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

2023
Bucharest

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GENETICS
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EFFECT OF NON-GENETIC FACTORS ON BIRTH WEIGHT IN A POPULATION OF TELEORMAN BLACK HEAD SHEEP BREED

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Abstract

Considering the increasing demand for sheep meat, it is necessary to optimize the breeding strategies and the management of sheep breeding in Romania in order to satisfy this demand by obtaining animals with high genetic potential in terms of body development traits. Knowing that some of the main factors such as sex, parity, type of birth are considered sources of variation of several growth-related traits within the sheep species, the aim of the present work was to determine the influence of these factors on the birth weight of a population of Teleorman Black Head sheep. In order to achieve the scope, the birth weight character of 732 lambs born in the 2021 lambing season was studied. The data obtained by weighing were statistically processed in Excel using the software `Real statistics`. The sex ratio was 1:0.77, with 407 females and 316 males, which had an average birth weight of 4.053 ± 0.039 kg and 4.19 ± 0.044 kg, respectively. The results showed that birth weight was insignificantly influenced by sex ($p>0.01$), strongly influenced by parity ($p<0.01$) and strongly influenced by birth type ($p<0.01$).

Key words*: birth weight, growth traits, non-genetic factors, Teleorman Black Head breed.*

THE BOOROOLA SHEEP BREED AS A GENETIC RESOURCE WORLDWIDE IN BULGARIA

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Abstract

The Booroola Merino Breed, developed in Australia, is a valuable genetic resource for increasing biological fecundity in sheep worldwide. The purpose of this study was to summarize information about the Booroola Merino breed and its use worldwide and in Bulgaria for increasing the reproductive potential of Merino sheep and other breeds. The positive effect of the introduction of the FecB gene for high fecundity in sheep has been confirmed by a number of authors over a period of over 30 years. It has been established that crosses with Booroola achieve up to 30% higher ovulation rates and 20% more lambs after weaning compared to the purebred animals. The positive effect of introducing the FecB gene from Booroola in the Bulgarian fine-fleece breeds of sheep was established in terms of increasing the ovulation rate and the number of lambs born, with an insignificant negative impact on weight development and wool productivity. Negative effects can be reduced by choosing appropriate crossing schemes. Achieving a balance between benefit and risk in the introduction of the FecB gene from Booroola is an important condition for increasing the economic effect of animal husbandry and creating sustainable production in sheep farms.

Key words*: Booroola Merino Breed, fecundity, FecB gene, sheep.*

PRODUCTIVE QUALITIES OF COWS OF THE HOLSTEIN BREED OF DIFFERENT ORIGIN

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Abstract

There are presented the results of the studying productive qualities of Holstein cows of various origins. The material for the research was cattle of the Holstein breed of German selection- Society of limited liability "Dastocom" and French selection - Society of limited liability "Holstein". Milk yield of cows in the herd of LLC "Dastocom" for the first lactation averaged 8851 kg of milk. The milk productivity of Holstein cows of French selection (LLC "Holstein") for the first lactation averaged 6334 ± 34.7 kg of milk. At cattle of the Holstein breed of German selection (LLC "Dastocom"), a high level of heritability for milk yield (mother-daughter) was found, which amounted to 0.756. The greatest influence on the fat content in the milk of the first-calving cows of LLC "Dastocom" was exerted by paternal ancestors (h^2 = 0.39). For the entire analyzed population of cows- heifers of LLC "Holstein", milk yield and fat content in milk were largely determined by heredity (h^2 = 0.24-0.49) and (h^2 = 0.44-0.32), respectively.

Key words*: milk yield, fat content, correlation, variability, heritability.*

ASSESSMENT AND SELECTION OF COWS OF FUTURE MOTHERS OF SIMMENTAL BULLS WITH THE USE OF GENETIC MARKERS

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Abstract

There are given the results of the selection, the assessment of future mothers of bulls of the Simmental breed. The materials for the research were cows of the first, second and third lactation of the Simmental breed of the herd of the breeding farm Society of limited liability "Strapit". The studies were carried out according to the scheme developed by us according to the following parameters: origin and genetic examination; constitution and exterior, marker alleles; productivity; breeding value; genetic evaluation methods. Milk yields for 305 days of lactation on average for the population of Simmental cows amounted to 6017 kg of milk, which is by 455 kg of milk more than the average for the first lactation, the difference is significant ($P<0.005$). Alleles B_2I_1Q, I', I'Q' are markers for the Simmental breed. There were selected 4 cows as candidates for mothers of future bulls, whose productivity in terms of the highest lactation varied within 7029 - 8003 kg of milk.

Key words*: assessment, blood groups, female ancestors, mothers of future bulls, productivity.*

CLIMATIC CHANGES OF ATMOSPHERIC PRECIPITATION AND THE VITAL ACTIVITY OF BEES

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Abstract

The aim of the present work was to reveal the impact of climate changes of atmospheric precipitation on the vital activity of bee colonies. To elucidate this impact, Pearson's linear correlation coefficients were calculated between monthly atmospheric precipitation and the average annual value of each of the 6 main morpho-productive characters of bee families, such as: queen prolificacy, winter resistance, strength and colony resistance to disease, brood viability and honey production. The scientific research was carried out on the families of Apis mellifera bees from the Carpathian race at the "Apibio Regina Mierii" experimental apiary. For the research, the average monthly and annual atmospheric precipitation data for the last 11 years (2010-2020) from the nearest hydrometeorological station, located at a distance of 27 km from the apiary, were used. The results of the research demonstrated that the winter resistance of bee families has an obvious tendency to be positively influenced by atmospheric precipitation in March ($r_{xy} = 0.461 \pm 0.237$; $t_r = 1.95$; $P < 0.1$). The prolificacy of queens is influenced negatively - by atmospheric precipitation in June ($r_{xy} = -0.582 \pm 0.199$; $t_r = 2.92$; $P < 0.01$) and positively - by atmospheric precipitation in July ($r_{xy} = 0.579 \pm 0.200$; $t_r = 2.89$; $P < 0.01$). The strength of bee colonies is positively influenced by atmospheric precipitation in December of the previous year ($r_{xy} = 0.571 \pm 0.213$; $t_r = 2.68$; $P < 0.05$), as well as in March ($r_{xy} = 0.561 \pm 0.206$; $t_r = 2.72$; $P < 0.05$) and July ($r_{xy} = 0.482 \pm 0.231$; $t_r = 2.09$; $P < 0.05$) of the current year. The viability of the bee brood is negatively influenced by atmospheric precipitation in the months of January ($r_{xy} = -0.469 \pm 0.235$; $t_r = 2.00$; $P < 0.05$) and May ($r_{xy} = -0.577 \pm 0.201$; $t_r = 2.87$; $P < 0.01$) of the current year, and positive - from the atmospheric precipitation in March of the current year ($r_{xy} = 0.504 \pm 0.225$; $t_r = 2.24$; $P < 0.05$) and October of the previous year ($r_{xy} = 0.599 \pm 0.203$; $t_r = 2.95$; $P < 0.01$). Disease resistance of bee families is influenced negatively - by atmospheric precipitation in January of the current year ($r_{xy} = -0.497 \pm 0.227$; $t_r = 2.19$; $P < 0.05$) and positively - by atmospheric precipitation in August of the previous year ($r_{xy} = 0.565 \pm 0.215$; $t_r = 2.63$; $P < 0.05$), as well as the annual atmospheric precipitation of the previous year ($r_{xy} = 0.560 \pm 0.217$; $t_r = 2.58$; $P < 0.05$). Honey production of bee families is positively influenced - by atmospheric precipitation in the months of September ($r_{xy} = 0.711 \pm 0.156$; $t_r = 4.56$; $P < 0.001$), November ($r_{xy} = 0.599 \pm 0.203$; $t_r = 2.95$; $P < 0.01$) and annual ($r_{xy} = 0.560 \pm 0.217$; $t_r = 2.58$; $P < 0.05$) of the previous year, and negatively - by atmospheric precipitation in February ($r_{xy} = -0.706 \pm 0.151$; $t_r = 4.68$; $P < 0.001$) and June ($r_{xy} = -0.511 \pm 0.223$; $t_r = 2.29$; $P < 0.05$) of the current year.

Key words*: atmospheric precipitation, bees, climate changes, vital activity.*

POSTNATAL DEVELOPMENT OF HEIFER AND MILK PRODUCTIVITY OF UKRAINIAN BLACK-SPOTTED DAIRY COWS OF DIFFERENT TYPES OF CONSTITUTION

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Abstract

Groups of animals were formed at six months based on the physiological and selection index we invented. We studied postnatal development in heifers of the high-enzyme (experimental group) and low-enzyme (control group) constitution type. Thus, due to the main diameters of body parts, which characterize the exterior in postnatal ontogenesis, animals of the high-enzyme type (experimental group) prevailed over their analogs of the low-enzyme type (control group). According to indices of the body structure in postnatal ontogeny, the development of some relative to others is evaluated. In our studies, significant superiority in the experimental group over the control analogs wasn't noted in terms of these indicators. Consonant to the leading indicators characterizing oxidation-reduction processes in the body, animals of the high-enzyme type (experimental group) significantly outnumbered their analogs of the low-enzyme type (control group). Therefore, this indicates that the level of metabolic processes in the experimental group was much more intense compared to the control group. Thus, animals of the high-enzyme type (experimental group) significantly outnumbered their analogs of the low-enzyme type (control group).

Key words*: heifers, black-spotted dairy breed, postnatal development, milk productivity.*

ASSOCIATION OF *FABP3* GENE POLYMORPHISM WITH LITTER SIZE IN EWES FROM THE BULGARIAN DAIRY SYNTHETIC POPULATION

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Abstract

The Bulgarian Dairy Synthetic Population (BDSP) is the most numerous breed in Bulgaria. FABP3 gene plays a crucial role in hormone action and cellular functions. The aim of the study is to investigate the relationship of FABP3 gene polymorphism with litter size in ewes of BDSP. This experiment involved 110 ewes from the herd of the Agricultural Institute-Shumen. Ewes were selected by birth type (singles, twins, triplets) and with records of the number of lambs born from a minimum of two consecutive lambing. The average number lambing of ewe is 3.94. Two alleles and two genotypes were identified in the studied animals in exon 2 of the FABP3 gene (SNP3) by the PCR-RFLP technique with BseDI endonuclease. The association of FABP3 gene polymorphism with total litter size and litter size depending on the parity and type of birth of ewes was studied by the one-way analysis model of variance ANOVA. A certain superiority was observed in the examined traits of the animals born as twins and triplets, but no significant differences were found between the individual groups.

Key words*: birth type, FABP3 gene, litter size, sheep.*

ESTIMATION OF CORRELATION COEFFICIENTS BETWEEN MILK YIELD AND MORPHOLOGICAL TRAITS IN A POPULATION OF LACAUNE SHEEP

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Abstract

The aim of the study was to estimate correlations between milk yield and growth traits. The biological material was 282 Lacaune ewes and traits studied were: milk yield (MY), body weight (BW), height at withers (HW), height at rump (HR), torso length (TL), chest width (CW), rump width (RW), chest depth (CD), chest girth (CG) and metacarpal circumference (MC). The data obtained were statistically processed and interpreted. Average values for milk yield was 120.86 kg for 135 days; average values for morphological traits was 65.10 kg for BW, 62.48 cm for WH, 63.23 cm for RW, 55.25 cm for TL, 25.04 cm for CW, 23.60 cm for RW, 24.06 cm for CD, 84.07 cm for CG and 6.91 cm for MC. Correlations were determined by Pearson test and correlation coefficients had values of +0.13 between MY x BW, -0.02 between MY x WH, -0.19 MY x RH, +0.12 between MY x TL, -0.03 between MY x CW, -0.08 between MY x RW, +0.03 between MY x CD, +0.002 between MY x CG and -0.06 between MY x MC.

Key words*: body traits, correlation coefficient, Lacaune, milk yield.*

ESTIMATION OF THE HERITABILITY FOR PRODUCTION AND REPRODUCTION TRAITS IN THE PALAS - PROLIFIC LINE SHEP, USING BLUP METHODOLOGY

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Abstract

The purpose of this study is to estimate the heritability in Palas - Prolific Line Sheep, for milk and prolificacy. This objective was undertaken applying the BLUP methodology, to a random regression animal model, for milk yield and, also, to an ordinary animal model for the number of offsprings/ewe/lambing. For milk yield, the data set consisted of 4610 test day records from the first lactation of 485 ewes, with records, sired about 97 rams. Totaly, there were 1049 animals, including the ascentors. The fixed effect in the model were fixed lactation curves and flock-test-date. The random effects of animal and permanent environmental effects were modelled using orthogonal polynomials of order three. The curve of daily heritabilities for milk yields were 0.216, 0.133, 0.151, 0.219, 0.280, 0.314, 0.318, 0.292, 0.243, 0.199 and 0.210 for 50, 64, 78, 92, 106, 120, 134, 148, 162, 176, 190 days in milk. For the number of offsprings/ewe/lambing (prolificacy) the heritability was estimated using an animal model. The fixed effect was the year and season of lambing. Random effects was represented by animals. The heritability of proloficacy was 0.177.

Key words*: animal model, Palas - Prolific Line Sheep, production and reproduction traits, random regression model, heritability.*

ESTIMATION OF GENETIC PARAMETERS FOR SCRAPIE RESISTANCE IN LOCAL BREEDS OF SHEEP RAISED IN ROMANIA

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Abstract

In the European Union, animal breeding programs have been implemented to increase scrapie resistance in sheep. In addition to increasing animal resistance to an infectious disease, selection for pathogen resistance has the potential to lessen the transmission of the pathogen to offspring, particularly when the population under consideration may serve as the primary pathogen reservoir. Several sheep populations from Romania were used in this study: Țurcană; Țigae; Merinos; Cap Negru de Teleorman and some imported breeds: Suffolk; Ille de France and Awassi. Sanger sequencing method was used to identify PRNP genetic polymorphism, at 136, 154 and 171 codons. From the analyzed samples, a moderate share of the homozygous ARR allele, responsible for the highest resistance to scrapie, respectively (R1), was observed, and the heterozygous ARR/ARQ (R2) and homozygous ARQ/ARQ (R3) genotypes had an abundance of over 50% of the genotype panel. In practice, the use of phenotype as input to the model is given by numbers (risk classes from 1 to 5). To estimate the heritability of resistance to scrapie, the animal threshold model was used.

Key words*: genotype, heritability, sanger sequencing, scrapie, trehold animal model.*

PARTICULARITIES OF BODY CONFORMATION OF THE MOLDAVIAN KARAKUL LAMBS

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Astract

The purpose of this research was to reveal the variability of the morpho-productive characters that determine the development of body conformation, as well as to identify the factors that influence its optimization. The researches were carried out on the batches of lambs from the classic Karakul and Moldavian Karakul races, born in the experimental households: the state farm "Kotovschii", Dumbrăveni district and the experimental agricultural station "Tevit", Anenii Noi district, Republic of Moldova. The results of the research demonstrated that the body conformation of the Moldavian Karakul lambs is typical of the classic (Asian) Karakul sheep race, with some particularities related to the development of body mass, body length and constitution. Moldavian Karakul lambs are quite full-bodied at birth, with an average body mass of 4.7-5.0 kg, and in some years over 5.0 kg, this being a biological peculiarity of the new type of sheep. Variability of lamb body mass at birth is hereditarily determined (genotypic correlation coefficient r_{xy} = 0.63; h^2 = 0.36; repeatability coefficient $K_{0\text{-}6\ months}$ = 0.26; $K_{0\text{-}18\ months}$ = 0.23) and influenced environmental conditions, in particular, the nutrition of pregnant ewes. The body mass of the lambs at birth is in a direct-proportional phenotypic relationship with: age of the ewes at calving, body length (r_{xy} = 0.49), skin thickness (r_{xy} = 0.45), fiber length (r_{xy} = 0.22-0.31), furskin surface (r_{xy} = 0.64), loop size and constitution; inversely proportional to: the prolificacy of the ewes in the term and the calving period; curvilinear with: the qualities of own furskin (weight in the flock at calving of the higher class Elita lambs). Lamb body length at birth is in the same similar phenotypic relationships as body mass, including with: skin thickness (r_{xy} = 0.54), fiber length (r_{xy} = 0.15-0.18), furskin area (r_{xy} = 0,78). The constitution of the lamb at birth is in a phenotypic relationship: directly proportional - with its own body mass, body length, thickness and skin reserve; inversely proportional - to skin density.

Key words*: body conformation, Moldavian Karakul lambs.*

EVALUATION OF STUD BULLS BY BETA-CASEIN GENOTYPE IN THE CONTEXT OF CONSERVATION OF LOCAL CATTLE BREEDS IN UKRAINE

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Abstract

Genotyping of 114 stud bulls of local and specialized dairy breeds based on the beta-casein gene has been carried out. According to the results of the research, it is found that the highest frequency of the A2A2 desired homozygous genotype is characteristic of local cattle of Lebedyn breed and OBV (56%), as well as stud bulls of the Ukrainian White Headed breed (50). A significant difference in the frequency of genotypes for this trait has been established between individual breeds. The creation of micro-populations of cattle based on beta-casein with the A2A2 desired homozygous genotype makes it possible to obtain milk that has a number of properties, which are not characteristic of ordinary milk. Thus, the increased frequency of the A2A2 genotype for beta-casein may contribute to the conservation and spread of local breeds on Ukrainian farms.

Key words*: allele, beta-casein, breed, genotype, stud bull.*

MARKER SELECTION IN ANIMAL HUSBANDRY AND POULTRY FARMING

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Abstract

This article provides data on candidate genes CS3, CS2, BLG, LALBA as molecular markers for predicting milk productivity, technological properties of milk in cattle of Red Estonian, black-mottled Belarusian and Moldovan breeds, Karakul sheep breed, and also, OV, TFR loci in chickens of various breeds. The marker selection makes it possible to identify animals with valuable genes and preserve them in the population, as well as to look for a relationship with economically useful traits. The disadvantage of this method today is the high cost of research. Analyzing the relationship of candidate genes with productive qualities, it can be seen that the genotypes beneficial for one breed are not those for another breed. This is due to the degree of absorption of the breed - founder/bull in crosses and breeding `in itself`, etc. Nevertheless, in our opinion, valuable kappa-casein alleles are introduced by individuals of the Holstein and Simmental breeds, which are of the greatest value for breeding.

Key words*: genotype, loci QTL, marker genes, selection, productivity.*

INNOVATIVE TECHNOLOGIES FOR FISH BREEDING WITH MINIMAL IMPACT ON THE ENVIRONMENT

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Abstract

This study reffers to the common carp (Cyprinus carpio), which is an adaptable species that enriches the variability of quantitative and qualitative characteristics and increases genetic diversity. Local aquaculture populations of common carp, called "landraces," have developed due to different environmental conditions and breeding efforts. However, the introduction of carp in some areas has led to negative impacts on natural aquatic ecosystems. To improve the quality of economically important fish species, the variation in morphological, physiological, and biochemical characteristics is utilized. In this study, a patent application for a system for reproduction, selection, and growth of fish fry with the simulation of natural conditions is described. The article explains the method used to replicate the natural aquatic environment and create viable products with high genetic adaptability to its conditions. The process falls into the category of extensive aquaculture, promoting sustainable aquaculture by increasing the percentage of ecological and environmentally friendly productions. The study concludes with the results and the development of a set-up of the station for laboratory use.

Key words*: aquaculture, artificial inteligence, future, technologies.*

SESSION
NUTRITION

ARE HABITATS WITH *Campanula romanica* Săvul. PREFERRED BY THE SOIL FAUNA?

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Abstract

In 2021, from the first time in Romania, soil fauna taxa were investigated from two types of habitats: with and without Campanula romanica, from Măcin Mountains National Park. Some population parameters were analysed as: taxa diversity, numerical abundance, dominance, evenness, equitability, Shannon-Wiener index of diversity. In total, 24 soil fauna groups were identified, with 399 individuals, recording characteristic structure and taxa for each type of plots. Even if the number of identified taxa is almost similar between plots, the numerical abundance was higher in areas without Campanula romanica. In the same time sixteen environmental variables were quantified, as: the thickness of three soil layers, air temperature and humidity, soil temperature and moisture, soil pH, soil penetration resistance, amount of organic carbon, total nitrogen, C/Nt ratio, humus content, potassium content, phosphorous content and the vegetation cover. They had a significant influence on structure composition of the edaphic taxonomic groups from the two types of habitats.

Key words*: Campanula romanica, environmental parameters, soil taxa.*

SILKWORMS PUPAE AS PROTEIN SOURCE FOR PIGS - A REVIEW

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Abstract

This study aimed to identify whether the silkworm pupae (SWP) added to pigs' diets can be considered a valuable protein-rich alternative source. The silkworm (Bombyx mori L.) and its by-products are highly valuable in terms of nutrition, medicine, and commerce. The SWP is the main by-product of the sericulture, considered a well-balanced source of nutrients in terms of proteins, lipids, minerals, vitamins and various bioactive substances such as fatty acids, peptides, and polyphenols with antioxidant, anticancer, cardiovascular, hepato-protective properties. The mulberry silkworm's potential for use in human food has been previously extensively documented, whereas the preponderance of literature data on SWP used in the livestock industry specific focus on poultry. There is limited pig-related data. In this study, we reviewed the most recently published papers on PubMed, Elsevier, MDPI, and Research Gate, using the keywords "silkworm pupae", "composition", "protein", and "pigs". We did not find any negative consequence on pigs' growth and health parameters in the reviewed published data.

Key words*: feed, pigs, protein, pupae, silkworms.*

ARTIFICIAL DIET AS AN ALTERNATIVE IN SILKWORM (*Bombyx mori* L.) FEEDING - A REVIEW

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Abstract

Silkworm (Bombyx mori L.) is an important monophagous insect in the sericulture industry. The mulberry leaves (Morus alba L.) are known as valuable plants rich in nutrients and nutraceuticals due to the presence of chemo-factors (morin, β-sitosterol) and antioxidants (flavonoids, anthocyanin and alkaloids), the traditional feed in the rearing of silkworm larvae. The mulberry is also used in pharmaceutical, food, beverage and healthcare industries, being considered a suitable plant for sustainable development. Over time, research on using the artificial diet in silkworms has been focused on different topics: i) rearing silkworms in the season when mulberry leaves are insufficient or not available and ii) as an organism model for human diseases (i.e., tumour, degenerative and metabolic diseases) due to the low breeding cost, short generation time, genetic background, large progeny size and numerous genes homologous to humans. This review aimed to summarize the literature information about the impact of nutrition as a key factor in silkworm rearing and the effectiveness of using an artificial diet based on different ingredients in silkworm productivity and health.

Key words*: artificial diet, nutrients, mulberry, silkworm (Bombyx mori L.)*

WAYS TO IMPROVE THE QUALITY OF MEAT PORK THROUGH ORGANIC NUTRITION

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Abstract

The analysis of the evolution of pig fattening indicators identifies a poor nutrition from the perspective of industrial feeding. The influence of a nutrition, largely organic, is decisive in the context of increasing the quality of meat from pigs. The optimization of the nutritional modalities of the Romanian breed Bazna, based on the application of a food recipe, mainly with: acorn, turnips, maize, sunflower, pumpkins (grown on chemically unfertilized land) represents a new perspective of the approach of modern methods of maintenance, as well as the diversification of feeding systems of type "ecological". The ingredients used in feeding must be guaranteed to come from organic crops.

Key words*: food recipe, growth indicators, meat quality, modern methods of nutrition.*

THE QUALITY OF FORAGE FROM PERENNIAL RYEGRASS (*Lolium perenne*) AND TALL FESCUE (*Festuca arundinacea*) UNDER THE CONDITIONS OF MOLDOVA

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Abstract

The main objective of this research was to evaluate the quality of green mass, hay and silage prepared from perennial ryegrass Lolium perenne and tall fescue Festuca arundinacea, grown in monoculture in the experimental plot of the "Alexandru Ciubotaru" National Botanical Garden (Institute), Chisinau, Republic of Moldova. It was established that the concentration of nutrients and energy in whole-plant dry matter of studied grass species, harvested in pre-flowering stage was 10.74-14.10% CP, 3.10-3.58 % EE, 29.95-31.66% CF, 36.35-45.76% NFE, 6.20-19.24 % sugar, 1.54-2.99 % starch, 10.45-14.31% ash, 2.9 g/kg Ca, 2.5-2.7 g/kg P, 8.93-9.49 MJ/kg ME and 4.97-5.06 MJ/kg NEl. The biochemical composition of the prepared silages was: pH= 4.06-4.21, 27.9-28.9 g/kg lactic acid, 0-0.4 g/kg butyric acid, 1.5-5.0 g/kg acetic acid, 9.12-9.67% CP, 3.37-3.99% EE, 39.16-41.30% CF, 30.53-37.37% NFE, 0.33-1.40 % sugar, 0.50-0.60 % starch, 10.98-14.51% ash, 36.34-56.33 mg/kg carotene, 8.31-9.53MJ/kg ME and 4.48-5.34 MJ/kg NEl. The nutritive value of prepared hay: 9.95-10.84% CP, 1.87-2.55 % EE, 36.90-37.32% CF, 38.48-39.99% NFE, 10.82-11.28% ash, 2.5-3.5 g/kg Ca, 2.6-2.7 g/kg P, 8.31-8.85MJ/kg ME and 4.54-493 MJ/kg NEl. The studied grass species contain a lot of nutrients, which make them suitable to be used as multi-purpose feed for livestock.

Key words*: biochemical composition, Festuca arundinacea, green mass, hay, Lolium perenne, silage.*

THE NUTRITIVE VALUE OF FODDER FROM CHICKPEA, *Cicer arietinum* L., CULTIVATED IN MOLDOVA

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Abstract

Chickpea, Cicer arietinum, is a multipurpose Fabaceae species, widely used around the world, notably as a source of protein, used to restore soil fertility, which can tolerate high temperatures and arid climate. This research was aimed at evaluating the nutritive value of fodder from the chickpea local cultivar ICHEL, grown in monoculture in an experimental field of the National Botanical Garden (Institute), Chişinău, Republic of Moldova. The results revealed that the dry matter of the whole Cicer arietinum plant contained 197 g/kg CP, 205 g/kg CF, 126 g/kg ash, 240 g/kg ADF, 376 g/kg NDF, 46 g/kg ADL, 181 g/kg TSS, 194 g/kg Cel, 136 g/kg HC, with nutritive and energy value 81.5% DMD, 73.7% DOM, RFV = 174, 11.25 MJ/kg ME and 7.26 MJ/kg NEl. The quality of the prepared hay was: 194 g/kg CP, 238 g/kg CF, 134 g/kg ash, 283 g/kg ADF, 438 g/kg NDF, 54 g/kg ADL, 89 g/kg TSS, 229 g/kg Cel and 155 g/kg HC, 74.8% DMD, 64.7% DOM, RFV = 142, 10.76 MJ/kg ME and 6.77 MJ/kg NEl. The fermented fodder was characterized by pH = 4.40, 5.0 g/kg acetic acid, 0.4 g/kg butyric acid, 39.4 g/kg lactic acid, 222 g/kg CP, 150 g/kg CF, 146 g/kg ash, 181 g/kg ADF, 313 g/kg NDF, 20 g/kg ADL, 198 g/kg TSS, 161 g/kg Cel, 132 g/kg HC, 59.62 mg/kg carotene, 89.0% DMD, 81.0% DOM, RFV = 222, 13.2 MJ/kg ME, 7.48 MJ/kg NEl. The harvested biomass of the chickpea cultivar ICHEL can be used as alternative fodder for farm animals.

