in lambs of the Bulgarian Dairy Synthetic Population (BDSP) depending on the factors age, sex, farm, type of birth, identification number, and sampling date using a mixed statistical model. The study was conducted in four sheep farms located in the Sofia region and included 56 suckling lambs - 25 females and 31 males - from which blood samples were collected twice for the analysis of plasma somatotropin levels using the ELISA method with a HGH Kit on an ELISA Reader. The data were statistically processed using a mixed model implemented in R, applying the MMRM package (mixed models for repeated measures) and the DPLYR package for descriptive statistics, while figures were generated using the ggplot2 package. Pairwise comparisons were made with the package emmeans, tukey method. The somatotropin level was treated as a continuous dependent variable, an unstructured covariance matrix was applied in the model, and variance estimation was performed using the restricted maximum likelihood (REML) method. The results showed that somatotropin levels differed significantly depending on the type of birth ($p < 0.01$), with twin lambs having, on average, 0.392 µIU/ml lower levels compared to single-born lambs ($p < 0.01$). No significant difference was found between male and female lambs. Age groups 4 and 5 exhibited significantly higher somatotropin levels compared to age group 1 - by 0.456 µIU/ml for group 4 ($p < 0.1$) and by 1.267 µIU/ml for group 5 ($p < 0.01$). Lambs raised at the Institute of Animal Science (IAS), Mirkovo, and Ravnishte had significantly lower somatotropin levels compared to those raised in Bosnek ($p < 0.01$): by 0.424 µIU/ml for lambs at IAS, by 0.507 µIU/ml for lambs in Mirkovo, and by 0.606 µIU/ml for lambs in Ravnishte.

Key words*: BDSP lambs, Mixed Statistical Model, sheep, somatotropic hormone.*

SESSION TECHNOLOGIES OF ANIMAL HUSBANDRY

HISTOLOGICAL STRUCTURE OF THE *Longissimus dorsi* MUSCLE IN NON-CASTRATED AND IMMUNOLOGICALLY CASTRATED PIGS AND ITS INFLUENCE ON CARCASS QUALITY INDICATORS

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Abstract

Immunocastration is increasingly used as an alternative to surgical castration, but its effects on muscle histology and carcass traits require detailed evaluation. To determine the influence of immunological castration on the histological structure of the Longissimus dorsi muscle and its relationship with carcass quality indicators in pigs slaughtered at 110 and 130 kg. The study involved 300 hybrid gilts divided into immunocastrated and non-castrated groups. Animals were slaughtered at 110 and 130 kg (15 pigs per group). From each group, 10 muscle samples were collected for histological and morphometric analysis. Muscle fiber diameter, relative

muscle and connective tissue area, and carcass quality traits were assessed using standard microscopy and statistical analysis. Immunocastrated pigs slaughtered at 130 kg demonstrated a 6.8% greater relative muscle tissue area compared with non-castrated counterparts. Mean muscle fiber diameter increased by 9.4% at 130 kg compared to 110 kg in immunocastrated animals. Connective tissue proportion was 5.1% lower in immunocastrated pigs at 110 kg. Carcass meatiness was positively correlated with muscle fiber hypertrophy and higher muscle tissue percentage. Immunocastration promotes moderate muscle fiber hypertrophy and increases muscle tissue proportion, particularly at higher slaughter weight. Biologically, this reflects enhanced postnatal muscle growth; practically, it supports improved carcass meat yield without adverse histological changes.

***Key words**: carcass meatiness, gilts, histological analysis, immunocastration, Longissimus dorsi, muscle fiber, pork meat.*

ALTERNATIVES TO MINIMIZE THE USE OF ANTHELMINTICS IN BUFFALOES

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Abstract

Gastrointestinal parasitic infections in buffaloes represent a significant health and economic problem in pasture livestock farming, associated with reduced productivity, reduced growth, poor feed conversion, reduced milk production and increased costs for veterinary services. The widespread and prolonged use of synthetic anthelmintics has led to the progressive development of drug resistance, which limits their therapeutic effectiveness and necessitates the search for alternative, sustainable approaches for helminth control. The aim of the present study was to evaluate and compare the anthelmintic effect of dried leaves of Stevia rebaudiana compared to a conventional veterinary medicinal product containing ivermectin in buffaloes with natural gastrointestinal parasitic infestation. The experiment was conducted in naturally infested animals, divided into control and experimental groups. The effectiveness of the applied agents was assessed by coproscopic examinations and determination of the reduction in the number of helminth eggs (EPG) before and after treatment. The results obtained showed a complete reduction of the parasitic invasion in the animals treated with ivermectin, as well as in the group receiving dry drug from Stevia rebaudiana. The results, reported on the 20th day of the experiment, demonstrated a positive effect on the biochemical profile in buffaloes that received 100.0 g of dried stevia in the food ration for 14 days. The changes observed in experimental group A1 are indicative of a hepatoprotective effect of the plant. The obtained data confirm the potential of Stevia rebaudiana as a natural alternative or complementary agent in the control of helminthiasis in buffaloes, with the possibility of limiting the development of antiparasitic resistance and implementing more sustainable strategies in modern animal husbandry.

Key words*: anthelmintics, buffaloes, drug resistance.*

APPLICATION OF STEVIA AS AN ALTERNATIVE THERAPY IN BUFFALOES IN MODERN VETERINARY MEDICINE

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Abstract

Under conditions of increasing restrictions on the use of antimicrobial agents in animal husbandry, growing interest is being directed toward natural bioactive substances as alternatives for maintaining health status and metabolic balance in young animals. Among these, Stevia rebaudiana Bertoni extract stands out due to its proven antioxidant, hepatoprotective, and metabolism-regulating properties. The aim of the present study was to evaluate the effect of stevia extract on hematological and biochemical blood parameters in newborn buffalo calves. In the experimental design, newborn calves received a 5% extract of Stevia rebaudiana Bertoni at a dose of 20 mL per day, administered with milk over a 30-day period. Hematological and biochemical blood parameters were monitored at the beginning of the experiment and on day 31. A statistically significant increase in hemoglobin (HGB) concentration by 21.8% ($p \leq 0.01$) was observed, along with a tendency toward increased values of white blood cells (WBC - 17.8%), lymphocytes (LYM - 10.1%; LYM%), monocytes (MON - 2.43%), granulocytes (GRA - 8.45%), red blood cells (RBC - 15.7%), and platelets (PLT - 34.4%). A statistically significant decrease in alanine aminotransferase (ALAT) activity by 52.11% ($p \leq 0.001$) was also recorded. Blood glucose concentration decreased significantly at the end of the experiment ($p \leq 0.01$). Total cholesterol and LDL-cholesterol levels were significantly reduced ($p \leq 0.01$ and $p \leq 0.001$, respectively). Statistically significant differences in triglyceride levels were observed on day 31 ($p \leq 0.01$), as well as a significant decrease in urea concentration at the end of the experiment ($p \leq 0.01$). The obtained results indicate a pronounced hematopoietic and hepatoprotective effect of stevia and confirm its potential as a natural agent for supporting metabolism and overall health status in animals.

Key words*: antibiotic resistance, calves, hematological indicators, stevia.*

RESEARCH ON THE INFLUENCE OF TECHNOLOGICAL FACTORS ON PRODUCTIVE PERFORMANCE IN A BROWN CATTLE HERD

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Abstract

This paper aims to highlight the influence of exploiting technology on productive performance in a dairy herd belonging to the Brown breed. The herd for which the study was carried out consisted of 48 head of cows in different lactations and which are exploited for semi-intensive milk production on a farm in NV Moldova, Romania. The data on milk production and quality for 2024 were obtained from records drawn up during the official control of the productions and those existing on the farm and were statistically processed using the software SAVC and SPSS 16.00 for WINDOWS. The average daily production was 20.03 kg of milk/head with 4.13% fat and 3.59% protein. The highest average production of 5,699.26 kg was achieved in the second lactation, when milk contained 3.83% fat and 3.42% protein. Analyzing the results obtained and comparing them with those characteristics of maternal ascendancy, we can conclude that, in the herd studied, milk is of good quality, but the animals do not externalize their genetic potential.

Key words: *Brown breed, milk, Romania.*

RESEARCH ON THE GENETIC VALUE OF A FLEKVIEH BREED HERD AND ITS INFLUENCE ON THE PRODUCTIVE LEVEL

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Abstract

This paper aims to highlight the influence of the genetic value of a Fleckvieh herd of cows on milk and meat production. The primary data came from 82 cows with lactations and 51 products obtained from them, animals exploited in semi-intensive system in a farm in Iasi County, Romania. With the help of the SAVC software (Variant and Covariant Analysis Statistic), the data were statistically processed and the average, variance, standard deviation, standard deviation of the mean and coefficient of variation were calculated. For milk production, the data covered the amount of milk (MY), fat (% F) and protein (% P) content and the number of somatic cells (NSC). For meat production, the data on calving weight (BW) and the average daily gain at 200 days (DWG200) were processed. In the flock, the highest average for milk production was 6643.80 kg/lactation, and for fat and protein percentage they were 4.04% and 2.93%, respectively. For meat production characters, the bull family 20215 recorded the highest average BW of 32.67 kg and 973.33 g/day for DWG200. The performances recorded by the animals fall within the breed-specific values, the herd having an important genetic potential.

Key words*: Fleckvieh, milk production, meat production.*

PRODUCTIVE PERFORMANCE OF CHAROLAISE CATTLE EXPLOITED IN EXTENSIVE AND SEMI-INTENSIVE SYSTEMS ON FARMS IN SUCEAVA COUNTY, ROMANIA

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Abstract

The present study aims to analyze the productive performance of Charolaise beef cattle exploited in extensive and semi-intensive systems on farms in Suceava county. The biological material consists of animals under official production control through which body weight is monitored at birth (BW), at 200 days (W200) and at 365 days (W365) and based on the results obtained through measurements, it was calculated the average of daily weight gain (DWG). The primary data were statistically processed using specific computer programs, calculating the values of the estimators and testing the differences in means. For BW, the average of animals in the semi-intensive system was insignificantly lower by 0.54 kg ($p<0.05$). The differences are significant in favor of this system only for the W365 and DWG365 environments which are higher by 32.93 kg and 138.18 g/day respectively, the performances at one year being influenced by the management applied.

Key words*: Charolaise, meat, production performance.*

STUDY OF THE EFFECT OF A SYMBIOTIC SUPPLEMENT ON RABBIT PRODUCTIVITY, SURVIVAL AND BIOLOGICAL QUALITY OF MEAT

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Abstract

The effect of a symbiotic supplement when feeding rabbits on their performance parameters, livestock survival, and physicochemical properties of muscle tissue was studied. Rabbits in the experimental group were periodically given a symbiotic supplement with water (pre-weaning) or with feed (post-weaning) on a specific schedule, while rabbits in the control group did not receive this drug. It was found that the use of the symbiotic improved the productivity (growth rate in terms of average daily gains) and survival of rabbits. The growth rate of rabbits in the experimental group was maximal during the first two months of life, which allows to reduce the time they are kept with their mothers. After slaughtering the rabbits, a comparative assessment of the biological value of meat in animals from both groups was carried out. The quality of meat was higher in rabbits fed the symbiotic supplement.

Key words*: biological quality of meat, productivity, rabbits, survivability, symbiotic.*

ADVANCES AND INNOVATIONS IN SERICULTURE - A REVIEW

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Abstract

This review aimed to emphasize recent discoveries and advances in sericulture. Current trends in silkworms rearing include technological progress and a diversification of products. Innovations like genetically modified silkworms, automation, and precision farming techniques including drone technology and monitoring systems are increasing efficiency by further optimized mulberry cultivation and silkworm rearing. There`s a growing effort to use silkworm pupae and sericin for high-value applications in medical, cosmetic, and nutraceutical industries. Genetic engineering has enabled the manipulation of silkworm genomes. Through genetic techniques, scientists can precisely edit the genes responsible for the synthesis of silk proteins. The production of disease-resistant silkworm breeds is part of an innovative line. Automated systems, drive units and artificial intelligence algorithms have offering new opportunities in the field. New opportunities for enhancing silk production have been made possible by biotechnology. Advances in molecular genetics, biotechnology, and engineering are leaving their mark on the evolution of sericulture, making paradigm shifts vital.

Key words*: innovations, sericulture, silkworms, trends.*

NATURAL ALTERNATIVES TO MITIGATE THE EFFECTS OF HEAT STRESS IN BROILER CHICKENS

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Abstract

Heat stress is one of the main challenges facing modern broiler production, having a significant impact on it, thus leading to reduced growth performance, the onset of physiological dysfunctions, and disruption of the oxidative balance. In recent years, numerous studies have been conducted on the use of natural feed additives as a sustainable alternative to mitigate the adverse effects of heat stress. This review article provides a comparative analysis of the main natural bioactive compounds used in the modern poultry industry (antioxidant molecules, plant-derived phytochemicals, and essential oils), highlighting their role in increasing heat tolerance, maintaining intestinal integrity, and supporting physiological homeostasis in broiler chickens. The results presented in the literature, highlight the fact that these natural alternatives can reduce oxidative stress, stimulate feed conversion performance, and partially restore productive performance without the disadvantages associated with the use of antibiotics. Summarizing the analysed information, it can be concluded that the rational integration of natural bioactive compounds into effective and sustainable nutritional programs supports both the resilience and productivity of broiler chickens exposed to heat stress conditions.

Key words*: broiler chicken, heat stress, nutrition, bioactive compounds.*

STUDY OF THE EFFECT OF PHYTOEXTRACTS ON OVERCOMING NEONATAL HYPOGLYCEMIA IN FARM ANIMALS. A REVIEW

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Abstract

Neonatal hypoglycemia is a common metabolic disorder characterized by abnormally low blood sugar levels, which can lead to serious health complications in newborn animals and is crucial for their survival during the first 1 to 3 days. They have low glycogen stores to initiate glycolysis and gluconeogenesis, as well as an underdeveloped liver. This condition leads to neurological damage, reduced growth, high mortality and a weakened immune system. The causes can be of different nature: insufficient or delayed colostrum intake, prolonged and difficult labor (dystocia) - depletion of energy reserves, infections, malnutrition, etc. Standard veterinary practices include intravenous or intraperitoneal administration of hypertonic solutions, which is laborious, requires the constant presence of a veterinarian, and the invasive procedure causes stress in the newborn and further complicates its condition. Glycolytic activity is a main parameter in metabolic studies in conditions such as hypoglycemia. The use of plant extracts shows potential to modulate glycolysis and restore energy balance in newborn animals. Traditional treatment is not always successful and often has the opposite effect and can lead to recurrence of hypoglycemia. Complications of intravenous infusions, such as phlebitis, often occur, requiring the placement of a central source, which is difficult in a farm setting. This requires avoiding aggressive intravenous infusion in favor of frequent oral administration of hypertensive phytoextracts. This review explores ways to overcome neonatal hypoglycemia by using alternative methods and limiting invasive and often unsuccessful interventions to optimize glucose balance.

Key words*: farm animals, glucose, neonatal hypoglycemia, phytoextracts.*

COMPARATIVE ANALYSIS OF MILK QUALITY PARAMATERS IN DAIRY FARMS FROM TRANSYLVANIA, ROMANIA

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Abstract

Milk quality, including physicochemical and microbiological parameters, is an essential element to increase the value of dairy products. Within the European Union, milk producers are incentivized to enhance these qualitative parameters by establishing solid standards and differentiated compensation systems. This study aims to present a comparative analysis of key milk quality parameters in dairy farms from Transylvania, Romania, between 2023 and 2025. For the scope of the study, four groups of farms, grouped by herd size, were assessed for milk physicochemical and microbiological indicators - fat, protein, density, total dry matter, lactose, somatic cell count, and total germ count. Data analysis included comparisons with Romanian national averages, EU averages, and top-performing EU countries (e.g., France, Germany), considering milk production volumes and predominant cattle breeds. The analysis revealed variations in milk quality parameters across farm groups, with differences influenced by herd size and breed composition. Comparative results highlighted areas where Transylvanian farms close in or diverge from national and EU benchmarks. The findings underscore opportunities for targeted improvements in milk quality among dairy farms in Transylvania. Implementing specific technical measures and adhering to sustainable milk quality standards could enhance raw milk valuation and increase processing yields on long-term, implicitly the farmers revenues.

Key words*: competitiveness, microbiology, measure, milk quality, physicochemical.*

IMPACT OF FEEDING REGIMES ON GROWTH, CARCASS TRAITS, AND MEAT QUALITY IN RUSTY TSIGAI LAMBS

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Abstract

This study investigated the effects of differentiated feeding on growth performance, carcass composition, and meat quality of Tsigai lambs – rusty variety. Two experimental groups were provided with distinct diets after the third week of fattening; body weight, average daily gain (ADG), and feed efficiency were monitored over a 75-day period. Lambs in group L2, fed a pelleted concentrate diet containing 136 g digestible protein (DP), exhibited higher growth rates, achieving an ADG of 261.78 g, compared to 218.33 g in L1, which received on-farm produced forage with 130 g DP. Final body weight was significantly greater in L2 ($p < 0.01$). Slaughter yields and carcass weights did not differ significantly between groups, but carcass tissue composition was influenced by diet: L1 had higher fat and lower bone content, while L2 showed a higher meat-to-fat ratio. Physicochemical analysis revealed significant differences ($p < 0.05$) in leg fat and water content. Textural profile analysis indicated the shoulder was firmer, the loin more tender and elastic, and the leg intermediate. These findings demonstrate that diet composition significantly affects growth, carcass characteristics, and meat quality in Tsigai lambs.

Key words*: average daily gain, chemical composition, diet, lamb, textural profile.*

EFFECT OF VITAMIN AND MINERAL NUTRITION ON REPRODUCTIVE PERFORMANCE IN BOTOȘANI KARAKUL MAIDEN EWES

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Abstract

The biological material consisted of two groups (L1 and L2) of young ewes, and the experimental factor was the supplementary administration of a vitamin-mineral complex (VM), applied only to the L2 group. At the time of breeding, the live weight of ewes in L2 was 4.67% higher than that of L1 ($p \leq 0.001$). Evaluation of body condition indicated that VM supplementation did not have a significant effect on body condition score; however, it directly contributed to improved body development in L2. For croup height, chest circumference, body width, chest depth, and croup length, the differences between the groups were highly significant ($p \leq 0.001$). In L1, the proportion of non-pregnant and aborted maiden ewes was higher (20% vs. 12%). The favourable effect of VM supplementation resulted in increased fecundity, fertility, and weaning rates in L2. In addition, L2 ewes showed improved intrauterine development of lambs, reduced neonatal mortality, and higher lamb weights at weaning (17.17 vs. 18.10 kg; $p \leq 0.001$).

Key words*: Botoșani Karakul, body condition, fertility, reproduction, young sheep.*

ANALYSIS OF CAROTENOID CONTENT AT VARIOUS PLANT SOURCES USED TO INTENSIFY MEAT COLOR IN CHICKEN BROILER

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Abstract

The increasing demands for the `yellow chicken` have led poultry farmers to adopt different technological strategies, including the administration of carotene-rich cereals, in quantities that ensure the desired coloration. In this context, we set out to determine the carotenoid content of the main color source used in poultry farming (six maize hybrids) and several plant species (marigold, red pepper, turmeric and sea buckthorn); all samples were analyzed by spectrophotometric methods. In maize hybrids, the total carotenoid content was only 0.29-0.74 mg/g, while in the tested plants it was 0.81-8.31 mg/g. The dosage of β-carotene (responsible for the red-orange color) showed that the highest content was in turmeric (0.84-96.63% higher than the other samples), a situation also valid for lycopene (yellow-orange-red color) at which the turmeric was ahead of the other samples by 21.15-99.72%. The results obtained indicate that, unlike the classic corn dye, the tested plants can ensure a much more intense coloring of the meat of the chicken broiler.

Key words*: lycopene, plant sources, pigments, β-carotene, yellow chicken.*

PERFORMANCE, CARCASS TRAITS, AND PRODUCTIVE POTENTIAL OF SUFFOLK CROSSBRED LAMBS WITH ROMANIAN BREEDS: A LITERATURE REVIEW

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Abstract

This review compiles multi-decade results on crossbreeding Suffolk rams with major Romanian local sheep breeds —Tsigai, Tsurcana, Teleorman Black Head, Spanca, and Merino-type populations. Data extracted from previously published studies highlight significant improvements in pre-weaning growth, fattening efficiency, carcass classification, meat composition, and adult morpho-productive traits in F_1 crossbreds. Suffolk inheritance led to higher birth weights, increased weaning weights, and superior average daily gains compared to pure local breeds. Carcass evaluations using the EUROP system indicated substantial progress in muscularity (frequent U and R scores) and desirable fat cover classes. Meat quality assessments confirmed higher meat percentages and improved meat-to-bone ratios. Adult F_1 animals also demonstrated larger body frames and greater productive potential. Collectively, reviewed findings show that Suffolk crossbreeding enhances growth performance and carcass value while maintaining the adaptive resilience of local breeds, supporting its continued use for improving meat production in Romanian sheep farming.

Key words*: lamb performance, meat quality, Romanian breed, Suffolk.*

PRODUCTIVE AND REPRODUCTIVE PERFORMANCE OF ROMANIAN SHEEP BREEDS AND THEIR F_1 CROSSBREDS WITH GERMAN BLACKFACE: A COMPREHENSIVE REVIEW

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Abstract

This review integrates results from multiple Romanian studies evaluating the productive and reproductive performance of local sheep and their F_1 crossbreds obtained with German Blackface (GBF) rams. The data show that crossbreeding with GBF consistently improves growth rates from birth to maturity, with crossbreds achieving higher weaning weights, superior post-weaning gains, and greater fattening efficiency under both intensive and semi-intensive systems. Carcass evaluations indicate clear advantages for crossbreds, reflected in higher dressing percentages, improved EUROP conformation scores, and more favorable meat-to-bone ratios. Tissue composition analyses further confirm increased muscularity and reduced fat deposition in F_1 lambs. Reproductive traits also benefit, particularly in young ewes, which exhibit higher conception rates and increased prolificacy. Wool traits are moderately affected: wool yield decreases in crossbreds, while staple length and fiber diameter show breed-specific responses. Overall, the integration of GBF genetics enhances the meat production potential of local sheep without compromising adaptability, supporting the development of efficient, meat-oriented breeding strategies in Romania

Key words*: carcass quality, crossbreeding, German Blackface, growth performance, reproductive efficiency.*

BIoTA EcoToken: SUSTAINABLE DAIRY 4.0 THROUGH INTEGRATED BLOCKCHAIN AND ARTIFICIAL INTELLIGENCE

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Abstract

In high-volume dairy production, ensuring animal health and welfare across diverse environments is a logistical challenge that exceeds human capacity. Addressing the dual challenge of animal welfare and environmental sustainability requires next-generation monitoring. This paper introduces the BIoTa EcoToken system, a multi-layered architecture integrating Internet of Things, deep learning, and a hybrid blockchain to revolutionize Dairy 4.0 practices. The system leverages distributed sensors and visual data to provide continuous, objective monitoring of cattle behaviour, physiology, and barn microclimate. Central to its success is the Proof of Sustainability consensus mechanism, which tokenizes rewards and incentivizes proactive farmer behaviour based on verified eco-actions. Experimental results demonstrate a 40% reduction in anomaly detection response time and a 30% increase in farmer engagement due to the EcoToken structure. With a validated security performance of <1% false validation rate, BIoTa EcoToken establishes a secure and scalable framework that translates real-time farm data into verifiable sustainable outcomes.

Key words*: animal welfare, artificial intelligence, blockchain, dairy farming, Internet of Things.*

ENVIRONMENTAL ENRICHMENT AS A METHOD OF ANIMAL WELFARE IN PIG HUSBANDRY

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Abstract

This study examines environmental enrichment as a practical strategy to enhance animal welfare in modern pig husbandry. Environmental enrichment involves providing pigs with manipulable objects - such as ropes, toys, or wooden blocks - to promote natural behaviours and reduce stress-induced aggression or tail biting. Using a comparative literature review approach, the paper synthesises experimental and applied research assessing behavioural and physiological responses to enrichment. Findings show that properly designed enrichment materials stimulate exploratory activity, lower cortisol levels, and improve overall welfare without compromising growth performance. Economically, enrichment practices support productivity by reducing injury-related losses and aligning with EU welfare standards. In conclusion, environmental enrichment represents a sustainable and cost-effective tool that integrates animal welfare improvements with efficient farm management, promoting a more ethical and resilient pig production system.

