
The 3rd International Electronic Conference on Animals

12–14 March 2025 | Online



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Welcome from the Chairs

Dear Colleagues,

It is with great enthusiasm that we announce the **3rd International Electronic Conference on Animals (IECA 2025)**. The conference is organized by the MDPI open access journal *Animals* (ISSN: **2076-2615**; Impact Factor: 2.7) and will be held **online** from **12th to 14th March 2025**.

On behalf of the Conference Chairs for IECA 2025, I invite you to participate in this important meeting. Animals face unprecedented challenges worldwide, including declining genetic diversity, climate change, pollution, and intensive production systems, to name but a few. The main topics and sessions of the conference are as follows:

- A. Sustainable animal nutrition;
- B. Animal genetics and genomics;
- C. Sustainable animal physiology and reproduction;
- D. Environmental challenges to animals and precision livestock farming;
- E. Sustainable animal welfare, ethics and human–animal interactions;
- F. Sustainability of products derived from animals;
- G. One health: improve disease manifestation and management in animals, humans, and the environment.

With the free publication of abstracts and proceedings papers, and awards for the best contributions, this conference represents a unique opportunity for animal scientists around the world to share their latest research, communicate with each other, solve problems, and suggest alternative options for a better future. As well as the energetic and dynamic nature of virtual international conferences, another advantage is that you do not need to travel to attend. You can take advantage of this opportunity from wherever you live.

All the accepted abstracts will be available online on Sciforum.net during and after the conference.

Please join in the discussion about how we can care for the planet's animal heritage better. You cannot afford to miss this conference!

Kind regards,

Conference Chairs
Prof. Dr. Clive J. C. Phillips
Prof. Dr. Colin G. Scanes
Prof. Dr. Michael Hässig



Prof. Dr. Clive J. C. Phillips
Conference Chair

Institute of Veterinary Medicine
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animals

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- **Open Access**— free for readers, with article processing charges (APC) paid by authors or their institutions.
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- **Journal Rank**: JCR - Q1 (Veterinary Sciences) / CiteScore - Q1 (General Veterinary)
- **Rapid Publication**: manuscripts are peer-reviewed and a first decision is provided to authors approximately 16.1 days after submission; acceptance to publication is undertaken in 2.5 days (median values for papers published in this journal in the second half of 2024).
- **Recognition of Reviewers**: reviewers who provide timely, thorough peer-review reports receive vouchers entitling them to a discount on the APC of their next publication in any MDPI journal, in appreciation of the work done.
- **Companion journals for *Animals* include: *Birds*, *Ruminants* and *Zoonotic Diseases*.**

Impact Factor: 2.7 (2023); 5-Year Impact Factor: 3.0 (2023)

Keynote Speakers



Professor Ana Rita Cabrita

Associated Laboratory for Green Chemistry (LAQV), Network of Chemistry and Technology (REQUIMTE), Department of Veterinary Clinics, School of Medicine and Biomedical Sciences (ICBAS), University of Porto, Porto, Portugal



Dr. Nucharin Songsasen

Center for Species Survival, Smithsonian Conservation Biology Institute, Front Royal, USA



Dr. Jacques Cabaret

UMR Infectiologie et Santé Publique, INRAE & SantéSocioVéto, Paris, France

Invited Speakers



Dr. Marcello Mezzasalma

Department of Biology,
Ecology and Earth Science,
University of Calabria,
University of Calabria,
Arcavacata, Italy



Dr. Mónica Lopes-Marques

CIIMAR/CIMAR—
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Marine and Environmental
Research, University of Porto,
Porto, Portugal



Dr. Arianna Manunza

Università Cattolica del Sacro
Cuore via Emilia Parmense 84,
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Biology and Biotechnology,
National Research Council,
Milan, Italy



Dr. Robert K. Browne

Sustainability America, Belize



Prof. Dr. Thomas Banhazi

University of Southern
Queensland, Toowoomba,
Australia



Professor Alberto Finzi

Università degli Studi di Milano,
Milan, Italy



**Dr. Mullakkalparambil
Velayudhan Silpa**

Rajiv Gandhi Institute of
Veterinary Education and
Research, Puducherry, India



Dr. Zoltan M. Varga

Zebrafish International
Resource Center, University of
Oregon, Eugene, USA



Dr. Linas Balčiauskas

Laboratory of Mammalian
Ecology, Nature Research
Centre, Vilnius, Lithuania



Dr. Silvia Prezioso

School of Biosciences and
Veterinary Medicine, University
of Camerino, Camerino, Italy