Key words*: Cicer arietinum, cv. Ichel, green mass, hay, nutritive value*, *silage.*

THE CHEMICAL COMPOSITION AND NUTRITIONAL VALUE OF THE PLANT MASS OF THE NEW HYBRID OF SORGHUM - SUDAN GRASS SAȘM-4 GROWN UNDER THE CONDITIONS OF MOLDOVA

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Abstract

To establish a fodder base under the conditions of climate change, it is necessary to use new plants species, cultivars and hybrids, which are more resistant to droughts and high temperatures. One of these plants is the new sorghum - Sudan grass hybrid 'SAȘM 4'. The goal of our research was to determine the dynamics of the chemical composition and nutritional value of these plants harvested in different developmental periods: stem elongation, tasseling, milk-wax and wax stage of grains, as well as the capacity of being processed into silage. It was determined that the dry matter content in the harvested green mass varied depending on the harvest time from 130.0 g/kg in the stem elongation period to 340.1 g/kg in the wax stage of grains, its chemical composition and nutritional value were: 6.53-18.40% crude protein, 2.05-3.86% crude fats, 28.62-37.61% crude cellulose, 38.90-54.84% nitrogen free extract, 7.71-10.56% sugars, 1.43-11.94% starch, 5.25-10.22% ash, 0.20-0.30% calcium, 0.13-0.26% phosphorus, 31.85-53.00 mg/kg carotene, 0.12-0.26 nutritive units/ kg natural fodder and 1.29-2.96 MJ/kg natural fodder metabolizable energy. The fermentation quality and fodder value of silage prepared from the sorghum- sudangrass hybrid 'SAȘM 4' were: Ph = 4.06, 19.8 g/kg lactic acid, 6.9 g/kg acetic acid, butyric acid was not detected, 334.8 g/kg DM, 7.05% crude protein, 2.55% crude fats, 34.05% crude cellulose, 51.12% nitrogen free extract, 1.03% soluble sugars, 9.96% starch, 5.22% ash, 0.22% calcium, 0.15-0.27% phosphorus, 23.75 mg/kg carotene, 0.26 nutritive units/kg silage and 2.99 MJ/kg silage metabolizable energy.

Key words*: chemical composition, green mass, nutritional value, silage, sorghum - Sudan grass hybrid 'SAȘM 4'.*

CURRENT ANALYSIS OF THE "ŢARA DORNELOR" GEOGRAPHICAL AREA AND THE DEVELOPMENT OF TRADITIONAL AGRICULTURAL POTENTIAL

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Abstract

The Dornelor Depression occupies a mountainous geographical area with subalpine specifics, known as "Ţara Dornelor". The geological, pedo-climatic, and floristic structure of this area represents the basis of the traditional agriculture development, which is mainly centered on the growth of some autochthonous cattle breeds (Transylvanian Pinzgau, Black Pinzgau/ Dorna Cow and Brown cow of Maramureş). This study aimed to analyse the current level of geological, pedological, climatic, and biodiversity conditions, as well as the need to preserve Pinzgau cow herds and the procedures for preparing traditional dairy products. The obtained results confirmed the location of Suceava county among the leading areas in domestic cattle breeding, Romanian Spotted Cattle being predominant. The analysis of the specific climate has revealed that it is directly influenced by the relief which is structured in altitude steps, the Dornelor land being a representative geographic area for the national and community heritage, through the protected natural areas of the "NATURA 2000" European Ecological Network.

Key words*: mountain area, pedo-climatic factors, traditional foods.*

THE COMPOSITIONAL AND HYGIENIC-SANITARY ANALYSIS OF JENNET MILK

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Abstract

Nowadays, the interest in jennet milk has considerably increased worldwide due to its nutritional characteristics. This study aimed to analyse the main physicochemical and hygienic-sanitary parameters of some jennet milk samples, by using current methods of quality monitoring. The following physicochemical (dry matter - DM, non-fat dry matter - NDM, fat, total protein, β-casein, lactose, and cryoscopic point), metabolic (urea, acetone, and β-hydroxybutyrate - BHB) and hygienic parameters (total bacteria count - TBC, somatic cell count - SCC and differential somatic cell count - DSCC) were assessed. Additionally, electrical conductivity (EC), pH, temperature, and density were investigated. The results revealed variations of total DM (9.64-11.11%), which were mainly given by the NDM oscillations (8.62-9.54%) and to a lesser extent by the fat content (0.25-1.66%). The study also emphasized low values of EC (1.75 mS/cm), TBC (22.16-62.15x10^3 CFU/mL), and SCC (3-30x10^3 cells/mL). The good health status was also confirmed by other metabolic indices, such as urea (36.27 mmol/L), acetone (0.06 mmol/L), and BHB (0.14 mmol/L).

***Key words**: Fossomatic, jennet milk, Milkoscan, quality testing.*

THERMAL STABILITY ANALYSIS OF DIFFERENT FOOD FATS

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Abstract

The thermal stability of different food fats is influenced, on the one hand, by the chemical composition, and on the other hand, by the temperature to which they are subjected. Food fats rich in unsaturated fatty acids have a low thermal stability, therefore knowing their behavior at different temperature levels is essential in choosing a stable fat at the temperature used in preparation. In addition, it must be taken into account that, following the thermal processing of culinary preparations in edible fats, toxic compounds resulting from the degradation of various ingredients may appear. In the experimental part, the stability of some food fats (of vegetable and animal origin) was analyzed at different temperature levels, as well as repeated exposure to high temperatures. The characterization of the studied food fats was carried out by determining the following physico-chemical parameters: density, acidity, indices of: acidity, peroxide, iodine, saponification, as well as the content in water and in volatile compounds. These analyzes were performed in the initial phase (before heating) and in each step in which the working temperature was changed.

Key words*: acidity, food fats, peroxide index.*

THE FUNCTIONAL APPROACH FOR THE STUDY OF CROP PEST PREDATORY ARTHOPODS

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Abstract

Crop pests represent the sole cause of pesticide use in agroecosystems, a practice linked to pollution and health problems. The use of natural enemies against crop pests can prove to be a solution to partially alleviate this anthropic pressure and reduce associated costs. Predatory arthropods, such as spiders and carnivorous ground beetles can be efficiently used to reduce harvest consumption by pests. The community structure and overall fitness of these natural enemies (and their efficacy in pest control) are inextricably linked to the functional traits of each comprising taxa. The trait-based approach proposes functional traits and functional diversity indices, as the common denominators between biotic communities instead of taxonomic diversity. This approach for the study of predatory arthropods in agricultural ecosystems, especially in the interest of mediating production losses, has recently increased in popularity due to its ease of use for biotic communities' assessments and for its convenience in predicating ecosystem interactions and fluxes. The scope of this research is to critically analyse the current state of knowledge on the use of the trait-based approach to study predatory arthropods in agroecosystems, in order to provide guidelines of how this framework can be efficiently used for scientific research and ecosystem management and to identify existing knowledge gaps, in order to support future scientific endeavours.

Key words*: agricultural ecosystems, functional diversity, functional traits, natural enemies, predatory arthropods.*

USING STINGING NETTLE (*Urtica dioica*) in POULTRY NUTRITION

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Abstract

Stinging nettle (Urtica dioica) which belong to the family Urticaceae in the major group Angiosperms (flowering plants) is a wild, herbaceous, perennial flowering plant. Stinging nettle is considered a weed by intensive agriculture. However, nettle leaves are good sources of protein, fat, carbohydrates, vitamins, minerals and trace elements. Besides, stinging nettle leaves contain a significant number of biologically-active compounds such as terpenoids, carotenoids and fatty acids, as well as various essential amino acids, chlorophyll, vitamins, tannins, sterols, polysaccharides, isolectins and minerals. Stinging nettle has antiproliferative, anti-inflammatory, antioxidant, analgesic, anti-infectious, hypotensive and antiulcer properties, as well as the ability to prevent cardiovascular diseases thanks to the biologically-active compounds it contains. Due to its biological properties, availability and simple processing technology, stinging nettle can be thought of as an excellent nutritional supplement for poultry. The aim of this review is to evaluate the potential of stinging nettle utilization in poultry nutrition in light of the studies conducted.

Key words*: nutrition, pharmacological activities, poultry, stinging nettle, usage possibilities.*

NUTRITIONAL CHARACTERIZATION OF SOME DROUGHT-RESISTANT PLANTS WITH POTENTIAL FOR USE IN FARM ANIMALS NUTRITION

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Abstract

As a result of climate changes, drought has become a repeatable phenomenon that creates major problems in the management of crop production systems, with direct effects on the livestock sector and implicitly on food security. In this context, the aim of this study was to evaluate the chemical composition and the nutritional value of some new drought tolerant varieties of sorghum and cowpea in order to establish their potential for use in the nutrition of monogastric and ruminant animals. Following the Weende analysis and the calculated nutritional value (PDI system), sorghum grains were characterized by a high crude protein content (10.93-12.50%), an energy value comparable to that of corn (3307-3320 ME kcal/kg) and a nutritional value of 99.81-113.89 g PDI/kg SU, 1.35 UNL and 1.42 UNC. Cowpea varieties also highlighted a high content of crude protein (28.8-30.4%), fats (8.3-13.1%), lower cellulose (5.0-5.8%), an energy value comparable to that of other legumes (12.7-12.9 Mj/kg SU) and a nutritional value of 201.57-212.53 g PDI/kg SU, 1.44 UNL and 1.49 UNC.

Key words*: animal nutrition, climate changes, drought, resistant plants.*

EFFECT OF DIETARY SUPPLEMENTATION OF CHROMIUM AND ZINC ON PERFORMANCE, SERUM BIOCHEMICAL PARAMETERS, CARCASS DEVELOPMENT, AND INTESTINAL MICROFLORA BALANCE IN BROILER CHICKENS REARED UNDER HEAT STRESS

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Abstract

The present study evaluates the effect of dietary chromium and zinc (Cr-Zn) supplementation on performance, serum biochemical parameters, carcass development and intestinal microflora of broilers reared under high heat stress (HS). An experiment was carried out on 60 Ross 308 broiler chickens, assigned to two experimental groups (C and Cr-Zn) with 30 chickens/group and maintained under high heat stress (32°C). Compared to the control diet (C), the experimental diet included the addition of a premix with 20 mg chromium picolinate +2.5 g Zn/kg premix (Cr-Zn). Dietary Cr-Zn did not affect the performance and serum biochemical parameters of broiler chickens reared under HS conditions. The use of Cr-Zn in broiler diet led to a significant reduction of Enterobacteriaceae, E. coli, staphylococci in the caecal and intestinal content. Both in the caecum and in the intestinal contents of Cr-Zn broiler chickens, the number of lactobacilli was significantly higher than in the C broilers. The combination of Zn and Cr in broiler feeding has a positive impact on maintaining the balance of intestinal microflora during heat stress

Key words*: broiler, chromium, heat stress, intestinal microflora balance, zinc.*

THE INFLUENCE OF WALNUT KERNEL CAKE ON THE DIGESTIBILITY OF NUTRIENT SUBSTANCES FROM THE COMBINED FODDER INTENDED FOR YOUNG SOWS

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Abstract

The work presents the results of the study of the chemical composition of walnut kernel cake and its influence on productive performance, digestibility and the exchange of nutrients in young piglets. When using 4%/t of walnut cake in the feed of the sows, the cost price of 1kg of combined fodder decreased by 1,7 euro cents, an average daily increase of 613 g was obtained, with the digestibility of the dry substance - 86.8%, crude protein -79.2%, crude fat - 62.3%, crude cellulose - 62.0%, organic substance - 88.4%, and when using 8%/t the cost price of 1kg of combined fodder decreased with 3,5 euro cents and the indices were 608 g - average daily gain, digestibility of dry matter - 85.4%, crude protein -78.5%, crude fat - 69.1%, crude cellulose - 37.3%, organic matter - 87.2%.

Key words: *chemical composition, digestibility, specific consumption, walnut kernel cake, young piglets.*

ATRIBUTES OF THREE VEGETABLE SOURCES RICH IN OMEGA 3 FATTY ACIDS STUDIED TO IMPROVE THE FEED OF BROILERS

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Abstract

Through their desire to lead a healthier life, people have realized that consuming foods with a higher Omega-3 content leads to substantial improvements in health and lifestyle. Therefore, three vegetable sources of seeds rich in n-3 polyunsaturated fatty acids were analysed to characterize their nutritional contribution to the diet of broiler chickens. Chemical analysis showed that the protein content of these sources ranged from 19.74% (hemp seeds) to 26.78% (flax seeds). α-linolenic acid was determined to be 14.2 g/100 g of total fatty acids for hemp seeds, 34.15 g/100 g for camelina seeds, and 50.71 g/100 g of total fatty acids for flax seeds. The best sources of polyunsaturated fatty acids will be introduced into the diet of broiler chickens and tested on batches to study their best performance.

Key words*: oilseeds, OMEGA-3, poultry feed, polyunsaturated fatty acid.*

OPTIMIZATION OF THE FERMENTATION CONDITIONS AND SURVIVAL OF *Bacillus licheniformis* AS FREEZE-DRIED POWDER FOR ANIMAL PROBIOTIC APPLICATIONS

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Abstract

Probiotics benefits translate into an increased interest in techniques for microorganisms preservation. In this study, the viability of Bacillus licheniformis ATCC 21424 (BL) strain was evaluated in shake flask culture (Erlenmeyer 100 mL-shaking incubator) and batch 7-L stirred-bioreactor under submerged-fermentation (SMF). The inoculum and fermentation process from the bioreactor was grown in a nutrient medium (37°C, 24 ± 2 h, 200 rpm) and the viability was evaluated by 10-fold dilutions. During SMF under controlled pH and oxygen availability, the cell growth rate was measured by OD600nm at different interval times. The maximum specific rate of BL in the exponential phase was calculated 0.524 h^{-1}. When the stationary phase was reached, the OD in SMF increased, which was 2.01 times higher vs. flask culture. Without any cryoprotectant, the cell suspension was subjected to cold shock first and then freeze-dried. The proven survival rate of cells after freeze-drying was 90.65%. The viability of BL-powder decreased only by 1.09 log (CFU/ml) vs. SMF. These results convincingly demonstrated that freeze-drying could be used in the preparation of BL as a lyophilized probiotic with applicability in animal nutrition.

Key words*: animal nutrition, bioreactor, freeze-drying, Bacillus, probiotics.*

QUANTITATIVE RESEARCH FOR CONSUMER PERCEPTIONS ON VEGETAL PROTEIN-RICH, NUTRITIONALLY BALANCED PRODUCTS

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Abstract

The modern lifestyle, with life being so busy with jobs, kids, and other activities, brings changes in eating habits, which has led to a significant reduction in daily number of traditional meals. Therefore, the market for protein-rich products, originally developed to increase the muscle mass of athletes, is growing supporting those who choose to replace traditional main meals as well as welcoming vegan and vegetarian consumers, whose number is constantly increasing. To meet the current demands of consumers, regarding the increase in the availability on the local market of healthy, minimally processed, protein-enhanced and last but not least nutritionally balanced products, which can be consumed by as many categories of consumers as possible, a study was carried out to establish consumer preferences for salty snack products with a high vegetable protein content. It involved the development of a questionnaire followed by its distribution in the online environment. The results obtained regarding the consumer preferences, allowed us to further establish the main characteristics and attributes of the desired product.

Key words*: consumer preferences, minimal processing, plant protein.*

COMMERCIAL AND NATURAL DOG AND CAT FOOD: STUDYING THE BENEFITS AND INCONVENIENCES OF USING CURRENT TYPES OF FEED - A REVIEW

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Abstract

The essential aspects in choosing pet food are the quality and nutrient content of the food. This becomes difficult for pet owners to manage when many diets or types of dog and cat food are available on the market as will be mentioned in the study: commercial pet food, BARF, home-made or vegetarian diets. There are also many brands and recipes in the commercial pet food industry, which again causes confusion and misleads pet owners. Pet owners now treat their dogs and cats as family members, which is why studies show that globally owners have become more aware of their pets' needs. The current study attempts to present the benefits and drawbacks/disadvantages of different varieties of dog and cat food. By providing an overview of pet feeding patterns, the study seeks to clarify the nutritional needs and highlight the physiological digestive capabilities of two specialized carnivores: the dog and the cat.

Key words*: BARF, carnivores, cat, dog, home-made, pet food.*

PEAS (*Pisum sativum* L.) AND LUCERNE (*Medicago sativa* L.) A VALUABLE PROTEIN SOURCES AS ALTERNATIVES TO SOYBEAN IN SWINE NUTRITION - A REVIEW

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Abstract

The possibility of dietary soybean meal replacement in swine nutrition with peas (Pisum sativum L.) and lucerne (Medicago sativa L.) could offer sustainable alternatives as part of a diet feeding strategy. Peas is an important source of amino acids and energy with high lysine content and a digestibility similar to soybean meal. Some studies included up to 36% peas in growing-finishing pigs' diets without negative effects on performance or carcass quality. Lucerne (Medicago sativa L.) has a high protein and digestible fiber content, used mostly for ruminant's feed, but also for monogastric's. The amount of dietary lucerne depends on the growth stage of the pig (grower-finisher category 10%-15%; breeding sow 15%). Lucerne demonstrated beneficial effects on sow reproductive performance, increased sow satiety, reduced sow constipation and piglets' diarrhea, intestinal microbiota production of saturated fatty acids. The two ingredients exert lots of advantages and beneficial effects on swine nutrition aiming to create an independence from soybean imports to ensure the local sustainability of the livestock system in the present context.

Key words*: peas, lucerne, swine, protein alternatives, sustainable, soybean meal*

EFFECT OF OREGANO ESSENTIAL OIL ON THE PERFORMANCE AND MICROBIOLOGICAL STATUS OF SUCKLING PIGLETS

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Abstract

Essential oils are gaining more and more importance in the animal nutrition, due to their antimicrobial and immunostimulant properties. This experiment aimed to assess the effect of oregano essential oil (OEO) on feed intake growth performance, health and microbiological status of suckling piglets. A total of 71 piglets, originated from 8 sows, were randomly allocated to two treatments - control (C - 35 piglets) and experimental (OEO - 36 piglets). Sows from C group received an antibiotic-free diet, and sows from the OEO group - control diet + 0,500 g/kg feed OEO. Piglets from the OEO group were treated orally by 1cm^3/day by an emulsion of OEO from day 3 till day 14 of age and by 1g/kg oregano powder added to creep feed from day 14 till day 35 of age. Application of OEO significantly increased sows' feed intake during the third and fifth weeks of lactation ($P<0.01$). In general, the use of oregano emulsion and powder had no effect on the growth performance and health status of suckling pigs. No significant difference was found in the results of bacteriological tests for the isolation of E. coli and Salmonella spp. of rectal swab samples between the OEO and C groups.

Key words*: ADG, E. coli, growth performance, oregano essential oil, piglets.*

EFFECT OF LOW PROTEIN LEVEL ON THE GROWTH PERFORMANCE AND BLOOD PARAMETERS OF WEANED PIGS

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Abstract

The effects of dietary protein content on health and productivity were studied in weaned Danube white breed pigs growing from 9 to 25 kg live weight. The compound feeds for the two groups had the same component composition and were calculated to match the needs of the animals, but differed in the amount of crude protein. Animals were offered two diets providing 190.2 and 160.2 g crude protein per kg and 9.3 g lysine per kg, respectively. Equalization of the lysine content in the compound feeds was done by synthetic lysine. Pigs were fed ad libitum equal rations. In conclusion: Reduced protein levels by 3% did not significantly affect the growth of weaned pigs when the compound feeds were equalized for lysine content. Pigs fed low protein levels had better utilization of crude protein ($p<0.001$) and poor utilization of crude fat ($p=0.045$). Reduced protein levels have a statistically significant positive effect on hematological and biochemical blood parameters associated with health status in weaned pigs.

Key words: *blood biochemical parameters, blood hematological parameters, feed utilization, protein level, weaned pigs.*

THE EFFECT OF ALFALFA MEAL USED IN BROILER CHICKEN DIETS ON PRODUCTION PERFORMANCES, EFFICIENCY FACTORS, ORGANS DEVELOPMENT AND INTESTINAL MICROFLORA

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Abstract

In this study alfalfa meal effects on production performances, efficiency factors, organ development and intestinal microflora were tested. For that, 60 Ross308 broiler chickens were divided into two groups of 30 broilers/group and fed a control or experimental diet in the grower and finisher phases. The birds were raised in an experimental room, with controlled microclimate conditions and fed a control or experimental diet containing 5% alfalfa meal. The production performances showed that the experimental group had no significant effect on production performances, but the efficiency factors were significantly improved. At the end of the trial, six broilers from each group were slaughtered, the organs were measured and samples of intestinal and caecal content were collected for microbiological analyses. The thigh muscle, liver and gizzard were significantly ($P<0.05$) higher in the experimental group compared with the control group. The effect of alfalfa meal was very efficient in increasing the beneficial bacteria in the intestinal and caecal segment such as Lactobacilli spp., and significantly decreased the total count of harmful bacteria like Staphylococcus spp., Escherichia coli, Clostridium spp., Enterococcus spp., and Coliforms.

Key words*: alfalfa meal, broiler chickens, feed additive, meat quality, performances.*

THE FEEDING EFFECTS OF URONIC ACID EXTRACTION FROM *Sargassum crassifolium* ON UNSATURATED FATTY ACIDS AND THE IMMUNITY OF LOHMAN CHICKEN EGGS

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Abstract

Antibiotics are currently not allowed to be used because they can make pathogenic bacteria resistant and leave residues in products. The purpose of this study was to determine whether Lohman chicken eggs' immunity was affected by drinking water containing uronic acid extracted from Sargassum crassifolium (S. crassifolium). Sixty laying hens were divided into two groups: 1) chickens fed commercial feed with antibiotics, and 2) chickens fed feed without antibiotics. The chickens were randomly assigned to one of five treatments that included brown seaweed in the drinking water, A1=0.0% (control); A2=2.5%; A3=5.0%; A4=7.5%; A5=10.0%. Five treatments, two factors, and three replications were used in the completely randomized study design. Six laying hen heads were included in each replication. Titer antibody and unsaturated fatty acid were different between treatments, but Salmonella sp. infection was the same. It came to the conclusion that the lohman chicken eggs' immunity and unsaturated fatty acid levels were both enhanced by the uronic acid extracted from S. crassifolium.

Key words*: fatty acid, immunity, Lohman chicken, Sargassum crassifolium, uronic acid.*

RED YEAST β-CAROTENE CONTENT: DEVELOPING EXTRACTION AND DETERMINATION FOR IMPROVING POULTRY NUTRITION

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Abstract

Vitamin A is an essential nutrient, for both production and reproduction of farm animals, however, most animals are unable to synthesize de novo precursors of vitamin A (β-carotene), and dietary supplementation is mandatory. The current paper aims to evaluate the analytical parameters and to improve the method efficiency for determining β-carotene content in red yeast and the internal laboratory validation protocol. Our method stands for the ultraviolet-visible spectrophotometric uses, having the Lambert-Beer law as the basis. To determine the β-carotene content, dimethyl-sulfoxide was employed as a solvent, calibration curve, and visible spectra were evaluated (300-900nm). The linearity of beta carotene measured at 465 nm using the UV-Vis method linearity range was 6.1-36.6 µg/ml, R^2 = 0.997, LOD = 5.39 µg/ml, LOQ = 16.32 µg/ml, SD less than 5% and RSD in between 1-15%. In conclusion, the β-carotene spectroscopic method determination is a cheap, and efficient method, suitable for β-carotene determination and retinol and retinoic acid estimation for nonconventional feed additives such as yeasts.

Key words*: β-carotene, retinol, spectrophotometry, UV-Vis method.*

FORMULATION OF HIGH-NUTRITION COMPOSITE FLOUR FROM GERMINATED SORGHUM AND CATERPILLAR (*Cirina butyrospermi*) FOR FIGHTING CHILD MALNUTRITION

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Abstract

The COVID-19 epidemic and the Russian-Ukrainian crisis have aggravated an already catastrophic food security and nutrition situation in the majority of low-income nations, with 12.9% of the population undernourished and over 45% of children under five dying. As a result, edible insects may be a good source of alternative protein as a dietary supplement. The goal of this study was to first assess the in vivo nutritional impact of composite flours made from sorghum and caterpillar and then choose the best flour for biochemical characterization, amino acid, fatty acid, and vitamin quantification. A statistical study demonstrated a significant difference in weight growth (7.57 ± 0.53 g/d and 10.82 ± 2.56 g/d), but no difference in the biological value (0.80-0.94) of the composite flours. F2 composite flour has a protein level of 22.31 ± 0.44% and the presence of important amino acids, a low fat content of 6.56 ±0.07%, and the presence of vitamins A, B1, B2, B9, B12, C, and E. The nutritional potentialities F2 composite flour imply that this flour might be used in newborn feeding to prevent infant malnutrition in the current COVID epidemic and Russian-Ukrainian crisis.

Key words*: child malnutrition, complementary foods, Edible insects, germinated sorghum, protein.*

MICROALGAL OIL AS AN ALTERNATIVE SOURCE OF DHA AND EPA ACIDS (OMEGA 3) IN ANIMAL DIETS: AN OVERVIEW

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Abstract

The role of omega-3 fatty acids (DHAandEPA acids) for animal and human health is very important, the main sources being represented by fish oil. In the near future, due to the fact that the global reserves of fish meal and fish oil obtained from marine species, with low value derived from the natural environment, will not be able to satisfy the market demand. From this reason, the orientation turned towards to finding an alternative sources for omega-3 fatty acids, with an important role in ensuring the animal/human welfare. Marine and freshwater microalgae caught attention because they are ability to produce lipids (between20-50% of dry weight). Also, studies have shown that some species of microalgae produce a large amount of omega-3 fatty acids. Lately, studies have begun to look at the effect of supplementing the fish diet with microalgae oil, that has a high concentration of omega-3 fatty acids, on growth and welfare status. So, this study represents an overview of the use of microalgae oil as a sustainable source in fish/animal diets, by replacing the fish oil.