Key words*: animal welfare, environmental enrichment, pigs, stress reduction.*

IoT-DRIVEN SYSTEM FOR EMISSION CONTROL AND SUSTAINABILITY IN ROMANIAN DAIRY FARMING

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Abstract

Dairy cattle production supports global food security but also contributes to greenhouse gas emissions, mainly methane, nitrous oxide, and ammonia. Effective mitigation requires continuous monitoring of key zootechnical parameters such as feed intake, feed efficiency, animal behavior, and herd structure. This project introduces BIoTa, a green dairy blockchain platform that integrates Internet of Things (IoT) sensors with blockchain technology to improve emission monitoring, data integrity, and traceability. IoT devices collect real-time data on feeding, manure management, animal activity, and environmental conditions, while blockchain ensures secure validation and decentralized storage. A multi-classifier cattle behavior recognition model achieved 90.3% accuracy (F1-score 90.2%), enabling predictive analytics and early anomaly detection. BIoTa provides a unified, transparent, and intelligent system that supports evidence-based decision-making and promotes sustainable dairy farming with reduced greenhouse gas emissions.

Key words*: blockchain, iot, smart farming, cattle monitoring, artificial intelligence predictive analytics.*

ASPECTS REGARDING THE ORGANIZATION AND DEVELOPMENT OF ORGANIC AGRICULTURE IN ROMANIA

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Abstract

Organic agriculture represents a strategic direction in the development of sustainable agricultural systems, supported by public policies and economic support mechanisms. This paper analyzed the essential aspects of the organization and functioning of organic agriculture, with emphasis on the structure of operators, certified areas and land under conversion, as well as the current status of the sector. Specific production and management practices of the organic system were examined, together with the development dynamics across the main crop groups and animal species, highlighting the role of inspection and certification bodies. Furthermore, the legislative framework and applicable regulations, as well as subsidy schemes and financial support mechanisms, were integrated into the analysis of the sector's evolution. During the analyzed period, the organic agricultural area in Romania increased from 289,252 ha in 2014 to 781,398 ha in 2024, while the number of operators increased from 14,470 to 15,330. Finally, the advantages and limitations of organic agriculture were outlined, emphasizing the key factors influencing the development and future perspectives of this system.

Key words*: ecological surface, operators, organic agriculture, organic animals, sustainable development.*

EFFECTS OF EARLY ADMINISTRATION OF AQUEOUS EXTRACTS IN MILK AS A PROPHYLACTIC ALTERNATIVE IN YOUNG CATTLE

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Abstract

The administration of aqueous extracts from medicinal plants in milk during the first days of life in young cattle represents a promising prophylactic alternative, with the potential to reduce antimicrobial use and to optimize immune responses during the neonatal period. The current study assessed the impact of milk supplementation with aqueous plant extracts on the therapeutic interventions and economics of raising newborn calves. The monitored parameters included the treatment number used, digestive tolerance, the occurrence of gastrointestinal disorders, and the economic gain resulting from using this prophylactic approach. The results demonstrated a significant reduction in the prevalence of neonatal diarrhea and an improvement in general health in the experimental groups, without negative effects on feeding behavior or growth rate. These findings suggest that administering aqueous plant extracts in milk may represent a safe and effective prophylactic alternative in neonatal calf health management, offering a valuable tool for modern strategies aimed at reducing antibiotic use in cattle farming.

Key words*: aqueous extracts, calves, diarrhea, milk, neonatal, prophylactic.*

QUALITY ASSESSMENT OF *Longissimus dorsi* IN AUBRAC CATTLE: IMPLICATIONS FOR MEAT NUTRITION AND SUSTAINABILITY

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Abstract

The Aubrac cattle breed is renowned for its adaptability to mountainous environments, growth performance, and notably favorable nutritional properties of its meat. This study investigated the biochemical composition of the longissimus dorsi muscle in male (n = 28) and female (n = 10) Aubrac cattle, focusing on amino acid and fatty acid profiles. Males exhibited higher concentrations of essential amino acids (15.05% vs. 12.68% in females), suggesting superior protein quality, while fatty acid analysis revealed higher saturated fatty acids (48.96% vs. 46.82%) and polyunsaturated fatty acids (3.96% vs. 2.66%) in males, whereas females showed higher monounsaturated fatty acids (44.45% vs. 39.11%). These results indicate that sex significantly influences muscle composition, impacting both nutritional value and meat quality. The findings highlight the genetic potential of Aubrac cattle to produce protein- and lipid-rich beef with favorable health-related traits, making this breed particularly suitable for extensive and sustainable production systems. Such insights can guide breeders, meat producers, and researchers in implementing targeted management, selection, and breeding strategies to optimize beef quality and consumer benefits.

Key words*: Aubrac, meat, nutrition, quality, sustainability.*

PATTERNS OF FUNGAL COLONIZATION AND MYCOTOXIN OCCURRENCE IN FEEDS FOR DAIRY COWS: IMPLICATIONS FOR FEED SAFETY AND ANIMAL HEALTH

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Abstract

Fungal and mycotoxicological contamination of feed represents a factor affecting feed quality and animal health in dairy production systems. This study assessed the total fungal load, the distribution of dominant fungal genera, and the occurrence of major mycotoxins in eight types of feeds used in the diet of dairy cows from a farm located in the eastern area of the Moldavian Plateau (Romania) during 2023. Total fungal counts ranged between 5.60 and 7.90 ×10³ CFU/g and were significantly influenced by feed moisture content. Low-moisture feeds were predominantly colonized by Aspergillus spp., whereas Fusarium spp. were mainly associated with high-moisture substrates, such as maize silage and total mixed ration. Mycotoxicological analyses revealed the presence of aflatoxins, deoxynivalenol, zearalenone, and ochratoxin A in all analyzed samples, with mean concentrations generally below the maximum limits established by European Union legislation, although isolated exceedances of aflatoxins were recorded. The results highlight the role of moisture content and feed type in shaping fungal and mycotoxicological contamination patterns and emphasize the importance of periodic monitoring to reduce the risk of cumulative exposure in dairy cattle.

Key words*: Aspergillus spp., fungal contamination, feedstuffs, mycotoxins, moisture.*

PRELIMINARY RESEARCH ON THE USE OF ALTERNATIVE PROTEIN SOURCES IN BROILER CHICKEN NUTRITION

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Abstract

This paper aims to evaluate the influence of alternative protein sources on broiler chicken performance, using a bifactorial experimental design based on two fixed factors: dietary treatment and sex of the individuals. The biological material consisted of one control and four experimental groups, each receiving compound feeds formulated with distinct plant-based protein sources. Performance traits were monitored and statistically processed using ANOVA and post hoc tests to assess significant differences among treatments. Preliminary findings are in line with national and international literature and suggest potential benefits in terms of efficiency and sustainability of broiler feeding strategies. The study provides relevant insights into the nutritional impact of alternative protein sources in poultry farming.

Key words*: raw materials, feed recipes, parametric tests, broiler chickens, post hoc analysis.*

INNOVATIVE BIOLOGICAL TECHNOLOGY FOR THE PREVENTION AND CONTROL OF ENDOPARASITES IN DOMESTIC WATERFOWL

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Abstract

This study investigates the diversity of endoparasites in domestic waterfowl (ducks and geese) of the family Anatidae, raised in anthropized environments in the Republic of Moldova, and evaluates the potential of a plant-based preparation for their control. Parasitological examinations revealed a diverse endoparasitic fauna, including class Trematoda (Echinostoma revolutum, E. robustum), class Secernentea (Amidostomum acutum, A. anseris, Ascaridia galli, Heterakis gallinarum, Ganguleterakis dispar), and class Conoidasida (Eimeria anseris, E. nocens, E. truncata). Given the prevalence of these parasites, a plant-derived product, Endopalmivet, based on extracts of Tanacetum vulgare, was tested. The product was administered in aqueous solutions of different concentrations, with the 20% solution showing the most promising results under the conditions of this study. Administration was carried out orally via drinking water, either as a single dose (prophylactic approach) or as two administrations at a 14-day interval (therapeutic approach). The results indicate a reduction in parasitic burden, varying depending on the parasite group and experimental conditions. Although the findings suggest promising potential, further rigorous studies are required to confirm efficacy, safety, and practical applicability.

Key words*: biological control, domestic waterfowl, endoparasites, plant extract, Tanacetum vulgare.*

PARTICULARITIES OF CERTAIN BIOCHEMICAL INDICES IN SHEEP INFESTED WITH *Dicrocoelium dendriticum* (Rudolphi, 1819)

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Abstract

The obtained results highlight notable alterations in biochemical parameters in sheep infested with Dicrocoelium spp. Compared to the control group, total protein levels decreased by 11.22% ($p > 0.05$), primarily due to a 12.23% reduction in albumin concentration ($p > 0.05$). In contrast, globulin levels increased by 6.12% ($p > 0.05$), suggesting a compensatory response in protein fractions. Analysis of hepatic enzymes revealed elevated activities in infested sheep, indicating potential liver dysfunction. Specifically, alanine aminotransferase (ALT) activity was 24.63% higher ($p > 0.05$), while gamma-glutamyl transferase (GGT) increased by 21.31% ($p > 0.05$) relative to the control group. Additionally, aspartate aminotransferase (AST), an enzyme present in multiple tissues, showed an 11.77% increase ($p > 0.05$) in the infested animals. These biochemical alterations reflect disturbances in protein metabolism and hepatic function associated with dicroceliosis. Although the differences did not reach statistical significance, the observed trends suggest subclinical effects of the parasite on liver health and systemic metabolism in affected sheep.

Key words*: sheep, Dicrocoelium dendriticum, biochemical parameters, liver enzymes, protein metabolism.*

EVALUATION OF QUANTITATIVE AND QUALITATIVE TRAITS OF MEAT PRODUCTION IN ROSS 308 BROILER CHICKENS

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Abstract

Poultry meat occupies an essential place in human nutrition due to its superior quality attributes. Compared to meat from other species, poultry meat offers major advantages: low in calories, rich in high-quality protein, characterized by a fine structure that facilitates mastication and digestion. Market demand shows a clear consumer preference for breast meat. The present study aimed to characterize this anatomical region in the Ross 308 hybrid. The analyses focused on several quantitative and qualitative parameters of the pectoral muscles (Pectoralis superficialis and Pectoralis profundus), comparing two slaughter ages: 35 and 42 days. Birds were reared under identical housing and feeding conditions, with a standardized diet. Differences in slaughter age resulted in significant variations in live weight (1985.11 ± 45.09 g at 35 days vs. 2788.63 ± 54.26 g at 42 days), which were reflected in breast weight with bone and skin, as well as in its proportion within the carcass. The study highlights notable differences between the two age groups and concludes that, from a quantitative standpoint, slaughtering Ross 308 broilers at 42 days is more economically efficient.

Key words*: food quality, meat quality, meat production, poultry, Ross 308.*

EVALUATION OF QUANTITATIVE MEAT PRODUCTION IN TURKEY BROILERS RAISED IN DIFFERENT SYSTEMS

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Abstract

This study evaluated quantitative meat production in turkey broilers reared under different systems during the finishing period (105–136 days): intensive (controlled environment, compound feed) and extensive (access to paddock, cereal-based diet). At slaughter, birds from the intensive system showed higher live weight (+5.70%) and superior slaughter yields (hot: +2.78%; cold: +2.41%). Carcass dissection revealed higher proportions of breast (+1.54%), thighs (+1.14%), and wings (+1.05%) in intensively reared broilers, whereas extensively reared birds exhibited a higher proportion of the back portion (+3.74%). The proportion of liver and gizzard was greater in the extensive system (+0.14% and +0.80%, respectively), while heart yield was higher in the intensive system (+0.13%). Overall, the intensive system improved quantitative production parameters, whereas the extensive system mainly influenced organ development and carcass distribution, with potential benefits for meat quality.

Key words*: anatomical portions, edible organs, rearing system, turkey broiler, slaughter yield.*

LIFE CYCLE ASSESSMENT OF BEEF CATTLE PRODUCTION SYSTEMS: METHODOLOGICAL VARIABILITY AND IMPLICATIONS FOR SUSTAINABILITY EVALUATIONS

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Abstract

The paper aimed to present the evolution of Milk Production during the period 1990-2011 in the North West Region of Life Cycle Assessment (LCA) is increasingly used to evaluate the environmental performance of beef cattle production, but comparisons among studies remain difficult because results are strongly influenced by methodological choices. This review synthesises recent peer-reviewed LCA literature on beef systems, with emphasis on system boundaries, functional units, allocation procedures, life cycle inventory modelling, soil carbon accounting and the representation of system-specific characteristics. The analysis shows that reported impacts differ not only because of real variation in geography, feeding strategy or management intensity, but also because studies use different product definitions, climate metrics and modelling assumptions. Particular uncertainty is associated with grassland-based and marginal-area systems, where soil carbon dynamics, ecosystem services and locally adapted breeds are not consistently captured. The review argues that more transparent, multi-indicator and context-sensitive LCA applications are needed to support robust sustainability evaluation of beef cattle systems, especially in European regions where extensive systems and local genetic resources remain relevant.

Key words*: beef cattle, environmental indicators, functional unit, life cycle assessment, sustainability.*

OPTIMIZING THE GROWTH OF MEAT QUAILS FROM THE JUMBO LINE BY VARYING FEED COMPOSITION AND LIGHTING DURATION

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Abstract

Quail meat production is a poultry sector of growing interest, particularly in the context of improving production efficiency. This study aimed to evaluate the effects of artificial lighting duration and feeding strategy on the growth performance of Jumbo quails. The experiment was conducted over six weeks on six experimental groups differentiated by photoperiod (24 h/day and 16 h/day) and feeding regime (continuous starter feed or starter–grower transition). The parameters analyzed included body weight, average weekly gain, feed consumption, and feed conversion ratio. Group C2, exposed to 16 h/day lighting and continuous starter feeding, achieved the best performance, reaching a final body weight of 255.25 ± 4.06 g/head, representing a 15.59% increase compared to the control group, along with the lowest feed conversion ratio (4.69 ± 0.56 g feed/g gain). These findings support the use of moderate photoperiods combined with high-protein feeding strategies as an effective approach for optimizing growth, improving feed efficiency, and enhancing the sustainability of quail production systems.

Key words*: artificial lighting, Coturnix coturnix japonica, lighting duration, quail breeding, weight gain.*

IMPACT OF NUTRITION ON THE WELFARE OF DAIRY SHEEP AND GOATS RAISED IN ORGANIC SYSTEMS

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Abstract

Research on the welfare of dairy sheep and goats in organic production systems is still limited, although interest in the living conditions and health of these species has increased in recent decades. The present study investigates the impact of nutrition on the welfare of dairy sheep and goats in 30 organic farms, of which 15 operate in an extensive system and 15 in a semi-intensive system. The assessment was carried out through a structured questionnaire, which quantified aspects related to feeding and nutrition, housing and comfort, health, behavior and good management practices. Each category was scored according to the welfare criteria, generating a total weighted score, used for comparison between systems. Preliminary results indicate that semi-intensive farms provide more rigorous control of nutrition and health, while extensive farms provide greater opportunities for natural behaviors and access to grazing. The study highlights the importance of integrating nutritional strategies with animal welfare management to optimize health, behavior, and productivity on organic farms.

Key words*: animal welfare, nutrition, sheep, goats, organic farms, production systems.*

RESEARCH REGARDING THE MODERN WAYS TO IMPROVE BROILER PRODUCTION TECHNOLOGIES

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Abstract

Improving broiler production technologies is a priority in modern agriculture to enhance productivity, animal welfare, and economic sustainability. This study compares conventional broiler farms with modern farms using artificial intelligence (AI) systems to highlight technological advantages. In conventional farms, management is mainly manual, with temperature, humidity, ventilation, and air quality monitored periodically. This approach causes microclimate fluctuations, delayed interventions, and reactive decision-making, negatively affecting growth uniformity, bird health, and efficiency. Modern farms employ sensors, automated systems, and AI algorithms for continuous data collection and analysis. AI enables predictive management, early detection of environmental or health issues, and automatic adjustment of ventilation, heating, and feeding processes. These improvements reduce stress, mortality, and inefficiencies while increasing energy efficiency and production consistency. The comparison shows that AI-driven farms offer a proactive, optimized approach to broiler management. The study concludes that transitioning from conventional to smart, AI-enabled systems can improve performance, enhance animal welfare, and support sustainable poultry production. Implementing these technologies is a practical strategy for advancing broiler farming and meeting the growing demands of modern agriculture.

Key words*: smart farming, broiler chickens, precision agriculture, sustainable production.*

PRECISION LIVESTOCK FARMING IN CATTLE SYSTEMS: PRODUCTIVITY AND SUSTAINABILITY

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Abstract

Precision Livestock Farming (PLF) is an emerging field at the interface of animal science and agricultural engineering, enabling sensor-based monitoring and data-driven management in cattle production. This review synthesises current evidence on PLF applications in dairy and beef systems, focusing on welfare and behaviour, health surveillance (mastitis), reproduction, body condition assessment, productivity, extensive/pasture-based management, and environmental implications. A qualitative literature review was conducted using peer-reviewed papers retrieved from ScienceDirect, PubMed, Scopus, Web of Science, Frontiers, and Google Scholar. Overall, findings indicate that PLF enhances herd performance by enabling continuous monitoring of behavioural and physiological indicators, supporting earlier detection of subclinical disorders, improved reproductive event identification, and objective phenotyping through automated body weight and body condition scoring. Evidence also suggests improved milk and beef production through increased biological efficiency, optimised grazing allocation in extensive systems, and improved estimation of enteric methane emissions. These insights support the adoption of PLF decision-support tools to optimise feeding, health interventions, and pasture management, thereby increasing productivity and supporting sustainability targets.

Key words*: animal welfare, beef cattle, dairy cattle, precision livestock farming, sensor technologies.*

PRECISION TECHNOLOGIES FOR DAIRY COW MANAGEMENT: A REVIEW OF WELFARE, HEALTH, AND SUSTAINABILITY OUTCOMES

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Abstract

Dairy cow farming is a strategic sector of agriculture, with a major impact on food production, the rural economy, and food security. In the context of increased production and increasing demands on animal welfare and sustainability, modern dairy farms are increasingly integrating advanced management technologies. This review synthesizes and analyses the main modern technologies used in dairy cow maintenance, including health and behaviour monitoring systems, precision nutrition technologies, automated milking systems, environmental management solutions, and digitally assisted reproductive technologies. The effects of these systems on cows' productivity, milk quality, health, and longevity of cows, as well as on the economic and environmental sustainability of farms, are assessed. Through the integrated approach to modern maintenance systems, this review contributes to clarifying the relationship between technology, animal welfare, and production efficiency, addressing gaps in the literature, where these issues are often treated separately.

Key words*: animal health monitoring, animal welfare, automatic milking systems (AMS), dairy cattle management, precision livestock farming (PLF).*

COMPARATIVE ANALYSIS OF ETHOGRAMS IN MAJOR RUMINANT SPECIES RAISED IN EXTENSIVE AND INTENSIVE SYSTEMS

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Abstract

This study evaluated the behavioral time budgets of four major ruminant species-cattle (Bos taurus), buffaloes (Bubalus bubalis), sheep (Ovis aries), and goats (Capra hircus)-raised under an extensive pasture-based system in Vârfurile commune, Arad County, Romania. The animals belonged to private household farms practicing traditional grazing management. Behavioral observations were conducted over a six-month grazing period using instantaneous scan sampling at 10-minute intervals combined with focal animal observation. The recorded ethological parameters included grazing/feeding, rumination, resting, locomotion, and social interactions. Statistical analysis included descriptive statistics, one-way ANOVA, Tukey post hoc tests, and independent samples t-tests comparing the extensive system with reference values reported in the literature for intensive systems. Significant interspecific differences were observed for most behavioral parameters ($p < 0.001$). Sheep showed the longest grazing and rumination durations, whereas goats exhibited the highest locomotor activity and social interaction levels. Compared with intensive production systems, the extensive system promoted longer grazing periods, increased locomotion, and greater behavioral diversity, indicating that pasture-based management supports natural behavioral expression and contributes positively to ruminant welfare. Unlike single-species studies, this research offers a unified multi-species comparison under identical conditions, revealing distinct interspecific strategies. The findings advance welfare frameworks by establishing behavioral diversity and species-specific patterns as key animal-based indicators applicable across diverse production systems.

Key words: *ethology, extensive farming, grazing behavior, ruminants, rumination.*

EVALUATION OF HEAT STRESS EFFECTS ON HEMATOLOGICAL AND BIOCHEMICAL PROFILES IN HOLSTEIN CALVES

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Abstract

This study aim was to evaluate the impact of heat stress on hematological and biochemical parameters in dairy calves. The research was carried out on a cohort of 35 Holstein dairy calves, with ages ranging between 2 and 4 months. The heat-stress group (HS, n=16, August 2025) were monitored comparatively with calves kept under thermoneutral conditions (TC, n=19, May 2025). HS calves showed a significant reduction (p≤0.001) for erythrocytes count (6.75±0.37 ×10⁶/µl), compared to TC group (9.95±0.14 ×10⁶/µl), while expressing significant increases (p≤0.01) in both hemoglobin (10.51±0.27 vs. 9.32±0.15 g/dl) and hematocrit counts (31.10±0.72% vs. 28.68±0.49%), suggesting dehydration-related hemoconcentration. Average cortisol levels were more elevated under heat stress, compared to thermoneutrality (47.88±9.56 vs. 34.91±4.52 ng/ml), yet were not statistically significant (p>0.05). Total proteins (6.21±0.08 vs. 5.74±0.09 g/dl) and urea (10.05±0.57 vs. 8.25±0.25 mg/dl) were higher in the TC group (p≤0.01), indicative of an increased protein metabolism. Overall, heat stress interfered with both hematological and biochemical balance and with a possible impact on the immunity and general health of the calves.

Key words*: biochemical profiles, dairy calves, heat stress, hematology.*

FLIES ASSOCIATED WITH FARMED HORSES IN PINABETENGAN VILLAGE, WEST TOMPASO DISTRICT, MINAHASA REGENCY, NORTH SULAWESI

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Abstract

This study aimed to identify fly species and analyze their population density in intensive (stall) and extensive (free-range) horse husbandry systems in Pinabetengan Village, West Tompaso District. Six fly species belonging to four families were identified, with the Muscidae family dominating (57.61%). The stall system served as the primary habitat for hygiene-disrupting flies, where Musca domestica showed the highest average population (female: 16.5; male: 14.2 individuals), followed by Stomoxys calcitrans (male: 12.5 individuals) and Phoridae sp. (female: 10.2 individuals). In contrast, the free-range system favored flies associated with blood-feeding activity, with Haematobia irritans recording the highest averages (male: 12.8; female: 11.2 individuals), followed by Tabanus sp. (male: 10.5 individuals). Overall, M. domesticawas the most abundant species (22.78%), with population distribution concentrated in stalls (63%) compared to free-range areas (37%). Despite habitat differences, the sex ratio was balanced between males (49.98%) and females (50.02%). The high fly population in stall areas indicates suboptimal organic waste management, highlighting the need for improved sanitation and integrated management strategies to reduce fly proliferation and potential disease risks in horse husbandry systems.

Key words*: flies, farm, horses, Pinabetengan village.*

PRODUCTIVE PERFORMANCE AND EGG QUALITY OF ISA BROWN LAYING HENS UNDER AN ORGANIC FEEDING SYSTEM

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Abstract

The expansion of organic egg production requires validation of genetic performance under organic nutritional constraints. This study evaluated the productive performance and internal egg quality of ISA Brown laying hens fed a certified organic Phase 1 diet under field conditions. The diet was formulated to provide 11.93 MJ/kg metabolizable energy, 17% crude protein, and balanced digestible amino acid levels, consistent with breed recommendations. Productive parameters including laying rate, egg weight, feed intake, and feed conversion ratio were monitored and compared with established ISA Brown performance standards. Egg internal quality was assessed through crude protein determination and albumen pH measurement. Results indicated that productive performance remained within expected genetic ranges, while egg protein content averaged 9.99 g/100 g and pH values were consistent with fresh egg standards. These findings demonstrate that ISA Brown hens can achieve competitive productive efficiency under organic nutritional management when diets are formulated to meet breed-specific nutrient requirements.