Program at a Glance

12th Morning	13th Morning	14th Morning
Session A. Sustainable animal nutrition	Session C. Sustainable animal physiology and reproduction Session F. Sustainability of products derived from animals	Session G. One health: Improve Disease Manifestation and Management in Animals, Humans, and the Environment
12th Afternoon	13th Afternoon	14th Afternoon
Session B. Animal genetics and genomics	Session D. Environmental challenges to animals and precision livestock farming	Session E. Sustainable animal welfare, ethics and human-animal interactions

IECA 2025 Program

12th March 2025 (Wednesday)

Session A. Sustainable animal nutrition

Time: 9:00 (CET, Basel) | 03:00 (EDT, New York) | 16:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
09:00-09:15	Prof. Dr. Clive J. C. Phillips Event Chair Prof. Dr. Michael Hässig Co-chair	<i>Opening Speech</i>
09:15-09:25	Dr. Elisabete Matos Session Chair	<i>Welcome from the session chair</i>
09:25-09:55	Prof. Ana Rita Cabrita Keynote Speaker	New Functional Protein Sources for Dog Foods: A Sustainable Approach
9:55-10:10	Qiujin Liu Selected Oral Speaker	Effects of the partial substitution of whole plant corn silage co-fermented with bacteria and enzymes on growth performance, slaughter performance and serum parameters in Taizhou geese
10:10-10:25	Marina Gálvez López Selected Oral Speaker	Including up to 15% pomegranate by-product in the diet does not affect physiological parameters in dairy goats
10:25-10:40	Reda El Boukhari Selected Oral Speaker	The Innovative Use of Lamiaceae Extracts in Animal Feeding- Stuffs and Nutritional Supplementations: A Patent-Based Analysis
10:40-10:55	Patricia Cavaleiro Diogo Selected Oral Speaker	New VitaBloom® products range: microalgae combined with probiotics for green water, rotifers nutrition and live feed enrichment
10:55-11:10	Marco Tulio Santos Siqueira Selected Oral Speaker	Effect of totally extruded diets with different roughage:concentrate ratios on the body performance of lambs
11:10-11:25	Karla Alves Oliveira Selected Oral Speaker	Energy metabolites and glycemic curve of sheep fed with different fiber levels in extruded roughage
11:25-11:40	Juan Sebastián Vittone Selected Oral Speaker	Performance of steers with finishing diets with r-zeta® additive to regulate intake
11:40-11:55	Aldo Fraijo-Valenzuela Selected Oral Speaker	Effect of cricket meal on transcriptional response of immune related genes of blue Tilapia (<i>Oreochromis aureus</i>)
11:55-14:00	Break	

12th March 2025 (Wednesday)

Session B. Animal genetics and genomics

Time: 14:00 (CET, Basel) | 08:00 (EDT, New York) | 21:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
14:00–14:10	Prof. Zissis Mamuris Session Chair	<i>Welcome from the session chair</i>
14:10-14:30	Dr. Marcello Mezzasalma Invited speaker	Chromosome diversification and karyotype evolution in squamate reptiles
14:30-14:50	Dr. Mónica Lopes-Marques Invited speaker	De Novo Variants and Gene Loss in Animals: Unconventional Models for Insights into Genetic Disease
14:50-15:10	Dr. Arianna Manunza Invited Speaker	Correlation Between Livestock Domestication and Human Migration Routes
15:10-15:25	Maria-Anna Kyrgiafini Selected Oral Speaker	Genetic Insights into Thermotolerance: Identifying miRNA Variants Linked to Heat Stress Resilience in Dairy Cows
15:25-15:40	Chiraz Ziadi Selected Oral Speaker	Genetic evaluation with major gene in the Tunisian Barbarine Sheep
15:40-15:55	Sabah Ahmed Abdelmaged Mohammed Selected Oral Speaker	Interspersed repeated elements analysis of Camelus dromedarius lactoferrin gene
15:55-16:10	Telma Esteves Selected Oral Speaker	Effects of the polycyclic aromatic hydrocarbon benzo[k]fluoranthene at two temperatures in 3D-cultured rainbow trout RTL-W1 cells
16:10-16:25	Carlos Arbizu Selected Oral Speaker	Genomic profiling of production traits of the Arequipa fighting cattle in Peru
16:25-16:40	Chiraz Ziadi Selected Oral Speaker	SNP-Based heritability of morphological traits in the Pura Raza Español Horse