Key words*: DHA acid, EPA acid, fish nutrition, fish welfare, microalgal oil, omega-3.*

RESEARCH ON THE EFFECT OF SOME NUTRITIONAL SUPPLEMENTS ON QUANTITATIVE AND QUALITATIVE PARAMETERS OF GOAT'S MILK

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Abstract

The purpose of this study was to evaluate the influence of the administration of nutritional supplements on the quantity and quality of goat's milk. For this purpose, homogeneous groups of goats from the Carpathian breed, in the middle of the lactation period (n = 10), were created, to whom were administered in food, experimentally: hemp seeds (group 2), hemp seeds and mineral supplement (group 3), flax seeds (group 4), flax seeds and mineral supplement (group 5). Milk production and milk protein and fat percentages were monitored for 20 days, and the results obtained were compared with those of the control group (group 1). The obtained results showed that in terms of milk production, there were significant increases ($p<0.05$) between the control group and the experimental groups (with 6.95% for group 3 and by 5.42% for group 5). Regarding the percentage of proteins, significant increases were observed in the case of groups 3 (6.06%) and group 5 (9.09%). Regarding the percentage of fat, it increased in the case of all experimental groups, the increases being 4.65% ($p<0.05$) for group 2, 11.62% ($p<0.01$) for group 3, 6.97% ($p<0.05$) for group 4, and 9.30% ($p<0.01$) for group 5.

***Key words**: flax, goat, hemp, milk, supplement.*

INFLUENCE OF FEEDING TYPE ON GROWTH AND BLOOD PARAMETERS OF BLACK BARBUS, *Puntius nigrofasciatus*

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Abstract

A twenty-five weeks study of Black Barbus, P. nigrofasciatus fry was conducted to determine the effectiveness of various combinations of feed and its effect on growth, survival, and physiological and hematological parameters composition of fish blood. To achieve this goal, Black Barbus, P. nigrofasciatus fry were kept in three identical 120-liter aquariums, and fed different diets. The first diet included industrial feed in the form of flakes. The second diet included live microorganisms and crustaceans. The third diet was a 1:1 combination of industrial feed and live organisms. The results of the study showed a higher growth rate in Black Barbus, P. nigrofasciatus, which consumed combined feed, than peers consumed dry feed by 0.60 cm or 10.53% ($p<0.05$) and than peers consumed live feed by 0.20 cm or 3.28% ($p<0.05$). The content of hemoglobin in the blood was the same in fish of three diets. The level of erythrocytes was higher by 0.12 million$\times\mu l^{-1}$ in the blood of fry, whose diet was combined.

Key words*: aquaculture, feed, fry, hemoglobin, hydro-chemical parameters.*

INNOVATIVE FEED PREPARED FOR IMPROVING PRODUCTIVE, REPRODUCTIVE PERFORMANCE, QUALITY ON DAIRY PRODUCTS AND REDUCING ENVIRONMENTAL POLLUTION IN COW FARMS

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Abstract

The current project is carried out by the University of Life Sciences "King Mihai I" from Timișoara, with partners Narcisa Bovine Breeders Association, C.S. Canamar SME, and C.S. Rogera Service SME. The main objective has been to establish an operational group (OG) comprised of a university, a cow breeding association, and two SMEs, specifically a milk processing enterprise and a feed production company, to jointly develop a product that stimulates innovation in dairy cattle farms by providing nutritional solutions to enhance productive performances, reproductive efficiency, and the final dairy product quality. Secondary objectives were focused on developing and employing an innovative feed preparation for dairy cows within the OG, training farmers, and publishing a brochure. The project will create benefits for the OG members, such as the adoption of protein raw material production technologies and techniques for fabrication and utilisation of feed preparations via training and workshop held within the project, improvement of milk yield and its quality, followed by reproductive parameters, and reducing environmental pollution by the inclusion of the preparation of the feed in diet of dairy cows.

Key words*: cow breeding, feed prepared, operational group.*

VITAMIN AND MINERAL NUTRITION OF DAIRY COWS AND ITS INFLUENCE ON RUMINAL METABOLISM AND MILK PRODUCTIVITY

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Abstract

The key to the intensive course of metabolic processes in the body of ruminants, and therefore to their high productivity, is the balance of rations according to the optimal level of vitamin and mineral nutrition, which is achieved through the use of balancing feed supplements. The basis of the planned research was to find out the influence of different levels of vitamin and mineral nutrition on the ruminal metabolism of cows and their milk productivity. Based on the results obtained in the course of the research, the prospective use of the improved vitamin-mineral supplement in the composition of compound feed K 60-32-89 (optimized for Phosphorus and Sulfur) was experimentally confirmed in the feeding of dairy cows during the summer grazing period. A balancing feed supplement is enriched with biologically active substances that are deficient for Pre-Carpathia in a complex with improved compound feed it provides the optimal level of vitamin and mineral nutrition of ruminants in accordance with the physiological need, which contributes to increasing the nutritional value of feed and has a positive effect on the studied indicators of ruminal metabolism. In particular, feeding dairy cows with optimized vitamin-mineral supplement contributes to an increase in the number of microorganisms (amylo-, cellulose- and proteolytic) in the forestomachs and their enzymatic activity. This causes intensive hydrolysis of feed carbohydrates and increases the level of volatile fatty acids by 14.1% while reducing ammonia nitrogen by 11.8%, which is evidence of the activation of metabolic processes involved in energy and synthetic reactions. By analogy with the increase in the intensity of metabolic processes in the rumen of ruminants as a result of a balanced diet by the limiting biologically active substances due to the use of vitamin-mineral supplement, the level of milk productivity increases by 10.8% and the chemical composition of milk improves (dry matter, fat, protein, milk sugar, calcium) compared to the P 60-5M premix.

Key words*: dairy cows, milk productivity, premix, rumen content, vitamin-mineral supplement.*

MINERAL OIL HYDROCARBONS (MOH) ANALYSIS IN ANIMAL FEED: A CHARACTERIZATION BASED ON MODERN POLLUTION

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Abstract

This research aims to confirm and quantify the presence of mineral oil hydrocarbons (MOHs) in feed, as well to investigate the contribution of modern pollution sources to the level of contamination. Through simultaneous processes of microwave assisted saponification (MAS), extraction and purification procedures, followed by the LC–GC–FID detection, 8 types of feeds from one of the most polluted areas of the country were analyzed. The results indicated contamination with MOH for most of the feed samples, mineral oil saturated hydrocarbons (MOSH) concentrations above the recommended limits (0.5 mg/kg) being recorded. The data indicated moderate to high contamination for MOSH, from 16.5 mg/kg to 77.3 mg/kg, while average values below the limit of quantification (< LOQ) were highlighted for mineral oil aromatic hydrocarbons (MOAH) content. Based on the results, was difficult to establish a clear relationship between feed contamination, crop location and different pollution sources. However, the information obtained by assessing the relationship between feed contamination and pollution, indicated that the pollution sources from the plotting area had an important contribution to the contamination of the analyzed feedstuffs.

Key words*: evolution, milk production, NW Region, Romania, trends.*

RESEARCH REGARDING OF THE INFLUENCE OF ORGANIC SELENIUM ON THE IMUNE RESPONSE IN SWINE

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Abstract

Currently, immunomodulation is an alternative in the fight against many diseases, being considered a possibility to fight against many infectious diseases that can affect pig herds. Selenium can be used for this purpose, the effect of its administration on the immune response being the main purpose of the present study. Following the administration of organic selenium, we found that in the case of WBC parameters, granulocytes and agranulocytes percentages and lymphoblastic transformation percentages of B lymphocytes, there are no major differences between the values recorded at the beginning of the experiment and the values recorded in the two experimental moments. Instead, following the administration of organic selenium, we observed significant increases in T lymphocytes percentages (by 9.94%, after 21 days, and respectively by 8.18%, after 30 days), percentages of lymphoblastic transformation of T lymphocytes (by 59.59% after 21 days, and respectively by 64.14% after 30 days), as well as the helper T lymphocytes / supressor T lymphocytes ratio (by 46.15% after 21 days, and respectively by 65.38% after 30 days). Regarding the percentage of B lymphocytes, a decrease of this parameter is observed by 38.34% after 21 days and by 21.84% after 30 days following the administration of the product based on organic selenium.

Key words*: immunomodulation, lymphocytes, pigs, selenium.*

EFFECTS OF PECKING STONE BASED FEED SUPPLEMENT ON ZOOTECHNICAL PERFORMANCE AND SOME BLOOD MINERALS IN COBB 500 BROILERS

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Abstract

The present study was conducted from October 2022 to February 2023 in order to reduce problems linked to mineral deficiency during broilers production, as well as to improve digestive capacity of nutrients. The chicks were divided from the first day into three (03) batches of 69 subjects and each batch was split into 3 sub-batches serving as repetition. A control batch (LT), not receive any mineral block, while, batch A (LA) and batch B were respectively supplemented with the pecking stones A and the pecking stone B. The results obtained showed that the feed efficiency of the Peck A (2.73), Peck B (2.70) and LT (2.97) significantly ($p<0.05$) decreased with the addition of the supplements. Body weight, average daily gain and carcass weight increased significantly ($p<0.05$) with the addition of pecking stones. Blood level of calcium significantly differed ($p<0.05$) between the batches. Economically, a significant decrease ($p<0.05$) in the cost of production of one kilogram of live weight of chicken was observed with the addition of the pecking stones. The stone-based pecking compliment improved the growth performance of the broilers.

Key words*: Broiler, COBB 500, pecking stone, growth performance, biochemical parameters*

SESSION REPRODUCTION, PHYSIOLOGY, ANATOMY

REPRODUCTIVE QUALITIES OF DAIRY COWS AT DIFFERENT AGE AND LEVELS OF MILK YIELD

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Abstract

The study results of the reproductive ability of cows depending of their age and milk productivity are presented. The studies were conducted in the Republic of Moldova on cows of the Holstein breed. The optimal parameters for the duration of the SP and CI were detected in cows with milk productivity less than 6000 kg of milk, at which the animals were characterized by the maximum indicators of calves yield and CCR. In cows with a milk yield of 9001 kg or more, a significant increase in the duration of SP (+109.8 days) and the CI (+90.3 days) was observed, the CCR decreased by 0.22, and the yield of calves/100cows per years by 21.7 heads. On average, each increase in milk yield by 1000 kg increases the duration of the SP by 27.6 days, the CI by 20.9 days. The share of the impact (η^2_x) of level of milk yield on the duration of SP was 18.0% ($p<0.001$), on the duration of the CI 15.6% ($p<0.001$), on the CCR 25.6% ($p<0.001$), the yield of calves 35.6 % ($p<0.001$). In order to increase the economic profit, we recommend livestock holdings to monitor the duration of SP.

Key words*: correlation; dispersion analysis*; *Holstein breed cows; level of milk productivity; reproductive capacity.*

EFFECT OF BREED, AGE AND FOOD ON REPRODUCTIVE EFFICIENCY OF FEMALE SHEEP OF THE TSIGAI – RUSTY VARIETY PUREBREED AND THEIR CROSS WITH THE SUFFOLK AND GERMAN BLACKFACE

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Abstract

Fertility, prolificacy and weaning rate were compared for Tsigai - rusty variety (TIRU) purebreed ewes and their Suffolk (50%) × German Blackface (37.5%) x Tsigai - rusty variety (12.5%) (S x BF x TIRU) contemporaries, mated at 8 and 18 months of age. The fecundity, prolificacy and weaning rate for animals mated at 8 months of age and fed in the shelter with hay and corn-barley based concentrate was 78.43%, 105.0% and 78.57% to females from TIRU and 80.0%, 100.0% and 54.17% for animals of the S x BF x TIRU genotype, respectively. For animals of the two breeds mated at 18 months of age and grazing on pastures, the fecundity, prolificacy and weaning rate was 64.71%, 100.0% and 87.88% to females from TIRU and 73.33%, 104.55% and 78.26% for animals of the S x BF x TIRU genotype, respectively. 88.24% females from TIRU and 90.0% from S x BF x TIRU genotype, mated at 8 months, have lambed once up to age of 23-24 months, and 56.86% females from TIRU and 56.66% from the animals from S x BF x TIRU genotype have lambed twice.

Key words*: early bred, efficiency, genotype, reproduction, Tsigai - rusty variety.*

MORPHOFUNCTIONAL FEATURES OF MECKEL'S DIVERTICULUM OF GEESE

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Abstract

The parameters and dynamics of the development of Meckel's diverticulum in large gray geese aged one day to 5 years were determined. The changes in the length, cross-sectional area and wall area of the Meckel's diverticulum indicate that its growth stops by 3 months of age. The age-related morphofunctional indicators of lymphoid tissue formation in the wall of Meckel's diverticulum were determined. Diffuse lymphoid tissue is predominant in the composition of lymphoid tissue. Full morphofunctional maturity of the lymphoid tissue with the development of four levels of its structural organization is observed at the age of 21 days in geese. The lymphoid tissue in the wall of Meckel's diverticulum reaches its maximum development by the age of 3 months, which must be taken into account when raising large gray geese and conducting experimental studies.

Key words*: geese, lymphocytes, lymphoid tissue, Meckel's diverticulum.*

INFLUENCE OF TEMPERAMENT ON MATERNAL BEHAVIOUR IN DAIRY GOATS

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Abstract

The behaviour of the mother goat plays a decisive role in the survival of the newborn kid. There are conflicting opinions regarding the influence of temperament on maternal behaviour in different animal species. In goats, as species that possess a behaviour of "hiding" their newborn, temperament should significantly influence the development of the relationship between the newborn kid and its mother. This is especially important in animals giving birth for the first time. Knowing the relationship between temperament and maternal response in goats would lead to better management of technological processes on the farm, which in turn would increase kid survival rates and reduce mortality rates. Various tests are used worldwide to determine the temperament of farm animals, some of which are applicable to goats. The aim of this review is to summarize the methods of determining temperament in dairy goats and how it affects the goat's behaviour towards the kid.

Key words: *goats, kids, maternal behaviour, temperament.*

STUDY OF THE IMPACT OF SOME FACTORS ON THE GESTATION LENGTH OF ANGLO-NUBIAN GOATS REARED IN FOOTHILLS

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Abstract

Data is presented from 140 records of pregnancies and births of goats of the Anglo-Nubian breed, bred in the farm of the Research Institute of Mountain Stockbreeding and Agriculture - Troyan, Bulgaria. The data was used to determine the influence of sex, type of delivery and parity on the gestation length (GL) in goats. The delivery season is not taken into account, as it is always in the winter. There was a significant difference in the GL of goats that gave birth to singles and twins ($p<0.001$). The GL for all kids born as singles was 151.1 ± 0.4 and twins 149.2 ± 0.3 days. No significant difference was observed between the GL of goat that gave birth to male (151.2 ± 0.7) and female (151 ± 0.6) singles. A difference of more than one day was found between the GL of goats that gave birth to male and female twins (148.2 ± 0.6 and 149.9 ± 1, respectively). The GL in goats that gave birth to twins of different sexes was 149.4 ± 0.4 days, and in goats from the first to the fifth parity (149.2 ± 0.6; 149.9 ± 0.5; 149.0 ± 0.6; 150.5 ± 0.6; 150.9 ± 0.7 days) respectively.

Key words: *gestation length, goats, parity, sex, type of birth.*

MORPHOLOGICAL CHANGES OF THE REPRODUCTIVE ORGANS IN DOMESTIC CHICKEN SUFFERED FROM INFECTIOUS BRONCHITIS, BASED ON AN EXCESS OF VITAMIN D3 IN THE DIET

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Abstract

In private mini-poultry farms, poultry that have recovered from infectious bronchitis are often not culled. Changes in the organs of the reproductive system of adult chickens and roosters that recovered after an outbreak of infectious bronchitis were studied. It was found that in most of the flock, egg productivity and condition quality of eggs were preserved in laying hens (69%), and in roosters - fertilization ability (after hatching the eggs, hens hatched condition chicks with 80% hatchability). In 31% of hens, egg productivity and/or egg quality was impaired: reduced laying; hens laid eggs with soft and/or deformed shells; there was no clear boundary between the dense and liquid layers of the egg white; the share of second-grade eggs has increased. During the post-slaughter examination of chicken carcasses, various pathologies of the reproductive organs were found: retention of the egg in the oviduct and damage to its walls (it is possible that this is due to calcareous growths on the eggshell); ovarian cysts; atresia of mature follicles.

Key words*: domestic chickens, egg production, infectious bronchitis, ovariitis, reproductive system, salpingitis.*

THE COMPOSITION OF HEAVY METALS AND THE CONTENT OF ESTERIFIED FATTY ACIDS IN BEE TISSUES DEPENDING ON THE ENVIRONMENTAL CONDITION

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Abstract

The work aimed to record the content of heavy metals, including toxic and esterified forms of fatty acids in tissues, and the honey productivity of bees in different natural zones of the Carpathian region. Experimental apiaries of clinically healthy honey bees of the Carpathian breed (Apis mellifera (L.) carpatica) were selected based on the private mountain (Slavsko village, Stryi district), foothills (Nizhnya Stynava village, Stryi district) and forest-steppe (village Myklashiv, Lviv district) zones of Lviv region. It was established that the total content of the studied heavy metals in the tissues of honey bees in the foothills and forest-steppe zones of the Carpathian region, compared to the mountain zone, is higher. The level of dangerous elements of the first class of toxicity - Lead and Cadmium - increases significantly in the tissues of honey bees of the foothills and forest-steppe zones, compared to the conditionally clean mountain environment. At the same time, the intensity of transformation of the esterified form of linoleic acid into its longer-chain and unsaturated derivatives of the omega-6 family is sharply reduced in the tissues of the breast of honeybees of the forest steppe and head of the foothills of the Carpathian region. In addition, the intensity of conversion of the esterified form of linolenic acid into its longer-chain and unsaturated fatty acids of the omega-3 family in the

tissues of the head of honeybees in the foothills and especially in the forest-steppe zones is sharply reduced. As a result of the accumulation of heavy metals in tissues, the energy, the structural, biological, and antimicrobial value of esterified forms of fatty acids for the body of honey bees that are kept in hives located in the foothills and especially forest-steppe zones of the Carpathian region decreases, compared to the tissues of bees that are kept in apiaries, situated in the mountainous area. The honey productivity of worker bees per beehive per season is lower in the foothills and forest-steppe zones of the Carpathian region compared to the mountainous ones.

***Key words**: natural zones of the Carpathian region, heavy metals, fatty acids, tissues, and honey productivity of bees, bioindicator.*

BREWER YEAST MANNOPROTEINS AS AN EFFICIENT SUPPLEMENT FOR PRESERVATION OF RAM SPERM BY REFRIGERATION

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Abstract

The purpose of the work was to evaluate the influence of a mannoprotein extract (MP) from brewer yeast on the motility, speed, as well as the morphological and microbiological indices of the ram semen preserved by refrigeration at +4°C. The experimental extender (EE) supplemented with MP at the concentrations of 0.6-0.9% v/v significantly increased (P≤0.05) the total motility (TM) and the progressive motility (PM) of ram spermatozoa during 96 hours of storage and did not negatively influence the VAP, VSL and VCL indices. At the end of the 96-120-hour period of storage MP in the concentrations of 0.8-1.0% v/v contributed to reduction of the abnormal sperm (AS) number as compared to the control extender (CE). EE with MP in the concentrations of 0.2-1.0% v/v significantly reduced (P≤0.05) the contamination of the semen samples with various microorganisms. The obtained results demonstrated perspectivity of the yeast extracts for effective semen dilution and preservation for further artificial insemination (AI) of animals.

Key words*: brewer yeast, extender, mannoproteins, microbiological indices, motility indices, preservation, ram semen.*

EFFECT OF DIETARY SUPPLEMENTATION OF *Nile tilapia* WITH SEA BUCKTHORN AND VITAMIN E ON THE HEMATOLOGICAL AND SERUM BIOCHEMICAL INDICES

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Abstract

The aim of this research was to investigate the effect of dietary supplementation with sea buckthorn and vitamin E on the hematological profile, some blood biochemical parameters and leukocyte reaction of Nile tilapia. The experimental variants were: V1-control, V2-1% sea buckthorn/kg feed, V3-500 mg vitamin E/kg feed and V4-1% sea buckthorn + 500 mg vitamin E/kg feed. The results revealed that dietary supplementation with this phytobiotic and vitamin contributed to the emergence of significant changes compared to the control variant at the level of the number of erythrocytes, erythrocyte constants (MCV, MCH, MCHC), glucose concentration and total protein. In variant V4 it was observed an increase of erythrocyte constants (MCV and MCH) and a reduction of the number of erythrocytes. Regarding to the leukocyte reaction, in V2, V3 and V4 variants was observed an improvement of the fish physiological status compared to the fish from control variant. In conclusion, the dietary supplementation with sea buckthorn and vitamin E (V4) presented a synergistic effect on the welfare status of Nile tilapia reared in a recirculating aquaculture system.

Key words*: hematological profile, Hippophae rhamnoides, leukocyte reaction, Nile tilapia, vitamin E.*

OPTIMATION OF NONI FRUIT EXTRACT USING ZINC OXIDE AND COPPER SULPHATE CATALYST AS AN ADDITIONAL FEED AND ITS EFFECT ON INTESTOLOGICAL HISTOLOGY OF SENTUL CHICKEN

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Abstract

The study was carried out experimentally, the first identified noni fruit extract on yield, and bacterial inhibition and the second was the application of noni fruit extract supplemented with Cu and Zn on intestinal histology. The first stage used a nested complete randomized design (CRD) and the second stage used RAL and was further tested with Duncan Multiple Range Test (DMRT). The livestock used were 100 DOC (Day Old Chicken) unsexing Sentul chickens, reared for 12 weeks. Data were analyzed using SAS JMP Pro version 14 software. The results showed that methanol solvent with a maceration time of 48 hours was the best treatment for producing yield, and inhibition of E. coli and S. aureus bacteria. The best treatment was the administration of 250 mg/kg of noni fruit extract supplemented with Cu and Zn. The conclusion is that the addition of noni fruit extract with Cu and Zn supplementation in the ration up to a level of 250 mg/kg can increase the height, width, and depth of the crypts and it is recommended to use it as a feed additive to replace Antibiotic Growth Promoter.

Key words*: antibacterial, intestinal villi, Noni fruit extract, Sentul chicken, yield.*

THE ACTION OF THE FOOD AND THERMAL FACTOR ON THE SALINE METABOLISM IN CALVES IN THE POSTNATAL PERIOD

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Abstract

The paper presents the results of the separate testing of the mineral premix PMVAS and conjugated with the thermal factor of a moderate stress intensity on some indices of saline metabolism in calves in the postnatal ontogenesis in order to determine the parameters that can condition the homeostasis, resistance and adaptive capacities of animals to the action of the environment. At the separate and conjugate application of the studied factors in dynamics (7, 30, 60, 90 days) on the organism of the calves were obtained original data regarding the functional state of the organism. An increase in calcium, phosphorus, potassium, sodium, magnesium and their ratio was found, which denotes a moderate intensification of macroelements metabolism in dynamics. The changing character of the level of these elements in the blood plasma of experimental animals reflects not only the amount of macroelements that come into the body through the food ration, but also the peculiarities of their metabolism. We can mention that depending on the application of the factors studied separately or conjugately, different results of the saline metabolism indices are obtained.

Key words*: mineral premix, temperature, calves, macroelements.*

THE ACTION OF THE MINERAL SUPPLEMENT PMVAS AND THE THERMAL FACTOR ON SOME TRACE ELEMENTS IN CALVES IN THE POSTNATAL PERIOD

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Abstract

This paper reflects the research carried out regarding the status in copper, zinc and iron depending to the intake of the mineral supplement `PMVAS` and establishing the correlation between the action of the food factor and the action of the low temperature of a moderate stress intensity on the organism of the calves in the early postnatal period. Thus, the study presents the results of the separate action of the mineral premix PMVAS and its conjugate with the thermal factor on some indices of saline metabolism in calves in postnatal ontogenesis carried out in order to correct the deficiency of trace elements and determine the parameters that can beneficially condition the homeostasis, resistance and adaptive capacities of animals to the action of the environment. At the separate and combined application of the factors studied in dynamics (7, 30, 60, 90 days) on the organism of the calves were obtained representative data regarding the functional state of the organism demonstrating a moderate intensification of the metabolism of trace elements.

Key words*: mineral supplement, temperature, calves, trace elements, stress.*

THE INFLUENCE OF POLYPHENOL EXTRACT FROM DANDELION ON THE PHYSIOLOGICAL STATE OF THE ORGANISM OF BREEDING ROOSTERS

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Abstract

This paper includes the study of specialized scientific bibliographic sources and the research of the influence of polyphenols on the improvement of the state of oxidative stress on the organism of breeding rooster. It is established that dandelion polyphenols have a beneficial influence and have the ability to stop and block reactive forms of oxygen through fermentative and non-fermentative antioxidant systems. All these changes are observed in the obtained results. It is established that there is an increase of superoxide dismutase (SOD) in the experimental group compared to the corresponding control group 159.6 ± 0.69 and 110,93±0,30 u/c, as well as catalase indicates significant changes in the experimental group versus the corresponding control group 35.0 ± 0.53 and 26.23 ± 0.37 μM/L, which provides reliable protection of the organism against the toxic effects of high concentrations of superoxide anion radical and hydrogen peroxide.

Key words*: breeding roosters, polyphenols, antioxidants, oxidative stress, food ration.*

THE INFLUENCE OF POLYPHENOLS OF GREEN WALNUT EXTRACT ON ZINC HOMEOSTASIS AND ITS ROLE IN THE ORGANISM OF BREEDING ROOSTERS

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Abstract

In this paper were analyzed the scientific bibliographic sources regarding the physiological and biochemical role of zinc on the tissues and organs of the organism of breeding roosters. In addition, in laboratory conditions, our researchers studied hematological, biochemical indices as well as glycine, glutamate and cysteine content in blood serum, seminal plasma and reproductive cells of breeding roosters. It is established that this element has a beneficial action on the organism of breeding roosters, maintaining and stabilizing the indices listed above at the level of physiological norms, compared to the roosters from the control group, and at the same time participating in the antioxidant protection of cells and maintaining cell homeostasis by balancing transmembrane metabolism.