Key words*: ISA brown, organic diet, egg internal quality, laying hens, egg performance.*

THE ROLE OF STIMULATIVE FEEDING OF NURSE BEES IN QUEEN REARING TECHNOLOGY

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Abstract

The aim of this study was to evaluate the role of stimulative feeding of nurse bees in the technological process of queen rearing. Under conditions of absent maintenance nectar flow, nurse colonies were fed 50% sugar syrup supplemented with the biostimulator Cloramicob. Supplemental feeding improved the physiological condition of the bees and stimulated royal jelly secretion for grafted larvae, which increased larval acceptance for rearing. It also promoted queen cell development, particularly length and diameter, and increased the body mass of both unmated and mated queens. The best overall response was generally obtained at the dose of 2.0 ml/L, while all stimulated groups outperformed the unstimulated control.

Key words*: biostimulants, queen cells, queen-rearing colonies, queens, sugar syrup.*

THE IMPACT OF REARING SYSTEMS ON PRODUCTIVE PERFORMANCE IN MEAT-TYPE DUCKS

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Abstract

This paper examines the influence of rearing systems on the productive performance of meat-type ducks, highlighting the role of management practices, environmental conditions, and technological control in modern poultry production. As duck farming expands globally, understanding the impact of different production systems is essential for optimizing efficiency and product quality. The study provides a review of intensive, semi-intensive, and extensive rearing systems, focusing on their effects on growth performance, feed efficiency, carcass traits, and meat quality. Intensive systems are characterized by high productivity and uniformity, achieved through strict environmental and nutritional control, but may raise concerns regarding animal welfare. Semi-intensive systems offer a balance between controlled feeding and outdoor access, improving adaptability and certain quality traits. In contrast, extensive systems rely on natural resources, resulting in lower productivity but enhanced animal welfare and superior sensory characteristics of meat. Overall, the choice of rearing system depends on production objectives and available resources, within the context of sustainable poultry production.

Key words*: carcass traits, feeding strategies, nutrient utilization, outdoor access, stocking density.*

REARING SYSTEMS IN GEESE: EFFECTS ON PERFORMANCE, MEAT QUALITY, GUT MICROBIOTA AND WELFARE

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Abstract

Rearing systems are a major factor influencing productive performance, meat quality, gut microbiota, and welfare in geese. This review article provides an integrated analysis of intensive, semi-intensive, and free-range systems, focusing on their effects on key zootechnical, physiological, and quality parameters. Intensive systems improve growth performance, feed efficiency, and flock uniformity through strict environmental and nutritional control, although they may limit behavioral expression and increase welfare-related risks. In contrast, free-range systems promote natural behaviors and enhance meat quality, particularly lipid composition and sensory attributes, but are associated with greater variability and higher sanitary risks. Semi-intensive systems may offer a balance between productivity and welfare, depending on management practices. Rearing systems also influence gut microbiota diversity, with implications for metabolism, immune function, and overall health. These findings highlight the need for a multidimensional evaluation of production systems integrating performance, welfare, and sustainability. Future research should focus on standardized methodologies and integrative approaches, including microbiome-based strategies and economic assessments.

Key words*: environmental exposure; husbandry; immune response; nutrient utilization; production variability.*

INTEGRATED STRATEGIES FOR *Salmonella* CONTROL IN BROILER PRODUCTION SYSTEMS

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Abstract

Salmonellosis represents one of the most important zoonotic diseases with a major impact on public health and the poultry sector, being frequently associated with the consumption of poultry meat and derived products. The presence of bacteria belonging to the Salmonella genus in broiler farms constitutes a significant problem for both animal producers and consumers, due to the risk of contamination of the food chain from the early stages of production. This bibliographic article aims to analyze the main sources of Salmonella spp. contamination in broiler farms, as well as the prevention and control methods described in the scientific literature. Biosecurity measures, sanitary-veterinary management, and the use of products administered through drinking water are highlighted, with the role of reducing and controlling Salmonella both in the drinking water systems and in the digestive tract of birds.

Key words*: broiler farms, biosecurity, drinking water treatment, Salmonella spp.*

SESSION TECHNOLOGIES OF THE AGRO FOOD PRODUCTS PROCESSING

THE EFFECT OF CARBON DIOXIDE ON IMPROVING THE STORAGE QUALITY OF RAW COW MILK

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Abstract

Prolonged storage of raw milk at refrigeration temperatures favors proteolysis under the action of psychrotrophic flora and endogenous enzymes, degrading the quality of raw materials, before processing. The study evaluated the effectiveness of CO_2 introduction (1.500 ppm) in reducing proteolysis of raw milk, compared to chemical acidification (HCl), under the influence of two levels of somatic cell count (SCC). Two batches of milk were used (Experiment 1: 115.000 SCC/ml; Experiment 2:1.150.000 SCC/ml). The samples were divided into three variants: Control, carbonated (CO_2 at pH 6.2) and Acidified (HCl at pH 6.2). Storage was carried out at 4°C, with analyses at T0, T36 and T72 hours. Nitrogen fractions (Kjeldahl method) and casein index were determined. CO_2 treatment limited the loss of casein index to only 1.02% in 72 hours. The study demonstrates that CO_2 possesses a specific bacteriostatic and enzyme inhibitory effect, which goes beyond simply lowering pH, being a valuable adjuvant technology for the cheese industry by guaranteeing protein integrity and preventing taste defects.

Key words*: carbon dioxide, casein index, casein nitrogen, non-protein nitrogen, somatic cells.*

FATTY ACIDS IN WILD BOAR MEAT

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Abstract

In the current context regarding the quality and nutritional safety of food, and its impact on the human body, the chemical composition of meat has become an important point for scientific studies. Wild boar meat represents an essential objective, as it presents special compositional particularities, especially within the intramuscular lipid fraction. Thus, wild boar meat has a good nutritional composition, a lower fat content, quality proteins and is richer in iron compared to meat from other domestic animals. Due to the increased risk of disease due to a diet based on farm meat, the population has started to look for alternatives to meat. Game meat has started to be increasingly sought after due to its natural habitat. Game meat is classified as a healthier meat compared to that from domestic farm animals, mainly due to its fatty acid and protein profile. Studies on the fatty acid profile of wild boar meat are numerous worldwide, but few in Romania, where wild boar meat is highly sought after and consumed. This study aims to analyze the fatty acids, using the HPLC technique, from wild boar meat from different areas of the Transylvania region.

Key words*: meat, wild boar, fatty acids, HPLC, Transylvania.*

IMPACT OF STORAGE TEMPERATURE AND WALNUT (*Juglans regia)* AND PISTACHIO (*Pistacia vera*) ENRICHMENT ON THE PHYSICOCHEMICAL STABILITY AND ANTIOXIDANT POTENTIAL OF SHEEP MILK CHEESE

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Abstract

Enrichment of dairy products with functional ingredients and the optimization of storage conditions are key strategies for enhancing the nutritional value of traditional cheeses. This study evaluated the combined effects of storage temperature (room temperature vs. refrigeration), salt content, and the addition of walnuts (Juglans regia) and pistachios (Pistacia vera) on the physicochemical profile and antioxidant capacity of ewe milk cheese. A three-way ANOVA was employed to analyze the interactions between the factors. The results showed that storage temperature was the dominant factor influencing the proximate composition. Samples stored at room temperature exhibited a significant concentration of nutrients due to moisture loss, reaching dry matter (DM) values of 60.84-64.07%, compared to 48.76-51.53% in refrigerated samples. Total lipids also increased proportionally in ambient storage, reaching values up to 32.21 ± 2.58%. Enrichment with pistachios significantly boosted the antioxidant capacity, with the highest value recorded in unsalted pistachio cheese stored at room temperature (16.5 ± 1.3 mg TE/g DM). pH values remained relatively stable across treatments, ranging from 5.02 to 6.17.

Key words*: sheep cheese, antioxidant capacity, storage conditions, Juglans regia, Pistacia vera.*

IMPACT OF MILKING SEQUENCE AND LACTATION NUMBER ON THE FATTY ACID COMPOSITION OF SHEEP MILK

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Abstract

The fatty acid profile of ewe milk is a critical indicator of its nutritional value and technological quality, being influenced by various physiological factors, including the stage of lactation and the order of milking. The aim of this study was to evaluate the evolution of the fatty acid composition in ewe milk across three consecutive lactations (L1, L2, and L3) and to determine the impact of milking sequence on these parameters. A total of 45 samples were collected over three milking sequences, from family farm of 15 heads of the Tsurcana (Țurcană) sheep breed from Șieuț locality, Bistrița Năsăud county. The findings revealed a significant improvement in the nutritional quality of the milk as the lactation rank advanced. A favorable decrease in the n-6/n-3 polyunsaturated fatty acid ratio was observed, shifting from 3.21 in the first lactation (L1) to 2.88 in the third lactation (L3). The analysis confirmed that the biochemical composition of ewe milk undergoes progressive modifications, with the lipid profile becoming more nutritionally balanced.

Key words*: ewe milk, fatty acid profile, lactation, lipid quality, n-6/n-3 ratio.*

EFFICACY OF ANTIOXIDANT MARINATION IN THERMAL RISK MODULATION: COMPARATIVE PAH CONTAMINATION DYNAMICS IN BEEF BRISKET AND SHOULDER MUSCLES SUBJECTED TO GRILLING, FRYING, AND PRESSURE COOKING

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Abstract

The Polycyclic Aromatic Hydrocarbons (PAH) are a significant category of thermogenic pollutants due to their potential to induce cancer, mutations, and DNA damage. This is because the thermal breakdown of lipids and the pyrolysis of organic molecules help them form. The purpose of this study is to find out how common thermal treatments impact the levels of PAH contamination in beef brisket and shoulder muscles and if marinating with a natural antioxidant source is an effective strategy to lower those levels. The antioxidant marinating recipe cuts down on PAH levels a lot while grilling and frying by breaking up chains of free radicals that generate PAH. This research demonstrates their proficiency in managing food safety issues effectively. The results show that using moderate cooking methods, limiting direct exposure to smoke or flame, and using antioxidant marinating methods during the pre-treatment phase can significantly reduce the risk of PAH contamination. The findings indicate that selecting moderate cooking techniques, minimizing direct exposure to smoke or flame, and employing antioxidant marinating methods during the pre-treatment stage can significantly reduce the risk of PAH contamination.

Key words*: PAH, antioxidant, beef brisket, beef shoulder, electric pressure cooking.*

PHYSICOCHEMICAL CONTROL OF MARINADE DELIVERY EFFICIENCY AND PAH MITIGATIGATION IN COOKED BEEF

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Abstract

This investigation examined the influence of beef muscle's physical and chemical characteristics on the efficacy of antioxidant marinades, the transformations induced by cooking, and the formation of polycyclic aromatic hydrocarbons (PAHs). Various cooking techniques, specifically grilling, frying, and electric pressure cooking, were employed on brisket (M. pectoralis profundus) and shoulder (M. supraspinatus) cuts.
We employed a fruit-based antioxidant marinade (5.69 µg TE/g). The shoulder samples absorbed more marinade and lost less during cooking. In contrast, the brisket didn't absorb as much, suggesting that the marinade didn't spread evenly. In the shoulder samples, a negative correlation was observed between the volume of marinade uptake and the extent of cooking loss. These findings suggest that the efficacy of antioxidant marinades is contingent upon their integration within a matrix, which subsequently influences their thermal stability and the quantity of PAHs generated during the cooking process. The effectiveness of antioxidant marinades is governed by the physicochemical properties of the meat matrix through their control over mass transfer and thermal stability.

Key words*: physical, chemical, antioxidant, beef brisket, beef shoulder.*

EVALUATION OF HISTOLOGICAL CHANGES IN WILD BOAR MEAT

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Abstract

The wild boar (Sus scrofa, L. 1758) is a wild, omnivorous animal found in many areas of the world. It is native to Europe, Asia and North Africa. The wild boar is one of the most discussed mammals in Europe and in some parts of the world. It is a very widespread species, even becoming invasive in some areas, with a rich history. Wild boar meat offers numerous advantages and is appreciated for its flavor and low fat content. The chemical composition of wild boar meat can have different values depending on its origin.Given that the wild boar is a wild animal, living freely, it can be exposed to heavy metal contamination due to migration after food.Wild boar can accumulate heavy metals either in the muscles or in other organs (liver, kidneys). The main heavy metals that they can accumulate are represented by lead (Pb), cadmium (Cd), mercury (Hg), arsenic (As), copper (Cu) or zinc (Zn). Heavy metals can affect the quality and safety of people's lives through the consumption of meat contaminated with these elements. Contamination can occur from industrial areas, mining operations, polluted soil and water, or by ingesting contaminated water or food. The aim of this study is to highlight the lesions that can be caused by heavy metals in certain tissues harvested from wild boar meat.

Key words*: wild boar meat, histological analysis, heavy metals.*

CHEMICAL COMPOSITION OF FIVE *Lavandula angustifolia* CULTIVARS FROM SĂLAJ COUNTY: RELEVANCE FOR APPLICATIONS IN AQUACULTURE NUTRITION

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Abstract

This study characterized the chemical composition of five Lavandula angustifolia cultivars (Sevtopolis, Munstead, Hidcote, Blue Scent, and Vera) cultivated in Sălaj County, Romania, and evaluated their nutritional profile in relation to their potential for further investigation in aquaculture nutrition. Stems and flowers were analyzed by FT NIR spectroscopy to determine ash, carbohydrates, crude fiber, lipids, and crude protein contents. Protein levels ranged from 13.47% to 18.14%, while crude fiber varied from 53.4% to 59.5% among cultivars, with Blue Scent stems showing the highest protein content. Overall, the analyzed lavender biomass was characterized by high fiber levels, moderate protein content, and low lipid concentrations, with clear cultivar-dependent differences in composition. Among the studied cultivars, Blue Scent and Vera exhibited favorable nutritional profiles, suggesting their suitability as potential candidates for further evaluation as plant-derived ingredients in aquaculture feed formulations. These findings provide baseline compositional data that support future research on the functional properties and potential applicability of lavender biomass in fish nutrition.

Key words*: aquaculture nutrition, chemical composition, functional plant additives, Lavandula angustifolia.*

ANTIOXIDANT CAPACITY AND POLYPHENOLIC PROFILES OF FIVE *Lavandula angustifolia* CULTIVARS: FUNCTIONAL POTENTIAL FOR AQUACULTURE

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Abstract

The selection of plant material with high phenolic and antioxidant potential is an essential preliminary step in developing phytogenic additives for aquaculture. The present study comparatively evaluated the antioxidant capacity and total polyphenol content of five Lavandula angustifolia cultivars (Sevtopolis, Munstead, Hidcote, Blue Scent, and Vera) cultivated in Sălaj County, Romania. Methanolic extracts obtained from flowers and stems were analyzed using the photochemiluminescence method to assess antioxidant capacity and the Folin–Ciocalteu assay for total polyphenols. Flowers consistently showed higher values than stems across all cultivars, indicating an organ-dependent distribution of phenolic compounds. Total polyphenol content in flowers ranged from 41.5 ± 3.3 to 47.0 ± 3.8 mg GAE per g dry weight, while antioxidant capacity varied between 25.7 ± 2.1 and 29.1 ± 2.3 mg TE per g dry weight. Among the analyzed cultivars, Blue Scent recorded the highest values and was identified as the most promising source of antioxidant compounds, providing a basis for further applied studies.

Key words*: antioxidant capacity, cultivar variability, Lavandula angustifolia, polyphenolic profiles.*

SUSTAINABLE UTILIZATION OF ROSE PROCESSING BY-PRODUCT IN THE PRODUCTION OF WHITE BRINED CHEESE

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Abstract

This study examines the incorporation of distilled Rosa damascena extract into traditional Bulgarian white brined cheese as a potential natural preservative. Cheese was produced from cow's milk and ripened in brine containing three concentrations of rose extract (0, 33.3, and 66.6 mg/kg) to assess its influence on physicochemical stability, microbial safety, and sensory quality. Standard analytical methods - including pH and titratable acidity measurement, salt and moisture analysis, Kjeldahl nitrogen fractionation, microbiological enumeration, and instrumental color and texture profiling - were applied before and after a 30-day ripening period and throughout refrigerated storage at the 1st, 3rd, and 6th month. The rose extract demonstrated antimicrobial and antioxidant activity, supporting controlled microbial growth and inducing subtle structural changes likely related to interactions with casein. Sensory evaluation indicated acceptable consumer perception across all samples. Overall, the findings show that integrating distilled rose extract into the brining process can enhance cheese quality while promoting sustainable practices through the valorization of aromatic plant by-products.

Key words*: antioxidant, rose, waste, White Brined cheese.*

FROM WASTE TO RESOURCE: MODERN APPROACHES TO WHEY UTILIZATION IN THE FOOD INDUSTRY

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Abstract

This review examines current approaches to whey valorization in the food industry, focusing on its transformation from a dairy by-product into a source of proteins, minerals, and bioactive compounds for functional foods and beverages. The paper summarizes contemporary scientific approaches to its use – from the development of functional drinks and protein concentrates to biotechnological and ecological solutions for managing waste streams, thereby closing the resource loop and supporting the circular economy. Emphasis is placed on the role of whey as a key element in the sustainable development of the dairy industry, as well as the opportunities for its effective utilization. Efficient whey valorization increases the profitability of enterprises, reduces environmental impacts, and leads to the creation of new health-promoting products that contribute to improved human health and quality of life.

Key words*: bioactive compounds, circular economy, dairy by-products, functional beverages, whey valorization.*

PHYSICOCHEMICAL AND SENSORY ANALYSIS OF MOZZARELLA CHEESE PRODUCED FROM THE MILK OF DIFFERENT CATTLE BREEDS

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Abstract

The physicochemical composition of individual and bulk milk samples obtained from the Bulgarian Rhodope Cattle (BRC), Montbéliarde, and Simmental breeds of various ages and lactations, raised at the Research Institute of Mountain Stockbreeding and Agriculture (RIMSA)-Troyan farm, was investigated. The samples were collected during the spring-summer period (April-September) and the autumn-winter period (October-March), and the results are presented as arithmetic means in tables. The physicochemical composition of the raw milk and the produced Mozzarella cheese was analyzed. The sensory evaluation of the finished product was conducted by a group of trained assessors. Sensory methods were used to determine the following indicators: taste, smell, color, appearance, and consistency. It was established that the milk and Mozzarella cheese from the BRC breed had the highest physicochemical values, followed by those from Simmental and Montbéliarde. The cheese from BRC received the highest sensory evaluation compared to the other two types.

Key words*: cow milk, Mozzarella cheese, organoleptics, physicochemistry.*

INVESTIGATIONS ON PUMPKIN PROTEINS ADDITION ON THE FUNCTIONAL AND RHEOLOGICAL BEHAVIOR OF THE GLUTEN-FREE FLOURS

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Abstract

The gluten-free diet was adopted by many consumers due to the high incidence of the celiac disease and the gluten-related disorders. Considering the well-known low nutritional profile and poor sensory characteristics of the gluten-free products, many research efforts are spent to formulate new promising gluten-free blends. Therefore, identifying gluten-free mixtures with good technological functionality and breadmaking properties is highly desired. The objectives of the study were to characterize sorghum and quinoa flours, alone and in admixture. In addition, the flour blends were enriched with pumpkin proteins. The water and oil retention capacity profile of the gluten-free mixtures was determined to gather information regarding their technological performance. The investigated gluten-free flours exhibited good water and oil retention properties, therefore being eligible to act as gelling, thickening or stabilizing ingredients in complex food matrices. The addition of plant proteins at levels which ensure obtaining high proteins bread, significantly impacted the water retention and rheological properties of the gluten-free flours. The obtained results suggested that the addition of pumpkin proteins might allow improving the functionality and breadmaking properties of the sorghum-quinoa flour mixtures.

Key words*: gluten-free mixtures, pumpkin proteins, quinoa flour, sorghum flour.*

PROCESSING OF CHICKPEAS FOR THE PRODUCTION OF MEAT-ALTERNATIVE PLANT-BASED FOODS

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Abstract

The growing demand for sustainable, nutritious, and ethical food systems has accelerated the development of plant-based meat alternatives. Chickpeas (Cicer arietinum L.) represent a promising raw material for such products due to their high protein content, favorable amino acid profile, functional starch, and widespread availability. Beyond nutritional and environmental considerations, consumer acceptance of meat alternatives is strongly driven by sensory attributes, including texture, juiciness, flavor, and appearance. This paper reviews and synthesizes current knowledge on the processing of chickpeas to obtain plant-based products with sensory, nutritional, and structural properties similar to meat. Particular emphasis is placed on how processing conditions and formulation strategies influence texture perception, flavor development, and overall sensory quality. Challenges and future research directions related to sensory optimization, digestibility, and consumer acceptance are also highlighted.

Key words*: chickpea, extrusion, meat alternatives, plant-based meat, protein extraction, sensory quality, texturization.*

DETERMINANTS OF FOOD WASTE AMONG CONSUMERS: RESULTS FROM A CROSS-SECTIONAL STUDY

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Abstract

This study investigates consumer behavior in relation to food waste based on a questionnaire administered to 273 respondents from both urban and rural areas. The survey examined meal and shopping planning habits, food purchasing criteria, management of household food supplies, and practices related to preserving and reusing leftovers. It also assessed the frequency of discarding perishable foods, purchasing behavior during holiday periods, awareness of environmental impacts, and willingness to adopt preventive measures. The findings indicate that meal planning and regular grocery shopping are common practices, and food purchases are mainly driven by household needs. Many consumers report using food already available at home before buying new products. However, behaviors such as repurposing leftovers and consistently consuming foods close to their expiration date are less frequently practiced. Although most respondents consider reducing food waste important and express concern about the issue, preventive behaviors are applied inconsistently. The results highlight a gap between consumer attitudes and actual practices, emphasizing the need for educational initiatives and accessible information to promote sustainable consumption and reduce household food waste.

Key words*: environmental awareness, food preservation, food purchasing habits, household food management, sustainable consumption.*

BIOTECHNOLOGICAL METHODS FOR IMPROVING QUALITY OF GLUTEN-FREE BREAD: A REVIEW

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Abstract

The manufacture of gluten-free bread remains a major technological and nutritional challenge due to the absence of the viscoelastic gluten network, which often results in products with reduced volume, weak crumb structure, rapid staling and limited sensory acceptance. In this review, recent biotechnological approaches applied to the improvement of gluten-free bread quality are critically analyzed, with emphasis on technological performance, nutritional enhancement and shelf-life extension. A systematic literature review was conducted in accordance with PRISMA guidelines in order to identify relevant scientific studies published within the last five years. The search focused on peer-reviewed articles addressing microbial fermentation strategies, enzyme-based technologies, and the incorporation of alternative protein sources and hydrocolloid systems. Additionally, the strategic combination of plant proteins and hydrocolloids was reported to compensate for the lack of gluten, especially when integrated with fermentation-based approaches, leading to synergistic improvements in technological and sensory quality. Overall, the findings support the potential of integrated biotechnological strategies to guide the development of gluten-free breads with improved quality and commercial viability.

Key words*: biotechnological methods, bread quality improvement, food biotechnology, gluten-free bread, gluten-free sourdough, selected microbial cultures, shelf-life extension, starter cultures, sourdough fermentation, texture enhancement.*

NATURAL INGREDIENTS BASED STRATEGIES FOR REPLACING FAT, SALT AND SYNTHETIC ADDITIVES IN MEAT PRODUCTS REFORMULATION - A SYSTEMATIC REVIEW

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Abstract

In recent years, increasing attention has been devoted to the reformulation of meat products as the food industry strives to address the growing consumer demand for healthier alternatives containing lower levels of salt, fat, and synthetic additives. This review summarizes recent advances in the use of natural ingredients to reduce fat, salt, and synthetic additives in processed meat systems. Structured plant oils, oleogel systems, and protein-based emulsions have shown good potential to partially or fully replace animal fat, while maintaining the texture and stability required in meat products. Sodium reduction is increasingly supported by umami-rich ingredients such as mushroom powders, yeast extracts, and selected seaweed fractions, which help preserve flavor and taste at lower salt levels. These ingredients enable the development of meat products that remain safe, stable, and sensorially acceptable, while meeting consumer expectations for cleaner formulations.