13th March 2025 (Thursday)

Session C. Sustainable animal physiology and reproduction

Session F. Sustainability of products derived from animals

Time: 9:00 (CET, Basel) | 03:00 (EDT, New York) | 16:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
9:00–9:10	Dr. Claudia Giannetto Session Chair	<i>Welcome from the session chair</i>

9:10–9:40	Dr. Nucharin Songsasen Keynote speaker	Roles of Reproductive Sciences in Species Conservation
9:40–10:00	Dr. Robert K. Browne Invited speaker	Reproductive and Advanced Biotechnologies, Intergenerational Justice, and Humanities Future
10:00–10:15	Godswill Arinzechukwu Iwuchukwu Selected Oral Speaker	Effect of Light Color during Incubation on Post-hatch Serotonin and Corticosterone Concentration in Gerze Turkish Indigenous Chickens
10:15–10:30	Tariq Sohail Selected Oral Speaker	Single Prostaglandin F _{2α} Injection in Barbari Goats: Ovarian Dynamics and Alterations in the Relationship of Estradiol-17β and Progesterone with Standing Estrus, Preovulatory Follicles, and Ovulation
10:30–10:45	Huan Yang Selected Oral Speaker	Modelling of Mechanistic Systems to Predict and Monitor Animal Health and Production: Case Study of Laying Hens
10:45–10:55	Prof. Dr. Clive J. C. Phillips Event Chair	<i>Welcome from the conference chair</i>
10:55–11:10	Dilek GÖKÇEK Selected Oral Speaker	Gender Effect on Carcass and Meat Quality Characteristics in Gerze Native Chickens
11:10–11:25	Clara Naccari Selected Oral Speaker	Study of toxic and essential metals in honey apiculture and consumers safety
11:25–11:40	Anna Kasprzyk Selected Oral Speaker	Meat quality of red deer (<i>Cervus elaphus</i>) farmed in the organic system
11:40–14:00	Break	

13th March 2025 (Thursday)

Session D. Environmental challenges to animals and precision livestock farming

Time: 14:00 (CET, Basel) 08:00 (EDT, New York) 21:00 (CST Asia, Beijing)		
Time in CET	Speaker	Title
14:00–14:10	Dr. Andrea Pezzuolo Session Chair	<i>Welcome from the session chair</i>
14:10–14:30	Prof. Dr. Thomas Banhazi Invited speaker	The utilisation of smart PLF technologies on commercial livestock farms to record environmental and other relevant parameters for improved management options
14:30–14:50	Prof. Alberto Finzi Invited speaker	Daily trends of emissions and air quality in pig houses with different floor types
14:50–15:10	Dr. Mullakkalparambil Velayudhan Silpa Invited speaker	Skin based NGS approaches to assess climate resilience in goats
15:10–15:25	Chiraz Ziadi Selected Oral Speaker	Comparison of mathematical functions in modelling lactation curves based on automatic milking system records in the Spanish Florida dairy goat
15:25–15:40	Amira A. Goma Selected Oral Speaker	Climate Resilience in Livestock Farming: Egypt Model
15:40–15:55	Karolini de Sousa Selected Oral Speaker	Daily Mean Temperature Humidity Index drives water intake but not visits or duration at water-trough in beef cattle
15:55–16:10	Isis Oliveira Selected Oral Speaker	A neural network to identify the usage of mechanical brushes by dairy cows
16:10–16:25	Andreea Mădălina Ciucă Selected Oral Speaker	Microplastics contamination in European anchovy (<i>Engraulis encrasicolus</i>) from the Romanian Black Sea coast—an emerging environmental threat