Key words*: zinc, blood serum, cell membranes, metabolism, cells.*

SPECIFICITY OF AMINO ACIDS OF PLASMA MEMBRANES OF ROOSTER GAMETES AT CRYOPRESERVATION

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Abstract

One of the most cryolable structures of cells is the biological membrane. The purpose of the research was to establish the amino acid composition of the plasma membranes of rooster spermatozoa at cryopreservation. Obtaining plasma membranes included the stages of division, separation and purification, and amino acids were determined at the aminoanalyzer. The results of the research of amino acids of membranes in native sperm and after its freezing-thawing established specific cryogenic peculiarities, which are manifested by changes in the content of all amino acid groups. The bound amino acids of membranes in the largest quantities are represented by hydrophobic ones. The essential changes in the content of hydrophobic amino acids manifested by their increase are predetermined by the modification of hydrophobic interactions. The inclusion of arginine in the composition of the synthetic mediums for the cryopreservation of rooster sperm, which possess adaptogenic properties, maintains the protein:lipid ratio unchanged in the plasma membranes of the spermatozoa after thawing. This process can be explained by the stability of the complexes between the structural elements of proteins, membranes and cryoprotective medium.

Key words*: spermatozoa, plasmatic membranes, amino acids, cryopreservation.*

THE EFFECT OF HEMP OIL ON THE PHYSIOLOGICAL INDICES OF RABBIT SPERM IN SYNTHETIC MEDIUM WITH GLUCOSE CONTENT

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Abstract

The permanent improvement of the dilution and the preservation mediums of the seminal material opens new horizons for the preservation of the genetic material. Since hemp oil is an antioxidant that contributes to the regulation of the glucose metabolism process, the medium with glucose and different concentrations of hemp oil from 10 to 100 mg were studied, by determining the optimal concentration of the components by the overlapping rows method. As a result of the research, we found that the most increased the mobility of rabbit spermatozoa at concentrations of hemp oil from 40 to 100 mg. One of the causes of this effect could be that hemp oil is particularly rich in polyunsaturated essential fatty acids from the omega family with antioxidant properties. Following the research, we observed the synergistic effect of some antioxidants administered together than their separate administration in high doses.

Key words*: synthetic medium, hemp oil, seminal material, antioxidant.*

THE INFLUENCE OF DANDELION POLYPHENOL EXTRACT ON THE LEVEL OF TOTAL PROTEIN IN THE BLOOD SERUM OF BREEDING ROOSTERS

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Abstract

The total protein content of blood serum reflects the state of protein metabolism. Serum proteins perform many functions in the organism, and the level of protein is one of the most important indicators of animal health. Total serum protein is an indicator that reflects the state of homeostasis. In this research, the influence of dandelion polyphenols on the protein level in the blood serum of breeding roosters was studied. The animals were administered 1 ml of hydroalcoholic extract for 30 days with a total polyphenol content of 0,027 mg/ml gallic acid equivalent. As a result of the research, changes were observed in the total protein content, thus in the control group this parameter constituted a value of 47 ± 0.49 g/L, and in the experimental group it was 57.6 ± 0.57. Therefore, the total protein content is a parameter to establish a number of disorders, especially those associated with severe metabolic disorders.

Key words*: total protein, dandelion polyphenol extract, blood serum, breeding roosters.*

PHYSICAL-CHEMICAL PARAMETERS OF CARPATHIAN GOAT COLOSTRUM AND MILK

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Abstract

Metabolism, a manifestation specific to life, represents the set of physical and chemical processes through which living matter achieves continuous renewal to function and organize the specific activity. The physical-chemical composition of goat milk is conditioned by breed, individuality, area, and age. This study analyzes the physical-chemical composition of milk from a population of Carpathian goat breed, in the first seven postpartum days (first, third, and seventh day) according to age (primiparous and multiparous) to observe the physical-chemical changes from colostrum to milk. The physical-chemical parameters analyzed were: Fat (g/100 g); Protein (g/100 g); Casein (g/100 g); Lactose (g/100 g); Solid non-fat - SNF (g/100g); Total dry matter (g/100 g); pH; Freezing point (FP); Urea mg/dl; Somatic cells count - SCC/ml x 1000; Total bacteria count - TBC/ml x1000. Results highlight the intense changes that occur at the physico-chemical level of goat's milk to cover the nutritional requirements of the newborn goat and indicate the health status of the mammary gland.

Key words*: casein; colostrum; fat; metabolism; protein.*

IMMUNOGLOBULINE-G LEVEL AND BODY WEIGHT OF BALB/C RECEIVING COMBINATION TREATMENT OF LYOPHILIZED *Curcuma longa* AND *Curcuma xanthorrhiza* DURING AN ANGIOGENESIS EXPERIMENTAL

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Abstract

*Immunoglobuline synthesis is largely determined by the presence of the type of antigen that enters the body. However, various biological bioactive substances have the potential to boost individual immunity processes. In this study, 5 weeks old BALB/c was used. This study aims to evaluate the role of the combination of Curcuma xanthorrhiza and Curcuma longa lyophilisate on serum immunoglobuline-G level, angiogenesis process and BALB/c body weight. The bio-active substances were distrubuted through drink water. This study used a randomized complete design arranged with factorial 2*4. The results showed that treatment had no significant effect on IgG levels and the process of angiogenesis (P>0.05), but had a significant effect on body weight (P<0.05). We concluded that combination of Curcuma xanthorrhiza and Curcuma longa lyophilisate could be used in wound healing during an angiogenesis process.*

Key words*: Curcuma, immunity, liopylisate, BALB/c.*

SESSION TECHNOLOGIES OF ANIMAL HUSBANDRY

LIFE CYCLE ASSESSMENT FOR EVALUATING MIXED FARMING SYSTEMS: A REVIEW AND RECOMMENDATIONS

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Abstract

The objective of this work was twofold: i) to characterise the main applications of the life cycle assessment (LCA) for assessing and representing mixed farming systems (MFS), and then ii) to propose a general methodological framework for conducting a comparative LCA of a case study of an MFS versus a specialised system in Romania. For this purpose, the main applications of LCA to MFS have been analysed in all its phases. Overall, the reviewed LCA studies highlighted the potential of MFS to improve environmental sustainability, but scarcity of real data hindered the assessment process. In addition, some studies focused on a single product rather than taking into account all products (crops and livestock) when comparing MFS with specialised ones. This may exclude interactions between farm components in the MFS and therefore may not reflect the overall impact of these systems. Therefore, an LCA based on a farm-level approach is recommended to provide a fairer comparison of MFS versus specialised systems.

Key words*: Mixed farming, environmental sustainability, interactions, farm-level approach.*

INVESTIGATIONS CONCERNING THE EXCRETION OF ANTIBIOTIC RESIDUES IN THE MILK OF COWS TREATED WITH ANTIBIOTICS

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Abstract

The somatic cell count in the mixed milk of the 4 quarters has dropped from 1.155 million to 200 thousand within 120 hours of the last treatment. In cow 5390 somatic cell count tends to decrease after 48 hours of treatment and this can be interpreted as a success of treatment. However, 72 hours after treatment, the somatic cell count increases again, in the affected quarter causing an increase in the somatic cell count in the mixed milk of the 4 breast quarters from 565 thousand to 812 thousand somatic cells. The amount of residue excreted via milk as a percentage of the total amount applied was from 5.2% to 45.3%. In the group of cows milked 1.5 times a day, the percentage of residue excreted via milk was 17.75% compared to 27.51% in the group of cows with two milkings per day. The average milk yield of the group of cows milked twice a day was 23.55 ± 4.8 kg standard deviation and in the group of cows milked 1.5 times a day was 26.4 ± 2.59 kg.

Key words*: antibiotic, milked, somatic cells, udder.*

COMPOSITION AND PROCESS FOR ADDITIONAL FEEDING AND DEWORMING OF HARES

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Abstract

The study of the composition and process for additional feeding and deworming of hares is an important, fundamental and, especially, applicative issue, because some species serve as definitive hosts in the development cycle and as parasitic vectors, being dangerous for both domestic animals and humans. Parasitosis are the most common diseases in wildlife of the hunting fauna, which results with substantial economic losses. The invention relates to the protection of hunting fauna, namely to a composition and a process for additional feeding and deworming of hares. The composition, according to the invention, comprises, in %: oats 30.0-50.0, wheat 4.0-7.0, barley 2.0-4.0, corn 2.0-4.0, sunflower groats 2.0-4.0, soybean groats 2.0-4.0, bentonite 20.0-30.0, molasses 1.0-2.0, dextrin 2.0-3.0, premix containing vitamins, oligoelements, minerals, coccidiostatic and antioxidant 1.0-2.0, and a preparation containing 20% albendazole 1.0-2.0. The process, according to the invention, provides for the administration to hares of said composition, in a dose of 75 g/hare, in winter, twice with an interval of 14 days, in the form of briquettes, placed at a height of 25-40 cm from the soil.

Key words*: hare, composition, additional feeding, deworming.*

NATURAL REMEDIES USED IN FIGHTING ECTOPARASITES IN GALLINACEOUS BIRDS

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Abstract

The scientific paper elucidates the importance of using remedies of natural origin, compared to those of chemical origin, in combating ectoparasites in gallinaceous birds. For the first time, the antiectoparasitic efficacy of the natural extract Ectogalimol, obtained from the plant raw material, dry aerial parts of the Dalmatian chamomile (Pyretrum cinerariifolium Trev.) which in a concentration of 3%, administered by spraying in two rounds at an interval of 14 days, in a dose of 50 ml per bird, possesses a high therapeutic effectiveness against the various species of ectoparasites (bird lice, fleas and gamasid mites). For comparative purposes, the drug Ivermec-OR is used, which also possesses a high antiparasitic efficacy against various species of bird lice, fleas and gamasid mites in gallinaceous birds, compared to the natural extract Ectogalimol, which does not require restrictions on the consumption of products and by-products from treated birds.

Key words*: antiparasitic drug, ectoparasites, gallinaceous birds, natural remedy.*

POTENTIALITIES FOR USING CERTAIN MODERN TECHNOLOGIES FOR THE TRACKING AND MONITORING OF FREE-ROAMING HORSES

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Abstract

With reference to the implementation of the areas - `Traditional practices for seasonal grazing of animals` and `Conservation of endangered local breeds`, the interest in free grazing of various farm animals in Bulgaria has been significant in recent years. Horses are particularly suitable for this type of breeding. Pastures are often located in remote areas with limited access, which makes it difficult to visit and inspect the herds and facilities in the pastures on a daily basis. In order to find modern technological solutions to solve these problems and reduce costs and efforts of farmers, we tested several modern devices that are traditionally used in other areas, and their application in animal husbandry in Bulgaria is an innovative approach. These are GPS (Global Positioning System) for tracking animals, photo traps, as well as drones. As a result, we found that they have a successful application in monitoring horses which are raised free grazing, save costs and time, do not cause stress and side effects. These devices can be used to control access to pastures and limit theft, harassment and other encroachments on herds.

Key words*: behavior, conservation, GPS, wild horses, sensors.*

ANALYSIS OF SOME BEHAVIORAL REACTIONS OF KARAKACHAN HORSES

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Abstract

The observation was made on a herd of Karakachan horses, bred freely in the area of the village of Prisadets, Southern Bulgaria. The study covers a period of one year, with 24-hour field surveys conducted every month. The analysis shows that horses drink water relatively rarely. Although not statistically proven, the highest percentage of horses drink water at moderate ambient temperatures - about 22°C, while at high temperatures around 36°C, when standing in the shade, the percentage of horses drinking water drops to 46.15%. Karakachan horses spend most of their time grazing. Most horses graze at noon (91.28%), and the least at night (40.90%). The factor time of the day had a significant effect on the following traits of behavior: grazing (P <0.001), sleeping / resting lying down (P <0.001), sleeping / resting standing (P <0.01), standing on alert (P <0.01) and standing in the shade (P <0.01). Ambient temperature affects resting behavior: lying down (P <0.01) and standing (P <0.01), chasing insects with a tail and head (P <0.001), and standing on alert (P < 0.001).

Key words*: autochthonous breed, behavior, Karakachan horse.*

COMPARATIVE STUDY ON THE DYNAMICS OF COWS, MILK PRODUCTION AND DAIRY PRODUCTS

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Abstract

The aim of this study is to achieve a comparative analysis of the cow livestock number, production of milk and of main dairy products in Romania and European Union. The work is an extensive bibliographic documentation with the application of statistical tests for the period 2017-2021. At European Union level the herd of dairy cows is in decreasing with 5.63% and in Romania with 7.95%, from 1175.4 thousand heads in 2017 to 1081.9 thousand heads in 2021. The largest amount of raw milk available on the farm in 2021 belongs to Germany which records 32531.56 thousand tons, approx. 21% of the total quantity at EU level. In 2021 compared with 2017, the Europeans consumed with 3.91% less fresh dairy products and with approx. 5% more cheese. In the future, will be exploit more productive animals, making cow rearing a part of solutions in food crisis.

Key words*: dairy, EU, herd, milk, Romania.*

RESEARCH ON THE LACTOGENIC POTENTIAL IN THE RESULTING F_1 SHEEP FROM THE CROSSING OF LOCAL SHEEP FROM NORTH-EASTERN AREA OF ROMANIA WITH AWASSI RAMS

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Abstract

The aim of the present work was to analyze the lactogenic potential in the second lactation of the F1 crossbreeds resulting from crossing the local sheep from the north-eastern area of the country with Awassi breed rams. To determine the total milk production, the control of milk production includes the suckling period of the lambs and the milking period of the ewes. The AT4 method was used in the milking period following the technical specifications recommended by the ICAR. During the suckling period, the amount of milk in crossbreds F1 sheep was 49.72 kg, and the production of milked milk was 95.13 kg. Average daily milk production on the 4 controls for F1 crossbred ewes was 774.37 ± 9.76 g with limits between 542 and 1006 g milk. The total production of milk obtained in 180 days at the second lactation of crossbreds F1 sheep was 144.85 kg, being 3% lower compared to that obtained by purebred Awassi sheep. The results regarding milk production at the second lactation of the F1 crossbred ewes are very good, so we recommend to breeders the use of crossing local sheep from the north-eastern area of the country with the Awassi breed for a significant improvement in milk production.

Key words*: Awassi breed, crossing, latogenic potential, local sheep, milk production.*

STUDY REGARDING THE BEEF MEAT PRODUCTION EVOLUTION WORLDWIDE AND NATIONAL LEVEL

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Abstract

The global beef industry has been growing steadily in recent years due to the fact that the largest beef exporters and importers in beef producing countries continue to invest financially in the global market. Beef, one of the most important products in the world livestock market, is often recognized as a premium source of protein in the human diet, therefore it is widely consumed in most countries around the world. In 2020, at the national level, the number of cattle slaughtered in industrial units (slaughterhouses) decreased by 15.6% compared to the previous year. Also, the beef production decreased from 196,000 tons in 2017 to 173,000 tons in 2020, even though the slaughter yield has increased.There are about 1 billion beef cattle worldwide, and compared to poultry and pigs, beef cattle have the lowest feed-to-meat conversion efficiency. Strategies to improve beef cattle performance emphasize operational and reproductive management, host genetics, functional efficiency of the rumen and respiratory microbiome, and forage structure and composition. There have also to consider the herd health and immunity and the need for beef cattle to thrive in a changing environment.

Key words*: cattle, consumption, meat, production, nutritive value.*

CHARACTERISTICS OF GROWTH AND WEAR OF HOOVES OF COWS RAISED ON PASTURE AND INDOOR CONDITIONS IN THE CENTRAL BALKAN MOUNTAINS

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Abstract

The paper deals with the study on individuals of two groups of cows, of red-white, wide-faced Montbeliarde and Simmental cattle breeds approved in Bulgaria according the qualities of their hoof horn and the impact of exogenous and endogenous factors on this process. Visual, metric and anatomically-topographical methods were used. Five measurements were made of the following indicators: length, width, total width, height and hoof angle of the thoracic and pelvic limbs of the studied animals during the indoor and pasture periods. Support point in cm² and the ratio of 1 kg live weight to unit support point in cm² were calculated. Pasture-raised cows, in both breeds, showed a higher coefficient (ratio) of a unit of support point compared to live weight, respectively a coefficient of 1,7576 for Montbeliarde breed or by 8.2% more and a coefficient of 1,3946 for Simmental breed or by 9.1% more. Mobility of cows affected critically to their ongoing health, productivity and longevity. Uniform growth of the hoof horn was determined by the equal distribution of cows' body weight over the distal limbs. Hoof growth was subject to seasonal fluctuations.

Key words: *breed, hoof horn, growth, pasture, length, width.*

LIMOUSIN BREED - CREATION, APPROVAL, SPECIFICATIONS AND CHALLENGES - REVIEW

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Abstract

Limousin is a cattle breed created and selected in France, more than 150 years ago in the region of the cities of Limoges, Albussac, La Courtine in the regions of Limousin and Marche that are part of the central massif of southwestern France, through artificial and natural selection, by the way of selection of the local Blonde d'Aquitaine, distinguished by a rough constitution and used for work. Local natural and climatic conditions affected on its creation. The aim of the present study was to analyze the creation, consolidation, exterior and constitution and related selection, available gene pool and the trend of distribution of Limousin breed worldwide, in Europe, and particularly Bulgaria. This is a breed with excellent meat production qualities. The cattle of this breed are unpretentious in feeding and care, having good utilization of pastures, and have normal fertility. They are resistant to diseases, and show intensive growth. They are used for the production of lean, high-quality beef and for industrial cross-breeding. The study is based on analysis of scientific developments and concepts dedicated to beef cattle breeding. General scientific research methods, information-logical analysis of scientific and scientific-practical information were used as methodological basis for its implementation.

Key words: *breeds, consolidation, constitution, exterior, trends.*

BODY CONFORMATION ANALYSIS THROUGH BIOMETRIC TRAITS OF AUBRAC CATTLE BREED

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Abstract

The purpouse of this paper was to highlight the results of biometric measurements were performed on cattle of the Aubrac breed, exploited in Romania. Were measured a total number of 84 bovine, both adult females and bulls (12-18 months), in three farms in the region of Moldova. The highest recorded average for biometric parameters was: height at the withers (133.23 cm at females, 130.24 cm at bulls); rump height (140.78 cm at females and 130.46 cm at bulls); chest girth (202.15 cm at females and 204.22 cm at bulls); slantwise body length (159.64 cm at females, respectively 161.22 cm at bulls). Body conformation indices were calculated based on the obtained values. Cattle exploited within farm 2, show the most pronounced massiveness. Weight values between 553.21 and 603.13 were recorded in adult females and between 551.89 and 618.82 in bulls. As a general conclusion, we can state that the animals taken in the study, exploited in the three farms, present overall reports that denote a well-proportioned body development, within the specific morpho-productive type.

Key words*: beef cattle, biometric parameters, performances.*

RESEARCH ON THE ECONOMIC ADVANTAGES OF BREEDING AUBRAC BEEF CATTLE: A REVIEW

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Abstract

Increased interest in breeding beef cows is a result of societal trends, particularly the consumption of high-quality raw protein of animal origin. The sustainability of the beef industry requires high on-farm efficiency and productivity, as well as efficient value chains that reward achievement of target market specifications. This work reviews the most important aspects of the characterization of the Aubrac beef cattle breed, namely: productive qualities (dynamics of body weight of young animals 0-18 months, average daily gain, economic efficiency of growing breeding calves for a period of 18 months of growing, results of bulls control slaughtering), morphological parameters of the carcass (muscle tissue, fat tissue, total meat, connective tissue, bones, flashing index) and chemical composition of the meat and energy value. In the near future, this breed will be one of the most appealing options for obtaining high-quality meat without incurring prohibitively high prices, with the cattle making excellent use of our country`s meadows while also easily adapting to relief and climate.

Key words*: beef cattle, economic efficiency, morpho-productive qualities.*

DISTRIBUTION AND PRODUCTIVE CHARACTERISTICS OF NORMANDE CATTLE BREED WORLDWIDE, IN EUROPE AND BULGARIA - REVIEW

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Abstract

The Normande breed originated from cattle brought to Normandy by Viking conquerors in the 9th and 10th centuries. For more than a thousand years, these cattle have become a dual-purpose breed to meet the milk and meat needs of the people of northwestern France. Normande cows have been exported around the world. The average height of bulls is about 152 cm and cows about 140 cm. The average body weight of male animals is about 1100 kg, and females about 700 kg. Normande cattle are an enduring French breed selected for the production of high-fat, high-protein milk, sought after for high-quality production of butter, cream and cheese and for their attractive meat properties. The Normande carry the Kappa Casein gene.The Normande breed is the only dairy breed sold as `first class` meat. The carcass weight for young bulls is 355 kg with a meat yield of 55%, for castrates - 391 kg with a 55% yield, and for slaughtered cows the carcass weight is 340 kg with a meat yield of 53%.

Key words: *fats, meat, milk, protein, Normande breed.*

EFFICIENCY OF GROWING OF CHICKEN BROILERS UNDER CONDITIONS OF COMPLIANCE WITH EU RULES OF WELFARE

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Abstract

The research focused on the effect of the application of the EU welfare rules on the technical-economic results achieved in a chicken broiler breeding farm. In this sense, three rearing halls identical in the usable area and technical equipment were studied, which were populated with day-old chicks Ross-308 following the densities imposed by the annual European funding program, as follows: batch Lm = 19 chickens/m^2 (mandatory minimum requirements); batch Lexp-1 = 17 chickens/m^2 (density reduced by 10% compared to the minimum requirements); batch Lexp-2 = 16 chickens/m^2 (density reduced by 15% compared to the minimum requirements). The level of production indicators was directly influenced by the density ensured, an aspect highlighted by the values calculated for the European Production Efficiency Factor and, respectively, for the European Broiler Index, which was much higher in the lot with only 16 chickens/m^2 (Lexp-2). The conclusion of the study was that the economic efficiency of chicken meat production farms affiliated with the annual European funding program strictly depends on the allocations received, as there are no price differences compared to farms that do not comply with welfare norms.

Key words*: broiler hen, welfare, performance, profitability.*

THE ROLE OF CIRCULARITY IN MIXED FARM SYSTEMS

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Abstract

The concept of circularity is present in the whole living world, at all levels of organization of living matter, and its simplest representation, at the macro level, can be perceived within a biocenosis through the trophic relations within it. The essential points that open and at the same time close the circle are: photosynthesis and mineralization. Complex regulation mechanisms intervene between the two to ensure ecosystem balance. The linear model found predominantly in the production of food for humans (in agriculture), unlike the circular one, needs additional energy and material inputs, and the outputs will be large, in the form of harvest and secondary products such as plant/animal leftovers, manure, soil erosion, greenhouse gas emissions and different pollutants, etc. Not including these secondary productions in the circuit, will have a negative impact on the environment, biodiversity and efficient use of resources. The purpose of this paper is to study the issue of greenhouse gas emissions in a mixed farm, and the results have shown that the different strategies for maintaining or increasing circularity have positive effects on the environment.

Key words*: circulariry, greenhose gas emission, mixed farm system.*

INFLUENCE OF THE TEMPERATURE-HUMIDITY INDEX ON SOME PHYSIOLOGICAL PARAMETERS IN DAIRY GOATS

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Abstract

The aim of this paper is to study the microclimate in a dairy goat farm during the warmest (July and August) and coldest months of the year (January and February) and evaluate its impact on animal welfare and health. Temperature, relative humidity and illuminance were monitored. The severity of temperature stress was determined by calculating the temperature-humidity index (THI). The average value of THI for the month of August exceeded that for the month of July by 1.5 and it also remained above the threshold accepted for extremely high heat stress (28.6). During the cold days of the year (January and February), when the goats were mainly in the barn, THI did not exceed 17, varying between 5 and 16.8. The average relative humidity and illuminance remained within their permissible values. As a physiological adaptive response during the hot months, animals responded with an increase in rectal and skin temperature, pulse rate and respiratory movements while rumen contractions decreased.

Key words*: goats, temperature stress, temperature-humidity index, physiological parameters.*

RESEARCH ON THE INFLUENCE OF TEMPERATURE AND HUMIDITY ON THE EX SITU DEVELOPMENT OF QUEEN LARVAE

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Abstract

At it is known, the development of larvae from worker bees or queen bees is identical during the first two days of the larval stage. Morphological differences appear starting from the third day of larval development. The food administered to the larvae ex-situ, at regular intervals, forms a dry film upon contact with the larva, under conditions of temperature and humidity similar to those in the hive. The food drying phenomenon is due to the temperature-humidity variation, in the hive these parameters are regulated and monitored by the nurse bees. In the study, different combinations of temperature and humidity values in the controlled environment were tested, so as to increase the number of queens obtained, by increasing food intake. As a conclusion, at a temperature between 35-36ºC and a relative humidity between 75% and 85%, it is possible to obtain 20-25% queens that reach maturity from total number of two days old age larvae from the start of study.

Key words*: bees, controlled environment, ingestion, larvae, metamorphosis.*

RESEARCH ON THE ASSESSMENT OF THE PORK CARCASSES QUALITY

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Abstract

A review of the literature on pork carcass quality was conducted. The quality of animals for meat is established after cutting, based on the ratio between four essential elements: the conformation of the carcass, the weight of the carcass and the portions in the carcass, the yield, the characteristics of the muscle and adipose tissue that form the meat and define the quality of the meat. The quality of the animals for meat after cutting, namely the assessment of the quality of the carcasses, can be established by assessing the following elements: conformation, state of fattening, smoothness, color and consistency of the muscles. These elements of the quality of a case depend on the invariable and variable factors. The invariable factors (species, breed, sex, age) determine the `classes` for the carcass. Variable factors (maintenance conditions, nutrition, functional gymnastics, section, etc.) participate in the determination, for each class, of carcass qualities. Thus, an animal for meat will be appreciated and considered quality to the extent that it satisfies the consumer`s requirements from this point of view.

Key words*: pork, carcasses, quality, meat.*

RESEARCH ON THE SITUATION OF ROUGH/RAW CATTLE HIDES AT WORLDWIDE AND NATIONAL LEVEL

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Abstract

Raw hide is an animal skin that has not been exposed to tanning. Cattle hides are very strong, have dense skin, have valuable technological properties. Raw cattle hides differ between breeds, between sexes and between ages, hence the importance of knowing the differences between them World wide, the amount of cattle hides reached 9,225,980.09 tons in 2020, and in 2021, the amount produced exceeded that of 2020, reaching 9,371,954.48 tons. The largest contributions to the amount of raw hides produced worldwide are brought by the American continent with 3,554,399.82 tons, the Asian continent with 3,368,416.94 tons, the European continent with 1,151,492.63 tons, the African with 994 669.41 tons, the reference year being 2021. The largest contributions to the world quantity of raw hides are brought by countries such as: China, USA, India, Brazil, Argentina, Australia, Russia, Turkey, France, Germany. At the national level, the amount of raw cattle hides produced in 2020 was 17,855.1 tons, and in 2021, the amount produced will decrease, reaching 16,881.63 tons.