Key words*: meat reformulation, fat replacers, salt reduction, synthetic additive alternative.*

COMPARATIVE QUALITY ASSESSMENT OF PARISIAN AND MILANESE CHICKEN FILLETS

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Abstract

The aim of this study was to comparatively evaluate the influence of the coating system on the quality of two chicken meat products, namely Parisian chicken schnitzel and Piccata Milanese chicken fillet. The methodology included the determination and comparison of the main quality indicators, namely physico-chemical parameters, textural properties, nutritional composition, and sensory characteristics. The results showed statistically significant differences ($p < 0.05$) between the two variants. The Milanese product exhibited higher cutting force (24.2 ± 1.3 N vs. 18.5 ± 1.1 N) and oil absorption (12.4 ± 0.6% vs. 9.8 ± 0.5%), indicating a more compact coating structure. Sensory evaluation also revealed higher scores for the Milanese variant, particularly for taste (8.6 ± 0.5 vs. 6.9 ± 0.6) and texture (8.2 ± 0.6 vs. 6.5 ± 0.7).
These differences are related to the coating formulation and processing parameters, which directly influence water retention, lipid absorption, and organoleptic properties. The results support the optimization of processing conditions and the development of chicken products with improved quality.

Key words*: chicken meat, physico-chemical parameters, texture, sensory evaluation, coated products.*

SUSTAINABLE USE OF SEA BUCKTHORN BY-PRODUCT AS FUNCTIONAL INGREDIENT IN FOOD APPLICATIONS: TRENDS AND CHALLENGES

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Abstract

Sea buckthorn juice processing generates substantial quantities of pomace, primarily consisting of seeds and peels, often discarded despite its potential as a valuable food ingredient. This work provides an overview of the literature on the conditioning, characterization, and valorization of sea buckthorn pomace (SBP) as a functional food ingredient. SBP is rich in valuable bioactive compounds and nutrients, allowing its transformation into a low-cost, highly functional food ingredient supporting circular economy principles and current food industry trends focused on sustainability and resource efficiency. Valorization of SBP for the development of value-added food products has attracted scientific interest due to its complex chemical composition, with high levels of phenolic compounds, flavonoids, proteins, and dietary fibers, enhancing both the nutritional and functional properties. This review addresses challenges related to SBP drying to preserve bioactive compounds and discusses applications in bakery, pastry, chocolate, dairy, and meat products, as well as its use as a natural antioxidant to improve the oxidative stability of edible oils. Overall, sustainable SBP exploitation provides environmental, economic, and nutritional benefits, supporting the development of foods with an enhanced functional profile.

Key words*: nutritional and functional benefits, sustainable use, upcycling of sea buckthorn pomace, value-added foods.*

COMPARATIVE EVALUATION OF PROXIMATE COMPOSITION AND PHYTOCHEMICAL PROPERTIES OF BANANA, MANGO, AND PAPAYA PULP AND PEEL

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Abstract

This study evaluated the proximate composition and phytochemical properties of the pulp and peel of banana (Musa spp.), mango (Mangifera indica L.), and papaya (Carica papaya L.). Proximate parameters, including moisture, ash, fat, protein, and carbohydrates, along with functional characteristics based on total phenolic content (TPC), total flavonoid content (TFC), and antioxidant capacity measured by ferric reducing antioxidant power (FRAP), were analyzed in samples from local agri-food markets. Results showed significant differences between peel and pulp in both composition and functional properties, highlighting their nutritional and health potential. Antioxidant activity was consistently higher in peels than in pulps, with mango peel exhibiting the highest value (166.89 μM Fe^{2+}/g d.w.). TPC and TFC followed a similar trend, with peels showing higher concentrations than edible fractions. These findings suggest that fruit peels are rich sources of natural antioxidants and have potential as functional ingredients, supporting the sustainable valorization of fruit-processing by-products for food and nutraceutical applications.

Key words*: banana, mango and papaya, by-products, functional properties, peel and pulp, proximate composition.*

THE INFLUENCE OF HERBS AND SEASONING OILS ON THE SHELF LIFE OF MEAT PRODUCTS

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Abstract

In the context of the current economy, marked by population growth and limited natural resources, controlling the shelf life of meat products is essential to limit losses. At the same time, the food industry is invaded by food additives that, in most cases, create harm to the health of consumers and the orientation towards the use of natural ingredients is more than important. The paper aims to analyze the influence of the addition of natural spices and spice extracts on the shelf life and storage stability of meat products. The experiments carried out showed that the use of thyme and basil, both in dried form and in the form of extracts, limited the spoilage processes, the oils proving to be more effective than the dried plants. Sensory analysis of the experimental samples showed a better appreciation of the products in whose composition the dried plants were used.

Key words*: meat, preservation, spices, seasoning extracts.*

COMPARATIVE EVALUATION OF TECHNOLOGICAL PARAMETERS IN PORK: THE INFLUENCE OF MUSCLE TYPE AND MATURATION TIME

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Abstract

The study aimed to evaluate the technological behavior of pork from three anatomical regions Longissimus dorsi, neck, and shoulder during a 15-day aging period under refrigeration (0–1°C). Samples were assessed at four time points (days 1, 5, 10, and 15) for pH, tenderness (cutting force in raw and cooked state), drip loss, and cooking loss. Significant differences ($p < 0.05$) were observed depending on both muscle type and aging time. Longissimus dorsi consistently showed superior traits, including the lowest lipid content, minimal drip and cooking losses, and highest tenderness, making it suitable for early processing. In contrast, shoulder and neck required longer aging to reach acceptable textural characteristics. Aging improved water-holding capacity and tenderness in all samples, though at varying rates. The results highlight the importance of muscle-specific aging and processing strategies to optimize product quality and minimize technological losses in pork processing.

Key words*: pork quality, muscle type, meat aging, water-holding capacity, cutting force.*

THE EFFECT OF ADDITION OF CRANBERRY SYRUP ON THE PHYSICOCHEMICAL AND SENSORY CHARACTERISTICS OF BEER

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Abstract

This study evaluates the effect of cranberry syrup addition on the quality of beer, focusing on physicochemical properties, sensory characteristics, and vitamin C content. Beer samples were produced with varying concentrations of cranberry syrup (5%, 10%, and 15%) and analyzed for pH, alcohol and vitamin C content, extract, color, and sensory profile. The results showed that increasing syrup concentration led to lower pH and alcohol content, while extract and color values increased. Sensory analysis indicated improved aroma and color, with the highest overall acceptability observed for the 10% sample. Additionally, vitamin C content increased significantly in enriched samples, confirming enhanced functional value. Although the 15% sample showed the highest vitamin C content, it presented slight sensory imbalance. Therefore, the 10% formulation was identified as optimal, offering a balance between improved quality and nutritional benefits.

Key words*: beer, cranberry, vitamin C, sensory analysis, physicochemical properties.*

VALORISATION OF SEA BUCKTHORN (*Hippophae rhamnoides* L.) IN OBTAINING CHOCOLATE PRODUCTS WITH FUNCTIONAL PROPERTIES

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Abstract

The paper aims to highlight the benefits of adding sea buckthorn to the composition of chocolate pralines, by analyzing its impact on the nutritional, sensory and functional quality of the finished product. Sea buckthorn is recognized for its high content of vitamins, carotenoids, polyphenols and essential fatty acids, which recommends it as a valuable ingredient in the development of innovative food products. In the study, sea buckthorn pulp or extract was incorporated into chocolate pralines in different proportions, and the products obtained were evaluated from a physicochemical, antioxidant and sensory point of view. The results indicate an increase in the biological value and antioxidant capacity of the pralines, as well as a favorable sensory acceptability, depending on the concentration of sea buckthorn used. The study supports the use of sea buckthorn as a functional ingredient in the confectionery industry, contributing to the diversification and improvement of their quality.

Key words*: chocolate, Sea buckthorn, vitamin C, antioxidants, pralines.*

QUALITY EVALUATIVE BIOMARKERS BASED ON BENEFICIAL LACTIC ACID BACTERIA IN BULGARIAN YOGHURT AND FERMENTED PLANT BASED MILK ALTERNATIVES

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Abstract

Bulgarian yogurt, as a traditional food, is produced with microbial lactic acid fermentation of only two bacterial species: Lactobacillus delbrueckii subsp. bulgaricus and Streptococcus thermophilus. The present study analyzes the microbiological and physicochemical characteristics of commercial yogurt, products with Protected Designation of Origin (PDO/BDS), homemade yogurt, and plant-based alternatives. MALDI-TOF was utilized in identification of the microbial community. On MRS/M17 agar media, the count of viable L. delbrueckii subsp. bulgaricus and Str. thermophilus demonstrated the highest concentrations in the PDO/BDS products, 8.24 log_{10}CFU/g and 8.86 log_{10}CFU/g, respectively. In contrast, the plant-based alternatives exhibited a significantly lower LAB (Lactic Acid Bacteria) population (6.03-6.57 log_{10}CFU/g) and lower titratable acidity (44°T). It was established that titratable acidity values above 130°T serve as an evaluative biomarker of an active post-fermentation process and a beneficial LAB load. The water-holding capacity (WHC) in traditional yogurt varies between 63% and 71.5%, whereas in plant-based products, it reaches as high as 75.4%. The identified microbiological, acidic, and rheological biomarkers serve as a reliable tool for the assessment of the authenticity and quality of fermented dairy and non-dairy products.

Key words*: dry matter, microbiological analysis, pH, plant - based milk alternatives, titratable acidity, water-holding capacity (WHC), yogurt.*

PHYSICOCHEMICAL AND SENSORY CHANGES IN COFFEE INDUCED BY ROASTING DEGREE - A REVIEW

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Abstract

Roasting degree is a key technological factor that significantly influences the physicochemical composition and sensory profile of coffee. This review synthesises current scientific literature on physicochemical and sensory changes in coffee induced by different roasting degrees, with relevance for quality assessment and product development. The analysis covers physicochemical parameters such as moisture content, ash content, pH, density, colour, caffeine content, and extractable compounds, alongside sensory attributes including aroma, flavour, bitterness, acidity, and overall acceptability. Published studies consistently report a progressive decrease in moisture content and density with increasing roasting intensity, accompanied by relative changes in ash content and chemical composition due to mass loss and thermal degradation of volatile compounds. In parallel, roasting degree strongly affects sensory perception, shifting the flavour profile from acidic and floral notes in lightly roasted coffees towards bitter, roasted, and smoky characteristics in dark-roasted samples. Variability among reported values is mainly attributed to coffee species, roasting conditions, and analytical methodologies. By comparing quantitative data from multiple studies, this review identifies common trends and divergences and highlights the importance of standardised analytical approaches for an accurate evaluation of coffee quality.

Key words*: coffee; roasting degree; physicochemical properties; sensory properties; moisture content; ash content.*

IMPACT OF PARTIAL SUBSTITUTION OF WHEAT FLOUR WITH CHESTNUT FLOUR AND CHOKEBERRY *(Aronia melanocarpa)* POWDER ON THE NUTRITIONAL, FUNCTIONAL AND COOKING QUALITY OF PASTA

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Abstract

This study aimed to evaluate the potential of chestnut flour (CF) and chokeberry powder (CP) as alternative sources of bioactive compounds for the development of pasta formulations with improved nutritional and functional properties. Four pasta formulations were obtained by partially replacing wheat flour (WF) with CF at levels of 0%, 10%, 20%, and 30%. In addition, three formulations were produced by further substituting wheat flour in the 20% CF sample with CP at levels of 2%, 4%, and 6%. The samples were analyzed for proximate composition, total phenolic content (TPC), antioxidant activity (DPPH assay), and cooking quality. Substitution of WF with CF at 10-30% resulted in significant improvements in nutritional and phytochemical profiles of pasta while maintaining acceptable cooking quality. Further substitution of wheat flour in the 20% CF formulation with CP up to 4% led to a marked increase in bioactive compounds and is therefore recommended for enhancing pasta functionality without compromising cooking quality. These findings support the use of CF and CP as functional ingredients for the development of innovative flour-based products.

Key words*: chestnut flour, chokeberry powder, cooking quality, functional pasta, nutritional profile.*

PHYSICOCHEMICAL COMPOSITION AND FUNCTIONAL PROPERTIES OF GREEN TEA - A REVIEW

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Abstract

Green tea (Camellia sinensis) is widely recognized for its nutritional value and functional properties, which are closely related to its physicochemical composition and processing conditions. This review synthesizes current scientific literature on the physicochemical composition and functional properties of green tea, emphasizing parameters relevant to quality assessment and health-related attributes. The analysis covers moisture and ash contents, pH, water activity, caffeine, total polyphenols, catechins, and antioxidant activity, as reported across different cultivars, processing techniques, and product forms. Published data indicate that physicochemical parameters such as moisture and ash vary significantly with fixation and drying methods, whereas functional components, particularly polyphenols and catechins, are strongly influenced by cultivar and processing intensity. Antioxidant activity is closely associated with bioactive compound concentration, although considerable variability among reported values is observed. Differences between studies are primarily attributed to raw material characteristics, technological factors, and analytical methodologies. By comparing quantitative data from multiple sources, this review identifies common trends and divergences and underscores the importance of standardized analytical approaches for an accurate evaluation of green tea functional potential.

Key words*: green tea, physicochemical composition, functional properties, polyphenols, catechins, antioxidant activity.*

COMPARATIVE ASSESSMENT OF SPICE MIXTURES ON THE OXIDATIVE STABILITY OF WALNUT OIL DURING STORAGE

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Abstract

This study investigated the impact of supplementing walnut oil with spice mixtures on its oxidative stability during six months of storage at 20°C. Three spice mixtures were incorporated into the oil: (1) garlic (Allium sativum) combined with black pepper (Piper nigrum); (2) pistachio (Pistacia vera), pine seed (Pinus pinea), and black pepper; and (3) cinnamon (Cinnamomum zeylanicum) together with vanilla (Vanilla planifolia). Oxidative stability was assessed using peroxide value (PV) for primary oxidation and para-anisidine value (p-AV) for secondary oxidation. In addition, the TOTOX value provides an overall measure of oxidation, reflecting cumulative formation of primary and secondary products, calculated by combining PV and pAV. The enhancement of walnut oil oxidative stability by spice mixtures was directly related to their antioxidant content, with higher levels providing greater protection. Among the mixtures tested, the pistachio, pine seed, and black pepper combination showed the strongest protective effect, delaying lipid oxidation and improving oil stability. These findings demonstrate the potential of spice mixtures as functional additives with antioxidant properties to extend the shelf life and quality of walnut oil.

Key words*: antioxidant compounds; oxidative stability; primary and secondary oxidation; spice mixtures; walnut oil.*

DEVELOPMENT AND COMPREHENSIVE EVALUATION OF CHICKPEA-BASED VEGAN CHEESE ALTERNATIVES: PHYSICOCHEMICAL, NUTRITIONAL AND SENSORY PROFILES

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Abstract

In the light of increasing health, sustainability, and ethical concerns, plant-based diets are rapidly gaining traction. This study developed chickpea-based vegan cheese analogues, evaluating three formulations: a control (C), a variant enriched with turmeric, black pepper, and oregano (VC1), and one with dried tomatoes and basil (VC2). A multi-analytical approach was used to quantify total polyphenol content (TPC), antiradical activity (DPPH), and antioxidant capacity (CUPRAC), alongside proximate composition and sensory profiles. Results showed that enriched formulations (VC1 and VC2) possessed significantly higher phenolic concentrations and enhanced antioxidant potential than the control, with VC1 exhibiting the highest values. Moreover, these variants achieved superior hedonic ratings, suggesting that strategic integration of natural additives effectively optimizes both the functional architecture and consumer acceptability of plant-based dairy alternatives.

Key words*: antioxidant activity, chickpea, polyphenols, proximate composition, vegan cheese alternatives.*

THE IMPACT OF EGGPLANT, ZUCCHINI, AND APPLE PEEL POWDER ADDITION ON THE PROXIMATE COMPOSITION, POROSITY AND SENSORY PROFILE OF SAVORY MUFFINS

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Abstract

Fruit and vegetable peels contain a variety of health-beneficial nutrients and serve as excellent nutritional sources. Their utilization contributes to the reduction of food waste, having a positive impact on both the environment and the economy. This article presents a study on the advanced valorization of apple, zucchini, and eggplant peels for the development of savory muffins. Four types of savory muffins were formulated using apple (MA), zucchini (MZ), eggplant (ME) peel flours, and control (MC). These were subjected to sensory evaluation and physicochemical analysis. The MA, MZ, and ME muffins demonstrated a high degree of acceptability. Proximate composition analysis revealed that the ME variant had the highest protein content. MA muffins recorded the highest levels of carbohydrates and dry matter, as well as the highest acidity. MZ and ME muffins had a higher salt content, while the ME variant exhibited the best porosity.

Key words*: acidity, antiradical activity, moisture, muffins, peel powder, porosity.*

TECHNOLOGICAL AND NUTRITIONAL EVALUATION OF PORK SAUSAGES ENRICHED WITH BUCKWHEAT, MUSHROOM POWDER AND NATURAL ANTIOXIDANTS

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Abstract

This study investigates the technological and nutritional implications of incorporating plant-based additives - specifically buckwheat flour and mushroom powder - into traditional pork sausages. The research evaluates how these ingredients influence the nutritional density, physicochemical characteristics, and sensory attributes of the final product. To ensure oxidative stability without compromising the traditional appearance, rosemary extract was utilized as a natural antioxidant. The experimental framework involved several formulations with varying concentrations of buckwheat (up to 10%) and pea protein isolate. Results demonstrate that the integration of buckwheat and mushroom powder significantly enhances dietary fiber and essential amino acid profiles while improving water-holding capacity and reducing lipid loss during thermal processing. Sensory evaluations indicated high consumer acceptability, as the umami notes from the mushroom powder effectively balanced the earthy profile of the buckwheat. These findings suggest that plant-based enrichment, supported by natural antioxidants, facilitates the development of functional meat products with improved nutritional profiles without compromising structural or organoleptic quality. These results highlight a novel formulation strategy that bridges traditional meat processing with clean-label innovation, offering promising applications for the functional food industry.

Key words*: pork sausages, buckwheat flour, mushroom powder, natural antioxidants, nutritional evaluation, technological evaluation.*

COMPARATIVE ANALYSIS OF PHEASANT MEAT TEXTURE FROM DIFFERENT REARING SYSTEMS (WILD VS. FARM RAISED)

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Abstract

Meat texture is an important parameter in the evaluation of products of animal origin, being influenced by biological, physiological, and environmental factors. The aim of this study was to perform a comparative analysis of the textural properties of pheasant meat obtained from different rearing systems. The study was conducted on breast muscles and thigh muscles, considered representative for assessing the mechanical properties of meat. Textural parameters were determined using a TA.XT Plus texture analyzer, applying instrumental tests to evaluate firmness. The obtained results were higher in wild pheasants, both in breast muscles (22.022 N in males and 21.411 N in females) and thigh muscles (21.321 N in males and 20.965 N in females), compared to farm-reared pheasants, which showed lower values for breast muscles (6.337 N in males and 5.314 N in females) and thigh muscles (6.10 N in males and 5.194 N in females). These results contribute to a better characterization of pheasant meat quality and highlight the influence of the rearing system on textural properties.

Key words*: meat quality, pheasant meat, mechanical properties, firmness.*

THE ELECTROACTIVATION OF WHEY: ADVANTAGES FOR OBTAINING DIRECTED PROTEIN CONCENTRATES

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Abstract

The processing of biological waste represents a key aspect of the circular economy, aiming to maximize the reuse and recycling of existing materials while minimizing environmental pollution. Effective waste recovery strategies also encompass technologies for whey reutilization, driven by the high biological value of its solid constituents, particularly proteins, as well as the potential to obtain valuable nutritional and therapeutic products. The processing of biological waste represents a key aspect of the circular economy, aiming to maximize the reuse and recycling of existing materials while minimizing environmental pollution. This study investigates whey electroactivation (EA) in diaphragm electrolysers with different geometric configurations (EDP-2, EDP-4, EDC-3, EDC-pilot) for obtaining protein mineral concentrates with predetermined protein content. EA was performed in periodic mode at current densities of 10 and 20 mA/cm² using a 2% $CaCl_2$ anodic solution. The results show that electrolyser design strongly affects both extraction efficiency and energy consumption. The highest total protein recovery was obtained in the EDC-3 electrolyser at 10 mA/cm², reaching 75.9–78.3% after 30 min, with the lowest specific energy consumption (0.023 W·h/mL). Differentiated fractionation was demonstrated: β-lactoglobulin (80–90%) in EDC-3, α-lactalbumin (~70%) in EDC-pilot, and caseins (20–25%) and HWP (~26-28%) in EDP-4. The novelty lies in demonstrating that electrolyser geometry and operating parameters enable controlled, non-denaturing, and energy-efficient fractionation of whey proteins into targeted products, supporting sustainable whey valorization

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Key words*: electroactivation, whey, protein concentrates.*

COMPARATIVE ANALYSIS OF ANTIOXIDANT ACTIVITY AND PHENOLIC CONTENT IN FRESH AND DRIED EDIBLE GREEN PLANTS

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Abstract

The paper evaluates the antioxidant potential and polyphenol content of seven green plants of dietary and therapeutic importance, used in various diets: garden orache (Atriplex hortensis L.), sorrel (Rumex acetosa), patience dock (Rumex patientia) wild garlic (Allium ursinum), lovage (Levisticum officinale), tarragon (Artemisia dracunculus), and dill (Anethum graveolens). The importance of these determinations lies in the need to quantify the actual nutritional value of plants, beyond their traditional use, providing a scientific basis for dietary recommendations. The study focuses on quantifying the total polyphenol content and evaluating the antioxidant capacity, comparing fresh samples with those subjected to conventional drying. The total polyphenol content was determined using the Folin-Ciocalteu spectrophotometric method, while the antioxidant capacity was evaluated using the DPPH method (RSA%). Monitoring these parameters is important for the food industry to optimize preservation methods, and the research highlights the essential role of these green plants in nutrition, promoting their use as natural and accessible sources of antioxidants.

Key words*: antioxidant activity, fresh and dried edible green plants, phenolic content.*

TOWARDS THE APPROPRIATE USE OF MEAT AND BY-PRODUCTS FROM COMMON CARP (*Cyprinus carpio)* AND BIGHEAD CARP (*Hypophthalmichthys nobilis*)

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Abstract

The efficient use of fishery resources represents a strategic initiative in the current context of sustainability, circular economy, and food security. Common carp Cyprinus carpio (Linnaeus, 1758) and bighead carp Hypophthalmichthys nobilis (Richardson, 1845) are among the most important freshwater fish species used in aquaculture, making an important contribution to global and national fish production. In addition to the traditional use of their meat for human consumption, the processing of these species generates considerable quantities of by-products which are often underutilized or discarded as waste, with negative impact on the environment and economic efficiency. This study evaluates the utilization potential of carp and bighead carp meat and by-products processing and valorisation pathways for food and non-food uses. The analysis highlights integrated resource utilization as an essential factor for enhancing value creation, reducing environmental impact, and supporting innovation within the fisheries sector. The results indicate that improved utilisation strategies for carp and bighead carp, along with their associated by-products, can contribute meaningfully to sustainable aquaculture development and to the food industry.

Key words*: circular economy, fish processing, food industry, innovation, sustainability.*

INFLUENCE OF THE GAME SPECIES (*Capreolus capreolus* L., *Cervus elaphus* L., *Dama dama* L.) ON THE CHEMICAL COMPOSITION, FATTY ACIDS AND AMINO ACIDS OF MEAT - A REVIEW

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Abstract

This article updates the present knowledge concerning the characteristics of venison from three cervid species, roe deer (Capreolus capreolus L.), red deer (Cervus elaphus L.), and fallow deer (Dama dama L.), in terms of chemical composition, amino acid profile, fatty acid composition, and mineral content. The literature shows that above mentioned game species has the potential to improve the supplying chain of the meat market. Venison from these species is rich in protein, and essential amino acids, but have low fat content, and valuable fatty acid profile. It is also characterized by a macromineral (Ca, Na, K, P) and micromineral (Fe, Zn, Se) content, that confer superior qualities to type of meat, which could include it in the class of the functional food. The differences between venison and conventional beef meat are determined by a series of factors, from internal nature, and also from external nature as environmental factors such as habitat. Our study confirms that venison could be an alternative of high nutritional value to conventional meat.