14th March 2025 (Friday)

Session G. One health: Improve Disease Manifestation and Management in Animals, Humans, and the Environment

Time: 9:00 (CET, Basel) | 03:00 (EDT, New York) | 16:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
09:00-09:10	Prof. Dr. Michael Hässig Session Chair	<i>Welcome from the session chair</i>
9:10-9:40	Dr. Jacques Cabaret Keynote Speaker	Parasites of animal, human and plants: A one health perspective evidenced by dictionary text analysis
9:40-10:00	Dr. Silvia Preziuso Invited speaker	The need for One Health approach for identification of emerging zoonoses: the case of Hepatitis E virus
10:00-10:15	Ethel Ukaegbu Selected Oral Speaker	Strengthening capacity for food surveillance of human pathogenic microsporidian spores on pig farms in Makeni, Sierra Leone
10:15-10:30	Antonio Peña-Fernández Selected Oral Speaker	First detection of human-associated microsporidia species in urban and suburban pigeons in the city of Leicester and surrounding areas, UK
10:30-10:45	Ishika Pal Selected Oral Speaker	Assessment of aquatic arthropod health in terms of heavy metal contamination: using <i>Macrobrachium lamarrei</i> as a representative
10:45-11:00	Farhan Jamil Selected Oral Speaker	Analysing aquatic invertebrate health in terms of Artificial Light at Night (ALAN)
11:00-11:15	Andreia Manuela Vieira Garces Selected Oral Speaker	Collateral Damage: Secondary Exposure to Anticoagulant Rodenticides in European Nocturnal Birds of Prey
11:15-11:30	Gianmarco Ferrara Selected Oral Speaker	Serological and molecular survey of Q fever in the dog population in southern Italy
11:30-11:45	Muhammad Hussain Ghazali Selected Oral Speaker	Mitigating the Impact of Lyme Disease on One Health: A Holistic Approach
11:45-14:00	Break	

14th March 2025 (Friday)

Session E. Sustainable animal welfare, ethics and human-animal interactions

Time: 14:00 (CET, Basel) | 08:00 (EDT, New York) | 21:00 (CST Asia, Beijing)

Time in CET	Speaker	Title
14:00-14:10	Prof. Dr. Colin G. Scanes Session Chair	<i>Welcome from the session chair</i>
14:10-14:30	Dr. Zoltan M. Varga Invited speaker	The overlap of the 3Rs of animal welfare and environmental sustainability using zebrafish as a laboratory biomedical species
14:30-14:50	Dr. Linas Balčiauskas Invited speaker	Two sides of roadkill
14:50-15:05	João Pedro Donadio da Silva Pereira Selected Oral Speaker	Rethinking environmental enrichment for dairy calves: improvements for basic biological needs?
15:05-15:20	Inês Laranjeira Selected Oral Speaker	Environmental enrichment, are we doing enough? A systematic review of protocols in rats and mice
15:20-15:35	Moutaz Alhamada Selected Oral Speaker	Development of a Comprehensive Evaluation Grid for Dairy Cow Welfare in Organic Farms
15:35-15:50	Hingryd Olmo Selected Oral Speaker	Gender effects in Brazilian livestock advisors' attitudes toward dairy cattle welfare and cow-calf contact
15:50-16:05	Gary Comstock Selected Oral Speaker	Imagining Other Species' Pains: Four Challenges

Session A. Sustainable animal nutrition

sciforum-109639: Advancing Animals' Nutrition: Sustainable feed ingredients for the future

Shashwat Pandey *, Preeti Yadav

School of Pharmaceutical Sciences Babasaheb Bhimrao Ambedkar University Lucknow, Uttar Pradesh, India

The global demand for animal protein is rising rapidly, driven by population growth and changing dietary preferences. Meeting this demand requires innovative strategies to improve animal nutrition while addressing environmental sustainability and resource efficiency challenges. Traditional feed ingredients such as soy and fishmeal are associated with environmental concerns, including deforestation and overfishing. As a result, there is a growing interest in alternative, sustainable feed ingredients to ensure future food security.