Key words*: cattle, skin, rough, raw.*

THE STAGE OF RESEARCH ON WELFARE REQUIREMENTS IN LIVESTOCK FARMS

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Abstract

In order for animals to express their genetic potential and their production not to be affected, their welfare is a must. This study analyzed the origins of the concept of welfare and what animal welfare means, which implies the 5 freedoms that must be respected. Then, it was briefly analyzed what the consumer`s consent paying a higher price for products obtained from farms that applied friendly animal technologies means. After that, it was analyzed the most important aspects that the farmer faces and can affect the animals welfare. At the end, the interaction of man-animal was brought into account, which has an enormous importance for animals welfare.

Key words*: animals welfare, farm welfare, requirements.*

STUDY ON THE TRENDS OF MILK PRODUCTION AND DAIRY PRODUCTS AT EUROPEAN AND NATIONAL LEVEL

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Abstract

Production of milk is one of the most problematic sectors of agriculture, both in the EU and in Romania. This paper aims to analyse the evolution of milk production and dairy products at the national and EU level, between 2017 and 2022. The data of the National Institute of Statistics, Eurostat and other public sources were statistically processed for establishing trends at the level of main European milk producers and processors and several countries neighbouring Romania. At the national level, the average quantities of milk collected by the processing units increased slightly from 2017 to 2021, but in 2020 and 2021, the amount of milk has a downward trend. In the first part of 2022, the milk production remained at a low level, only during September-November were higher values recorded than in the same periods of 2020 and 2021. Romania's milk production falls for the second year in a row in 2022, under pressure from rising costs (especially fuel and energy) of the drought that has affected the feed quantity and quality and imposition of prices by large processors.

Key words*: dairy products, European Union, milk production, Romania, trend.*

RESEARCH ON DIFFERENT TYPES OF PROTEIN IN COW'S AND SHEEP'S MILK ACCORDING TO DIFFERENT INFLUENCING FACTORS

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Abstract

This paper focuses on the dynamic of milk protein in cows and sheep and explores the factors that influence milk protein content. Milk protein plays a crucial role in determining the quantity and quality of milk products, and therefore, various studies have been carried out to investigate the factors that influence milk protein content. To achieve this, we plan to monitor several farms raising different breeds of cows and sheep over a period of time to determine the changes of protein content. The breeds of cows that will be monitored include Holstein, Brown, and Romanian Spotted breeds. While the breeds of sheep that will be monitored have not yet been determined. Previous research has shown that optimizing the nutrition and management of cows and sheep can increase milk protein content. However, further research is necessary to better understand the complex dynamic of milk protein in both species and to develop best practices for improving milk production and quality.

Key words*: cow, milk production, protein, Romania, sheep.*

STUDY REGARDING THE IMPROVEMENT OF MILK PRODUCTION ACCORDING TO THE SIRES VALUES

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Abstract

The research proposed to evaluate the influence of the seminal material on milk production. Also was studied seminal material from different countries in order to determinate if the origin influence as well, genotype - environment correlation. The study was carried out on Holstein cows from Romania and data provided by Holstein Ro association. For sires values were consulted international website, recognized worldwide, like dairybulls.com, where the data are published by CDCB (Council on Dairy Cattle Breeding) or INTERBULL. The cows that took part at the research were all at their first lactation, from farms located throughout Romania. After establishing the groups of contemporaries, the real production achieved on standard lactation was compared with the surplus amount of milk due to the sire's values, in order to see if the expected result was achieved. For avoiding error conclusions were compared cows from the same farm, same sire, in that working hypothesis the feeding influence is removed.

Key words*: dairy cows, Holstein, milk production, Romania.*

THE EFFECT OF THE SEASON ON THE PHYSICAL-CHEMICAL AND MICROBIOLOGICAL PARAMETERS OF MILK OBTAINED FROM BUFFALOES FROM THE FĂGĂRAŞ AREA

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Abstract

Currently, approximately 20,000 buffaloes are raised in Romania, of which 11% are found in the Făgăraș area. The present study was conducted to observe the effect of season on the components of raw milk obtained from buffaloes cows reared in this region. 320 milk samples were collected during the morning milking, during the grazing and stalling seasons, from 80 buffaloes cows in different stages of lactation. The fat, protein, lactose, non-fat dry matter (NFS), density and pH content were determined from the collected samples. Microbiological determinations mainly considered somatic cell count (NSC) and total germ count (NTG). The individual analysis of milk samples from buffaloes revealed significant differences in terms of the variation of these parameters, the researches carried out highlighted differences determined by the breeding system of the animals involved in the study, the feeding regime, as well as the reference season. Therefore, the results of the present research indicated that the season and stage of lactation influence the physicochemical and microbiological parameters of milk and could be minimized by better management practices.

Key words*: buffaloes, microbiological, milk, physico-chemical, season.*

STIMULATIVE FEEDING INFLUENCE OVER MILK PRODUCTION AT KARAKUL OF BOTOSANI BREED

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Abstract

The main objective of the research carried out, was to determine the impact due to additional feeding on the specific performance of milk production in Botoșani Karakul sheep breed. In order to achieve the main objective of the research, two groups of adult females between three and six years of age were formed. Both lots were maintained under similar conditions, applying a traditional technology based on feeding them from the stock during the cold season and on pasture during the warm season. The experimental treatment was represented by the fact that L2 benefited from additional feeding applied 25 days before the mating date. This batch received a 170 g amount each morning consisting of a mixture of cultivated cereals (ground corn, sunflower meal, barley and oat grains). Live weight and body condition evaluation at mating time indicates a 2.41 kg higher live weight at L2 but also an improvement in body condition by 0.31 points. For live weight, a significant difference between groups was obtained for P≤0.05. Regarding the milk production obtained from the females in relation to the BCS assigned to L1 the biggest difference was between BCS = 3.0 and BCS = 1.5 and in L2 between BCS = 2.5 and BCS = 1.5, both situations being significant for P < 0.01.

Key words*: flushing, milk production, body condition, ewes milk, Botoșani Karakul Sheep Breed.*

INFLUENCE OF PARATYPICAL FACTORS ON MILK PRODUCTION IN UKRAINE

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Abstract

The article presents data on the influence of paratypical factors on the milk productivity of dairy cows in different regions of Ukraine on farms with different methods of keeping animals - tethered and loose ones. In order to more accurately determine the impact, a multi-criteria analysis was conducted by 10 indicators. When comparing untethered and tethered methods of keeping dairy cows, the advantage of the loose method was revealed; its objective function according to the considered criteria was the smallest one of 0.1391. This indicator appeared to be 1.1553-5.3394 times worse for the tethered method. Also, to establish the correlation between paratypical factors - daily yield of standardized milk, diet overall nutrition value, crude protein content, undegradable protein content, daily ambient temperature and air humidity, mathematical models were developed and analyzed: linear, incomplete quadratic and full quadratic ones.

Key words*: mathematical model, method of animal keeping, milking cows, multi-criteria analysis, paratypical factors.*

POLYCOMPONENT MATHEMATICAL MODELS OF SELECTION INDEXES AND THE EFFICIENCY OF THEIR USE FOR ASSESSMENT OF SOWS BY REPRODUCTIVE QUALITIES

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Abstract

The purpose of the work is to investigate the reproductive qualities of Large White sows, to determine the criteria for the selection of highly productive animals according to policomponent mathematical models of selection indexes, as well as to calculate the economic efficiency of the obtained results. It was established that in terms of fertility, milking and nest weight during the weaning at the age of 60 days, the Large White sows from the controlled populations belong to the I class and the elite class. The selection index of reproductive qualities of sow (SIRQS) from the controlled population is equal to 90.23±1.090 points, the index of reproductive qualities of sow (IRQS) ranges from 200.43 to 244.67 points. Taking into account the intrabreed differentiation of animals according to the index of reproductive qualities of sow (IRQS) and the selection index of reproductive qualities of sow (SIRQS), it was established that the sows from the I experimental group exceeded significantly their peers from the III experimental group in terms of multifetation by 28.08% on average, suckling pigs by 36.35 %, nest weight during the weaning at the age of 32 days by 25.44%, nest weight during the weaning at the age of 60 days by 27.26%. Pairwise correlation coefficients between policomponent mathematical models of selection indexes and reproductive qualities of Large White sows range from –0.186±0.0934 (tr = 1.99, P>0.05) to +0.986±0.0027 (tr = 366 .68, P<0.001). The maximum increase in

additional production was obtained from sows from the I group of intrabreed differentiation according to the index of reproductive qualities of sow (IRQS) (+14.54%) and the selection index of reproductive qualities of sow (SIRQS) (+13.85%). The criteria for selecting highly productive animals in the controlled population according to the index of reproductive qualities of sows (IRQS) and the selection index of reproductive qualities of sow (SIRQS) are the following: 223.79-244.67 and 97.85-120.51 points, respectively.

Key words: *breed, correlation, economic efficiency, policomponent mathematical models of breeding indexes, reproductive qualities, sow, variability.*

THE USE OF AGRIVOLTAIC SYSTEMS, AN ALTERNATIVE FOR ROMANIAN FARMERS

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Abstract

The climate changes of recent years require more and more the finding of alternative solutions for the provision of electricity at the farm level. More farmers from countries such as Germany, France, Italy or USA use agri/agrovoltaic systems. Such a system used in livestock farms and placed directly on the grassland, allows, in addition to obtaining the necessary electricity for the operation of essential consumers (e.g. watering system, electric fence or electric tractor), providing shaded spaces for species such as sheep, cows or rabbit. Research carried out over the years has demonstrated the effectiveness of such systems, especially in the case of shade-tolerant fodder crops (clover, alfalfa). At the EU level, legislative solutions are being wanted that can be easily implemented in the member states and that can support farmers. This study reviews and analyzes the existing legislative solutions for Romanian farmers and opportunity to use agrivoltaic systems on the lands intended for grazing and the cultivation of fodder plants.

Key words*: agrivoltaic farming, climate change, Farm 5.0, solar grazing.*

STUDY ON THE WELFARE OF DAIRY COWS ON FARMS IN SOUTHERN ROMANIA

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Abstract

The study aimed to present the importance of welfare regarding the animals, more specifically dairy cows. Five farms from the south of Romania where taken in the study. In order to examinate the level of the welfare for these farms was used the system ANI 35 (Animal Need Index), system that has 5 groups in its component. The analysis period was represented by the livestock year 2021-2022. The main results prove the fact that in Romania, in the south area, the cows from the farms studied benefit of optimal and good welfare condition. However, there are groups of characters that can be improved, in particular type and characteristics of the floor and outdoor areas. The paper highlighted the strengths but also the weaknesses regarding the welfare in the dairy farms. Based on the results obtained, correlated with the results from the rest of the country the national autorities can develop welfare legislation and the farmers can see where to action in order to ensure for animals better conditions.

Key words*: welfare, dairy cows, ANI 35, Romania.*

RESEARCH ON EFFECT OF MILKINGS FREQUENCY ON COWS' MILK PRODUCTION

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Abstract

In the present socio-economic context and environmental sustainability trend it is a high accent on milk production related with increased milk yield per cow. This study aims to explore the influence of milking technology for Holstein dairy cows on "milk" productivity and quality, at the farm level. Over three consecutive years, the dynamics of milk quantity and its quality parameters (% fat, % protein, somatic cells count, % dry matter) were followed. The values of these parameters changed as a result of the increase of milkings frequency per day, from two in the first year of study, to three milkings per day in the following years. The results were statistically analyzed, from the point of view of significance, using the Fisher and Student tests. The comparative analysis of the 3 years of production shows that milk production had a positive evolution, both in terms of quantity and quality.

Key words*: dairy cow, Holstein, milking technology, qualitative milk parameters.*

OPTIMIZATION OF INDOOR MICROCLIMATE PARAMETERS IS AN IMPORTANT FACTOR IN STIMULATING METABOLISM IN THE BODY AND INCREASING PIG PRODUCTIVITY

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Abstract

Numerous scientific studies conducted in recent years have proven that, along with genetic and feeding factors, the provision and control of optimal microclimate parameters is closely related to the physiological state of animals, the course of the main metabolic processes in the body of pigs of different ages and productive groups. It is known that the potential productivity of animals under unsatisfactory housing conditions is realized only by 70-80%. Among these indicators, an important role in the process of growing pigs belongs to the microclimate of the premises - temperature, humidity, speed of air movement, its gas composition, concentration of harmful gases, microorganisms and dust in it. When pigs deviate from the optimal parameters, thermoregulation and metabolism are disturbed, the digestibility and assimilation of feed nutrients deteriorates, and as a result, productivity decreases, which ultimately negatively affects the quality of pork and the efficiency of production. Taking into account the constant intensification of pork production processes and climatic changes on the territory of Ukraine, the study of the influence of indoor microclimate parameters on metabolic processes and productive qualities of pigs of different age groups is relevant and of both scientific and practical interest.

Key words*: indoor microclimate, metabolism, pig productivity, stress.*

RESEARCH ON THE EFFECT OF RECONSTITUTED MILK IN THE LEARNING OF INFANT LAMBS

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Abstract

The paper aims at the artificial weaning that is currently used in sheep and goat farms. In Romania, the main mating season is autumn, and calving takes place in spring. The price of milk and dairy products is high during this period because the milk produced by sheep and goats is consumed especially by lambs / kids, to be capitalized on the stain only after their weaning. In sheep and goats with very good milk yields, one milking per day can be practiced provided that enough milk remains for sucking lambs. In other cases, the lambs are weaned early and will be raised with milk substitutes and the milked milk is fully exploited on the market. Breeders who want to capitalize on all or part of the milk production produced by the mother sheep as early as possible after farrowing try to find those technological variations of feeding lambs/kids that do not affect their growth. This line also includes the research carried out regarding the effect of using milk substitutes (reconstituted milk) in the feed of lambs / kids by breastfeeding and by incorporating them into the mixture of concentrates.

Key words*: lambs, milk powder, nutrition, Romania, weaning.*

RESEARCH ON THE USE OF BIOFERTILIZERS IN MULBERRY CULTURE AND SILKWORM REARING

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Abstract

One of the objectives of the sericultural research is the reducing of research field was the reducing of chemical fertilizers quantity by applying some ecological agricultural practices, among which it can be mentioned, next to using extra-radicular fertilizing, also the biofertilizers of vesicular-arbuscular mycorrhize (VAM) type, in the form of commercial products obtained by biotechnologies of high biological performance. The biofertilization of VAM type aims to reduce or eliminate the chemical fertilization, the mulberry being a plant with a high consumption of mineral elements. Also, this type of mycorrhize stimulates the plants growing and development, having a role in soil remediation and nutrition improvement from soil-plant system.

Key words*: mulberry, mycorrhize, silkworm.*

THE IMPLEMENTATION OF MANURE DEGRADATED BY BLACK FLY LARVAE (*Hermetia illucens* L.) ON NATIVE LAYER PHASE CHIKENS EGG QUALITY

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Abstract

This study aims to determine the extent to which the utilization of manure flour resulting from the degradation of black fly (Hermetiaillucens L.) larvae on egg weight, egg yolk weight and egg mass of native chickens has been carried out in Pinili Village, Tatelu District, North Minahasa Regency, for 8 months starting March to December 2023. R0 = 0% MHD flour, R1 = 5% MHD flour, R2 = 10% MHD flour and R3 = 15% MHD flour. The results showed that the treatment had no significant effect (P>0.05) on the variable, so it could be concluded that the use of degraded manure flour (MHD) of black fly larvae (HermetiaIllucens L.) with a level of up to 15% in egg-laying stage native chickens was added on feed formulations.

Key words*: eggs, larvae, manure.*

AI BASED DEVELOPMENT OF A LOW COMPUTATIONAL INTENSITY ALGORITHM FOR CATTLE HEART RATE (HR) ESTIMATION

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Abstract

The main goal is to estimate the HR value from the activity sensor 3D acceleration measurements of the cattle rumen bolus. During the development of the algorithm it was intended to execute the primary calculations on the device`s microcontroller and the additional calculations could be performed on the server. The proposed HR estimation algorithm is based on simple data cleaning and peak detection, but the validation and postprocessing of the detection uses AI methods, namely MLP artificial neural network with different cell numbers. The accuracy of the period estimation (IBI) was ± 50 ms, which means an 8% error. This allows basic alerts to be implemented.

Key words*: HR estimation, cattle rumen bolus, 3D accelerometer data, artifical intelligence methods.*

PHYSIOLOGICAL TOLERANCE TEST OF COMBINATION TREATMENT OF ANTIGEN-G AND CURCUMIN EXTRACT ON VEGF LEVELS, MORTALITY RATE OF BALB/c

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Abstract

The paper aimed to present the Physiological Tolerance Test of Combination Treatment of Antigen-G and Curcumin Extract on VEGF Levels, Mortality Rate of BALB/c. This research consists of several stages. The TMd-G antigen (ITMd) was isolated from the thoracic segments of Musca domestica larvae 4th instar stage and the thoracic segments of the adult cycle stage, 5 days old. The larvae were obtained from the rearing process using defined media. Curcumine extract (EK) was obtained from Curcuma xanthorrhiza rhizomes through the process of broyage, mixing, precipitation, lyophilization and collection of dry EK. The VEGF serum molecules were significant higher (P<0,05) in Ek20Ag3 to Ek20Ag9 then in other combination treatment. The zero-mortality rate obtained in using AgLMd.

Key words*: antigen, curcuma exctract, insect, VEGF.*

SESSION TECHNOLOGIES OF THE AGRO FOOD PRODUCTS PROCESSING

OVERVIEW ON THE WAYS TO LOSSES REDUCTION AND EFFICIENCY OF FISH PROCESSING

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Abstract

A detailed bibliographic study finds that fish is a very important human food, valued by its balanced content of protein, lipids, and biologically active components. From the up-to-date statistics, it finds out that fish represents an important percentage of human food and protein sources. However, fish, like many other animal food sources, represents a future problem. In the food industry, fish can be sold as such, preserved, or processed in different ways. During fish processing technology, fish by-products are also generated and this represents a problem for the food industry and for the environment also. Transformation of these by-products into different products or their use in other industrial applications can solve the problems and may become a sustainable solution for the industry. This bibliographic study represents the starting point of the food innovation process, by analyzing the actual use of the by-products as medicinal products, artificial pearls, fish skin, isinglass, glue, body oil, manure and guano, silage, soluble, flour, fins, biscuits, macaroni, sausage, ham, liver oil and others and finding new paths of developments in order to achieve the goal.

Key words*: by-products, fish value chain, sustainability, waste management.*

QUALITY CHARACTERISTICS OF YOGURT FROM BUFFALO MILK SUPPLEMENTED WITH ARONIA (*Aronia melanocarpa*) JUICE

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Abstract

Yogurt was prepared from buffalo milk supplemented with 3% and 5% Aronia (Aronia melanocarpa) juice. The mineral and fatty acid composition, free amino acid composition, vit. B1, B2, B6 and antioxidant activity were investigated. Buffalo yogurt produced with 3% aronia coagulated in a shorter time (135 min) compared to natural (control) yogurt and the one produced with 5% aronia (158 min). Buffalo yogurt produced with 5% aronia juice has the highest content of potassium (1004 mg/kg) and zinc (5.28 mg/kg) and the lowest of calcium, magnesium and manganese compared to the control yogurt and yogurt with 3% aronia addition. Aronia supplementation increased the amount of unsaturated fatty acids in buffalo yogurt by 5.7% (3% aronia) and 7.3% (5% aronia), respectively. Polyunsaturated fatty acids increased by 15.7% in 3% aronia yogurt and 22.6% in 5% aronia yogurt respectively, compared to natural buffalo yogurt. Yogurt produced with 5% aronia juice has the highest antioxidant activity and also has a higher content of vitamins B1, B2 and B6 compared to the control yogurt and yogurt with 3% aronia.

Key words*: antioxidant activity, aronia, buffalo milk, fatty acid composition, yogurt.*

TECHNOLOGICAL INDICATORS OF GOAT'S MILK AS A RAW MATERIAL FOR CHEESE PRODUCTION - SURVEY

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Abstract

Cheese is a product with a high nutritional value, compared to milk, because of its low water content, presence of lactic acid and cooking salt. The yield, composition and organoleptic qualities of cheese are influenced by production technology and milk composition, which varies depending on the breed, the season, the lactation stage, the type and proportion of fodder in the goat ration, and other factors. The quality of raw milk, along with the cheese preparation technology, have an impact on some physicochemical parameters and the proteolytic processes during cheese ripening. The casein fraction of the milk protein is a dominant factor affecting curd density, the syneresis rate, the moisture content and ultimately the cheese quality and yield. The technological characteristics of goat's milk coagulum differ from those of cow's milk, as the differences are mostly related to the genetic polymorphism of α_{s1}-casein. The purpose of this survey is to analyze the technological indicators of goat's milk and some factors related to the quality of the finished cheese product.

Key words: *cheese, goat's milk, technological indicators.*

THE DEVELOPMENT OF *Crocus sativus* L. IN THE AREA OF THE CITY OF SOFIA

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Abstract

Saffron (Crocus sativus L.) is a geophytic plant which is one of the most commonly known medicinal and aromatic plant species in the world. The stigma of saffron is used for dye, food, or beverages additive and in the pharmacology industries. The saffron crocus has been cultivated in our country quite recently, but the areas with this crop are rapidly increasing. Saffron (Crocus sativus L.) is the most expensive spice in the world. This plant species is propagated vegetatively through the formation of daughter corms from the mother one. The field experiment was conducted to determine the most suitable bulb size for saffron cultivation. In the present article, we summarize scientific observations on the influence of air factors on the development of saffron and the size of the bulbs, their mass and also the number of daughter bulbs. One of the most important organs for plant development.

Key words*: corms, Crocus sativus, reproduction, Saffron, vegetatively.*

IMPACT OF CLIMATE FACTORS ON THE HONEY-BEARING QUALITY OF SAFFRON CROCUS (*Crocus sativus*)

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Abstract

The saffron crocus (Crocus sativus) is a flowering plant of the Iridaceae family A spice called saffron is obtained from the dried red stigmas of the flower and is used in the pharmaceutical, cosmetic, perfumery and textile industries. It has been grown in our country for a short time, but the areas with this culture are rapidly increasing. To date, no scientific research has been conducted on this type of plant in our country. In the present article, we summarize scientific observations on the influence of climatic factors, temperature, and air humidity on the honey qualities of the saffron crocus. We determined the amount of nectar and its sugar content, the amount of individual pollen from one flower, and the size and shape of the pollen grains in the pollen. We tracked the flowering period and the number of flowers against the age of the planted bulbs.

***Key words**: climatic factors, Crocus sativus, flowers, honey qualities, nectar, pollen.*

CONTENT AND SOURCES OF CONTAMINATION OF DONKEY MILK BY HEAVY METALS - MINI-REVIEW

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Abstract

Agricultural practice, the methods used in increasing and feeding of animals, may be a main factor in the appearance of harmful elements in the products obtained from them. Due to the high consumption of milk worldwide, the question has arisen of determining the compounds that can be harmful to consumers, such as the presence of heavy metals. Heavy metals are toxic to the human body, consumed even in small proportions, and their sources in milk, its products or by-products, can be both natural and anthropogenic, as the main sources being water used in irrigation, agricultural practices, air pollution and contaminated feed used in the ration of animals. The most common heavy metals determined in fresh donkey milk are iron, copper, magnesium, lead, zinc, cadmium, arsenic and chromium, their determination being possible both by means of standard methods and by means of the mass spectrometry method. The determination of these toxic compounds which may be present in milk is of importance, in particular as regards babies and children, on which they may have a carcinogenic effect.

Key words*: heavy metals, donkey, zinc, lead, milk, factor.*

METHODS OF MICROSCOPIC SLIDES PREPARATION TO IDENTIFY THE POLLEN GRAINS DERIVED FROM DIFFERENT BEE PRODUCTS

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Abstract

Palynological research has applicability in several scientific fields, the most important being taxonomy, plant evolution, medicine and the analysis of honey - melissopalynology. The palynology provides data regarding the botanical and geographical origin of bee products like bee pollen, bee bread, royal jelly and propolis, which is useful in establishing their provenance and correct labelling. This paper details the characteristics and investigation of several methods for obtaining microscope slides from different bee products. The microscopic examination represents an essential part of the palynological analysis. Several methods for the preparation of microscopic slides were selected and assessed regarding preparation time, costs, dangerous substances used and results. The methods were employed successfully for different bee products, but the non-acetolysis method published by Louveaux et al. (1978) offers several advantages in terms of ease of use, safety and efficiency. The results of our comparative analysis emphasize that some methods are recommended for the creation of reference libraries, while others are well suited for being used in routine analysis of bee products.

Key words*: bee products labelling, microscopic analysis, palynology, slide preparation.*

MODULATING SOY PROTEINS FUNCTIONALITY BY MEANS OF PROTEASES

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Abstract

Soybean proteins are widely recognized as valuable food ingredients. The aim of the study was to enhance the physiological and functional properties of the soybean proteins through limited hydrolysis. Three different proteases (bromelain, Neutrase and trypsin) have been used to get different hydrolysis degrees between 2% and 10%. The resulting soluble peptide mixtures were characterised in terms of functional properties and antioxidant activity. The soybean proteins hydrolysis resulted in significant improvement of the foaming properties (the overrun was by 25-50% higher compared to the native proteins). All peptide mixtures exhibited better emulsifying properties compared to the starting soybean proteins. The rheological measurements indicated that all emulsions prepared with 0.5 oil fraction exhibited predominant viscous like behaviour. The methods based on scavenging the DPPH and ABTS radicals were employed to assess the antioxidant activity, and both indicated that the peptide mixture obtained with Neutrase was the most active, being followed by samples prepared with bromelain and trypsin. It can be concluded that bromelain, Neutrase and trypsin are suitable for generating peptide mixtures with enhanced functionality compared to the soybean proteins.