Key words*: cervid, fallow deer, nutritional value, red deer, roe deer.*

THE IMPACT OF STORAGE CONDITIONS ON QUALITY DEGRADATION AND SHELF-LIFE MODELING OF SELECTED FRESH FRUITS AND VEGETABLES

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Abstract

Fresh fruits and vegetables are highly perishable commodities, whose shelf life is strongly influenced by storage conditions along the postharvest chain. This study investigates the effects of temperature and relative humidity (RH), on quality degradation and of some fruits (apples and pears) and vegetables (carrots and cucumbers) shelf life. Products were stored under controlled conditions at different temperatures and relative humidity levels, and periodically evaluated for physicochemical, sensory, and microbiological quality attributes. Weight loss, firmness, colour, soluble solids content, titratable acidity, visual defects, and sensory acceptability were used as primary quality indicators, while total viable counts and yeasts and moulds were monitored as hygiene indicators. Shelf life was defined as the time to loss of acceptability based on predefined quality thresholds. Quality changes were modelled using kinetic approaches, and the effect of storage temperature on degradation rates was described using Arrhenius-type relationships. In parallel, survival analysis was applied to estimate shelf-life distributions under each storage condition, enabling comparison of storage scenarios and identification of limiting quality factors.

Key words*: shelf-life extension strategies; sustainable storage solutions; quality preservation technologies; food waste prevention; supply chain resilience.*

BEYOND HEAT: NOVEL NON-THERMAL STRATEGIES FOR FOOD SAFETY AND NUTRITIONAL RETENTION

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Abstract

Conventional thermal processing remains a fundamental approach to ensuring food safety, yet it often leads to significant losses of nutrients, bioactive compounds, and sensory quality. In response to growing demand for minimally processed foods, novel non-thermal technologies have gained increasing attention as effective alternatives. This paper reviews emerging non-thermal strategies for food preservation, including high-pressure processing (HPP), pulsed electric fields (PEF), cold plasma, ultraviolet (UV) irradiation, ultrasound, and bio preservation. The mechanisms of microbial inactivation and their efficacy against foodborne pathogens are examined alongside their impact on nutritional and functional components such as vitamins, antioxidants, proteins, and lipids. These technologies demonstrate the ability to achieve high levels of microbial safety while minimizing detrimental changes to food structure and quality. Recent technological advances, industrial applicability, and the use of combined non-thermal approaches to enhance processing efficiency are also discussed. Additionally, challenges related to regulatory frameworks, equipment costs, and consumer acceptance are addressed. Overall, non-thermal processing represents a promising and sustainable approach to food safety, aligning public health requirements with nutritional preservation and clean-label food trends.

Key words*: alternative technologies, challenges, food quality and safety, high-pressure processing, nutritional retention.*

QUALITY EVALUATION OF DIFFERENT TYPES OF TRADITIONAL HOMEMADE SYRUPS

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Abstract

This study evaluated the quality of artisanal fruit syrups through a range of physicochemical and sensory assessments, enabling a holistic appraisal of their production practices and their conformity with relevant quality standards. Sensory evaluation indicated that the syrups were appreciated due to their bright, transparent appearance, pleasant flavor, and attractive aromatic characteristics, as well as their smooth textures with minimal solid particulates. Physicochemical evaluations were conducted to verify syrup quality by assessing several key quality indicators. The syrup samples maintained a turbidity range between 12.9 and 22.7 NTU. The pH range of 2.9-4.2, together with total acidity values of 0.3%-3.8% expressed as citric acid, creates conditions that effectively suppress bacterial and fungal growth, thereby contributing to the overall stability of the product. Microbiological testing demonstrated that none of the syrup samples showed evidence of bacterial or fungal contamination.

Key words*: fir buds, quality control, sea buckthorn, strawberry, syrup.*

COMPARATIVE ANALYSIS OF THE EFFECTIVENESS OF CONVECTIVE DRYING OF CHICKEN GIZZARDS IN CUT AND GROUND FORM

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Abstract

This research explores convective drying methods for producing pet protein supplements from chicken gizzards. It compares two preparation techniques: slicing gizzards into pieces versus mincing them into sausages, which allows for grain additives such as oatmeal or rice. Experiments were conducted in a 12-tray cabinet dehydrator using an ESP-32-based IoT control system. This setup utilized BME-280 and DS18B20 sensors to record real-time telemetry - including air humidity, temperature, and power consumption - to the cloud. Key findings include: efficiency (mincing significantly reduces processing time; ground gizzards reached equilibrium humidity in 15 hours, compared to 25 hours for sliced pieces), temperature (drying time remained relatively stable across the range) and quality (lower temperatures promoted beneficial self-fermentation, enhancing product palatability for pets). The study concludes that mincing and forming gizzard "sticks" is the superior method. It optimizes production by reducing drying time and energy consumption while maintaining high animal appeal.

Key words*: drying, gizzards, IoT.*

DEVELOPMENT AND QUALITY ASSESSMENT OF MOCHI ASSORTMENTS: IMPACT OF CUSTOM-PROCESSED VEGETABLE AND FRUIT POWDERS ON FROZEN STABILITY

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Abstract

This study investigates the development of innovative mochi assortments using custom-processed vegetable and fruit powders. The research covers the entire production process, from the dehydration and milling of raw materials to their integration into the glutinous rice base. The study evaluates the impact of these natural additives and fruit-based fillings on the product`s quality, focusing on sensory attributes, pH levels, and textural profiles. A central objective is the assessment of frozen stability, monitoring parameters such as drip loss, colour retention, and changes in firmness after thawing. The investigation establishes how different formulations influence moisture migration and the structural integrity of the rice-based base. The findings provide a practical framework for optimizing the shelf-life and physical properties of mochi using entirely natural ingredients.

Key words*: acceptability, firmness, hydration, pigmentation, storage.*

VALORIZATION OF WHEY THROUGH FOOD UPCYCLING: EVIDENCE FROM HIGH-PROTEIN DAIRY AND CEREAL PRODUCTS ON THE RETAIL MARKET IN ROMANIA

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Abstract

This study investigates the prevalence and distribution of whey-derived protein ingredients in high-protein food products available on the Romanian retail market, through a cross-sectional label analysis survey conducted between December 2024 and March 2025 across major national retail chains. A total of 87 products were analyzed across three categories: high-protein beverages (n = 27), protein bars and cookies (n = 35), and dairy products (n = 25). Products were assessed for declared protein sources, with particular attention to whey protein concentrate (WPC), whey protein isolate (WPI), and whey protein hydrolysate (WPH) as indicators of whey valorization. WPC was the most prevalent whey-derived ingredient, explicitly declared in 41 products (47.1%), while WPI was identified in only one product and WPH was entirely absent. Despite their widespread incorporation into retail formulations, whey-derived ingredients were absent from any upcycling or sustainability communication on product labels, with the seven products bearing sustainability claims (8%) referring exclusively to packaging materials. These findings confirm that whey upcycling is already implicitly embedded in the Romanian retail food sector, driven by nutritional rather than circular economy objectives, highlighting a significant communication gap between whey valorization practices and consumer-facing label transparency.

Key words*: cereal-based products, dairy products, food upcycling, high-protein foods, retail market survey, Romania, whey protein, whey valorization.*

EVALUATION OF PRESERVATIVE ADDITIVES IN REFRIGERATED PÂTÉ AND LIVER SAUSAGE PRODUCTS MARKETED IN ROMANIA: A CASE STUDY

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Abstract

Refrigerated meat products such as pâtés and liver sausages represent a widely distributed food category on the Romanian market, whose microbiological stability is largely ensured through the use of synthetic preservative additives, particularly sodium nitrite (E250). In the context of increasing consumer demand for products with cleaner ingredient lists ("clean label") and growing concerns regarding the long-term safety of synthetic preservatives, the present study aimed to systematically evaluate the preservative and antioxidant additives declared on the labels of products from these categories marketed in Bucharest.
The study employed a descriptive observational design and included a sample of 29 refrigerated products: 16 pâtés and 13 liver sausages, collected in April 2026 from four modern retail chains (Kaufland, Carrefour, Mega Image, Lidl) and from butcher/cold meat specialty shops in Bucharest. The identified additives were classified according to Regulation (EC) No. 1333/2008 and analyzed descriptively by calculating absolute and relative frequencies.

Key words*: bioactive compounds, clean label, food preservatives, labeling, sodium nitrite.*

ANIMAL FAT CONSUMPTION VERSUS SUGAR INTAKE: IMPLICATIONS FOR OBESITY IN THE POPULATION OF THE REPUBLIC OF MOLDOVA

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Abstract

This study examines the relationship between obesity prevalence and dietary patterns in the Republic of Moldova, with a comparative focus on animal fat and sugar consumption. The analysis is based on national-level data from FAOSTAT Food Balance Sheets, the World Health Organization, and the World Bank, covering the period 2010-2022, for which consistent data are available. Obesity prevalence among adults and children is assessed alongside food supply indicators for animal fats and sugar. The results indicate a higher descriptive correlation between obesity prevalence and sugar supply compared to animal fat intake, based on seven biennial observations across co-trending time series; these associations should be interpreted as population-level trend indicators rather than as evidence of differential dietary effect or causation. While both dietary components show increasing trends over the study period, sugar availability exhibits a closer temporal alignment with rising obesity rates, whereas animal fat consumption displays a weaker and more variable relationship. The study does not account for other determinants of obesity, such as physical activity or sedentary behavior. Therefore, the findings should be interpreted as population-level associations rather than evidence of direct causality. The results highlight the importance of prioritizing sugar reduction strategies in public health interventions addressing obesity in the Republic of Moldova.

Key words*: animal fat consumption, sugar intake, population obesity, Republic of Moldova.*

PHYSICOCHEMICAL PROPERTIES OF DAIRY, FRUIT-BASED AND PLANT-BASED FROZEN DESSERTS: IMPLICATIONS FOR FUNCTIONAL PACKAGING DESIGN

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Abstract

This review compares dairy, fruit-based, and plant-based frozen desserts from a compositional and physicochemical perspective, with emphasis on their implications for functional packaging. The study is based on a literature review, focusing on fat, protein, pH, overrun, texture, viscosity, and melting behavior. Dairy ice cream demonstrated the highest structural stability due to its aerated fat-protein structure, resulting in slower melting. Fruit-based sorbets showed lower stability and faster melting, while plant-based products showed variable behavior depending on formulation. These differences directly influence packaging requirements. Products containing lipids require protection against oxygen and light, while structurally less stable systems demand improved thermal insulation and strict temperature control. Overall, adapted functional packaging solutions can represent an effective approach to maintaining quality and extending shelf life.

Key words*: ice cream, sorbet, plant-based frozen desserts, sensory properties, texture.*

COMPARATIVE NUTRITIONAL ASSESSMENT OF BEEF MARROW-BASED SPREADABLE PRODUCTS: PLAIN AND SOY-ENRICHED FORMULATIONS

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Abstract

The valorisation of animal by-products into nutrient-dense foods has received increasing attention in food science due to its potential to enhance resource use efficiency and reduce food waste within sustainable food systems. This study aimed to develop a beef marrow-based spread and to evaluate its nutritional value in both a plain formulation and a soy-enriched variant (33.3% soy). Beef marrow is rich in lipids, proteins, and bioactive compounds; however, its application in spreadable food products remains limited. Both formulations were analysed for total fat content, fatty acid profile, protein and collagen content, oxidative stability, and shelf life. Results indicated a predominance of unsaturated fatty acids (UFA) in both products. The plain formulation exhibited higher levels of polyunsaturated fatty acids (PUFA) and more favourable lipid quality indices, whereas soy enrichment increased protein content and the proportion of monounsaturated fatty acids (MUFA), thereby improving oxidative stability, likely due to increased oleic acid content. Compared with conventional animal fat sources, beef bone marrow exhibited a favourable UFA profile, supporting its nutritional value and potential application in food formulations. Overall, bone marrow represents a valuable animal by-product with strong potential for incorporation into circular food systems.

Key words*: alternative protein sources, food valorisation, lipid quality, nutritional enhancement.*

SAFETY AND STABILITY: HOW STORAGE TEMPERATURES BETWEEN -20°C AND 40°C CAN ALTER THE PROFILE OF MINERAL WATER

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Abstract

Tap and bottled natural mineral water represent essential sources of daily hydration, and maintaining their quality during storage is critical for consumer safety. This study evaluated the short-term influence of storage temperature and packaging type on the physicochemical and microbiological stability of tap water and commercially available natural mineral water (still and carbonated). Samples were analyzed at the initial time point (T_0) and after 7 days of storage at −20°C, 4°C, 16°C, 22°C, and 40°C. Physicochemical parameters such as pH, electrical conductivity, free CO_2, alkalinity, dry residue, iron, nitrates, ammonia, and major cations and anions. Microbiological quality was assessed by determining E. coli, total coliforms, fecal coliforms, Pseudomonas aeruginosa, and total viable counts at 22°C and 37°C. Minor variations in certain physicochemical parameters were observed, particularly in PET-packaged samples stored at 40°C, which likely reflected a combination of normal inter-bottle variability and slight concentration effects associated with elevated temperature exposure.

Key words*: hydrochemical stability, microbial regrowth, mineral precipitation, thermal stress, water potability.*

FOOD WASTE IN THE ROMANIAN HOSPITALITY SECTOR: AN ASSESSMENT OF ECONOMIC AND ENVIRONMENTAL IMPACT IN A MID-SIZE COASTAL HOTEL

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Abstract

Food waste in the hospitality sector represents a pressing challenge with compounding economic and environmental consequences. This empirical study assesses food waste generation and its economic and environmental impacts in a mid-size hotel located in Neptun, Romania, during the peak (August 2025; n = 295) and off-peak (September 2025; n = 425) seasons. Daily food waste was quantified through direct weighing of service-waste and plate-waste across set-menu and buffet meal services. Results show higher per-guest waste during peak season compared to off-peak. Estimated environmental impacts were calculated using standardized emission and water footprint factors. Economic losses, based on average ingredient cost, were also estimated. Buffet meals consistently generated more waste than set menus, confirming literature that self-serve formats amplify waste. Differences by demographic groups were aligned with previous regional findings. This study contributes with a replicable methodology and localized evidence on food waste impacts, supporting Sustainable Development Goals (SDG) 12.3 objectives of halving food waste by 2030.

Key words*: circular food economy, farm-to-fork, greenhouse gas emissions, HoReCa sustainability, plate waste quantification, seasonal tourism pressure.*

STRENGTHENING FOOD SAFETY MANAGEMENT SYSTEMS THROUGH PROCESS OPTIMIZATION AND WORKFORCE TRAINING: IMPLICATIONS FOR PUBLIC HEALTH

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Abstract

Food Safety Management Systems (FSMS) are essential for public health protection, yet their effectiveness depends on both process performance and workforce competence. This study evaluates an integrated Continuous Improvement program combining Lean Six Sigma tools (5S, SMED, Kaizen, OEE, root cause analysis) with differentiated workforce training over four years (2022-2025) in an industrial food processing unit. Using a mixed-methods approach, pre- and post-intervention indicators were systematically analysed across 611 enrolled employees. Over the program window (2022-2025), Potential Food Safety Risk complaints decreased by 36% and client laboratory specification deviations by 60%, concurrent with a 27% increase in production volume; cumulative reductions versus the 2020 pre-program baseline reached 76% and 93%, respectively. Staff turnover declined from 29% to 17%, while the rookie ratio dropped from 28% to 14%, crossing the critical threshold for elevated food safety risk. IFS audit scores reached 98.47% and BRC certification progressed from Grade A to AA. The framework provides a scalable, evidence-based approach for enhancing FSMS effectiveness and supporting public health objectives.

Key words*: continuous improvement, food safety culture, human capital development, lean six sigma, public health protection.*

CLOSING THE LOOP IN THE BAKERY SECTOR: ADVANCED UPCYCLING TECHNOLOGIES FOR DEVELOPING HIGH-VALUE FUNCTIONAL FOOD ADDITIVES

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Abstract

The bakery industry generates significant quantities of waste, posing substantial economic and environmental challenges. Traditionally discarded or used as low-value animal feed, bakery by-products are increasingly recognized as valuable feedstocks for a circular bioeconomy. This article explores modern technological approaches for transforming surplus bread and bakery waste into high-value functional ingredients. Key strategies discussed include enzymatic hydrolysis for sugar recovery, microbial fermentation for postbiotic production, and advanced thermo-mechanical treatments such as extrusion to modify techno-functional properties. These processes enable the extraction of bioactive compounds, dietary fibers, and protein hydrolysates with specific nutritional benefits. By upcycling bakery waste into functional additives and nutritional fortifiers, the industry can reduce its carbon footprint and align with Sustainable Development Goal (SDG) 12.3. This review highlights the potential of these technologies to bridge the gap between waste management and food innovation, providing a scalable framework for sustainable production.

Key words*: bakery waste, circular economy, enzymatic hydrolysis, functional ingredients, upcycling.*

HEAVY METAL NOTIFICATIONS IN RASFF: PATTERNS, PRODUCT CATEGORIES, AND IMPLICATIONS FOR FOOD AND FEED SAFETY

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Abstract

This study assessed heavy metal contamination in food and feed using notifications recorded in the Rapid Alert System for Food and Feed (RASFF). Data covering 1 January 2010 to 31 December 2022 were extracted from the RASFF database, resulting in 2862 notifications and 3319 analyzed records for 16 heavy metals. Descriptive statistics, correlation analysis, cluster analysis, and principal component analysis were used to examine contamination patterns by product category, risk decision, and country of origin. The results showed marked differences between product groups. Mercury was mainly associated with fish and fish products, cadmium with bivalve molluscs and food contact materials, lead with food contact materials, and arsenic with feed-related categories and some plant-derived products. Recurrent notifications in feed materials, feed additives, seafood products, and food contact materials indicate critical points for surveillance and control. Overall, the study confirms the value of RASFF as a tool for risk-based monitoring and for supporting regulatory updates aimed at reducing consumer exposure to hazardous metals.

Key words*: contamination, feed safety, food safety, heavy metals, RASFF.*

QUALITY ANALYSIS OF SOME BOILED-SMOKED PORK LOIN

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Abstract

The purpose of this study was the comparative assessment of the quality of some assortments of pork products (boiled-smoked loin) sold in Romania. Sensory and physico-chemical properties were analyzed. The results of the sensory analysis revealed a minimum score for product B (13.73 points/`unsatisfactory product` according to quality standards), compared to product A which obtained the best score among all the analyzed assortments (16.90 points/ `good product `). Were observed differences between products in terms of fat content (between 1.20% and 3.10%), of proteins (between 20.10%-22.20%) and water content (between 74.40%-76.95%, all products exceending the maximum standard limit). The salt content had the highest value of 3.40%, exceeding standard limit, in the case of A product. The determined pH value indicates a corresponding freshness (between 5.99 and 6.39). A higher brightness was observed for product D (L=72.11) and a lower one for product C (L*=65.65), the latter having higher values for the red-green coordinate a*=12.45. Product D presents a higher texture hardness (40.30 N/m2), compared with A product (23.70 N/m)2, based on different technological factors.*

Key words*: pork, meat, proteins, texture, quality.*

DEVELOPMENT OF A NEXT-GENERATION MEAT PRODUCT ENRICHED WITH *Astragalus membranaceus* AND EXPLORING ITS POTENTIAL

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Abstract

The food industry, and especially the meat industry, is in a constant search for new, innovative products that meet the increasingly demanding requirements of consumers who are looking for functional products, rich in benefits and without synthetic additives, in line with the trends of recent years. With this idea in mind, we developed this new type of beef product in the form of sticks, which would incorporate both the benefits of the meat and the added Astragalus membranaceus, an antioxidant superfood, and meet the demand for innovation that consumers are demanding. For this study, three batches of products were produced: a control batch without added Astrogalus membranaceus and two experimental batches with added Astrogalus in 1 and 3%. All three batches were evaluated for physicochemical characteristics, instrumental colour, texture, antioxidant activity, bioactive compound profile, and sensory properties, including hedonic assessment, QDA, and PCA. The results showed that Astragalus membranaceus powder significantly influenced most quality parameters, particularly antioxidant activity, phytochemical composition, colour, texture, and sensory descriptors, with the strongest effects generally observed at the 3% addition level.

Key words*: antioxidants, innovative meat products, functional foods, sensory evaluation, beef meat products.*

INFLUENCE OF GINGER POWDER AND PICKLED GINGER ON THE SENSORY CHARACTERISTICS OF EMULSIFIED CHICKEN MEAT PRODUCTS

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Abstract

The present study evaluated the influence of dried ginger powder and pickled ginger, incorporated at 0.5% and 1.5%, on the sensory quality of chicken frankfurter-type sausages. Five formulations were analyzed: one control sample (207) and four ginger-enriched batches - 0.5% ginger powder (305), 1.5% ginger powder (189), 0.5% pickled ginger (237), and 1.5% pickled ginger (837). Sensory evaluation was performed by 45 semi-trained evaluators using Check-All-That-Apply (CATA), Quantitative Descriptive Analysis (QDA), and a nine-point hedonic test. Data were analyzed through Correspondence Analysis (CA), Principal Component Analysis (PCA), and external preference mapping (PREFMAP). The results showed that ginger processing form had a greater impact on sensory perception than concentration level. Pickled ginger formulations, especially at 0.5%, were associated with desirable attributes such as balanced odour, elastic texture, and pleasant flavour persistence. In contrast, high concentrations of ginger powder generated less favourable sensory profiles characterized by crumbly texture and pronounced pungent notes. All formulations achieved hedonic scores above 6.00, indicating general consumer acceptance. The control sample recorded the highest overall acceptability (8.11), closely followed by the 1.5% and 0.5% pickled ginger formulations. The findings suggest that pickled ginger represents a suitable alternative for the sensory enhancement of chicken frankfurter-type sausages.

Key words*: emulsified chicken products; ginger; sensory evaluation; hedonic scale; QDA; frankfurter-type sausages.*

EFFECTS OF PAPAIN AND BROMELAIN ADDITION ON THE PHYSICOCHEMICAL AND TEXTURE PROFILE PROPERTIES OF SUMMER SALAMI

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Abstract

The aim of this study was to evaluate the effect of proteolytic enzymes - specifically bromelain and papain - on the physicochemical characteristics of fermented salamis. Three variants were analyzed: a control sample and two samples treated with bromelain and papain. The results revealed statistically significant differences ($p < 0.05$) between the variants in terms of fat, water, dry matter, and protein content. The samples treated with bromelain had the lowest fat content (14.62%) and dry matter content (37.48%), as well as the highest water content (62.52%), indicating an improvement in water-holding capacity. Overall, bromelain demonstrated a more pronounced impact on the physicochemical properties of the product, highlighting its potential as a functional ingredient for improving the texture and juiciness of meat products. The results obtained highlight the importance of the controlled use of proteolytic enzymes in meat processing and support their applicability as an effective strategy for improving product quality.

Key words*: summer salami, papain, bromelain, proteolytic enzymes, meat quality.*

EFFECT OF FLAXSEED AND SESAME FLOUR INCORPORATION ON THE SENSORY QUALITY OF HETEROGENEOUS SAUSAGES

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Abstract

The reformulation of meat products through the incorporation of functional plant-based ingredients represents a priority direction in the modern food industry. This study investigated the effect of flaxseed flour (Linum usitatissimum L.) and sesame flour (Sesamum indicum L.), at two inclusion levels, on the sensory quality of heterogeneous sausages. Five batches were prepared, including one control and four experimental formulations with 2% and 4% plant flour additions. Sensory evaluation was conducted by a panel of semi-trained assessors using Quantitative Descriptive Analysis (QDA), a hedonic test, the Check-All-That-Apply (CATA) method, and Preference Mapping (PrefMap). The results revealed significant modifications in colour, aroma, texture, juiciness, and overall acceptability as a function of the plant flour concentration. Optimal substitution levels were identified based on acceptability scores and the sensory profile of the reformulated products, demonstrating the considerable potential of these ingredients in the development of functional meat products with an improved nutritional profile.