This review highlights advancements in sustainable feed ingredients, focusing on novel protein sources, functional additives, and innovative feed formulations. Insects, algae, and single-cell proteins have emerged as promising alternatives due to their high protein content, lower ecological footprint, and ability to utilize organic waste streams. Additionally, agricultural by-products such as rice bran, wheat middlings, and brewery waste are being repurposed into animal feed, reducing food waste and promoting circular economy principles.

The inclusion of functional feed additives such as probiotics, prebiotics, and phytogenics further enhances nutrient utilization and animal health, reducing the reliance on antibiotics and improving overall productivity. Advances in feed processing technologies, such as precision fermentation and enzymatic hydrolysis, have also improved these novel ingredients' digestibility and nutritional profile.

However, challenges remain in terms of scalability, regulatory acceptance, and consumer perceptions of alternative feed ingredients. This review explores these hurdles and emphasizes the need for interdisciplinary collaboration among researchers, policymakers, and industry stakeholders to overcome them.

Sustainable feed ingredients not only hold the potential to transform animal nutrition but also contribute significantly to reducing the environmental impact of livestock production. By embracing these advancements, the livestock industry can achieve a balance between productivity and sustainability, paving the way for a resilient and sustainable food system.



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sciforum-109453: Black soldier fly larvae meal: an alternative protein source for sheep feed

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Globally, growing demand for animal-based food could be met through livestock intensification. However, intensive systems raise concerns about animal welfare and limitations associated with the sustainability of input use. Insect meal shows great potential as a protein source for ruminants, particularly as a substitute for soybean expeller. This study investigates alternative, environmentally sustainable feed sources for sheep, with the aim of evaluating the effects of replacing soybean expeller with black soldier fly larvae (BSFL) meal on key indicators, including animal performance, ruminal fermentation profiles, and animal welfare during the fattening phase of Merino lambs. To this end, Merino lambs were fattened for 50 days with two diets: soybean expeller (S) and insect meal (IM). Animal performance was measured by individual body weight, body condition score, feed intake, average daily gain, and feed conversion ratio. Animal welfare was evaluated using hematological parameters as stress indicators, including glucose levels, cortisol levels, and total protein concentrations. At the end of the experiment, rumen fluid was sampled and analyzed. No significant differences between diets were found in productive performance, ruminal fermentation, or stress indicators of Merino lambs, suggesting that BSFL meal could be a viable and competitive alternative. These results highlight the potential of IM as a sustainable alternative feed ingredient for ruminants.



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sciforum-109550: Effect of cricket meal on transcriptional response of immune related genes of blue Tilapia (*Oreochromis aureus*)

Aldo Fraijo-Valenzuela ^{1,*}, Barbara Aboites-Martínez ², Joe Luis Arias-Moscoco ³, Ramón Casillas-Hernández ⁴, José Tadeo Salazar-Anduro ⁵, Libia Zulema Rodriguez-Anaya ⁶ and Jose Reyes Gonzalez-Galaviz ⁶

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The rapid growth of aquaculture and the shortage of fishmeal has increased the demand for quality and cost-effective protein sources for aquafeeds. Recently, cricket meal (*Acheta domesticus*) has gained interest due to its high protein content, cheap production costs and lower environmental impacts than conventional protein sources. Worldwide, Tilapia (*Oreochromis aureus*) is one the most commercially important species produced by aquaculture, yet the increasing costs of feed and diseases endanger its sustainability. Therefore, the aim of this research was to evaluate the effects of replacing fishmeal with cricket meal (0, 20, 40, 60 and 80%) on the final weight, survival and the expression of interleukin 1 β (IL-1 β), interleukin 8 (IL-8), tumor necrosis factor (TNF), and immunoglobulin G (IgM) of tilapia. For this purpose, 200 tilapia fingerlings (2.00 $\pm$ 0.9 g) were randomly distributed in 20 tanks (250 L each). Each diet was randomly divided into four replicates (10 tilapia per tank). Tilapia were fed to satiation with an initial ration of 0.3% of their biomass divided into 3 rations during the day (8:00, 12:00 and 16:00 h) for 10 weeks. At the end of the trial, blood samples were taken from 4 tilapias of each replica, pooled and treated with Trizol for RNA extraction. cDNA was synthesized using oligo dT and the IMPROM-II system. Transcriptional response was based on immune-related genes and β -actin as control. There were no differences in the final weight of tilapia fed the control and 20% diets. However, growth decreased significantly with increasing inclusion of cricket meal in the diets. Survival did not change among groups. Overall, the inclusion of 40-80% cricket meal increased the expression of all genes. In conclusion, cricket meal can replace fishmeal up to 20% without affecting growth, whereas increasing its inclusion improves immune related gene expression.