Key words*: soy proteins, enzyme assisted hydrolysis, antioxidant activity, functional properties, rheological behaviour.*

BIODEGRADABLE ACTIVE PACKAGING APPLICATION ON FRESH MINCED BEEF

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Abstract

Meat quality and safety is of great importance, and it frequently depends on the packaging technology. Recently, active packaging gained more and more attention in food industry, due to its ability to carry antimicrobial and antioxidant ingredients, which could lead to enhanced properties of the packed food. The aim of this study was to determine the quality parameters of fresh minced beef during storage in the presence of an active packaging material based on PLA, PHBV and nano emulsion of nisin and dill essential oil. Physical-chemical and microbiological analysis were performed for fresh minced beef quality determination. Furthermore, a challenge test was performed using Escherichia coli ATCC 8739 as test microorganism to determine the developed materials antimicrobial efficacy. The results showed that the application of active packaging decreased the microbial load during storage at 4°C.

Key words*: active packaging, food safety, minced beef, nisin, essential oil.*

THE EFFECTIVENESS OF HEAT TREATMENT PROCESSES APPLIED TO SOUR CREAM FOR THE PRODUCTION OF BUTTER, VALIDATED BY ENZYMATIC METHODS

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Abstract

The purpose of this article was to evaluate the efficacy of heat treatment procedures used on sour cream, a raw material used to make butter. To investigate the safety of sour cream, 25 samples of unpasteurized sour cream, 25 samples of pasteurised sour cream, and 25 samples of butter were evaluated. The samples were then subjected to enzymatic and biochemical analysis. The titratable acidity of unpasteurized sour cream resulted was 19.84±0.10°T. All 25 samples tested positive for peroxidase activity. The titratable acidity of pasteurised sour cream was 20.24°T, although the peroxidase activity was negative. Using the reductase test with methylene blue, the samples of unpasteurized sour cream ranged in the second quality class, with a discoloration interval of samples substrate till 289.60±3.49 minutes. The titratable acidity of the butter was 2.59±0.04°T, and the peroxidase activity was negative in all 25 samples. The sour cream heat treatment techniques have been validated, with the examination of the two dairy products yielding good findings in compliance with standards.

Key words*: butter, dairy products, enzymatic methods, heat treatment, sour cream.*

ELECTROACTIVATION EMERGING METHOD OF PROCESSING OF WHEY WITH HIGH PROTEIN CONTENT

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Abstract

Electroactivation is an emerging method of non-residual processing of secondary dairy products, namely, whey with high protein content, which presents one of the directions that describe the treatment of whey with different initial protein content and the extraction of serum proteins into protein mineral concentrates. The treatment of whey with high protein content was carried out in different electrolyzers with different ratios of the processed whey volume to the electrode/cathode surface and different geometric shapes, different distances between the electrodes and the membrane, which influences the specific energy consumption per unit volume. The main objective of the work was the maximum extraction of whey proteins in protein mineral concentrates and the simultaneous isomerization of lactose into lactulose at low energy consumption and the exclusion of "dead"/inefficient areas for the electroactivation of whey in different diaphragm electrolyzers. The mechanisms of whey protein extraction depending on pH and redox potential values upon electrochemical activation of whey with high protein content are presented.

Key words*: whey, protein mineral concentrates, electroactivation, pH, redox potential.*

EVALUATION OF CONSUMER KNOWLEDGE, ATTITUDES AND PERCEPTIONS REGARDING ANTIOXIDANTS AND THEIR CONSUMPTION THROUGH MEAT PRODUCTS

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Abstract

As of recent times, consumers are starting to be more and more aware of the impact that nutrition has over their health. The present study is based around the use of antioxidants and their consumption through meat products. In this sense, the study focused on using a survey to evaluate the consumers' understanding of what antioxidants are and their potential health benefits, their perceptions of the taste and quality of meat products that contain antioxidants, as well as their willingness to purchase such products. The survey showed that most consumers are aware of the potential harmful effect of long-time consumption of artificial antioxidants. The surveyed people also stated that they consume meat and meat products almost on a daily basis, however most stated that they would not repurchase a meat product if the natural antioxidant used would cause changes in the product's colour and taste. As shown in the study, research methods such as surveys can provide valuable insights into consumers` attitudes and purchasing habits.

Key words*: antioxidants, meat, survey.*

THE EFFECT OF VARIOUS TYPES OF FLOUR AS FILLER MATERIALS ON PHYSICAL, CHEMICAL AND ORGANOLEPTIC CHARACTERISTICS OF SALAMI CULLED LAYING HENS

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Abstract

The aim of this study was to determine the effect of various types of flour on the physico-chemical and organoleptic characteristics of salami as a filler. The study was conducted using a completely randomized design with 5 treatments P1 (corn flour), P2 (sorghum flour), P3 (sago flour), P4 (wheat flour) and P5 (tapioca flour) each treatment was repeated 4 times. Variables measured included physical properties (Water Holding Capacity, Cooking Loss, and Tenderness) chemical properties (proximate) as well as organoleptic tests. Data were analyzed using ANOVA and continued with the Honest Significant Difference Test. Based on the research results obtained physical quality such as the highest cooking shrinkage of corn flour 19.62; The highest water binding capacity of sago flour is 42.03; the highest tenderness of sago flour 52; chemical quality such as the highest water content using sago flour (47.11%), the highest protein in wheat flour 20.65%, the highest fat in tapioca flour 20.46%, the highest carbohydrate in corn flour 19.58%; The organoleptic score for color was 2.66 (liked) using sago flour, aroma 2.77 (like) corn flour, texture 2.90 (neutral) using sago flour and taste 2.30 (like) using wheat flour.

Key words*: corn flour, sorghum, sago, flour, tapioca, salami.*

RESEARCH ON THE PHYSICO-CHEMICAL ANALYSIS OF WHITE AND RED GRAPES MUST FROM A WINERY IN PRAHOVA COUNTY

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Abstract

The paper proposed an analysis of the physico-chemical composition of several types of grape varieties (white and red). Their analysis was done during the years 2019-2021 at a winery in Prahova County. The determinations were made on must, and the analyzed varieties were: Sauvignon Blanc, White Feteasca and Black Feteasca. The sugar content was determined, which is an important parameter in wine-making to estimate the favorable time for harvesting, but also to decide what wine is produced (dry, sweet, semi-sweet). The total acidity of the wine was also determined, acids representing important components of the wine. Low acidity will cause a "flat" and uninteresting taste, and too much acidity will cause an overly sour and astringent taste. At the same time, the pH was analyzed, which affects the taste, sugar, acidity level and stability of the wines. The observed values were in normal limits.

Key words*: acidity, must, pH, sugar, variety.*

RESEARCH ON THE PHYSICO-CHEMICAL AND MICROBIOLOGICAL QUALITY OF FAST FOOD PRODUCTS

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Abstract

This study aimed to monitor the quality of food products distributed in fast food restaurants. Physico-chemical and microbiological analyses were conducted on burger and sandwich products containing beef, chicken, turkey, fish, cheese, as well as on sweet desserts such as apple juice, ice cream, and milkshakes. Additionally, the equipment and utensils used in the preparation of these products were checked microbiologically. The ice and drinking water from the supply network, used in the preparation process of these products, were tested both microbiologically and physic-chemically. The analysis indicates that all the ingredients and equipments meets all the requested standards and the risk of contamination with pathogenic microorganisms is manageable through the implementation of sanitation programs and the education of workers in the respective units.

Key words*: burger, dessert, food quality, meat.*

ASSESSING THE ABILITY OF FREEZE-DRIED EXTRACTS FROM BLACKBERRY PROCESSING BY-PRODUCTS TO ENHANCE THE ANTIOXIDANT FUNCTION OF SUNFLOWER OIL DURING HIGH-TEMPERATURE HEATING

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Abstract

The aim of this study was to assess the ability of two freeze-dried extracts from blackberry processing by-products resulted after juice extraction, compared to butylhydroxytoluene (BHT) in preventing the lipid oxidation of sunflower oil (SFO) subjected to high-temperature heating at 180ºC up to 12 hours. The blackberries were collected from spontaneous flora of two regions of Romania, Zugau (Arad County) and Paltinis (Sibiu County) and the blackberry by-products extracts (BBE) were noted according to the place of origin as ZBBP, respectively PBBE. The evolution of lipid oxidation was tracked by means of specific indices as: peroxide value (PV), p-anisidine value (p-AV), total oxidation (TOTOX) value and the response of TBA-malondialdehyde (MDA) interactions evaluated by thiobarbituric acid (TBA) method. The results revealed that BBE displayed a high inhibitory effect on SFO thermo-oxidation. This response was dose-dependent, thus, the rate of lipid oxidation was inversely related to BBE concentration. The recorded data highlighted that BBE constitutes efficient natural antioxidants that can contribute to the development of sunflower oil with extended thermo-oxidative stability.

Key words*: blackberry processing by-products, freeze-dried extracts, inhibitory effect, lipid oxidation, thermo-oxidative stability.*

THE USE OF *Moringa oleífera* AS VALUE-ADDED INGREDIENT IN BAKERY INDUSTRY

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Abstract

In this study, the nutritional, physicochemical, phytochemical and sensory potential of Moringa flour, composite Moringa/wheat flours in different proportions, and bread obtained from these flours were examined. The nutritional analysis revealed an increase in the mineral content of the bread with the addition of 10% Moringa flour, as well as an increase in protein and fat content. The results obtained show that the maximum mineral and fat contents were recorded in the case of bread with 10% Moringa flour and are 3.89% and 4.93% respectively. They also show that the addition of moringa flour results in an abundance of micro- and macro-nutrients in composite flour samples and breads depending on the percentage added. The bread containing 2.5% of Moringa flour has values close to the control bread in terms of physical properties: 83.88%, 250.57cm3/100g, 93.66% and 0.717 respectively for porosity, volume, elasticity and H/D ratio. The total polyphenol content was between 191.87 and 279.83 mg/100 g and flavonoids between 6.18 and 9.76 mg EQ/100 g. The sensory analysis showed a reluctance of consumers to bread with more than 2.5% of moringa flour. This study reveals that the addition of moringa leaf flour up to 2.5% allows obtaining an elastic bread, acceptable from an organoleptic point of view while improving the nutritional quality without negative effects on the physicochemical characteristics.

Key words*: Moringa, polyphenols, flavonoids, organoleptic, nutrition.*

EFFECT OF PRE-SLAUGHTER WEIGHT ON CARCASS QUALITY IN PIGS OF IRISH ORIGIN

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Abstract

To determine the effect of pre-slaughter weight on carcass performance of pigs of Irish origin, two groups of 14 pigs were formed with live weights of 90 and 110 kg per group, including 7 barrows and 7 gilts. After slaughter and carcass fabrication, carcass indicators were measured and the relationship to pre-slaughter weight was examined. For 110 kg pigs, a 1 kg inrease in pre-slaughter weight increased carcass chilling losses by 0.1% ($r = 0.41$; $p<0.001$), decreased carcass yield by 0.81 kg ($r = -0.5$; $p<0.001$), increased carcass length by 0.48 cm ($r = -0.64$; $p<0.001$), increased fat thickness over withers by 0.76 mm ($r = 0.38$; $p<0.001$), increased fat thickness over 6^{th}–7^{th} thoracic vertebrae by 0.76 mm ($r = 0.37$; $p<0.001$). For 90 kg pigs, an 1 kg increase in pre-slaughter weight icreased fat thickness over 6^{th}–7^{th} thoracic vertebrae by 0.45 mm ($r = 0.45$; $p<0.001$), increased fat thickness in sacrum by 0.89 mm ($r = 0.16$; $p <0.001$), and decreased meat content by 0.89% ($r = -0.28$; $p<0.001$). An increase in pre-slaughter weight did not lead to a decrease in the carcass quality class.

***Key words**: bacon halves, carcass yield, carcass length, fat thickness, meat content.*

CURRENT TRENDS IN THE DEVELOPMENT OF VALUE-ADDED FOOD PRODUCTS BY EXPLOITING THE FUNCTIONAL POTENTIAL OF CHESTNUT FLOUR AND ROSEHIP POWDER

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Abstract

The scientific research done in the past few years has been conducted with the aim of discovering and developing new materials and technologies to develop foods that are healthier and more valuable nutrition-wise. The new generation of products should be in accordance with the environmental directives, sustainable, should do no harm, and should also ensure equitability of the market. Among the unconventional materials that caught our attention, chestnuts and rosehips are sustainable, underexploited resources that meet dietary and nutritional requirements. The aim of this paper is to gather comprehensive knowledge and get an overview of the use of chestnut flour and rosehip powder in different value-added food products, and to identify the possible gaps in the current knowledge. This work will help the further research in the field of valorization of chestnut and rosehip, and therefore, contribute to the development of innovative functional food formulations. Moreover, this matter is of importance because the generation of novel products would meet consumer expectations and will both help generate income to the food industry and provide a more sustainable use of resources.

Key words*: chestnut flour, rosehip powder, functional foods, value-added food product, nutritional properties.*

A MEAT PRODUCTS ALTERNATIVE: VEGAN CASHEW PARISER - ANTIOXIDANT, NUTRITIONAL AND SENSORY CHARACTERISTICS

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Abstract

Since the beginning of the third millennium, globally, there has been a continuous increase of the flexitarian, vegetarian and vegan diet people number, which has led to a higher market demand for plant-based alternatives to meat products. The work first goal was to obtain a cashew nuts pariser, in two assortments: VCP1 and VCP2, the difference between them being that in VCP2 was added red beet juice as natural coloring. Another aim of this paper was to analyze the two finished products concerning total polyphenol content (TPC), antioxidant activity by Cupric Ion Reducing Antioxidant Capacity (CUPRAC) and by 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging activity (RSA), proximate composition, energy value and sensory characteristics (5 points hedonic scale). Because, compared to cashews, red beet juice had a TPC (9.46 ± 0.14 mg gallic acid/g) more than twice as high, a CUPRAC (68.72 ± 0.18 mg Trolox/g) more than 5 times higher, a stronger RSA, the addition of this juice to VCP2 determined a higher TPC and a better antioxidant activity compared to VCP1. Both finished products were well appreciated by tasters for all organoleptic characteristics.

Key words*: antioxidant activity, cashew, polyphenols, red beet, vegan pariser.*

SENSORY AND PHYSICO-CHEMICAL CHARACTERISTICS OF MUFFINS OBTAINED FROM NON-CONVENTIONAL AGLUTENIC FLOURS

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Abstract

In this work we obtained and characterized gluten-free muffins from almond and coconut flour. Three distinct muffin recipes were designed with the two types of flour in different proportions: Var. 1 (100% almond flour), Var. 2 (50:50) almond flour: coconut flour and Var. 3 (80:20) almond flour: coconut flour. The muffins were analyzed from a sensory point of view (using the hedonic method) by a group of 25 consumers, evaluating: external appearance, appearance on the section, taste, smell, aroma, texture, color and consistency. Overall, the highest score was recorded in Var. 3, followed by Var. 1. The taste, color and aroma of the three variants were appreciated very well, but differences could be observed in the appearance on the section and texture. The level of acceptability by consumers was high for all muffin variants obtained. Moisture (34.8±0.7 - 37.5±0.51%), height/diameter ratio (0.4±0.03 - 0.6±0.026), porosity (68.2 ±2.3 - 72.7±1.8%) and elasticity (48.58±1.4 - 54.9±1.63%), polyphenol content (47.15±2.21 - 128.4±3.47 mg gallic acid/g) and the antiradical activity were evaluated (RSA: 68.2±3.41 - 63.7±2.6%).

***Key words**: almond flour, coconut flour, muffins, physicochemical characteristics, sensorial evaluation.*

EVALUATION OF MICROORGANISMS AND MOLECULAR VARIABILITY OF SOME OLD VARIETIES OF *Malus domestica* L.

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Abstract

Even if the Romanian market has been overrun in recent years by non-indigenous hybrids, the high degree of adaptability of the Romanian varieties helps them to persist in the struggle for survival. The demands of organic consumption have determined a segment of the country's population to refocus on the consumption of indigenous apples or originating from other areas, but grown for a very long time in our country. The interest for these varieties with tasty fruits and special flavors led us to make a microbiological and molecular assessment. Molecular variability was investigated using ISSR (Inter Single Sequence Repeats) and SCoT (Start Codon Targeted) markers. The microbiological methodology is based on techniques for the isolation and determination of mesophilic bacteria, molds, yeasts, the presence of faecal bacteria and Escherichia coli, Salmonella and Shigella species. Escherichia coli was observed in some samples and enterococci were highlighted in only one sample. The results indicate a variation of the microbial groups in the varieties analyzed and the absence of species that can disturb serious the digestive tract (for example Salmonella and Shigella).

Key words*: Malus domestica L., microorganisms, Escherichia coli, molecular variability.*

BAKERY PRODUCTS WITH VALUE-ADDED PREMIX BASED ON LUPIN (*Lupinus angustifolius*) SPROUTS

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Abstract

The paper aims to study the nutritional and sensorial properties of bakery products fortified with lupin sprouts. The lupin seeds were germinated, and the sprouts collected after 14 days of germination were dried and ground. Wheat flour mixed with different percentages of sprout flour (10-30%) was used to obtain bun-type bakery products obtained from leavened dough. The proximate composition (proteins, lipids, mineral substances, carbohydrates), macro and microelements composition and the content of total polyphenols, as well as the antioxidant activity of fortified products was determined. The obtained results showed that the maximum mineral content was recorded in the case of buns with 30% (2.225%). The content of total polyphenols varied between 8.0-28.9 µM GAE/g.d.m.) and antioxidant activity (2.52-9.44 µM Fe^{2+}/g d.m.). Elemental composition highlighted an increase of Cu (0.873-1.382 ppm), Ni (0.647-1.348 ppm), Mn (0.622-283.409 ppm), Fe (2.182-12.197 ppm), Zn (3.440-14.133 ppm), Na (607.973-851.325 ppm), Mg (165.781-389.073 ppm), Ca (451.163-502.318 ppm), K (202.683-420.596 ppm) with the percentage of lupin sprouts addition. Sensorial analysis showed that the addition of 10% lupin sprouts was appreciated by consumers regarding all the sensory parameters analyzed.

Key words*: legume sprouts, polyphenols, antioxidant activity, macro and microelements*

THE INFLUENCE OF PRODUCTION TECHNOLOGY PARTICULARITIES ON THE RED WINES CHARACTERISTICS AND QUALITY

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Abstract

In this study, the technological development of two wines obtained from the Feteasca Neagra grape variety was investigated, by the comparison of production methods and the wine's specific characteristics. Although wines were made from the same grape variety, the differences between them are major. Wine production started from the same raw material, but harvested at different maturation periods, reaching different selection and processing methods, and aging methods. As for the production technologies, classical technology, and thermomaceration were used to obtain V-type wine and an artisanal technology for A-type wine (with fermentation in clay amphorae and then continued in oak barrels for 24 months, followed by bottling to aging for a minimum of 12 months). Finally, wine A-type had a lower density of 0.27% and residual sugar of 62.82%, a higher total acidity of 5.77%, and an alcohol concentration of 13.15%. From the sensory point of view (taste, smell, color, clarity, aroma, general harmony), wine A-type received a higher score.

Key words*: Feteasca neagra, red dry wine, acidity, alcoholic concentration, sensorial characteristics.*

A PRELIMINARY INVESTIGATION INTO THE ENHANCEMENT OF CHEESE WITH GRAPE SKIN POWDER

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Abstract

Improving management and making the food industry more sustainable requires a focus on reducing waste and finding uses for by-products. In the case of grapes, by-products account for approximately 20%. It is worth noting that these by-products contain beneficial phenolic compounds that have anti-allergenic, antibacterial, anti-carcinogenic, anti-inflammatory, antioxidant, and cardioprotective effects. For these reasons, the food industry sector must turn its attention to them and use them as functional ingredients. In this study, grape skin powder (GSP) was added to cheese to increase its antioxidant and bioactive compounds content. The enriched cheese contained significantly higher levels of total phenolic content (TPC) and antioxidant activity compared to the control sample. Adding 2% grape skin powder resulted in an increase of 1.927 mg GAE/g DW (mg gallic acid equivalents (GAE) per gram of dry weight (DW)) of TPC in cheese formulation. The GSP-supplemented cheese also showed greater antioxidant activity than the control. This study demonstrates that grape by-products can effectively transfer beneficial compounds to cheese.

Key words*: by-products, cheese, food, quality.*

EFFECT OF USING *Lactobacillus plantarum*, *Bifidobacterium* AND ITS CONSORTIUM PROBIOTIC YOGURT IN PREVENTING THE GROWTH OF *Klebsiella pneumoniae* THAT CAUSES PNEUMONIA

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Abstract

Klebsiella pneumoniae has been linked with dysbiosis in the intestinal microbiota. This has led to the idea of improving respiratory defense by regulating the intestinal microbiota with the supplementation of beneficial strains, such as yogurt probiotics. To develop probiotics in yogurt, the addition of lactic acid bacteria (LAB) in it such as Lactobacillus plantarum and Bifidobacterium is needed. Yogurt is expected to improve human health, specifically in gastrointestinal and respiratory health. This study aims to study the effect of probiotic yogurt with a specific consortium based on Lactobacillus plantarum and Bifidobacterium to inhibit the growth of Klebsiella pneumoniae which causes pneumonia. The literature research method used Google Scholar and PubMed from 2000 to 2022 which obtained 60 journals. Based on observations, it was shown that Lactobacillus plantarum and Bifidobacterium were able to inhibit the growth of Klebsiella pneumoniae due to the decrease of pulmonary inflammation response after giving Lactobacillus plantarum, and the increase of IL-10 production by Bifidobacterium bacteria. Therefore, yogurt probiotics consortium could be used to prevent Klebsiella pneumoniae which causes pneumonia and lung damage.

Key words*: Bifidobacterium, consortium microbiota, Lactobacillus plantarum, Klebsiella pneumoniae, yoghurt probiotic.*

STUDY ON THE DYNAMICS OF CATTLE LIVESTOCK, MILK PRODUCTION AND FRESH DAIRY PRODUCTS IN ROMANIA BETWEEN 2016-2020

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Abstract

Farmers receive subsidies from the state and an assessment of the living standard in the respective nation can be made based on the dynamics of cattle livestock and the development of dairy products. The EU Council receives data on these issues from EU nations each year.The data processed in the study were collected from the Annual Statistical Surveys. The data came from about 600 economic operators but summative data organization and presentation techniques (descriptive statistics) were used for processing. In Romania, during the analyzed period, even though the cattle herd decreased by 8.01%, milk production increased by 15.91% from 2016 to 2020, as farmers were interested in exploiting genetically valuable specimens. Butter production followed a sinusoidal trajectory, increasing in 2017 (177 tons), decreasing by 12 percent until 2019, and then increasing by 14.33 percent in 2020. Cheese production followed an upward trend ranging from 1 to 5.68 percent, with the highest determined increase (5 127 tons) in cheese production for 2018 compared to 2017.

Key words*: cattle livestock, dairy, fresh dairy, butter and cheese production, development regions.*

FUNCTIONALITY AND APPLICATION OF DIETARY FIBER IN FOOD PRODUCTS - REVIEW

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Abstract

Dietary fibers are components of plant material, extremely important in the diet, because they resist enzymatic digestion in the digestive tract, with a role in improving intestinal transit. Chemically, dietary fibers are diverse in composition,, and can be grouped generally by their solubility, viscosity, and fermentability, which affect how fibers are processed in the body. The presence in the daily diet of whole grains, nuts, vegetables, fruits and seeds positively affects health, because their consumption has been linked to the decrease in the incidence of several diseases. From a technological point of view, dietary fiber is added as a functional food ingredient in food products to provide water-holding capacity, viscosity, gel-forming capacity and fat-binding capacity to food products. These beneficial characteristics of dietary fiber components can enhance the image of products as healthy and functional foods. This article reviews the concept and definition of dietary fibers used in food production and their functional characteristics and health benefits.

Key words*: dietary fiber, food product, functional property, processing.*

ANALYSIS OF THE STATUS OF FOOD AND DRINKS PROTECTED BY GEOGRAPHICAL INDICATION SCHEMES IN ROMANIA AND EUROPEAN UNION

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Abstract

Food production is experiencing nowadays the transition to "smart" products which are processed by new protective techniques or minimally processed; there is also an increasing interest in traditional foods, which are perceived as healthier, and more environmentally friendly. In this regard, EU agricultural policies are based on specific measures for the entire food chain, aimed at reducing food waste and increasing sustainability; this has an essential role in protecting the availability, accessibility, and quality of agri-food products. In this paper, we focused on presenting the main categories of foods and drinks protected by geographical indication schemes PDO (Protected Designation of Origin), PGI (Protected Geographical Indication), TSG (Traditional Speciality Guaranteed), GI (Geographical Indication) at the EU and Romanian levels. We presented the statistics based on eAmbrosia EU and the Romanian Ministry of Agriculture database, the procedure for registration, and the role of this certification for the producers, community reputation, and branding.

Key words*: Ambrosia database, GI, PDO, PGI, quality schemes, registration, statistics, TSG*

STUDY ON THE DIFFERENT LAMBS SLAUGHTERING METHODS AND THE ASSESSMENT OF THE DEGREE OF STRESS THROUGH THE DETERMINATION OF SERUM CORTISOL

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Abstract

All animals reared for meat will experience a level of stress prior to slaughter, which will manifest itself in negative effects on meat quality. The purpose of this research is to find out the level of stress of the animals, at the moment of slaughter, by measuring the cortisol in the serum, as an indirect method of evaluating the quality of the meat. The study was carried out between March and October 2021, on three batches of sheep. Batch 1 was slaughtered conventionally (with stunning), batch 2 was slaughtered traditionally (without stunning) and batch 3 was slaughtered halal (without stunning). Blood samples were collected from the bleeding wound, and cortisol was dosed in a specialized laboratory by the immunoenzymatic method with chemiluminescence detection. Comparing the analyzed batches, it can be seen that higher average values of the cortisol level were recorded in the batch slaughtered in the halal system, followed by the batch slaughtered in the conventional system and then by the one slaughtered in the traditional system, which obtained the lowest values. The quality of the meat is directly influenced by the way the animals are slaughtered and by the stress during slaughtering.

Key words*: cortisol, halal, meet, sheep, stress.*

PORK JERKY USING SUGAR ANTS NIRA AND SALT DURING STORAGE

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Abstract

This study uses a Split Plot design, the time design is set as follows. Factor A is the concentration of palm sugar + NaCl salt, namely A1 = 15% palm sugar + 5% NaCl, A2 = 10% palm sugar + 10% NaCl salt, A3 = Palm sugar 5% + NaCl 15% salt and factor B is the duration of storage at room temperature 20-250C, B1 = 10 days, B2 = 20 days, B3 + 30 days, with three replications. The variables observed were water content, pH and the number of microbes. The results showed that the use of palm sugar sap + NaCl gave a very different effect (P < 0.01) on the moisture content and the number of microbes in pork jerky. The use of palm sugar 5% + NaCl 15% can extend the shelf life of pork jerky up to 30 days.