Key words*: flaxseed flour, sesame flour, heterogeneous sausages, sensory quality, CATA, QDA.*

BEYOND CONVENTIONAL CHICKEN MEATBALLS THROUGH OAT FIBER INCORPORATION AND ITS PHYSICOCHEMICAL, TEXTURAL, AND SENSORY EFFECTS

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Abstract

Growing interest in clean-label meat products has encouraged the use of dietary fibers that improve nutritional value and technological functionality. Oat fiber was incorporated at 3% and 6% into chicken meatballs from breast and thigh meat, and compared with a control formulation. The samples were evaluated for proximate composition, energy value, pH, water activity, color, Warner-Bratzler cutting properties, texture profile analysis, and sensory perception using hedonic evaluation, descriptive sensory analysis, and PCA. Oat fiber affected most quality parameters. Moisture decreased from 70.96% in the control to 70.05% and 69.50% in the 3% and 6% samples, while dry matter, ash, and fiber increased. Fiber increased from an undetectable level to 2.77% and 5.12%, respectively, whereas protein, fat, energy value, pH, and water activity decreased markedly ($p < 0.001$). Color analysis indicated significant changes in L, b*, and chroma, whereas a* and hue were not significantly affected. Oat fiber also strengthened the structure, increasing hardness, Warner-Bratzler shear force, and work of shear from 13.52 N, 9.31 N, and 83.24 mJ to 19.29 N, 11.02 N, and 122.55 mJ.*

Key words*: chicken meatballs, oat fiber, dietary fiber, meat science, poultry meat products.*

EFFECT OF KOMBUCHA-ENRICHED BRINE ON THE TENDERIZATION OF INJECTED BEEF: IMPLICATIONS FOR TEXTURE PROFILE, PHYSICOCHEMICAL PROPERTIES, AND SENSORY ACCEPTABILITY

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Abstract

This study evaluated the potential of kombucha - a fermented beverage produced through the symbiotic activity of acetic acid bacteria and yeasts - incorporated at three concentration levels (5%, 10%, and 15%) into the injection brine, as a natural source of organic acids with potential tenderizing and quality-modifying effects for smoked beef loin. Four batches were produced and assessed: one control (CB0%, with standard brine) and three formulations (KB5%, KB10%, KB15%), all injected at a rate of 10% (w/w). The products were evaluated for chemical composition, color parameters, texture profile, pH, water activity, and sensory acceptability. The addition of kombucha to the injection brine produced a dose-dependent improvement in meat tenderness, reflected by significantly reduced Warner-Bratzler shear force and TPA hardness values compared to the control ($p < 0.05$). Sensory evaluation confirmed good overall acceptability for all experimental formulations, with the kombucha-enriched batches receiving favorable scores for texture and overall acceptability.

Key words*: meat tenderization; injection brine; kombucha; smoked beef; texture profile analysis.*

RED LENTIL FLOUR IN PORK SAUSAGES: A MODERN STRATEGY FOR QUALITY IMPROVEMENT AND SENSORY STABILITY

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Abstract

Growing demand for meat products with recognizable plant-based ingredients has intensified interest in reformulating traditional sausages without compromising technological quality or consumer perception. Red lentil flour was incorporated at 4% and 8% into thin pork sausages, using a control formulation without plant addition. Samples were evaluated for proximate composition, pH, water activity, instrumental color, Warner–Bratzler cutting behavior, texture profile analysis, antioxidant activity, and sensory perception. One-way ANOVA revealed that red lentil flour incorporation significantly affected most quality traits, including proximate composition, water activity, instrumental color, Warner–Bratzler cutting behavior, and texture profile parameters ($p < 0.05$). In contrast, pH remained statistically unaffected by the reformulation ($p > 0.05$). The multivariate sensory showed limited sensory separation among formulations, indicating that red lentil flour did not compromise the sensory quality of the products, while antioxidant assays suggested an enhanced bioactive potential in the reformulated sausages. These findings suggest that red lentil flour is a promising ingredient for pork sausage reformulation, contributing to improved chemical quality while preserving the sensory characteristics of the final products.

Key words*: red lentil flour, pork sausage, sensory quality, antioxidant activity, meat science.*

TECHNOLOGICAL DEVELOPMENT AND EVALUATION OF A BEEF-BASED SNACK PRODUCT

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Abstract

Ready-to-eat products represent a food category of increasing interest, intended for consumers with an active lifestyle and the need for rapid nutrient intake, particularly animal-derived proteins. In this context, the present study aimed to develop a beef jerky product and evaluate it for nutritional, colorimetric, and textural properties, as well as food safety, throughout the technological process. The product obtained from beef muscle (Musculus semimembranosus) exhibited characteristics typical of jerky, with a high protein content (48.92±0.11) and a low lipid content (9.38±0.04). Textural analysis indicated a compact and uniform structure, while color parameters revealed specific shades characteristic of this type of dried meat product. Furthermore, microbiological results confirmed adequate product stability throughout the technological process.

Key words*: beef jerky, ready-to-eat, high-protein snack, meat-based snack.*

THE EFFECT OF INJECTING *Aronia melanocarpa* JUICE ON THE TEXTURAL, PHYSICOCHEMICAL AND SENSORY CHARACTERISTICS OF SMOKED CHICKEN BREAST *(Musculus pectoralis)*

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Abstract

The optimization of the textural, physicochemical, and sensory characteristics of poultry meat products represents an important direction in the development of products with a compact structure, especially in the context of using natural ingredients with functional potential. This study investigates the effect of injecting aronia juice into chicken breast (Musculus pectoralis) in proportions of 3%, 6%, and 9%. The experimental design consisted of obtaining aronia juice through pressing, injecting it into chicken breast, wet aging under vacuum in refrigerated conditions, and thermal treatment. Subsequently, the textural parameters were analyzed, with the results highlighting an improvement, and the analysis of the physicochemical parameters indicated favorable developments. From a sensory perspective, the product exhibited a high level of acceptability among the panelists. The results highlighted a significant influence of the injection, suggesting that aronia contributed to the overall improvement of the final product`s quality.

Key words*: poultry meat, textural optimization, quality, aronia juice, sensory acceptability.*

EFFECT OF SALT CONCENTRATION ON MICROBIAL STABILITY AND QUALITY EVOLUTION OF CARP *(Cyprinus carpio)* ROE DURING MATURATION

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Abstract

Carp roe (Cyprinus carpio) is a rich, concentrated source of nutrients in the human diet, offering multiple health benefits. The maturation of Cyprinus carpio roe is a complex technological process characterized by a series of controlled biochemical transformations that contribute to the development of the final sensory profile. The aim of this study was to monitor the maturation process of Cyprinus carpio roe under controlled refrigeration conditions (0-4°C) for 20 days. Three experimental trials were conducted in which different amounts of NaCl (4%, 7%, and 9%) were added per 450 g of raw material. Controlling maturation parameters, including NaCl concentration, temperature, and duration of the process, is essential for obtaining a product with optimal consumer properties, quality, and safety. The experimental samples were tested microbiologically and physicochemically at 10 and 20 days to identify the optimal maturation time. According to the results, increasing the NaCl concentration led to a significant reduction (<0.005) in total microbial load and mold, with the effect being more pronounced at 9% NaCl. However, at 10 days of maturation, TVC values were slightly higher at 7% and 9% NaCl compared to 4%, suggesting a possible selection of halotolerant microbiota in the product. The physicochemical analyses were significantly influenced (<0.005) by both the salt concentration and the time period. Water activity is significantly influenced by time, salt concentration, and the interaction between time and salt concentration (<0.005). The L parameter is influenced by salt concentration (<0.005) and is not influenced by time. A maturation period of 20 days was identified as optimal for ensuring the safety and quality of the final product.*

Key words*: carp, roe, maturation, quality, safety.*

GAME MEAT AND CONVENTIONAL MEAT: A COMPARATIVE REVIEW OF NUTRITIONAL COMPOSITION AND TECHNOLOGICAL CHARACTERISTICS

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Abstract

This review analyzes the nutritional profile and technological properties of game meat in comparison with conventional meat, based on a structured search of scientific databases such as Scopus, Web of Science, and PubMed. Game meat is generally distinguished by a higher protein content, lower fat levels, and a more favorable fatty acid composition, particularly due to increased polyunsaturated fatty acids and omega-3 content. It is also an important source of essential micronutrients, including iron, zinc, and vitamin B12. From a technological standpoint, however, game meat is more prone to lipid oxidation, which can negatively impact shelf life and processing stability. In contrast, conventional meat exhibits greater oxidative stability but typically contains higher levels of saturated fat. These variations are influenced by species, diet, physical activity, and rearing conditions.

Key words*: game meat, conventional meat, nutritional profile.*

SESSION WILD LIFE MANAGEMENT, FISHERY AND AQUACULTURE

EARLY MORPHOLOGICAL VARIABILITY IN COMMON CARP (*Cyprinus carpio* L.) OFFSPRING FROM PURE ROPȘA AND FRĂSINET STRAINS UNDER UNIFORM REARING CONDITIONS

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Abstract

The present study aimed to characterize the early morphological variability in common carp (Cyprinus carpio L.) offspring belonging to the pure Romanian strains Ropșa and Frăsinet, in order to highlight phenotypic differences and specific growth potential for each line. The research was conducted on a total of ten families (five Ropșa×Ropșa and five Frăsinet×Frăsinet), evaluated at the age of 45–47 days under uniform rearing conditions (density, feeding regime, dissolved oxygen, and temperature). Morphometric traits analyzed included total length, standard length, fork length, head length, maximum body depth, and body weight at 45–47 days post-hatching. Statistical analysis (mean, SD, CI95, Welch t-test) revealed significant differences between strains. Ropșa offspring showed higher values for body size and weight, while Frăsinet individuals displayed longer heads and greater within-family homogeneity. The differences were statistically significant ($p < 0.01$ for most traits). These findings emphasize the genetic and morphometric differentiation between the two Romanian carp strains, confirming the growth advantage of the Ropșa strain in early developmental stages, which is relevant for selection and breeding programs in aquaculture.

Key words*: Cyprinus carpio, ropșa, frăsinet, morphometry, early growth.*

THE HETEROSIS EFFECT ON MORPHOMETRIC TRAITS IN HYBRID PROGENY OF COMMON CARP (*Cyprinus carpio* L.) OBTAINED FROM CROSSES BETWEEN ROPȘA AND FRĂSINET VARIETIES

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Abstract

This study evaluates the heterosis effect on early morphometric traits in hybrid progeny of common carp (Cyprinus carpio L.) obtained from controlled crosses between the Romanian strains Ropșa and Frăsinet. The aim was to identify the hybridization direction with a positive influence on body conformation and growth potential. The analysis was based on mean values obtained for pure families (R×R, F×F) and hybrids (R×F, F×R), for the main morphometric traits. The heterosis effect was calculated using the classical method, comparing hybrid means with the parental average. The results revealed a moderate positive heterosis in R×F hybrids for volumetric traits (body height and weight), suggesting initial hybrid vigor, while F×R hybrids showed positive heterosis for head length but negative values for the other traits. The direction of crossing significantly influenced phenotypic expression, confirming the maternal effects in shaping body morphology. These findings support the controlled use of reciprocal hybridization as a tool in breeding programs for the genetic improvement of common carp.

Key words*: Cyprinus carpio, heterosis, hybridization, morphometry, maternal effect.*

IMPACT OF HABITAT FRAGMENTATION ON SOIL MITE COMMUNITIES (ACARI-MESOSTIGMATA) FROM TWO SMALL PROTECTED AREAS FROM BRAŞOV COUNTY, ROMANIA

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Abstract

One of the main threats of terrestrial ecosystems is habitat fragmentation. This threat has impact even on soil fauna, as predator mites. The present study wants to demonstrate that the mite community structures and species diversity are strongly correlated with the type of fragmented habitats, from two fragmented Natura 2000 site: Forest and Eutrophic Marshes from Prejmer (ROSCI0170) and Lempeş Fortress Hill-Hărman Marsh (ROSCI0055), characterized by the presence of different ecosystems: calcareous fens, alluvial, oak-hornbeam and beech forests. In 2018, eighty soil samples were investigated. In total, 29 species of Mesostigmata were identified. Considering the numerical abundance and species richness of Mesostigmata, we observed that the highest value was obtained in Prejmer protected area. If we make this comparison, considering the four fragments from each investigated area, we observed that in the fragments characterized by wet ecosystems (calcareous fens with Cladium mariscus (L.) Pohl), soil mites found the most favorable environmental conditions for their development. Each investigated fragments from the two protected areas were defined by the characteristically pattern of the soil mite structures, according to the applied statistical analysis.

Key words*: habitat, mite, predator, soil, structure.*

EARLY MORPHOLOGICAL VARIABILITY IN COMMON CARP (*Cyprinus carpio* L.) OFFSPRING FROM HYBRID CROSSES ROPȘA × FRĂSINET AND FRĂSINET × ROPȘA UNDER UNIFORM REARING CONDITIONS

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Abstract

The study analyses early morphological variability in common carp (Cyprinus carpio L.) offspring obtained from reciprocal hybridizations between the Romanian strains Ropșa and Frăsinet, focusing on the effect of cross direction on phenotypic traits. Research was carried out on hybrid families Frăsinet × Ropșa (F×R) and Ropșa × Frăsinet (R×F), evaluated at 45–47 days post-hatching under identical rearing conditions. Morphometric traits measured included total length, standard length, head length, maximum body depth, and body weight. Statistical analysis comprised the calculation of means, standard deviations, 95% confidence intervals (CI95%), and Welch's t-test. Significant differences were observed between hybrid directions: R×F offspring showed higher total length and body weight, whereas F×R individuals exhibited a significantly longer head. These findings highlight the influence of hybridization direction on body conformation and early growth potential in common carp.

Key words*: Cyprinus carpio, hybridization, morphometry, variability.*

RELEVANCE OF EDIBLE SNAIL EXPLOITATION UNDER MOLDOVA'S CLIMATE WITH ESSENTIAL SCIENTIFIC ARGUMENTS

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Abstract

The edible snails: Helix pomatia, Helix aspersa Muller, and Helix aspersa Maxima are terrestrial hermaphroditic species native to Europe, including Moldova. They thrive in local areas which provide ideal feeding habitats. While EU legislation protects wild populations, farmed specimens are legally harvested for food processing. With global population growth intensifying food production challenges, snail farming offers a sustainable protein and mineral sources, that aligns with ecological and food security priorities. Additionally, these molluscs contribute to the sanitation of the polluted ambience. Unlike intensive livestock farming, Helix mollusk cultivation generates negligible greenhouse gases emissions, being an opposite option for traditional animal breeding in our country. In controlled studies, the average daily weight gain of Helix pomatia can be around 0.05 grams per day, while in the wild they can reach at maturity of 2 years only approximatively 19g. Helix aspersa reveals better results. Our research confirms these species' economic profitability: it requires limited space, has high reproduction rates, and incurs low maintenance costs. Furthermore, their consumption involves no waste, as all processing by-products can be efficiently utilized according to concrete purpose.

Key words*: feasibility study, growth intensity, Helix snail breeding, meat chemical composition.*

DISTRIBUTION AND CONSERVATIVE ISSUES OF *Lucanus cervus* (Linnaeus, 1758) AND *Cerambyx cerdo* (Linnaeus, 1758) FROM CRÂNG FOREST, BUZĂU - ROMANIA

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Abstract

According to the European legislation invertebrate species Lucanus cervus (Linnaeus, 1758) and Cerambyx cerdo Linnaeus, 1758 are two species with conservative value, being included in the European Union Habitats Directive 92/43/EEC. They are considered indicator species for mature deciduous forest ecosystems, characterized by old oak trees and dead wood. Crâng forest located near Buzău city provided favorable habitats for these invertebrates. The Crâng forest is located in the forest-steppe zone in the southeast of Romania, has an area of 189 ha. The distributions of Lucanus cervus and Cerambyx cerdo were established, in this location. If we consider the numerical abundance, 40 individuals of Cerambyx cerdo and 45 individuals of Lucanus cervus were counted, on 25 studied transects. On the other hand another two species were investigated: Oryctes nasicornis (Linnaeus, 1758) and *Dorcus parallelipipedus (Linnaeus, 1758). In order to protect these invertebrates, the pressures, threats and conservation measures were established. The present study demonstrated that a mature, old deciduous forest dominated by Quercur robur tree species, even if it is located near an urban area, could constitute a favorable habitat for two Natura 2000 invertebrates' species.*

***Key words**: abundance, forest, habitat, protection, threat.*

HISTOMORPHOLOGICAL HEPATIC ALTERATIONS IN *Squalius cephalus* (Linnaeus, 1758) EXPOSED TO HEAVY METALS: A CROSS-WATERSHED COMPARATIVE STUDY OF TWO ROMANIAN RIVERS

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Abstract

Heavy metal pollution poses a major threat to freshwater ecosystems and aquatic organisms. This study investigates liver histomorphology in chub (Squalius cephalus), a sentinel species, from two Romanian rivers with contrasting contamination levels: the Arieș River in the Roșia Montană area, a basin heavily affected by long-term mining, and the unpolluted Hășdate River. Water analyses confirmed significant metal contamination in the Arieș River and clean conditions in the Hășdate River. Hepatic tissue was collected, histologically processed by the routine paraffin embedding technique, and stained with Goldner's trichrome to assess structural integrity. Livers from Hășdate fish displayed normal hepatic architecture, whereas hepatic samples collected from the Arieș River exhibited histopathological alterations, including vascular adaptations (hyperaemia), degenerative lesions (vacuolar/lipidic or hydropic degenerations) and extended necrotic lesions. These findings demonstrate that chronic exposure to heavy metal-contaminated waters induce clear structural changes in fish livers, highlighting hepatic histology as a sensitive biomarker for aquatic pollution. The study provides insights into ecosystem health and supports the use of fish liver histopathology for environmental monitoring and risk assessment, offering a model for evaluating pollution impacts in freshwater systems globally.

Key words*: freshwater ecosystems, heavy-metal contamination, histopathology, sentinel species.*

EVALUATING HEMPSEED MEAL BY-PRODUCT AS A FUNCTIONAL ADDITIVE IN *Cyprinus carpio* var. *specularis* DIETS

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Abstract

Hempseed meal, a nutrient-rich by-product resulted from oil extraction from Cannabis sativa L., represents a promising candidate for high value functional feed additive due to its favorable amino acid profile, increased levels of essential fatty acids, and availability as an agro-industrial residue. This study investigates the nutritional value and functional potential of hempseed meal as a partial supplementary alternative to traditional protein ingredients in the diet of common carp (Cyprinus carpio), one of the most economically important freshwater species in global aquaculture. The analysis focuses on the biochemical composition, its digestibility, and its influence on growth performance, feed utilization, and metabolic efficiency. Preliminary evidence suggests that the inclusion of moderate levels of hempseed meal in carp diets can enhance feed efficiency without compromising growth or health, while supporting a more sustainable production system through the valorization of agricultural by-products. The findings highlight the relevance of hempseed meal as a functional ingredient that aligns with circular economy principles and contributes to reducing the environmental impact of aquaculture.

Key words*: common carp, functional ingredients, hempseed meal.*

FISH WELFARE RESPONSES TO HEAVY METAL EXPOSURE: A REVIEW

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Abstract

Heavy metals are persistent contaminants with a high potential for bioaccumulation and biomagnification in aquatic ecosystems, exerting toxic effects that impair physiological functions and compromise fish welfare. Although numerous studies have investigated oxidative stress, endocrine disruption, histopathological alterations, and sublethal effects, the integration of these processes within a comprehensive fish welfare framework remains limited. This review synthesizes current knowledge on the toxic effects of major heavy metals (Cd, Pb, Hg, As), focusing on their bioaccumulation patterns, tissue distribution, physiological and behavioral alterations, and their implications for fish welfare. By integrating ecotoxicological evidence with contemporary welfare concepts, this study highlights key mechanisms underlying welfare impairment and identifies major gaps in the current literature. The findings emphasize that sublethal and chronic exposure to heavy metals can compromise fish welfare even in the absence of immediate mortality. Overall, this review provides a functional perspective on heavy metal toxicity and outlines priority directions for future research and the development of monitoring and management strategies aimed at mitigating the impact of heavy metal contamination in aquatic ecosystems.

Key words*: aquatic ecotoxicology, bioaccumulation, biomagnification, oxidative stress, physiological responses.*

UTILISATION OF INSECTS IN ORNAMENTAL FISH NUTRITION: A REVIEW

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Abstract

Starting from the limitations surrounding fishmeal and the relevance of ornamental fish farming, this paper highlights the possibility of utilizing insects in their diet. Based on the scientific literature, specific nutritional requirements of ornamental fish and the valuable properties of certain insects were identified. Furthermore, experiments using insect protein biomass and artificial feeds formulated with varying percentages of insect meal for feeding ornamental fish were thoroughly analysed. It was demonstrated that insect meal can be included in the diets of goldfish and zebrafish at levels of 60% and 100% without adversely affecting growth or welfare, while for the Siamese fighting fish, the optimal level is 13%. In guppies and swordtails, testing inclusion levels of 50–75–100% yielded results indicating the potential for the complete replacement of fishmeal in their diet. The analysed experiments highlighted that ornamental fish are capable of assimilating nutrients and carotenoids from the composition of certain insects. A positive influence on fish health and coloration was observed, and significant performance was recorded regarding the survival and growth of fry in several freshwater and marine species.

Key words*: food, insects, ornamental fish.*

HABITAT DIFFERENCES AND THE TRANSITION FROM WILD TO AQUACULTURE OF THE SIBERIAN STURGEON (*Acipenser baerii* Brandt, 1869)

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Abstract

The Siberian sturgeon (Acipenser baerii Brandt, 1869) is a species of high ecological and aquaculture relevance, whose transition from natural riverine habitats to controlled farming systems has created the need for a deeper understanding of its environmental requirements. This study examines how key water quality parameters influence the species' living conditions, comparing its natural ecological setting with modern aquaculture environments. In the wild, **A. baerii** *inhabits cold, oxygen-rich freshwater systems with stable physicochemical profiles that support its feeding, migration, and reproductive behaviour. However, habitat degradation, overexploitation, and pollution have contributed to population declines. In aquaculture, the species benefits from controlled conditions that enhance growth and survival, yet it remains highly sensitive to fluctuations in temperature, dissolved oxygen, pH, ammonia, nitrite, nitrate, and other chemical stressors. These parameters directly affect physiological responses, immune performance, metabolic efficiency, and overall welfare. By comparing natural and cultured settings, the study emphasizes the importance of continuous monitoring and controlled regulation of key water quality parameters to support sustainable sturgeon production while contributing to conservation strategies for this endangered species.*

Key words*: aquaculture, habitat, siberian sturgeon, wild.*

PHOTOVOLTAIC SYSTEMS ABOVE AQUACULTURE PONDS: SUSTAINABLE SOLUTIONS FOR ENERGY INFRASTRUCTURE

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Abstract

The integration of photovoltaic (PV) systems above aquaculture ponds is a promising design strategy for reducing carbon emissions and enhancing energy efficiency in aquaculture. These systems can generate renewable energy on-site, reduce water evaporation, and help stabilize temperatures, which can benefit aquatic organism health and farm productivity. Examples from Asia and Europe show the feasibility of aquavoltaic setups, including their compatibility with recirculating and open-pond systems. In Taiwan, PV shading structures have been installed above fish ponds, whereas European studies highlight opportunities to integrate PV systems with digital water-quality monitoring technologies. This study offers a design-focused conceptual assessment of a modular PV system proposed for the Brateş experimental aquaculture laboratory in Romania. The system is not yet operational, and the work focuses on estimating its expected energy performance, how it integrates structurally, and its potential microclimatic effects on reproduction ponds. By outlining the system architecture and expected functional outcomes, the study provides a feasibility-based basis for future deployment and scaling of solar-powered aquaculture infrastructure once the system is fully implemented.

Key words*: aquaculture ponds, aquavoltaics, energy efficiency, microclimate regulation, photovoltaic systems, renewable energy integration, smart aquaculture infrastructure, sustainable aquaculture.*

GROWTH PERFORMANCE OF JUVENILE CARP (*Cyprinus carpio*) REARED USING SLUG (*Arion vulgaris*) MEAL AS AN ALTERNATIVE PROTEIN SOURCE IN FISH FEED

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Abstract

Alternative protein sources to fish meal in aquaculture feeds are being researched for decades. This continuous race is driven by the problems that surround fish meal: high cost, availability issues, environmental impact. Throughout the world, gastropods (class Gastropoda) are a common occurrence, and have been researched as candidates to substitute fish meal in aquaculture feeds. Among gastropods, research did not focus on slug species for their potential as alternative protein sources to fish meal, although they are widespread and in some regions are manifesting as invasive species. In this research slug meal obtained from the invasive species Arion vulgaris, was tested as an alternative protein source in an experimental feed on the growth of juvenile carp (Cyprinus carpio) in parallel to a feed containing fish meal. The results displayed no statistically significant differences between the experimental feed and the control feed, showing the potential of slug meal as an alternative protein source.

Key words*: aquaculture nutrition, fish meal, Gastropoda, growth dynamics, invasive.*

LENGTH-WEIGHT RELATIONSHIP AND GROWTH OF ARTIFICIALLY REARED DANUBE SALMON (*Hucho hucho*, Linnaeus 1758)

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Abstract

The Danube salmon, Hucho hucho (Linnaeus, 1758), is a species of high economic and conservation interest, for which aquaculture plays an essential role in stock maintenance and restocking programs. This study presents biometric and growth-related information on H. hucho specimens reared under controlled farming conditions at the Valea Bistrișorii Trout Farm, Alba County, Romania. Fish were captured using routine aquaculture handling methods and measured to assess the length–weight relationship and relative condition factor. The results indicated a positive allometric growth pattern, suggesting suitable rearing conditions. The relative condition factor showed variation among individuals, reflecting differences in growth performance within the stock. These findings provide useful data on the growth characteristics of farm-reared Danube salmon and support the importance of aquaculture facilities in research and management of this species.

Key words*: salmonid culture, growth performance, captive rearing, biometric assessment, stock management.*

EVOLUTION OF FISHERY RESOURCES IN THE CONTEXT OF CLIMATE CHANGE IN ROMANIA

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Abstract

Climate change is increasingly shaping the dynamics of fish resources in Romania. It influences both natural aquatic ecosystems and aquaculture systems. Progressive increases in water temperature, modifications in precipitation regimes, and river discharge patterns have significant ecological consequences for aquatic ecosystems. The increasing frequency of extreme hydrological events has collectively induced significant alterations in species composition, spatial biomass distribution, and reproductive dynamics. Cold-water and other climate-sensitive native species have experienced marked population declines. In contrast, thermophilic and invasive taxa have expanded their ranges and abundances, leading to profound changes in ecological structure and functioning across the Danube Basin, the Danube Delta, and inland lakes and reservoirs. Concurrently, aquaculture faces increased risks of oxygen depletion, disease outbreaks, and water scarcity. These trends demonstrate a complex interplay between climatic stressors and anthropogenic pressures, including pollution, habitat fragmentation, and overexploitation. The study emphasizes the primary vulnerabilities of Romania's ichthyofauna to climate change. It underscores the necessity for integrated monitoring, adaptive management strategies, habitat conservation, and sustainable aquaculture practices to ensure the long-term resilience of ecosystems and the sustainability of resources.

Key words*: climate change, fish resources, aquatic ecosystems, Romania.*

VALORIZATION OF BLACK SOLDIER FLY (*Hermetia illucens*) LARVAE MEAL IN GUPPY (*Poecilia reticulata*) FEED

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Abstract

The global trade in ornamental fish, feed, and aquarium equipment is an important component of the world economy. The majority of ornamental species are freshwater, fish of the Poeciliidae family are recognized as the most popular. Fishmeal is the most important ingredient in animal feed. The substantial reduction in oceanic fish stocks has imposed strategies to limit the use of fishmeal. Among these, the identification of alternative replacement sources is noteworthy. This study aimed to test a diet for guppy fish in which fishmeal was replaced by 60% insect meal. It also investigated whether the addition of enzymes promotes better availability and assimilation of this feed. The experiment lasted 75 days. The results showed no significant differences in growth between fish fed a commercial diet and those fed the insect-based diet. It was also found that feeding insect meal did not negatively influence the health of the fish and did not affect water quality parameters. It was also found that insect meal feed did not negatively affect the health of the fish or the water quality parameters.

Key words*: black soldier fly, guppy, protein larval meal.*

NEW INSIGHTS ON *Alosa immaculata* (Bennett, 1835) STOCKS UNDER PRESENT ENVIRONMENTAL CONDITIONS AND COMMERCIAL FISHERIES

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Abstract

Alosa immaculata (Pontic shad) is a key anadromous species in the Danube–Black Sea system, supporting valuable commercial fisheries while remaining vulnerable to environmental alteration and overexploitation. This study provides new insights into the status and dynamics of A. immaculata stocks under current environmental conditions and contemporary commercial fishing pressure. Stock structure, size and age composition, and catch characteristics were analysed using recent fisheries-dependent and fisheries-independent data collected across major migratory routes. Environmental drivers, such as hydrological variability, water temperature and salinity, were evaluated in relation to the observed biological patterns. This study highlights the need for integrated ecological and fisheries governance to ensure the conservation and sustainable use of A. immaculata under ongoing environmental change.

Key words*: Anadromous fishes, environmental drivers, fishing pressure, population dynamics, stock structure.*

GROWTH, CONDITION AND POPULATION INSIGHTS OF *Mesogobius batrachocephalus* IN THE ROMANIAN BLACK SEA

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Abstract

Understanding the ecology and population dynamics of Mesogobius batrachocephalus along the Romanian Black Sea coast is essential due to limited available data. This study examined population structure, growth, and condition based on 248 individuals (183 females, 65 males), revealing a female-biased sex ratio of 2.82:1. Morphometric measurements (total length, TL; body weight, W) were collected, and Fulton's condition factor (K) was calculated. TL ranged from 11.5 to 32.4 cm (mean ± SD: 24.06 ± 3.44 cm) and W from 26.22 to 287 g (131.68 ± 50.64 g). K varied between 0.61 and 1.86 (mean ± SD: 0.92 ± 0.17). The length–weight relationship was $W = 0.0457 \times TL^{2.4882}$ *(*$r^2 = 0.8521$*). Von Bertalanffy parameters were* $L\infty = 34.11$ *cm,* $K = 0.370$*, and* $t_0 = -0.355$*. Mortality estimates were* $Z = 1.34$*,* $M = 0.63$*, and* $F = 0.71$*. These findings provide essential baseline information for monitoring and managing M. batrachocephalus populations in the western Black Sea.*

Key words*: condition factor, Knout goby, length-weight analysis, population dynamics, Von Bertalanffy growth.*

HEAT SHOCK PROTEINS (HSPs), THERMAL STRESS AND EPIGENETIC REGULATION IN WILD FISH POPULATIONS: A REVIEW

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Abstract

Rising water temperatures associated with climate change represent a major stressor for wild fish populations, affecting their physiology, distribution, and adaptive capacity. Heat shock proteins (HSPs), particularly HSP27, HSP70, and HSP90, are central components of the cellular response to thermal stress and are widely used as molecular indicators of sublethal stress. This review synthesizes current literature on the role of HSP expression in assessing thermal stress and temperature adaptation in wild fish populations, with a specific focus on epigenetic regulatory mechanisms. Available evidence indicates that epigenetic modifications, including DNA methylation and histone remodelling, can modulate HSP gene expression, thereby contributing to physiological plasticity and population-level differences in thermal responses. Integrating HSP-based biomarkers with epigenetic information provides a robust framework for understanding adaptive responses of wild fish populations to climate-driven thermal stress.

Key words*: DNA methylation, histone modifications, temperature adaptation, stress response, wild fish stocks.*

ECTOPARASITE FAUNA OF DOMESTIC WATERFOWL IN THE NORTHERN REGION OF THE REPUBLIC OF MOLDOVA

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Abstract

A study on the ectoparasite fauna of domestic waterfowl (ducks and geese) from the Anatidae family in the northern region of the Republic of Moldova showed that domestic ducks (Anas platyrhynchos domesticus, Linnaeus, 1758) were infested with six species of chewing lice: Trinoton querquedulae, Anatoecus icterodes, Anatoecus dentatus, Anaticola crassicornis, Anaticola anserinum, and Menopon obscurum, as well as the gamasid mite Dermanyssus gallinae. Domestic geese (Anser anser domesticus, Linnaeus, 1758) were found to host ten species of ectoparasites, including eight species of chewing lice: Trinoton querquedulae, Trinoton anserinum, Anatoecus icterodes, Anaticola crassicornis, Anaticola anserinum, Anatoecus adustus, Menopon obscurum, and Lipeurus caponis. In addition, geese were infested with the gamasid mite Dermanyssus gallinae and the argasid tick Argas persicus.These findings indicate a high diversity of ectoparasites infesting domestic ducks and geese in the northern region of the Republic of Moldova, with differences between host species. The presence of lice, mites, and ticks highlights the need for monitoring and controlling ectoparasite populations in order to maintain the health of domestic waterfowl in this region.

Key words*: ectoparasite fauna, habitat, mixtinvasions, monoinvasions, waterfowl.*

ENHANCING ENVIRONMENTAL SUSTAINABILITY THROUGH IMTA: INTEGRATING *Mylopharyngodon piceus* INTO FRESHWATER POLYCULTURE TO CONTROL INVASIVE BIVALVES

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Abstract

IMTA represents the most accessible option for increasing efficiency in aquaculture production, providing a flexible framework for integrating a wide combination of aquatic organisms and fish. Mylopharyngodon piceus (Richardson 1846)*, a species that feeds on mussels, snails, and small crustaceans, was introduced into an experimental pond in order to reduce the population of the bivalve Sinanodonta woodiana* (Lea, 1834)*, a species considered invasive in several countries and accidentally introduced into Romania through the import of Asian cyprinid species (silver carp, grass carp, and bighead carp). Limiting the spread of this mussel proved effective in the experimental pond, where the following species were stocked in polyculture (common carp - 40%, black carp - 30%, bighead carp - 10%, grass carp - 15%, pike-perch - 5%). Mussels were an integral part of the pond population and were estimated to account for approximately 20% of the total aquatic biomass. Following evaluations at the end of the growth period, a reduction of approximately 60% in the bivalve population was observed, along with an accelerated growth rate in the black carp population. The stocking density was found to be efficient for the entire IMTA system, successfully improving the quality of the aquatic habitat and the growth characteristics of fish.*

Key words*: freshwater polyculture, habitat quality enhancement, multitrophic aquaculture systems, non-native bivalves, trophic regulation.*

EFFECTS OF *Ulva lactuca* EXTRACT ON HEMATOLOGICAL RESPONSES IN COMMON CARP SUBJECTED TO ANTIBIOTIC TREATMENT

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Abstract

The widespread use of antibiotics such as florfenicol and oxytetracycline in aquaculture contributes to the development of antimicrobial resistance and may negatively affect fish health, environmental quality and food safety due to residue accumulation. This study investigated the potential of Ulva lactuca extract as a functional feed additive to mitigate the physiological effects associated with antibiotic treatment in common carp (Cyprinus carpio). Juvenile carp (initial mean weight 20.20 ± 0.13 g) were assigned to two dietary treatments and fed either a conventional diet (C) or a diet supplemented with U. lactuca extract (U). After 10 weeks, fish were subsequently divided into six experimental groups: control (C), florfenicol-treated (C+FF), oxytetracycline-treated (C+OTC), Ulva-supplemented (U), Ulva-florfenicol (U+FF), and Ulva-oxytetracycline (U+OTC). Hematological parameters, including red blood cell count (RBCc), hemoglobin concentration (Hb), hematocrit (Ht), and derived erythrocyte indices (MCV, MCH, and MCHC), were assessed to evaluate physiological responses. Dietary supplementation with U. lactuca extract contributed to the maintenance of hematological homeostasis in antibiotic-treated fish, partially counteracting the alterations induced by florfenicol and oxytetracycline administration. U. lactuca extract shows promise as a functional aquafeed ingredient, enhancing fish health and mitigating antimicrobial therapy's adverse effects.

Key words*: hematological profile, Ulva lactuca, mitigation, florfenicol, oxytetracycline.*

EVALUATION OF GROWTH PERFORMANCE OF CYPRINIDS UNDER CLIMATE INSTABILITY IN RECIRCULATING AQUACULTURE SYSTEMS: AN EXPERIMENTAL APPROACH

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Abstract

Climate instability increasingly affects freshwater aquaculture by altering growth patterns, metabolic rates, and reproductive performance of cultured cyprinids. This study evaluated the effects of controlled thermal conditioning on growth and reproductive performance of common carp Cyprinus carpio (Linnaeus 1758) reared in a recirculating aquaculture system (RAS), as a strategy to mitigate climate-related variability. Two breeds of carp, Ropsa and Frasinet, were used, each represented by one experimental lot and one control lot. Fish were introduced into a pilot intensive RAS facility in January and maintained for three months until reproduction. In the experimental groups, water temperature was progressively increased and maintained at 18 °C in January, 19 °C in February, and 20 °C in March to stimulate metabolic activity and accelerate reproductive maturation. Control groups were reared under non-conditioned thermal regimes, being supplied with water from the supplying pond, thus reflecting natural seasonal temperature fluctuations. Results showed that carp reared under controlled thermal conditions reached reproductive maturity 36 days earlier than control fish in both strains. These findings demonstrate that temperature manipulation under RAS conditions significantly enhances reproductive scheduling in common carp.

Key words: *climate change, common carp, RAS, reproductive performance, thermal conditioning.*

INNOVATIVE DIGITAL TECHNOLOGIES FOR NON-INVASIVE BEHAVIORAL MONITORING OF ROE DEER (*Capreolus capreolus*) AND WILD BOAR (*Sus scrofa*)

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Abstract

The study of wild game behavior plays a key role in sustainable wildlife management and biodiversity conservation. In recent years, advances in modern technology have significantly improved the possibilities for non-invasive ethological research, particularly for species such as the roe deer (Capreolus capreolus) and wild boar (Sus scrofa). This review examines the main contemporary methods used to investigate the behavior of these species, focusing on the application of smart camera traps, GPS tracking devices, and analytical techniques based on artificial intelligence. Current scientific studies demonstrate that these technologies provide valuable insights into daily activity rhythms, feeding habits, social interactions, and behavioral responses to human-induced environmental pressures. In comparison with traditional direct observation, modern monitoring approaches offer higher data accuracy while minimizing disturbance to animals in their natural habitats. Overall, the findings of this review highlight the growing importance of digital tools in improving game management practices and supporting informed, evidence-based conservation decisions.

Key words*: behavior, monitoring, noninvasive, wildlife.*

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TOTAL MERCURY AND FATTY ACID CONTENT OF SELECTED FISH SPECIES FROM THE BLACK SEA (BULGARIA): IMPLICATIONS FOR HUMAN HEALTH RISK

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Abstract

Total mercury (Hg) and fatty acid profiles were analysed in the muscle tissue of 19 Black Sea fish species, based on fifty-five samples. Mercury was quantified using a MA-3000 analyser, and fatty acids by gas chromatography with flame ionisation detection. Hg concentrations ranged from 6.00 µg/kg wet weight in garfish to 341.9 µg/kg in spiny dogfish, all below EU regulatory limits. Lipid content varied from 0.8 to 25.8 g/100 g fresh weight, with PUFA/SFA ratios between 0.51 and 1.52. Combined EPA and DHA contents ranged from 10.2% in red mullet to 48% in whiting. Nutritional indices (AI, TI, h/H) indicated favourable lipid profiles, while human health risk assessment (EDI, THQ, HI) demonstrated minimal risk at current consumption levels. Small pelagic species showed high n-3 PUFA content with low Hg, whereas predatory species had higher Hg but retained beneficial fatty acids. The integrated analysis highlights that Black Sea fish offer both valuable nutritional benefits and a low toxicological risk, supporting their safe inclusion in the diet.

Key words*: Black Sea fish, fatty acid composition, lipids, total mercury Black Sea fish, fatty acids, lipids, mercury, EPA, DHA.*

HEALTH RISK ASSESSMENT OF HEAVY METALS AND LIPID QUALITY IN FRESHWATER FISH FROM THE KARDZHALI, STUDEN KLADENETS, AND IVAYLOVGRAD RESERVOIRS

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Abstract

This study evaluates Hg concentrations, associated health risks, and lipid nutritional quality in freshwater fish from the Kardzhali, Studen Kladenets, and Ivaylovgrad reservoirs and the Arda River. Hg levels in muscle tissue of eight species ranged from 9.6 to 109 µg/kg, remaining below the regulatory limit of 0.5 mg/kg. Toxicological indicators, including Estimated Daily Intake (EDI) and Target Hazard Quotient (THQ), indicated negligible risk for adults. At the same time, slightly elevated THQ values (>1) were observed in children's predatory perch and some roach samples due to trophic biomagnification. Fatty acid analysis by gas chromatography revealed favourable lipid profiles characterised by high polyunsaturated fatty acids (PUFA), balanced PUFA/SFA and n-3/n-6 ratios, and low atherogenic (AI) and thrombogenic (TI) indices. Predatory perch contained particularly high levels of the omega-3 fatty acids EPA and DHA, highlighting their nutritional value. Overall, the results indicate that freshwater fish from these ecosystems represent a nutritious and generally safe dietary resource.

Key words*: fatty acid composition, freshwater fish, health risk assessment, heavy metals, lipid quality, mercury.*

PARASITES AND PARASITE COMMUNITIES OF FRESHWATER FISH FROM THE LUDA YANA RIVER

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Abstract

The aim of the study is to investigate and track 1) differences in parasite communities between mining-influenced biotopes versus wastewater impacts, and 2) expected relationships between parasite load and Fulton condition factor. The species composition and dominant structure of the fish complexes in the two biotopes were compared. The dominant species in both biotopes is Alburnus alburnus (Linnaeus, 1758), followed by Barbus cyclolepis Heckel, 1837. All specimens of the identified fish species were examined for parasites using standard methods. The dominant structure of the parasite communities is discussed at the level of component communities and infracommunities. A common parasite species for both biotopes is Acanthocephalus anquillae (Müller, 1780) Lühe, 1911. The similarity of the fish and parasite communities in both biotopes is presented. The factors influencing their formation are analysed. Alb. aburnus from the Luda Yana River is a new host for four parasite species: Rutilus rutilus (Linnaeus, 1758), B. cyclolepis and Gobio gobio (Linnaeus, 1758), for one parasite species each. Biotope Svoboda is a new habitat for five parasite species, and biotope Pazardzhik – for three species.

Key words*: component parasite communities, dominant structure, fish species, parasite infracommunities, similarity.*

THE ROLE OF *Salvia officinalis* AS A PHYTOGENIC ADDITIVE IN FISH. A REVIEW

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Abstract

Despite restrictions on the use of antibiotics in agriculture, these practices are still widely applied in some aquaculture farms in major producing countries. In this context, the application of phytogenic additives in aquaculture has been increasingly in focus, particularly regarding the sustainable replacement of synthetic chemicals and antibiotics. Salvia officinalis, also known as common sage, is a medicinal herb that contains a variety of biologically active substances, such as flavonoids, phenolic acids, terpenoids, and essential oils, which possess antioxidant, antimicrobial, anti-inflammatory, and immunomodulatory activities. This review provides an outline of the existing knowledge on the chemical composition of S. officinalis and its possible use as a phytogenic fish feed additive. Particular attention is drawn to its ability to affect growth rate, metabolism, immune system, oxidative stress regulation, and resistance to diseases in fish. Moreover, this review also focuses on safety aspects, dosage maximization, and difficulties during its use as aquaculture feed. Overall, Salvia officinalis shows promising potential as a natural feed additive for improving fish health and sustainability in aquaculture, although further species-specific and long-term studies are required.

Key words*: aquaculture, phytogenic additives, Salvia officinalis, fish health, sustainable feed.*

CONSTITUTIONAL AND GROWTH INDICES, HEMATOLOGICAL AND METABOLIC PROFILES IN CARP (*Cyprinus carpio* Linnaeus, 1758), DUE TO THE ADMINISTRATION OF BREWERY YEAST (*Saccharomyces cerevisiae*)

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Abstract

This work aimed to determine the influence of brewer`s yeast (Saccharomyces cerevisiae) on the growth dynamics, health and physiological status of common carp (Cyprinus carpio Linnaeus, 1758). An experimental device was installed with four groups of carp in summer I. The control group was fed with classic feed. Groups II, III and IV are the experimental groups to which brewer`s yeast was added to the feed in a proportion of 3% (Group II), 5% (Group III) and 7% (Group IV). At the end of the experiment conducted over a period of 30 days, total weight gain (TWG) and average daily gain (ADG) as growth indices and the Fulton index (K) as a constitutional index were calculated, as well as the following physiological indices: hemogram and metabolic profiles. A 3% dietary supplementation of brewer's yeast produced the highest growth performance (TWG 69.58 g; ADG 2.32 g/day) and significantly improved Fulton's condition factor, while higher inclusion levels (5-7%) reduced growth performance and induced signs of metabolic stress. Hematological parameters remained stable across treatments, whereas moderate supplementation improved protein metabolism and physiological status without disrupting homeostasis. The addition of brewer`s yeast to the feed structure proved beneficial both in terms of growth dynamics and the health of the fish.

Key words*: yeast, physiological status, growth indices, constitutional indices, cyprinids.*

ASSESSING BIODIVERSITY IN PĂDUREA CRÂNG (CODRII VLĂSIEI, BUZĂU, ROMANIA): A BASELINE STUDY FOR NATURA 2000 PROTECTED AREAS

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Abstract

Pădurea Crâng (Buzău County) is a valuable remnant of the former Codrii Vlăsiei forest, designated a county-level natural reserve in 1995. This study provides the first comprehensive assessment of its biodiversity and conservation value, establishing a scientific baseline for potential designation as a Natura 2000 site. Field surveys indicate high conservation importance, reflected by mature forest structures dominated by old-growth oak stands and the presence of rare, vulnerable, and protected species. The priority habitat 91I0 (Euro-Siberian steppic woods with Quercus spp.) was confirmed, underscoring the site's European significance. The flora includes notable species such as Tulipa sylvestris* subsp. *australis, Klasea bulgarica, Dianthus guttatus, Chaerophyllum nodosum, and Fraxinus pallisiae. Invertebrate fauna comprises Habitats Directive species (Cerambyx cerdo, Lucanus cervus) and nationally protected taxa, indicating structurally complex forests. Avifaunal surveys recorded several Birds Directive species, while the presence of Emys orbicularis confirms reptile conservation value. Overall, Pădurea Crâng represents a key biodiversity refuge in southeastern Romania and strongly merits designation as a Natura 2000 Site of Community Importance.*

Key words*: Codrii Vlăsiei, conservation value, Euro-Siberian steppic oak woods, forest biodiversity, Natura 2000.*

LENGTH-WEIGHT RELATIONSHIP (LWR), FULTON CONDITION FACTOR (K) AND COMPARATIVE MORPHOMETRIES OF BULLHEAD (*Cottus gobio*, Linnaeus 1758) FROM DIFFERENT RIVERS OF TRANSYLVANIA

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Abstract

The aim of this study was to determine the length-weight relationship (LWR), the Fulton condition factor (K) and to make a comparative analysis of bullhead specimens (Cottus gobio) from the upper reaches of the Someșul Rece, Someșul Cald, Iara and Gurghiu rivers (Transylvania, Romania). From an allometric point of view, the growth type of bullhead specimens was a positive allometric one, except for the upper reaches of the Someșul Cald where the growth type was negative allometric (b).