Key words *: pork jerky, palm sugar sap, salt.*

INNOVATIVE PASTA FORMULATION BASED ON BARLEY/OAT FLOUR FORTIFIED WITH SEA BUCKTHORN POWDER

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Abstract

This study aimed to design innovative pasta formulations with improved functional properties starting from a basic matrix consisting of a mixture of barley and oat flour which was fortified by including sea buckthorn powder in the recipe. For this purpose, in the novel pasta formulatios the barley/oat flour was replaced with sea buckthorn powder in proportions of 5, 10, 15, 20, and 25% (w/w). After preparation, pasta formulatios were assessed in respect of proximate composition, total phenolic content, total flavonoid content and antioxidant activity expressed by ferric reducing antioxidant power (FRAP) value and the inhibition percentage of 2,2-diphenyl-1-picrylhydrazyl (DPPH). The results showed that the content of analysed bioactive compounds and antioxidant properties of innovative pasta formulations increased significantly ($p < 0.05$) by using the sea buckthorn powder in the recipe. The highest increase for all investigated parameters was recorded for pasta in which barley/oat flour was substituted with 25% of the sea buckthorn powder. The obtained results reveal the desirability of using sea buckthorn to develop novel pasta formulas with enhanced functionality.

Key words*: antioxidant properties, barley/oat flour, proximate composition, sea buckthorn.*

THE EFFECT OF RED LENTIL FLOUR ON THE QUALITY CHARACTERISTICS OF BEEF BURGERS OBTAINED FROM TWO DIFFERENT ANATOMICAL REGIONS

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Abstract

The study was carried out to evaluate the quality of four beef burgers from two different anatomical regions (round and hind shank) that were manufactured in the USV Iasi Meat Processing Workshop. The technological process of obtaining the four types of burgers had as a specificity the addition of red lentil flour in two proportions (5 and 10%) and the adjustment of the proportions of added fat according to the level of added lentil flour (35 and 15% fat). The obtained products were evaluated physicochemically for color, chemical composition, cooking, and sensory parameters to determine the perception of the attributes appearance, aroma, juiciness, tenderness, aftertaste, and off-flavor. Samples with higher percentages of red lentil flour showed lower lightness, lower heat treatment losses, and less diameter reduction. The same samples demonstrated better water retention capacity after cooking, though the type of raw materials used also had an impact on this parameter. According to the sensory evaluation, the addition of lentil flour in combination with the fat content resulted in improved textural attributes (juiciness and tenderness) and the samples showed high acceptability.

Key words*: beef burgers, red lentil flour, beef round, beef hind shank, quality parameters.*

SENSORIAL CHARACTERIZATION OF MUTTON PRODUCTS IN MEMBRANE MADE IN THE MEAT PROCESSING

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Abstract

The paper aimed to produce four different types of sheep meat products with heterogeneous structures in the meat processing workshop of the University of Life Sciences Iasi, which presented as variation factors the type of membrane and the type of product (salami/sausage, imprinted by the membrane used). Two varieties of salami (in collagen and polyamide membrane) and two varieties of sausages (in natural pork and sheep membrane) served as the four samples. The four samples obtained were subjected to sensory analysis, carried out in two stages: the first stage consisted of assessing the products based on the main sensory attributes (appearance, aroma, taste, texture, overall acceptability), and the second stage aimed at describing the products using specific sensory terms included in the CATA (Check-All-That-Apply) test from the perspective of consumer perception. The results obtained revealed sensory attributes characteristic of membrane products with heterogeneous structure, with the CATA test describing the products through positive attributes (colour, aroma, texture), with the differentiation of a firmer, harder texture in the case of natural membrane products, superior juiciness in the case of the S3MC sample, and a slightly brittle texture in the S4MP sample.

Key words*: sensory evaluation, mutton, natural / sintetic membranes, CATA,*

INFLUENCE OF THERMAL PROCESSES ON DONKEY MILK

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Abstract

People`s needs for food that do not cause intolerances or allergies, particularly in the dairy and milk sector, has aroused an interest in studying it as widely as possible in other species, such as donkeys. Donkey milk is an ideal substitute in the case of infant children who have different allergies to cow`s milk proteins, and due to the multiple benefits that donkey milk has, conferring antibacterial, antiviral, hypoallergenic, immunomodulatory and pharmaceutical properties, it is of interest in determining the technological methods suitable for maintaining the nutritional values of this product. The possibility of maintaining the quality of milk both in terms of property and through the beneficial contribution it presents to the human body, is strictly related to the determination of appropriate technological methods for the milk of this species. Technological processes such as freeze-drying, pasteurization, and atomization may produce more or less significant changes in milk. The determination of technological methods that preserve the nutritional properties of donkey milk, is of great importance, making it possible to process this product in order to improve the quality of life.

Key words*: donkey milk, freeze-drying, pasteurization, atomization, proteins.*

PHYSICO-CHEMICAL AND SENSORY EVALUATION OF THREE TYPES OF PORK MORTADELLA MANUFACTURED IN THE IULS MEAT PROCESSING MICROSECTION

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Abstract

The objective of this study was to develop and characterize three batches of mortadella made at the IULS meat processing microsection from three anatomical regions of the pork carcass: loin, tenderloin, and chop. The proportion of ingredients introduced were: 80% meat, 15% pork fat, and 5% ice flakes. The mortadella samples were characterized physicochemically in terms of moisture, lipid, protein, and collagen content, as well as sensoryly to determine the perception of a group of evaluators on sensory attributes (appearance, color, aroma, taste, texture, general acceptance). The batch of mortadella obtained from tenderloin had the highest moisture and protein content and the lowest lipid percentage compared to the batches obtained from loin and chop. The anatomical region significantly influenced the color parameters of the mortadella, with the L3MC batch showing the most intense lightness, the highest value of the b parameter, and the lowest red intensity compared to the other two samples. Regarding the sensory evaluation, the batches were scored between 6.27 and 8.03 for the sensory attributes, and the ranking of the overall acceptance of samples was: L1MS, L2MM, L3MC.*

Key words*: mortadella, anatomical regions, pork, loin, tenderloin, chop.*

DEVELOPMENT OF A FUNCTIONAL MEAT PRODUCT WITH SEA BUCKTHORN OIL AND ANALYSIS OF ITS SENSORY AND PHYSICOCHEMICAL QUALITY

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Abstract

The present study was carried out to follow the technological manufacturing process of functional meat products - three batches of pork tenderloin injected with sea buckthorn oil in three different proportions of 1, 3, and 5% and to analyze their quality. The products were obtained in the Meat and Meat Products Microproduction Workshop of the University of Life Sciences, Iasi. After the experimental batches were made, their sensory and physical-chemical analysis was carried out. The sensory analysis of the three types of muscle injected with sea buckthorn oil involved the application of a CATA questionnaire to a group of evaluators, which showed that these products have good consumer acceptability, especially the 3% and 1% sea buckthorn oil batches. The physicochemical aspects were analyzed in terms of color, pH, and raw chemical composition. The colorimetric analysis showed a decrease in the brightness of the samples with an increase in the amount of sea buckthorn oil in the batch. As for the chemical analysis, the increase in the amount of sea buckthorn oil resulted in very different values between batches.

Key words*: functional food product, sea buckthorn oil, meat product, quality parameters.*

SMOKING TEMPERATURE CHARACTERISTICS AND INFLUENCE OF QUALITY INDICATORS ON PHYTOPHAGUS FILLET (*Hypophthalmichthys molitrix*)

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Abstract

The evolution of modern technologies for preserving fish and fish products has led to the eclipse of the preservation properties of many traditional methods, including the smoking method. Nowadays, the main purpose of smoking has been redirected towards highlighting the sensory quality rather than its preserving effect. The main aim of this paper is to highlight the physicochemical, sensory, and color characteristics of smoked phytophagous fillets. To produce the necessary products, nine specimens of phytophagous (Hypophthalmichthys molitrix) were harvested from the fish farm "Piscicola Vlădeni, CC&C PES SRL" Iasi, which were processed and prepared in the Microproduction Workshops of the University for Life Sciences "Ion Ionescu de la Brad" Iasi. Three different smoking methods were applied to the fillets resulting from the phytophagous processing; hot smoking, semi-hot smoking, and cold smoking. The most appreciated fillets were those processed by heat treatment with semi-warm and warm smoking.

Key words*: smoked fish, phytophagus fillet, quality parameters, perishability.*

SESSION WILD LIFE MANAGEMENT, FISHERY AND AQUACULTURE

PARASITES AND PARASITE COMMUNITIES OF *Squalius orpheus* Kottelat & Economidis, 2006 FROM THE CHEPELARSKA RIVER

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Abstract

In the autumn of 2022, 37 specimens of Orpheus dace (Squalius orpheus Kottelat & Economidis, 2006) were subjected to helminthological examination. The fish were caught from the lower section of the Chepelarska River (in the area of Katunitsa village). Three endohelminth species were isolated – Acanthocephalus tenuirostris (Achmerov & Dombrovskaja-Achmerova, 1941) Yamaguti, 1963 (class Trematoda), Contracaecum sp., Rhabdochona denudata (Dujardin, 1845) Railliet, 1916 (class Nematoda). The component community and infracommunity of Orpheus dace were reviewed. One core species (Contracaecum sp.; P% = 32.43) was found in the component community of Sq. orpheus. Brillouin's diversity index (HB), Pielou's evenness index (E), and Simpson's dominance index (C) were calculated. The research aims to provide data on the helminths and helminth communities of Orpheus dace from the freshwater ecosystem of the Chepelarska River. The studied biotope (Katunitsa) is a new habitat for the found helminth species of Orpheus dace.

Key words*: Acanthocephalus tenuirostris, Bulgaria, Contracaecum sp., Maritsa River Basin, Rhabdochona denudata.*

PARASITES AND PARASITE COMMUNITIES OF *Squalius orpheus* Kottelat & Economidis, 2006 FROM THE LUDA YANA RIVER

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Abstract

The present study presents new data on the helminths and helminth communities of fish from the freshwater ecosystem of the Luda Yana River as part of the Maritsa River Basin in Bulgaria, Eastern Aegean Water Basin. In connection with this, 32 specimens of Orpheus dace (Squalius orpheus Kottelat & Economidis, 2006) were collected and examined. The specimens were collected in the autumn of 2022 in the vicinity of the Popintsi village, located in the middle section of the Luda Yana River. The helminthological examination was carried out according to standard methods. Invasion with 3 species of helminths was found – one cestode species (Caryophyllaeides fennica (Schneider, 1902) Nybelin, 1922); one acanthocephalan species (Acanthocephalus lucii (Müller, 1776) Lühe, 1911) and one nematode species (Rhabdochona denudata (Dujardin, 1845) Railliet, 1916). Ac. lucii is reported for the first time from Sq. orpheus in Bulgaria.

Key words*: Aegean Water Basin, Bulgaria, helminths, helminth communities, Orpheus dace.*

NEW DATA ON THE HELMINTH FAUNA OF *Alosa immaculata* Bennett, 1835 FROM THE BULGARIAN SECTION OF THE DANUBE RIVER, NORTHWESTERN BULGARIA

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Abstract

During 2019-2021, six specimens of pontic shad (Alosa immaculata Bennett, 1835); family Clupeidae were examined for parasites. The specimens were collected from three biotopes (Kudelin, Yasen, and Koshava) located in the section of the Danube River in the northwestern part of Bulgaria. Infection with 3 species of helminths was found - 1 species of the class Trematoda (Lecithaster confusus Odhner, 1905); 1 species of the class Acanthocephala (Pomphorhynchus laevis (Zoega in Müller, 1776) Porta, 1908) and 1 species of the class Nematoda (Hysterothylacium gadi aduncum (Rudolphi, 1802) Deardorff et Overstreet, 1981 (larvae). Ecological indices of the found helminth species were examined. The purpose of the study is to provide new data on the helminth fauna of the pontic shad from the freshwater ecosystem of the Danube River in Bulgaria. Al. immaculata is a new host for one endohelminth species (L. confusus). Two of the investigated biotopes (Koshava and Yasen) are new habitats for the found endohelminths in pontic shad.

Key words*: helminths, Koshava, Kudelin, pontic shad, Yasen.*

ECOPARASITOLOGICAL STUDY OF SIX SPECIES OF FISH FROM THE BULGARIAN SECTION OF THE DANUBE RIVER

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Abstract

For the period 2019-2021, an ecoparasitological study of six fish species - grass carp [Ctenopharyngodon idella (Valenciennes, 1844)]; silver carp [Hypophthalmichthys molitrix (Valenciennes, 1844)]; pumpkinseed [Lepomis gibbosus (Linnaeus, 1758)]; Prussian carp [Carassius gibelio (Bloch, 1782)]; gudgeon [Gobio gobio (Linnaeus, 1758)]; European bitterling [Rhodeus amarus (Bloch, 1782)] was conducted. The fish were caught from 3 biotopes (Koshava, Kudelin, Novo selo) from the upper section of the Danube River in Bulgaria. A total of two parasite species [Pomphorhynchus laevis (Zoega in Müller, 1776) Porta, 1908 and Contracaecum sp. (larvae)] were found in two of the investigated fish species. Four fish species were not infected. The ecological indices (mean intensity; mean abundance; prevalence) of parasites were calculated. Kudelin and Koshava biotopes are new habitats for the found helminth species of the infected fish species.

Key words*: freshwater fish, helminths, Koshava, Kudelin, Novo selo.*

ECOLOGOHELMINTHOLOGICAL INVESTIGATION OF *Cobitis elongata*, *Cobitis taenia*, AND *Sabanejewia bulgarica* (Cobitidae) FROM THE DANUBE RIVER, BULGARIA

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Abstract

For the period 2019-2021, three fish species of the family Cobitidae, caught from the upper section of the Danube River in Bulgaria, were subjected to ecologohelminthological investigation. Four specimens of Cobitis elongata Heckel & Kner, 1858 (two specimens from Kudelin biotope and two from Koshava biotope); six specimens of spined loach (Cobitis taenia Linnaeus, 1758) (from Koshava biotope) and one specimen of Sabanejewia bulgarica Drensky, 1928 (from Kudelin biotope) are objects of research. The trematode Asymphylodora tincae (Modeer, 1790) Lühe, 1909 was reported for the first time as a helminth of S. bulgarica. The nematode Pseudocapillaria tomentosa (Dujardin, 1845) Moravec, 1987 was reported for the first time as a helminth of C. elongata. Kudelin and Koshava biotopes are new habitats for the found helminth species. During the helminthological examination of C. taenia, infection with helminths was not found. The study provides new data on helminth fauna and ecological indices (MI, MA, and P%) in the helminth communities of C. elongata and S. bulgarica.

Key words*: ecological indices, fish species, helminth species, Koshava, Kudelin.*

EFFICIENCY OF THE FLOATING CAGES GROWING METHOD OF CARP WITH THE HELP OF RARING AND LOTTING

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Abstract

Cypriniculture is the growth of cyprinids in a controlled environment. By planning and rationalizing feed and creating appropriate conditions to cover the needs of carp farming, this branch of aquaculture is made more efficient. Carp is a poikilothermic animal that does not consume energy to maintain body temperature. Thus, the administered food is converted into body mass more effectively than in other animal species. The feed conversion ratio shall not exceed 2. The action of lotion is differentiated from the one of raring by the process of populating the floating cages according to the weight category in which the carp individuals fall. The study involves the identification of an effective method of growing carps in floating cages, depending on the weight and amount of food administered. The technique of separating carp by lotting was proven to be more efficient compared to decreasing the number of individuals on floating cage. Carp individuals remained in the same weight category without large differences between them. This ensures the uniformity of biological material, and an economic beneficial effect.

Key words*: aquaculture, feed, floating cage, production, weight.*

STUDIES ON THE HELMINTH FAUNA OF TWO FISH SPECIES OF THE GENUS *Ballerus* Heckel, 1843 FROM THE BULGARIAN SECTION OF THE DANUBE RIVER

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Abstract

During the period 2019-2021, the helminth fauna of two species of freshwater fish of the family Cyprinidae, genus Ballerus Heckel, 1843 - white-eye bream [Ballerus sapa (Pallas, 1814)] and zope [Ballerus ballerus (Linnaeus, 1758)] were examined. Six specimens of white-eye bream and one specimen of zope were collected from a total of three biotopes located in the Bulgarian section of the Danube River between 845 and 807 river km. Three species of helminths were found - 2 species of the class Trematoda [Asymphylodora imitans (Mühling, 1898) Looss, 1899; Nicolla skrjabini (Iwanitzky, 1928) Dollfus, 1960)] and 1 species of the class Nematoda [Contracaecum sp. (larvae)]. The present study aims to provide new data on the species composition and helminth ecological indices of the two examined fish species. B. sapa is reported as a new host record for the three helminth species in Bulgaria. Koshava biotope is a new habitat for the established helminths in the white-eye bream.

Key words*: Ballerus ballerus, Ballerus sapa, ecological indices, helminths, Vidin Province.*

EVOLUTION OF FISH PRODUCTION ACHIEVED FROM COMMERCIAL FISHING IN THE DANUBE RIVER IN THE PERIOD 2015-2021

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Abstract

The paper presents the evolution of fish production from commercial fishing in the Danube River during 2015-2021 and is based on the analysis of statistical data collected by the National Agency for Fisheries and Aquaculture as part of the data collection program. Production data were collected annually by authorized commercial fishermen, quantitatively and by species. During the analysed period, there is a quantitative decrease in the production of wild carp and raptors, and significant increases in catches of Asian carp species. Catches of Danube record annual fluctuations with decreasing trends in the analysed period. At the end, the causes of the catches decrease of commercial fishing are analysed and the fisheries management measures that must be taken, based on ecosystem principles, to protect and restore the declining fish populations in the Danube River.

Key words*: biodiversity conservation, catches, fisheries management, sustainability.*

ZEOLITE FILTERS - TOOLS TO IMPROVE WATER QUALITY IN RECIRCULATING SYSTEMS IN AQUACULTURE

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Abstract

For the efficient and sustainable use of water in recirculating aquaculture systems, in order to improve water quality, zeolite filters have been used by retaining ammonia. The efficiency of the filters was tested in systems with volumes of 220 liters of water, populated with batches of 36 carp seedlings (Cyprinus carpio) in summer I. Horizontal filters with zeolite bed and composite filters, obtained from a granular mixture of silicate glass and zeolite, were used when filtering the water. For the determination of ammoniacal nitrogen, the continuous concentration criterion (CCC) and the maximum concentration criterion (CMC) were used. After 24 and 48 hours of water filtration using clinoptilolite filters, it was found that the maximum permissible values of ammonia in the water were not exceeded. Ammonia is absorbed in relatively large quantity, zeolite improves the filtration yield, which recommends the use of these types of filters in controlled recirculating systems in aquaculture.

Key words: *ammonia; continuous concentration criterion, clinoptilolite, maximum concentration criterion, organic recirculating systems.*

WILD BOAR SURVEILLANCE THROUGH ELECTRONIC MODULE "HUNT" MOBILE APPLICATION IN BULGARIA

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Abstract

African swine fever is a disease that affects representatives from Suidae family and leads to serious economic losses and ecological damage to swine population. A major role in the etiology of the disease is played by wild boars, both as a vector and as a reservoir. Due to this fact, monitoring the spread of the disease among feral pigs is one of the main factors for the prevention of the disease. For this reason, in 2019, the Bulgarian Food Safety Agency launched `Module "Hunt" application. The application allows hunters both easy and quick sending of data on the sample taken from a shot or found dead animal, as well as checking the result just by writing the sample number, while location, date and time of taking the sample are obtained automatically by the application. The current study analyzed both application performance (input, output of data) and data on number of samples taken from hunted feral pigs, percentage positive results from shot animals, proportion of samples taken from wild boars found dead with ratio of positive samples from them.

Key words*: African swine fever, surveillance, wild boars.*

NUMBERS AND POPULATION DYNAMICS OF THE WHITE STORK (*Ciconia ciconia*) COLONY IN BELOZEM - THE EUROPEAN WHITE STORK VILLAGE IN BULGARIA - IN 2020-2022

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Abstract

The White Stork is one of the iconic bird species that is easily recognized by humans as it inhabits and nests in settlements as well as other places and structures located near lakes, rivers, dams, rice fields, wet meadows, and others. Given its feeding habitats, the species is a typical farmland bird. In many settlements in Bulgaria, including the village of Belozem, several dozen nesting pairs have been established, and this number is significantly higher than the average for the country. Some of the largest rice fields in the country, which are key foraging habitats for the species, are located around Belozem. In the village of Belozem, the stork colony formed on the roof of the local school is very impressive and counts over 20 nests, which represent almost half of the pairs nesting in the village - about 40 in total. In the current study, 41 to 53 stork nests were recorded, and 35-37 pairs successfully reared at least one juvenile each. The number of fledglings leaving the nest ranged from 94 to 115.

Key words*: breeding parameters, farmland birds, rice fields.*

OCCUPATION RATES OF ARTIFICIAL NEST BOXES BY LESSER KESTREL IN SPA "SAKAR" (BG0002021), BULGARIA

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Abstract

Lesser Kestrel often nests in urban areas, where is provided nesting sites and the level of threat of predation is lowland. Demolition of older buildings where the birds nested is the problems of the breeding range. Due to the drastic reduction of natural habitats, the placement of artificial nest boxes provides reliable nesting sites with a low risk of predation. Over 70 artificial nest boxes were installed on the territory of SPA `Sakar` part of NATURA 2000 where the Lesser Kestrel has been successfully recovered as a breeder. The installed artificial nest boxes are different types providing more breeding opportunities. In this survey our goal is to process which factors affect the occupation rate of provided artificial nest boxes. The results showed that artificial nest boxes performances (type of the nest boxes, height above ground and etc.) significantly influenced the occupancy. We conclude that artificial nest boxes are of great importance in providing safe nesting sites.

Key words*: endangered species, Falco naumanni, Natura 2000, nest boxes.*

BIODIVERSITY AND HELMINTH COMMUNITIES OF *Barbus cyclolepis* Heckel, 1837 FROM CHERNA RIVER, BULGARIA

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Abstract

The study presents for the first time the ChernaRiver, southern Bulgaria, Aegean water basin, the results of research on the biological diversity and helminth communities of the Round-scaled barbell Barbus cyclolepis Heckel, 1837. 30 specimens of B. cyclolepis are studied. Infections by 5 species of helminths are found [Allocrea diumisoporum (Loos, 1894); Bathybothrium rectangulum (Bloch, 1782); Caryophyllaeus laticeps (Pallas, 1781); Schulmanela petruschewskii (Schulman, 1948) Ivashkin, 1964; Neoechinorhynchus rutili (Müller, 1780)]. The infection indices and the dominant structure of helminth communities are presented. Basic biotic indices are determined. Helminth communities are analysed at two levels: infracommunity and component community. All established parasite species are autogenous for the helminth communities of the Round-scaled barbel from the fresh water ecosystem of the Cherna River. New data for helminths and helminth communities of B. cyclolepis are presented. The bioindicator significance of helminths and helminth communities is discussed.

Key words*: Barbus cyclolepis, bioindication, Aegean water basin, ecological indices, helminth communities.*

BIODIVERSITY OF THE HELMINTH COMMUNITIES OF *Carassius gibelio* (Bloch, 1782) FROM MARITSA RIVER, BULGARIA

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Abstract

This study is the first to reveal the helminth fauna and helminth community's structure of Prussian carp (Carassius gibelio) from Maritsa River, Bulgaria. In 2022, ten Prussian carp specimens were collected from the Maritsa River and examined for parasites. 90% of the studied hosts harbour parasites. Two species of helminths were fixed: one from class Acanthocephala [Acanthocephalus anguillae (Muller, 1780)] and one from class Nematoda [Pseudocapillaria tomentosa (Dujardin, 1843)]. The established nematode species is distinguished with high prevalence. Carassius gibelio is reported for the first time as a host for Pseudocapillaria tomentosa in Bulgaria. The river ecosystem of Maritsa is a new locality record for Pseudocapillaria tomentosa in Bulgaria.

Key words*: bioindication, Carassius gibelio, Maritsa River, helminth communities.*

NEW DATA FOR HELMINTH FAUNA OF *Esox lucius* (Linnaeus, 1758) FROM MARITSA RIVER, BULGARIA

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Abstract

Twelve specimens of northern pike [Esox lucius (Linnaeus, 1758)] were caught from the Maritsa River during 2020-2021 and examined for parasites. Helminth parasites were found in 50% of the examined northern pikes (6 specimens) from the Maritsa River. Two species of parasites were fixed: one trematode species [Bunodera luciopercae (Müller, 1776)] and one nematode species [Raphidascaris acus (Bloch, 1779)]. The dominant structure of the established species is represented at the level of component communities and infracommunities. R. acus is a core species for the component community of Esox lucius from the Maritsa River. B. luciopercae is an accidental parasite species for northern pike helminth communities. The data for the infracommunities were used to determine the basic biotic indices. The bioindicator significance of the established parasite species was discussed for an ecological assessment of the studied river ecosystem. As a result of the conducted research, new data on the parasite fauna of E. lucius from the Maritsa River have been presented.

Key words*: bioindication; Esox lucius; Maritsa River; helminths,*

HELMINTHS AND HELMINTH COMMUNITIES OF *Perca fluviatilis* (Linnaeus, 1758) AND *Vimba melanops* (Heckel, 1837) FROM MARITSA RIVER, BULGARIA

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Abstract

As a result of the study of 10 specimens Perca fluviatilis Linnaeus, 1758 and 10 specimens Vimba melanops (Heckel, 1837) from the Maritsa River, Aegean water basin, Bulgaria, infection with 5 helminth species are presented [Allocreadium isoporum (Loos, 1894); Proteocephalus percae (Müller, 1780); Caryophyllaeus laticeps (Pallas, 1781); Contracaecum sp., larvae and Acanthocephalus lucii (Müller, 1776)]. All identified parasite species are autogenous to the parasite communities of the perch and Macedonian vimba, except Contracaecum sp.*, which is an allogeneic species. Infection indices are discussed and pathways of helminth flux circulation are traced. The dominant structure of the helminth communities was analyzed. New data on the helminths and their communities in the two species of freshwater fish, as well as on the ecological status of the studied biotopes of the freshwater ecosystem are presented.*

Key words*: Aegean water basin, ecological status, helminth communities, Macedonian vimba, perch*.