***Key words**: bullhead, allometry, protected species, Romania, different rivers.*

ASSESSMENT OF THE TROPHIC STATUS OF PONDS USED FOR CARP (*Cyprinus carpio*) CULTURE IN FIRST SUMMER USING PHYTOPLANKTON AS A BIOINDICATOR OF WATER QUALITY

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Abstract

Phytoplankton plays an essential role in the functioning of aquatic ecosystems in fish ponds, contributing to primary production, water oxygenation and supporting food chains. For the assessment of trophic status, three fish ponds used for rearing common carp (Cyprinus carpio) in the first summer were used, differentiated by the rearing systems applied (extensive, semi-intensive, and intensive). The analyses were carried out between May and October 2025, using phytoplankton as a bioindicator. The main physical and chemical parameters of water quality, phytoplankton abundance and specific diversity, expressed by the Shannon-Wiener index (H'), were analyzed. The results highlight significant differences between the types of systems, reflecting the impact of carp growth intensity on the structure of phytoplankton communities and on the ecological conditions of fish ponds. Phytoplankton density increased from spring to mid-summer, reaching maximum values of 27,900 thousand ind./m³ in the intensive pond in July, while phytoplankton biomass reached seasonal highs of 123.38 g/m³ in August. Species diversity (H') ranged from 1.16 to 1.29, indicating moderate diversity of phytoplankton communities.

Key words*: aquaculture systems, bioindicator, Cyprinus carpio, phytoplankton, water quality.*

BIOLOGICAL DIVERSITY AND STRUCTURE OF THE ICHTHYOCOMPLEXES OF THE KRUMOVITSA RIVER AND THEIR PARASITE COMMUNITIES

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Abstract

The research aims to study the fish communities at the mouth of the Krumovitsa River, before it flows into the Arda River (Potochnitsa Biotope), which is influenced by anthropogenic impacts. The Krumovitsa River belongs to the East Aegean Basin and River Type R14c: Sub-Mediterranean, temporary (drying-up) small and medium-sized rivers and streams in Ecoregion 7: Eastern Balkans. Standard research methods were applied. Ten species of freshwater fish have been identified. Of these, the highest number in the samples shows Alburnus alburnus (Linnaeus, 1758). The analysis of the structure of fish communities is based on basic biotic indices (number of species, abundance in percentages (A%), weight (BW), weight in percentages (BW%), and absolute dominance (Di)). Each of the fish species was examined for parasites. The parasite component and infracommunities were analysed. Four fish species were free of parasites. The circulation routes of the parasite flow were described. The influence of parasitic species was discussed.

Key words*: absolute dominance, Arda River Basin, freshwater fish communities, parasite circulation routes, parasite communities.*

REDWORM (*Eisenia fetida*) AND HOUSE FLY LARVAE (*Musca domestica*) USED AS PROTEIN SUPPLEMENTS IN THE DIET OF COMMON CARP (*Cyprinus carpio*). THEIR EFFECTS ON GROWTH AND PHYSIOLOGICAL STATUS

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Abstract

In this experiment, some alternative sources of animal protein (Redworm and House Fly larvae) were tested, administered in the carp feed. Four experimental groups were established: a control group fed with classic feed, a group fed in proportion of 75% with classic feed and 25% with fly larvae, a group fed in proportion of 75% with classic feed and 25% with redworms and a group fed in proportion of 75% with classic feed, 12.5% with fly larvae and 12.5% with redworms. The best results regarding growth dynamics were obtained in the case of group 2 (feed + fly larvae). The worst results were obtained in group 3 (feed + redhworms). Hematological determinations (RBC, Hb, HCT, MCV, MCH, MCHC) and biochemical determinations (protein, enzymatic, lipid, carbohydrate and mineral profiles) were performed. By administering alternative protein sources, a good physiological status of the experimental groups resulted.

Key words*: alternative protein, Cyprinus carpio, growth rate, physiological status, blood parameters.*

INTERANNUAL VARIATION IN LENGTH STRUCTURE AND REPRODUCTIVE CONTRIBUTION OF *Alosa immaculata* IN THE BLACK SEA-DANUBE SYSTEM (2020-2025)

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Abstract

An anadromous keystone species in the Black Sea-Danube system, Alosa immaculata plays an important ecological role by linking marine feeding habitats with riverine spawning grounds. Alterations in size structure can directly affect its reproductive output and long-term population stability. This work evaluates the interannual evolution (2020-2024) of length-frequency structure in Black Sea and Danube catches to assess changes in population composition, size-selective migration, and reproductive contribution. Marine data describe the feeding population, while riverine catches represent the spawning stock. Temporal comparisons focus on shifts in size spectra, variation in the proportion of sexually mature individuals, and persistence of the biological filter separating juvenile marine components from migrating adults. Results highlight consistent dominance of smaller size classes in the marine environment and the prevalence of mature individuals in riverine catches, with interannual variability in the representation of large size classes. These patterns indicate a stable but potentially vulnerable reproductive bottleneck, amplified by selective fishing during migration. Integrating multi-year marine and riverine length-based data supports assessment of population resilience and protection of mature individuals during reproduction.

Key words*: anadromous fish, interannual variability, length-frequency structure, pontic shad, size-selective migration, spawning stock dynamics.*

EFFECTS OF PHYTOADDITIVES ON RAINBOW TROUT (*Oncorhynchus mykiss*, Walbaum, 1792) GROWTH AND CAROTENOID CONTENT AT LOW TEMPERATURE

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Abstract

This study aimed to evaluate the effects of dietary phytoadditives on growth performance and muscle carotenoid content in rainbow trout (Oncorhynchus mykiss) reared at low temperatures. Three plant meals - carrot (Daucus carota), tomato (Solanum lycopersicum), and spinach (Spinacia oleracea) - were incorporated at 2% into a standard diet. A total of 200 clinically healthy trout of similar commercial body weight were randomly assigned to four groups: control (standard feed) and three experimental groups receiving carrot, tomato, or spinach supplementation. The 90-day trial was conducted from November 2023 to February 2024 at the Gilău trout farm (Cluj County). Morphometric parameters were measured at the beginning and end of the experiment to determine growth performance. Muscle tissue composition was analyzed at the end of the trial. Growth performance during winter was satisfactory in all groups, confirming the feasibility of feeding at low temperatures. The carrot-supplemented group showed the highest growth gain, specific growth rate, protein efficiency ratio, and feed conversion efficiency. Muscle carotenoid content increased markedly in all supplemented groups, with the highest levels observed in the spinach-fed trout.

Key words*: carrot, vegetal meal, spinach, rainbow trout, winter feeding.*

NEW RECORDS OF *Phytoecia (Pilemia) tigrina* (Coleoptera: Cerambycidae) FROM ROADSIDE HABITATS IN ROMANIA

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Abstract

Phytoecia (Pilemia) tigrina (Mulsant, 1851) is a rare longhorn beetle, listed in Annexes II and IV of the EU Habitats Directive, characterized by a highly fragmented, patchy distribution at the European scale. Within the European Union, the species is currently protected in 11 Natura 2000 sites, of which eight are located in Romania, two in Hungary and one in Bulgaria, highlighting Romania as a key stronghold for the conservation of the species at EU level. This uneven distribution underlines the particular responsibility of Romania for maintaining the long-term viability of P. tigrina populations. This paper contributes to the knowledge of the current distribution of P. tigrina in Romania by documenting two new localities: one in Timiș County, within the protected area ROSCI0402, and another in Sălaj County. Both occurrences are situated along road margins, habitats that are highly vulnerable due to their small spatial extent and frequent vegetation removal associated with road maintenance. Our findings emphasize that, despite their marginal character, such linear habitats may play an important role in sustaining local populations, provided that appropriate conservation and management measures are applied.

Key words*: conservation, habitat, Natura 2000, Phytoecia (Pilemia) tigrina, records.*

A NEW RECORD OF *Rhysodes sulcatus* IN THE ROSCI0002 APUSENI NATURA 2000 (ROMANIA): IMPLICATIONS FOR HABITAT INTERPRETATION AND CONSERVATION

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Abstract

Rhysodes sulcatus (Coleoptera: Rhysodidae) is a cryptic and rarely recorded saproxylic beetle of high conservation concern at the European level. Its distribution is considered incomplete and fragmented, largely due to its concealed life cycle within decaying wood and the low detectability of adults. In Romania, the species is currently protected within only five Natura 2000 sites, highlighting its restricted known occurrence and the importance of each new confirmed record. This paper reports a new occurrence of R. sulcatus within the ROSCI0002, where the species was identified in an isolated fallen trunk located in a sun-exposed, open area situated near the forest edge. The microhabitat differs from the typical shaded, closed-canopy forest conditions usually associated with the species, suggesting a broader ecological plasticity than previously assumed. This finding contributes to the refinement of the known distribution of R. sulcatus in Romania and underlines the conservation value of dead wood structures, including isolated trunks in semi-open landscapes. The record emphasizes the need for targeted saproxylic beetle surveys and for maintaining a diversity of dead wood microhabitats within and around protected forest ecosystems.

Key words*: Apuseni Mountain, biodiversity conservation, Natura 2000, new record, Rhysodes sulcatus.*

CLIMATE CHANGE AS A FACILITATING FACTOR FOR THE OCCURRENCE OF THE NON-NATIVE SPECIES *Macrobrachium nipponense* IN THE ROMANIAN SECTOR OF THE DANUBE RIVER

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Abstract

Climate change is increasingly facilitating the introduction and establishment of non-native aquatic species in freshwater ecosystems. Changes in water temperature, hydrological regimes, and seasonal patterns create favorable conditions for thermophilic organisms. This study examines how climate change influences the occurrence of the non-native freshwater shrimp Macrobrachium nipponense in the Romanian sector of the Danube River. Field observations and monitoring data were analyzed alongside long-term trends in water temperature and hydrological variability. The presence of Macrobrachium nipponense was associated with periods of elevated water temperature and altered flow conditions, suggesting that climate-driven environmental changes facilitate the species' successful establishment. The high ecological plasticity, broad thermal tolerance, and reproductive capacity of Macrobrachium nipponense further enhance its invasion potential under warming scenarios. The findings indicate that climate change is a significant facilitator of biological invasions in large river systems. The establishment of this non-native species may affect native benthic communities and ecosystem functioning, underscoring the need for integrated monitoring and management strategies under changing climatic conditions.

Key words*: Macrobrachium nipponense, freshwater, Danube River, climate change.*

RECYCLING AND CIRCULAR MANAGEMENT OF END-OF-LIFE FISHING NETS IN THE DANUBE RIVER BASIN: INTEGRATION OF RENEWABLE ENERGY AND THE DANUBE-BRATEȘ CASE STUDY

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Abstract

End-of-life fishing nets are a significant source of pollution in aquatic ecosystems, contributing to "ghost fishing," habitat degradation, and microplastic generation. In the context of the circular economy and the European Union's climate-neutrality objectives, recycling fishing gear has become a strategic priority. This paper examines the types of fishing gear used in the Danube River Basin, estimates the quantities of end-of-life fishing nets, and assesses the ecological impact of abandoned fishing nets. Furthermore, European models for the collection and recycling of fishing nets are reviewed, and an integrated circular management model is proposed that incorporates renewable energy sources, particularly photovoltaic systems. The Danube-Brateș case study highlights the potential to implement sustainable, replicable solutions to reduce fisheries-related waste and protect the aquatic environment.

Key words*: fishing nets, pollution, aquatic ecosystems.*

GROWTH AND POST-EMBRYONIC DEVELOPMENT DYNAMICS OF BLACK CARP (*Mylopharyngodon piceus* R., 1846) UNDER CONTROLLED AQUACULTURE CONDITIONS

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Abstract

The black carp (Mylopharyngodon piceus R., 1846) is of particular interest for aquaculture due to its economic value and its ecological role in controlling mollusk populations. The study was conducted at SCDP Nucet during 2024 and 2025, using two experimental variants (BExp1-V1 and BExp2-V2), and aimed to investigate the dynamics of post-embryonic growth of the species under controlled aquaculture conditions, in order to evaluate growth performance and adaptability during the early stages of development. The biological material was reared in controlled systems, where the main environmental parameters and feeding regime were monitored. The experimental results revealed significant differences between BExp1 and BExp2 in terms of growth performance (0.753-0.888 g/individual in BExp1 and 0.985-1.035 g/individual in BExp2) and survival rate (62.54-66.71% in BExp1 and 60.74-65.14% in BExp2). The research highlights the importance of rearing conditions for maximizing survival and growth performance in controlled aquaculture systems. The conclusions contribute to improving knowledge on the developmental biology of the black carp species and provide useful data for the implementation of efficient aquaculture rearing technologies.

Key words*: aquaculture, black carp, growth, post-embryonic growth.*

THE INFLUENCE OF FEEDING FREQUENCY ON PIKE-PERCH (*Sander lucioperca*, Linnaeus, 1758) DURING THE POST-EMBRYONIC DEVELOPMENT PERIOD IN PROTECTED AQUACULTURE SYSTEMS

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Abstract

Pike-perch is a species with increasing market demand and a higher economic value compared to other fish species. The post-embryonic development period is challenging in terms of growth rate and reduced survival, due to factors such as environmental conditions, the occurrence of cannibalism, feed quality and feeding frequency. As a predatory and stress-sensitive species, pike-perch (Sander lucioperca, Linnaeus, 1758) responds noticeably to changes in feeding regime. The experiments conducted at SCDP Nucet were organized into three experimental variants as follows: V1 - low feeding frequency, in which feed was administered 3 times a day; V2 - moderate feeding frequency, in which feed was administered 6 times a day; and V3 - high feeding frequency, in which feed was administered 10 times a day. Marked differences, with poorer results, were recorded in variant V1 (low feeding frequency), where survival ranged between 44.2-48.6% and cannibalism was highly pronounced, compared to variants V2 (moderate frequency) and V3 (high frequency), where survival ranged between 68.6-76.5% and cannibalism was almost absent. A moderate to high feeding frequency improves survival rates and reduces cannibalism in pike-perch juveniles compared to a low feeding frequency, indicating that optimizing the feeding regime is essential for successful post-embryonic development in this species.

Key words*: aquaculture, fry rearing, feeding regime, survival, cannibalism.*

EFFECTS OF DIETARY SPIRULINA ON THE GROWTH AND HEALTH STATUS OF CARP (*Cyprinus carpio*, Linnaeus 1758)

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Abstract

The study aimed to investigate the influence of dietary supplementation with S. platensis on the growth performance of carp (Cyprinus carpio, Linnaeus, 1758), reared in a recirculating aquaculture system, and on its health status, assessed by primary hematological indicators and blood biochemical parameters. For this purpose, three experimental variants were used, differentiated by the concentration of spirulina added to the feed: V0 - control, without spirulina supplementation; V1 - diet supplemented with 4% spirulina powder; V2 - diet supplemented with 6% spirulina powder. At the end of the study, it was found that all biotechnological indicators analyzed showed higher values in the experimental variant in which the diet was supplemented with 4% spirulina. The main conclusion derived from the evaluation of hematological parameters is that supplementation with 4% spirulina enhances the process of erythropoiesis, as evidenced by increased hematocrit values and erythrocyte counts. The data obtained indicate that spirulina is a safe and effective protein additive, and that including 4% in the diet is the optimal option for stimulating growth, improving protein utilization, and increasing feed conversion efficiency without compromising fish health and while ensuring a favorable cost-benefit ratio.

Key words*: carp, growth, health status, RAS, spirulina.*

IMPACT OF HABITAT ORIGIN ON THE MICRO- AND MACROELEMENT PROFILE OF COMMON CATFISH (*Silurus glanis*)

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Abstract

This study examines how habitat origin influences the macro- and microelement composition of wild and farmed catfish, with emphasis on the distribution of toxic metals across tissues. Mineral levels in liver, bones, head, skin, muscle, and fins were quantified by AAS and ICP-MS. Ca was the dominant macro element, with concentrations up to 4.5% higher in aquaculture fish, followed by potassium (7200 ppm), Na (6066.5 ppm), and Mg (4108 ppm). Fe was the predominant microelement, reaching 363.05 ppm in the liver of wild catfish compared with 342.55 ppm in farmed specimens. Zn and Cu showed the largest habitat-related differences, with levels approximately 19.8% and 16.3% higher, respectively, in aquaculture fish, while manganese remained similar across samples. Microelements accumulated mainly in the liver, followed by skin and fins, and were lowest in muscle and head. Hg occurred only in the head and skin, with levels 2.3 times higher in skin and 2.1 times higher in the head of wild fish. Habitat origin significantly shaped elemental profiles, underscoring the importance of selecting raw material for safe catfish products.

Key words*: aquaculture catfish, habitat, heavy metal, mineral profile, wild catfish.*

ROLE OF DIETARY SUPPLEMENTATION IN THE GROWTH AND WELFARE OF JUVENILE CARP EXPOSED TO HIGH-TEMPERATURE REARING CONDITIONS

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Abstract

This study aimed to evaluate the role of dietary supplementation on the growth and welfare of juvenile carp (Cyprinus carpio, Linnaeus, 1758) by administering various feed additives (yeast, spirulina, vitamin C, and zeolite) within a recirculating aquaculture system. For this purpose, five experimental groups were established, differentiated by the type of feed additives used, as follows: V0 - control, without feed additives; V1 - diet supplemented with yeast; V2 - diet supplemented with spirulina; V3 - diet supplemented with vitamin C; V4 - diet supplemented with zeolite. The results obtained for growth performance indicated a feed conversion ratio (FCR) of 0.99 in V2, compared to the control. In contrast, hematological and biochemical parameters showed significant differences ($p<0.05$) between the groups administered feed additives and the control. In conclusion, dietary supplementation with feed additives demonstrated a stimulatory effect on the welfare of juvenile carp in a recirculating aquaculture system by supporting adaptive processes under high-temperature conditions.

Key words*: carp, feed additives, growth, RAS (Recirculating Aquaculture System), welfare.*

MORPHOLOGICAL AND MERISTIC ANALYSIS OF *Macrobrachium nipponense* POPULATIONS: IMPLICATIONS FOR ECOLOGICAL STABILITY IN LENTIC HABITATS OF THE DANUBE DELTA

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Abstract

This paper analyzes the morphometric and morphological characteristics of the alien species Macrobrachium nipponense (De Haan, 1849) in the Danube Delta ecosystem. The study was conducted on a representative sample of specimens collected from Matița-Merhei lake complex of the Danube Delta Biosphere Reserve, aiming to assess phenotypic variability in the context of acclimatization to local hydro-climatic conditions. The methodology involved measuring 15 morphometric parameters, including total length, carapace length, and claw dimensions, as well as examining the qualitative characteristics of the rostrum The meristic analysis focused on the variability of the rostral formula and pereiopod segmentation, confirming a high adaptive plasticity of the species in lentic habitats. The analysis of morphometric correlations indicates a plastic adaptation of populations to the thermal and hydrological regime of the Danube Delta, confirming the high competitive potential of the species compared to native crustaceans. The data obtained provide essential information for monitoring the population dynamics of this oriental shrimp, contributing to the understanding of the ecological impact of allochthonous species on benthic biodiversity in the region.

Key words*: freshwater, interspecific competition, Matița-Merhei, meristic traits, shrimp.*

SUBSTITUTION, MISLABELING, AND FRAUD IN THE SEAFOOD INDUSTRY

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Abstract

Illicit practices within global seafood supply chains pose major challenges to economic integrity, environmental sustainability, and public health. This paper reviews and integrates recent scientific investigations that examine the scale, drivers, and consequences of deceptive practices in seafood commerce. By combining evidence from species identification, market surveillance, and regulatory enforcement reports, the analysis demonstrates how opaque trade networks facilitate the commercialization of undeclared or illegally sourced aquatic organisms. These activities result in financial losses for consumers and legitimate operators, while simultaneously undermining fisheries governance. From a conservation standpoint, inaccurate product identification conceals the exploitation of threatened stocks and compromises biodiversity protection by distorting catch statistics and management assessments. Additionally, the circulation of incorrectly identified seafood products raises food safety concerns, including exposure to allergens, unexpected toxins and heavy metals, and inconsistent nutritional values. The paper underscores the growing importance of authentication tools, improved traceability technologies, and coordinated international regulatory frameworks. Addressing these interconnected issues requires an integrated approach that links economic oversight, biodiversity conservation, and food safety policies to promote transparency, sustainability, and consumer confidence in the seafood sector.

Key words*: aquatic biodiversity, economic adulteration, ethics, food safety, seafood fraud, supply chain, traceability.*

SEASONAL BEHAVIORAL ECOLOGY AND HUMAN-ASSOCIATED RESPONSES OF THE EUROPEAN BISON (*Bison bonasus*) IN A SEMI-NATURAL RESERVE

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Abstract

The European bison (Bison bonasus) persists in semi-natural reserves where behavioral ecology is shaped by both environmental seasonality and controlled human activity. This study investigated seasonal activity budgets and flight initiation distance (FID) responses in a semi-free-ranging herd from the Haţeg-Slivuţ Reserve, Romania. Behavioral monitoring was conducted across one annual cycle using standardized scan sampling. Season exerted a significant effect on activity distribution ($p < 0.001$). Feeding predominated during the warm season (45%), while winter was characterized by reduced feeding effort (29%) and increased resting and rumination (41%). Agonistic behavior exhibited a structured daily distribution with peaks during active displacement periods. FID responses varied significantly among disturbance types ($p < 0.001$), with minimal avoidance toward reserve personnel and markedly greater distances recorded in the presence of dogs. The findings demonstrate seasonal restructuring of behavioral priorities and context-dependent responses to human presence, providing practical guidance for disturbance mitigation in semi-natural bison management systems.

Key words*: activity budget, European bison, flight initiation distance, human disturbance, seasonal behaviour, wildlife management.*

POPULATION DYNAMICS, PHYSIOLOGICAL ADAPTATIONS AND BEHAVIORAL RESPONSES OF GAME SPECIES IN SUBMONTANE ECOSYSTEMS: A MINI REVIEW

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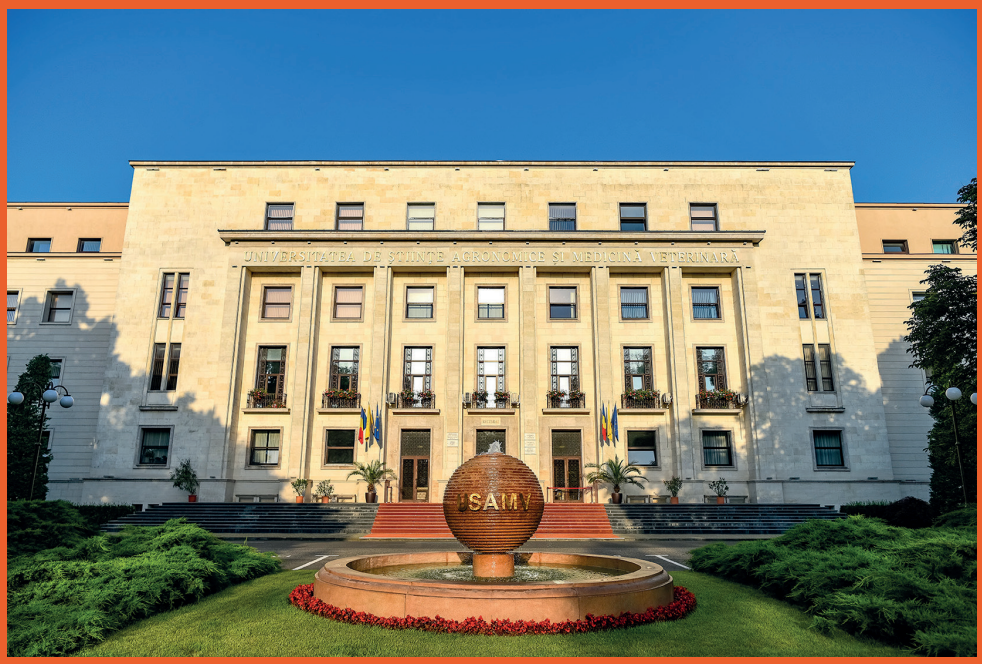
Abstract

Understanding the interactions between physiological processes, population structure, and behavioral responses is essential for the sustainable management of game species in submontane ecosystems, especially under increasing environmental and anthropogenic pressures. This review aims to synthesize current knowledge on population dynamics and physiological adaptations of game species, with a particular focus on cervids and wild boar. The study is based on a comprehensive analysis of recent scientific literature, integrating data on population structure parameters (density, demographic composition) and key physiological mechanisms underlying behavior, including metabolism, thermoregulation, reproduction, and stress response. The results indicate that species-specific physiological adaptations influence survival, reproductive success, and spatial distribution, leading to distinct population patterns in submontane habitats. Overall, the results show that effective game management should take into account the ecological context, physiological constraints, and behavioral patterns of species.

Key words*: behavioral responses, physiological adaptations, population dynamics, game species.*



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