IMTA KEY CONCEPT FOR DEVELOPING A STRATEGY TO INCREASE AQUACULTURE PRODUCTION AND IMPROVE ENVIRONMENTAL SUSTAINABILITY

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Abstract

This paper is a comprehensive study of the strategic approach, in the context of global population growth, to create more food using current natural resources. Integrated multi-trophic aquaculture (IMTA) can provide aquaculture products in much larger quantities using the same resources involved. Harnessing all the waste in the waters for this purpose brings multiple environmental and economic benefits. In the context of the circular economy, IMTA principles aim to significantly reduce waste and degrade the environment, but without restricting economic and social progress. In Romania, polyculture fish farming is practised to exploit all aquatic resources in fish farms. Each fish species is selected so that it can be nutritionally supported with natural feed from the environment, and various types of feed can be used to increase production. The results of the study can be used to improve the aquaculture development strategy, in the environmental sustainability context.

Key words*: aquaculture products, multi-trophic aquaculture, resource valorisation, sustainability, trophic level.*

OVERVIEW OF ECOSYSTEM SERVICES PROVIDED BY LESSER KESTREL IN ITS MAIN-BREEDING HABITAT IN BULGARIA

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Abstract

The Lesser Kestrel (Falco naumanni, Fleischer, 1818) strongly attached to agro-environmental landscapes, showing high preferences towards extensively managed wheat crops and extensively grazed or otherwise maintained pastures. The colonies of that species are often nesting in urban areas usually surrounded by agricultural fields or open uncultivated grasslands, securing food resources. This defines the species as a typical representative of farmland birds, whose main foraging and breeding habitats in Bulgaria fall into two main types of ecosystems - agroecosystems and grassland ecosystems, and its breeding habitats cover urban ecosystems. The aim of the present study is to assess the potential ecosystem services provide by Lesser Kestrel after recovering the species as a breeder in Bulgaria by Green Balkans NGO. MAES Ecosystem classification and data from the largest colony of the species in the country, located within SPA Sakar, part of the ecological network NATURA 2000 used. As a result, two major ecosystem services provided by the species: the provision of regulating ecosystem services by suppressing arthropods, reptiles and rodents populations and cultural ecosystem services through opportunities of ecotourism, environmental education, birdwatching were identify. Because of the critically endangered status of the Lesser Kestrel in Bulgaria, the species further contributes to the protection of habitats and thus, to the ecosystem services they provide.

Key words*: agroecosystems, Falco naumanni, farmland birds, grassland, NATURA 2000*

ALTERNATIVE INGREDIENTS CHARACTERISTICS ON TROUT FEED - KEYS OF AQUACULTURE SUSTAINABILITY

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Abstract

Using of new ingredients in trout feeding is a challenge for those involved in the fish farming sector. The study and introduction of non-conventional ingredients in trout feed comes from the increasingly acute need to ensure protection of the environment, and of the consumer. By ensuring food safety, the consumers' confidence in purchasing fish from aquaculture will increase, at the expense of captured fish from the natural environment. In this context, a bibliographic study was carried out on new ingredient sources that can be used in trout feed. It was followed the classification of the new ingredients according to their origin (vegetable/animal), the establishment of the provenience areas, the physico-chemical and microbiological characteristics, and the effects of alternative ingredients use in trout feed. The study results can be used to improve the feed management strategy in aquaculture, in sustainable development goals and productivity increase context.

Key words*: aquafeed, emerging feed resource, environment, productivity, salmonid.*

THE INFLUENCE OF THE EXPOSURE TIME TO THE PREVENTIVE TREATMENTS OF THE PIKE-PERCH (*Sander lucioperca* L., 1758) EGGS, AGAINST FUNGAL INFECTION, DURING THE EMBRYONIC DEVELOPMENT PERIOD

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Abstract

Infection with Saprolegnia spp. is reported more and more frequently, becoming endemic in many aquaculture units, having a devastating impact on this sector, especially on embryonated eggs during the incubation period. This paper presents the way to prevent infection with Saprolegnia spp. by applying prophylactic treatments with formaldehyde to pike-perch eggs, during the embryonic development period. The experiments were carried out in triplicate, at SCDP Nucet, Romania, in 2022, at the artificial fish reproduction station. For prevention, formaldehyde solution was used, in a concentration of 1.7ml/l, the exposure time being different: in version V1 (control) of 10 minutes and in version V2 in which the exposure time was based on the respective water temperature 5, 10 and 15 minutes. The results were very good in the V2 variant with losses due to fungal infection of 4.8%, and good in the V1 variant (control) with losses of 14.6%.

Key words*: eggs, formaldehyde, fungal infection, pike-perch, Saprolegnia spp.*

FIRST DATA ON BATS OF CONSTANTINE (NORTH-EAST ALGERIA)

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Abstract

In a perspective of updating the observation maps of different species of Algerian bats, an inventory was carried out in the main types of habitats and certain underground lodgings in Constantine and its provinces. Bats were studied by acoustic surveys and exploration of roosts. The acoustic surveys have confirmed the presence of 7 species, namely; Tadarida teniotis, Miniopterus schreibersii, Eptesicus isabellinus, Pipistrellus kuhlii, P. pipistrellus, Hypsugo savii and Myotis capaccinii where Kuhl`s Pipistrelle is the most active species and the most frequent. Prospecting roosts allowed to add 4 other species: Rhinolophus ferrumequinum, R. hipposideros, Myotis punicus and Plecotus gaisleri. This list of chiroptera includes 3 species placed on the IUCN red list. It is imperative to study their ecological preferences for better conservation management of this group of taxa.

Key words*: Chiroptera , acoustics , inventory , conservation , northeastern Algeria.*

URBAN ICHTYOFAUNA: BECAȘ RIVER CASE STUDY, CLUJ-NAPOCA (TRANSYLVANIA)

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Abstract

The monitoring of ichthyofauna from rivers and rivulets crossing urban areas is important in the context of preserving ecosystems under continuous anthropic pressures. In addition, new invasive species may be observed. This study aims to present current data on the ichthyofauna of Becaș River, which has its entire course in Cluj-Napoca, Romania. For this purpose, alpha diversity, LWRs, Fulton condition factor (K) and relative condition factor (Kn) were determined. In total, 1216 specimens were analyzed, classified into 13 species, from 8 families. The species with the highest abundance was Pseudorasbora parva (46.46%), and the species with the lowest abundance were Cyprinus carpio and Perca fluviatilis (0.16%). Regarding LWRs, the lowest value of the b coefficient was obtained for Rutilus rutilus (2.7651) and the highest value for Phoxinus phoxinus (4.0868). The highest value of K was obtained for C. carpio (1.815) and the lowest value for Cobitis elongatoides (0.5942). The Kn was between 0.5436 (Gobio carpathicus) and 1.0330 (C. elongatoides).

Key words*: anthropization, aquatic ecosystem, Cyprinidae, invasive species.*

HEAVY METALS CONTAMINATION IN THE ROMANIAN AQUATIC ENVIRONMENT: A REVIEW

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Abstract

Due to extensive anthropogenic activities such as mining, agricultural processes, and disposal of industrial waste materials, the concentration of heavy metals found in the aquatic environment of Romania has increased to dangerous levels nowadays. Heavy metals found in water bodies include nickel, chromium, lead, zinc, arsenic, cadmium, selenium, and uranium. Some of them are potentially toxic and are transferred to the surrounding environment through different pathways. Heavy metal toxicity has proven to be a major threat and there are several health risks associated with it. The toxic effects of these metals remain harmful to the flora, fauna, and also throughout the food chain for the human body. In this review, heavy metal pollution in water bodies across all regions of Romania has been evaluated.

Key words*: pollution, mining, heavy metals.*

MAIN CAUSE FOR ADMITTANCE OF WHITE STORKS IN WILDLIFE REHABILITATION AND BREEDING CENTRE IN BULGARIA

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Abstract

The White Stork (Ciconia ciconia) is one of the only two taxa representatives of the Family Ciconiidae (Storks) that nest in Bulgaria. The species is protected both on the territory of the country and the EU, and is included in the subject and conservation objectives of many SPAs in the country, part of the European ecological network NATURA 2000. In this paper we present the number, etiology, condition and treatment outcome of over 2,900 specimens of the species accepted for treatment in the period 1999-2021. These are patients of the Green Balkans Wildlife Rescue Center in Stara Zagora, which is leading unit for ex-situ conservation of wildlife protected and rare bird species not only in the country but also on the Balkan Peninsula. The outcome of the treatment of all white storks is presented in 4 main categories - returned to nature, housed for aviary breeding, redirected to other ex situ structurers, as well as lethal outcome. We evaluated the influence of different etiological factors, age and season on the treatment outcome.

Key words*: ex situ conservation, protected and rare birds, wildlife.*

GASTROPODS: ALTERNATIVE PROTEIN SOURCE IN FISH FEEDS - SHORT REVIEW

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Abstract

The present review analyses research done on the use of gastropods (class Gastropoda) in aquaculture fish feeds. Gastropods, especially water dwelling species, represent a natural food source for fish. Species from the Gastropoda class are used in aquaculture feeds as a valuable source of nutrition in fish rearing, especially as a protein source to replace fishmeal, for which a replacement is continuously sought after, due the unsustainability of the fishmeal industry and the impact of this industry on the aquatic ecosystems that stand at the basis of fishmeal production. Research on the nutritional value of gastropods, processing methods and efficiency in aquaculture feeds is presented in this review. The use as an alternative protein source is closely analysed.

Key words*: aquaculture, fish nutrition, Gastropoda, protein meal.*

ESTIMATION OF GROWTH AND MORTALITY OF SOME COMMERCIAL FISHES FROM THE DANUBE DELTA

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Abstract

Common carp and Prussian carp are two of the main exploited freshwater fish from the Danube Delta, that`s why obtaining information regarding the stock assessment has great importance for population structure. Our study aimed to investigate the parameters of growth and mortality among these populations. From the result of our study, the correlation between length and weight was W = 0.04×Lt2.70 for common carp and W = 0.10×Lt2.47 for Prussian carp. The calculated parameters for mortality were: total mortality (Z) was 1.74 for Common carp and 2.29 for Prussian carp, the natural (M) was 0.82 for Common carp, respectively 1.03 for Prussian carp, while the rate of exploitation reached a value of 0.53 for common carp and 0.55 for Prussian carp.

Key words*: von Bertalanffy's equation, Length-Weight ratio, inland fishing, freshwater fish.*

ASSESSMENT OF GROWTH AND MORTALITY PARAMETERS OF *Alosa immaculata,* Bennet, 1835 FROM THE DANUBE DELTA

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Abstract

The aim of this study is to calculate the growth and mortality rates of Alosa immaculata, an important species whose population is in decline. Sampling was realized every month, from March to June 2022 from Sulina Branch Mm 34-18. Each of the specimens that were captured was weighed and measured individually, with weights ranging from 150 to 450 grams and total lengths ranging from 25 to 39 centimeters. The ELEFAN program from FiSAT II was utilized to determine the parameters for the von Bertalanffy growth function, resulting in the values of $L\infty = 36.75$ *cm and* $k = 0.66\ yr^{-1}$*. Using the linear regression analysis, the length-weight ratios were predicted based on log-transformed data using the equation* $W = a \times L^b$*. The mathematical relationship between the length and weight for the Pontic shad was:* $W=0.0904 \times Lt^{2.3198}$*. The population of Pontic shad experienced high mortality rates, with a total mortality estimate at 1.83 and a natural mortality rate of 0.87. In addition, the calculated exploitation rate for the Pontic shad population exceeded the optimal value of 0.5, indicating slight overexploitation of the population.*

Key words*: inland fishing, Length-Weight relationship, migratory fish, von Bertalanffy's equation.*

THE GROWTH AND DEVELOPMENT OF KALE AND ARUGULA IN AN AQUAPONIC SYSTEM

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Abstract

The objective of the current study was to determine the effect of two fish stocking densities on the growth performance, development, and antioxidant capacity of kale (Brassica oleracea L. var. acephala) and arugula (Eruca vesicaria ssp. sativa) in an aquaponic system with common carp (Cyprinus carpio). The aquaponics system consists of six rearing units for fish and twelve units for plants, purple light-led lamps for plants (36 W), biological and mechanical filters, and pumps for water recirculation. Two fish stocking densities were used: 3.5 kg×m^{-3} and 7 kg×m^{-3}, each replicated three times. For each treatment or fish stocking density, 15 kale seedlings (51 plants×m^{-2}) and 15 arugula seedlings (51 plants×m^{-2}) were planted. All treatments were done in triplicates. At the end of the trial, the fresh weight of the plants was measured, and the results showed that the stocking density of the common carp of 7 kg×m^{-3} resulted in higher production of kale and arugula by maintaining good water quality for the plant and fish.

Key words*: aquaponic, carp, plant production.*

THE USE OF CAROTENOIDS IN THE AQUACULTURE OF SALMONIDS: A REVIEW

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Abstract

This study aims to review the use of carotenoids in farming salmonid species, especially freshwater salmonids. Aquaculture is a rapidly growing sector, salmonids being one of the focuses of European aquaculture production. Salmonids present some advantages for farmers: they have a nutritional content of high quality, their organoleptic properties are appreciated by consumers, and the technology of farming is well known. However, farmers face new challenges, as consumers have easy access to information and are more considerate about the source and production of their food. Thus, animal welfare is an important factor in farming. Carotenoids are often used in aquaculture, providing some major benefits. They improve the health of fishes, they help the reproductive physiological processes, and they colour various tissues of the fish, an important element not only for ornamental purposes, but also for consumption purposes, where consumers often choose fish with pink, orange or red coloured flesh, considering it more appealing. Their effect on growth is debatable, with conflicting results. Therefore, carotenoids have become an important ingredient in salmonid feeds, both from a welfare and an economical perspective.

Key words*: β-carotene, pigment, rainbow trout, welfare.*

EFFECTS OF KOMBUCHA AND MILK KEFIR DIETARY SUPPLEMENTS ON THE MEAT BODY COMPOSITION OF SIBERIAN STURGEON (*Acipenser baerii*)

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Abstract

This paper aimed to evaluate the effect of a diet supplemented with fermented products on the meat quality of Siberian sturgeon (Acipenser baerii) reared in a recirculation aquaculture system. The fermented product was made by combining artisanal cultures of Kombucha and milk kefir granules grown up in sucrose, black tea, and bovine colostrum. Four experimental groups were established: V1 - a control group that received a commercial diet with 54% crude protein, and V2 to V4 groups, which received the same diet supplemented with 1 g/kg, 2 g/kg, and 3 g/kg of fermented product, respectively. After 35 days of diet administration, the biochemical composition of fresh meat was analysed. The results showed that the addition of fermented products significantly influenced the water, ash, and lipid content of A. baerii meat ($p < 0.05$), while the protein content was not influenced ($p > 0.05$) by the administrated diet.

Key words*: sturgeons, bioactive fermented products, meat composition.*

Anurans (*Amphibia*) - VECTORS OF THE PARASITIC AGENTS TO WILD AND DOMESTIC ANIMALS IN MOLDOVA

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Abstract:

In this scientific work are exposed data with reference to the description of the diversity of the helminthic fauna of ecaudata amphibians from Ranidae and Bufonidae families, and the determination of its role as vectors for various groups of helminths to wild and domestic animals. As result of helminthological investigations during 2020-2022 years, 17 helminths species (secernentea, trematoda, palaeacanthocephala) was established: H. variegatus Rudolphi, 1819; G. varsoviensis Sinitzin, 1905;C.urniger Rudolphi, 1819; P. robusta Szidat, 1928; P. brumpti Buttner, 1951; P. confusus Looss, 1894; T. excavata Rudolphi, 1803; D. subclavatus Pallas, 1760; O. ranae Froelich, 1791; S. falconis Szidat, 1928; H. cylindracea Zeder, 1800; P. medians Olsson, 1876, C. ornata Dujardin, 1845; O. filiformis Goeze, 1782; I. neglecta Diesing, 1851; S. lupi Rudolphi, 1809; A. ranae Schrank, 1788). Of the 17 helminth species detected in amphibians, a special importance is attributed to the presence of 4 species of medical-veterinary importance helminths (Spirocerca lupi, Codonocephalus urniger, Parastrigea robusta, Strigea falconis), which can cause sterility, parastrigeosis and strigeosis in birds, as well as spirocercosis in dogs, foxes, wolves and occasionally in goat, horse, cattle and other.

Key words*: anurans, Moldova, parasitic agents, vectors, wild and domestic animals.*

EVALUATION OF THE HAEMATOLOGICAL PROFILE AND BIOCHEMICAL INDICES IN THE BLOOD OF COMMON CARP (*Cyprinus carpio*), AS RESPONSE TO SUPPLEMENTING THEIR DIET WITH PHYTOGENIC COMPOUNDS

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Abstract

The aim of this study was to evaluate the impact of different phytogenic compounds on the haematological profile and biochemical indices of carp, reared in a recirculating pilot aquaculture system. The experiment was conducted for 52 days. A basic feed, Aqua Classic type, with 46% protein and 22% lipid, was used. 5 g of different phytogenic compounds were added to form the experimental diets, as follows: V1-control, V2 – 0.5% licorice (Glycyrrhiza glabra), V3 – 0.5% echinacea (Echinacea purpurea) and V4 – 0.5% wild thyme (Thymus serpyllum). At the end of the experiment, blood samples were taken to evaluate the haematological and blood biochemical parameters. The mean values for Ht, Hb, RBC and WBC were higher in the experimental variants than in the control. Serum protein was significantly lower ($p<0.05$) in variants V2 and V3 compared to the control. The serum glucose values registered significant differences between the control and the 3 experimental variants. In conclusion, the addition of phytogenic compounds in the diet has beneficial effects on the haematological and blood biochemical profile of carp (Cyprinus carpio).

Key words*: aquaculture, carp, haematological profile, phytogenic.*

THE INFLUENCE OF REARING CONDITIONS ON GROWTH, MEAT QUALITY AND MORTALITY OF *Acipenser ruthenus*

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Abstract

To evaluate the growth of sterlet sturgeon (Acipenser ruthenus, Linnaeus 1758) in different rearing production systems (recirculating aquaculture system - RAS and earthen ponds system), the meat quality (biochemical profile), growth (allometric and Fulton coefficient) and mortality indices were determined. Sterlet sturgeon specimen were reared for 60 days in a RAS system, after which half of the biological material was transferred into earthen ponds, while the other half was further reared in the RAS system. The physico-chemical parameters of the technological water were monitored during the experimental period. The fish specimens were fed by using the same feed and the same feeding strategy. It was observed that the specimen reared in earthen ponds presented an isometric growth, while those reared in the RAS system had a positive allometric growth. The results registered after biochemical fish meat analysis highlighted that specimen reared in earthen ponds had a higher protein concentration compared to the ones reared in RAS system. As well, the survival rate of fish individuals was higher in the earthen ponds system.

Key words*: allometry, aquaculture systems, Fulton, meat biochemistry.*

SIGNS OF THE PRESENCE OF THE EURASIAN BEAVER (*Castor fiber* Linnaeus, 1758) IN THE PRE-DELTAIC AREA OF ROMANIA

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Abstract

Romania belongs to the historical distribution area of the Eurasian beaver. The European beaver is nicknamed the "engineer of ecosystems" for the ingenuity through which it builds a mosaic of habitats where it retains water and expands wetlands, so necessary in the current conditions of climate change. Moreover, this herbivorous species has a long-term impact on the environment in which it lives, enriching the biodiversity of these habitats. The purpose of this manuscript is to update the information about the beaver populations in the pre-deltaic area of Romania. The information was collected during period 2019-2022, when we effectuated researches in weekly in the dig-mal flood zone of the Danube River, between Grindu locality and Tulcea city and in the area of the Somova-Parches aquatic complex. Our studies were carried out based on the method of signs of presence, a methodology also approved by the IUCN working group. The discovery of new territories occupied by the Eurasian beaver demonstrates that the beaver population in Danube's avandelta has expanded since it was reported in 2010 by occupying favourable habitats.

Key words*: Eurasian beaver, Danube's avandelta, presence.*

THE IMPACT OF ENVIRONMENTAL FACTORS ON THE METABOLIC RATE IN FISH: INTEGRATION OF EXISTING DATA

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Abstract

Many studies in animal physiology concern the impact of physiological, morphological or environmental factors such as mass, temperature or chemical pollutants on metabolic rate. Metabolic rates vary hugely within and between populations, yet we know relatively little about factors causing intraspecific variation. A number of interactions exist between the control of feeding and the control of metabolism. Both oxygen and temperature are fundamental factors determining metabolic performance, fitness, ecological niches, and responses of many aquatic organisms to climate change. Water temperature is one of the most important environmental variables influencing metabolic rates of ectotherms. The effect of water temperature on fish metabolic rates has been widely studied. However, other environmental factors (such as oxygen, salinity) are also potent determinants of the fish metabolic state. This review aims to integrate the currently existing data regarding the influence of environmental factors on metabolic rate in fish.

Key words*: impact, fish, metabolic rate, environmental factors.*

UPDATED OVERVIEW OF MARINE FISH BIODIVERSITY: SCIENTIFIC SUPPORT FOR AN ECOSYSTEM-BASED MANAGEMENT OF THE DANUBE DELTA BIOSPHERE RESERVE

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Abstract

Fish biodiversity is a key indicator of the health of a waterbody and the structure and function of fish communities are considered good indicators of the ecological status of marine ecosystems. Therefore, the long-term assessment and the development of predictions regarding the size and productive capacity of fish populations are necessary, aiming at ensuring an ecosystem-based management of living resources. In the frame of the revision of the Danube Delta Biosphere Reserve Management Plan, an updated evaluation of fish species present in the marine zone (ROSCI0066) was performed. The scientific fishing (by survey trawling and gillnetting) revealed a rich ichthyofauna: 32 taxa, belonging to 21 families were identified. The species array is diverse, including both economically important fish (turbot, shads, anchovy, sprat) and species of high conservative interest (sturgeons), emphasizing the crucial importance of this area as feeding and spawning ground of Black Sea ichthyofauna.

Key words*: assessment, Danube Delta - Marine Zone, ecosystem-based management, fish biodiversity.*

ADAPTIVE RESPONSE OF CARP TO AQUATIC ENVIRONMENT CHANGES: A CASE STUDY

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Abstract

As part of a larger study, the present work highlights the way fish specimens affect the parameters of the aquatic environment, which is essential in fish farming. Six common carp (Cyprinus carpio) were subjected to an experiment where they were transferred to new aquatic environments, while two specimens remained in the water of origin. Each individual modified the initial values of the aquatic environments by balancing them to create a framework conducive to their survival. During the experiment, no feeding methods were applied, and the individuals' intervention on the water was strictly observed. The results demonstrated the high degree of adaptability of the species, but there was also an early case of fatality, which was justified. The intervention of the individuals was highlighted by the value of the parameter PO_4, which exceeded the recommended value in aquaculture. However, the value was identical when each individual was removed from the experimental module.

Key words*: aquatic environment, Cyprinus carpio, freshwater aquaculture, transfer.*

THE ROLE OF AMPHIBIANS IN MAINTAINING PARASITIC ZOONOSES (TREMATODOSIS) IN FISH IN THE REPUBLIC OF MOLDOVA

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Abstract:

The paper presents data on the identification of the helminth fauna structure of ecaudata amphibians from Pelophylax and Bufo genera, and the determination of its role in maintaining parasitic zoonoses (trematodosis) in fish in the Republic of Moldova. As result of helminthological investigations 4 *helminths species* was established*: Opisthioglyphe ranae Froelich, 1791; Tylodelphys excavata Rudolphi, 1803; Isthmiophora melis Shranch, 1788 and Neodiplostomum major Dubinina, 1950. This trematode species from a taxonomic point of view fall into a class (Trematoda), 3 orders (Plagiorchiida, Echisnostomida, Diplostomida), 3 families (Omphalometridae, Echinostomatidae, Diplostomidae) and 4 genera (Opisthioglyphe, Tylodelphys, Isthmiophora, Neodiplostomum). All this species of helminths comune in amphibians and fish, species of trematodes, for the fish are a negative impact, because causing various zoonosis. The need to write such a paper is due to the fact that the study of ichthyoparasites in the Republic of Moldova was carried for a long period of time (since 1963), but at the same time there was no discussion about the groups of organisms that contribute to the maintenance of the causative parasitic agents of various trematodes.*

Key words*: amphibians, fish, Moldova, parasitic zoonosis.*

FIRST RECORD OF *Gambusia holbrooki* (EASTERN MOSQUITOFISH), AN INVASIVE FISH IN THE TUZLA LAKE, ROMANIA

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Abstract

The current study reveals the first record of Gambusia holbrooki (eastern mosquitofish), an invasive fish in the Tuzla Lake, Romania. The investigated area is located 150 m from the shore of the Black Sea and is adjacent to Lake Techirghiol. The formation of the lake occurred due to human factors and was favored by natural factors. During the field campaigns carried out by NIRD GeoEcoMar in Lake Tuzla, in October 2022, a series of measurements and samples collection were carried out. The individuals of Gambusia holbrooki were found in the samples collected with the limnological net. The main objective of this contribution is the presentation of the first occurrence of the invasive species of eastern mosquitofish in Tuzla Lake. It is recognized as "a superior invader" due to the "invasiveness" characteristics of the species. It is important to monitor this species in Tuzla Lake to observe the impact on the rest of the fish populations, considering that this lake is used as a fish farm.

Key words*: invasive fish, littoral lake, freshwater, eastern mosquitofish.*

THE REDISCOVERY OF *Lycaena helle* (Lepidoptera: Lycaenidae) IN DORNA DEPRESSION (ROMANIA), 125 YEARS AFTER ITS FIRST MENTION

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Abstract

At present, the known populations of Lycaena helle from Romania are found at a lower altitude than those from Western and Central Europe. Besides land-use changes, climate warming severely threatens this specie that prefer humid and cool habitats. Withdrawal to higher altitudes is also restricted by the species' low dispersal ability. Therefore, the future of the Romanian population is uncertain. While implementing a peatlands restoration project in the northeastern part of the country, we investigated the local invertebrate fauna around a bog woodland from Dornelor Depression (Suceava County). Here we found a mosaic of wet habitats sheltering a violet copper population. This population was mentioned long ago, representing the first recorded instance of this species in present-day Romania. The violet copper butterfly has not been spotted in the area since the initial record was published in 1897, and current literature only refers to it as historical data from the Dorna Depression. We describe the habitat occupied by this population, bring up to date the specie's distribution, and prompt for the designation of a special area of conservation for this European protected species.

Key words*: Lycaena helle, Bistorta officinalis, protected species, Romania.*

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