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sciforum-109758: Effect of totally extruded diets with different roughage:concentrate ratios on the body performance of lambs

Luana de Oliveira Faria ¹, Pedro Henrique Cavalcante Ribeiro ², Marco Túlio Santos Siqueira ^{2,*}, Karla Alves Oliveira ³, Lucas Eduardo Gonçalves Vilaça ⁴ and Gilberto de Lima Macedo ⁴

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Introduction: High-roughage diets limit nutrient intake and ruminant performance, however extrusion alters fiber stability and degradation. **Objective:** To evaluate the performance of lambs fed totally extruded diets with different roughage:concentrate (R:C) ratios. **Materials and Methods:** The experiment was conducted at the Small Ruminants Sector of the Universidade Federal de Uberlândia (UFU), Minas Gerais, Brazil. The experiment was conducted using twenty crossbred lambs ($\frac{1}{2}$ Dorper x $\frac{1}{2}$ Santa Inês), with body weight of 25.0 ± 2.28 kg and 120 ± 8 days old, allocated in collective pens (five animals per pen, each pen one treatment), distributed in a randomized design and fed *ad libitum* totally extruded diets with different R:C ratios (60:40, 50:50, 40:60, and 30:70), at 08:00 am and 4:00 pm, during 105 experimental days (15 days for adaptation and 90 days for collection). Body condition score (BCS) was determined by palpation of the 12th and 13th lumbar vertebrae to assess fat deposition, while body weight (BW) was used to calculate the average daily weight gain of the animals. Both assessments were recorded at 15-day intervals. Data were subjected to normality and homoscedasticity tests, followed by analysis of variance and regression analysis ($P \leq 0.05$). **Results:** The R:C ratio had no significant effect on BW (33.67 kg; $P=0.81$), BCS (3.15; $P=0.85$), or average daily gain (ADG) over the entire evaluation period (0-90 days; $169.77 \text{ g day}^{-1}$; $P=0.88$). However, significant differences in ADG were observed between treatments during specific periods: from 30 to 45 days ($P=0.01$; 153.33, 125.00, 241.66, and 325.33 g day^{-1} for R:C ratios of 30:70, 40:60, 50:50, and 60:40, respectively) and from 75 to 90 days (191.33, 168.33, 75.02, and 102.00 g day^{-1} for R:C ratios). **Conclusion:** The inclusion of up to 60% extruded roughage in fully extruded diets does not compromise the overall performance of lambs.



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sciforum-108426: Effects of the partial substitution of whole-plant corn silage co-fermented with bacteria and enzymes on the growth performance, slaughter performance and serum parameters in Taizhou geese

Qiujin Liu *, Junyi Yin, Changsheng Bai, Qiufeng Tian, Huan Wang, Jun Zhang, Yu Cao, Zhanmei Xue

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This feeding experiment was performed to determine the effect of gradually increasing substitution of compound feed with whole-plant corn silage co-fermented with bacteria and enzymes (WPCS-BE) on the growth performance, slaughter performance and serum parameters of geese. A total of 180 35 d old healthy female Taizhou geese were distributed into six groups and fed the compound feed (control group), and the experimental groups (groups I, II, III, IV and V) were fed diets in which the WPCS-BE replaced 10%, 20%, 30%, 40% and 50% of the compound feed for 49 days. The BW of the geese in group III was increased from 56 to 63 d of age. The ADG of groups II, III and IV was improved during the age of 42-70 d ($P < 0.05$). At 42-91 d of age, the ADFI and F/G increased significantly with the proportion of WPCS-BE in each experimental group. The geese in group IV had a higher slaughter yield than that of the other groups at 91 d of age ($P < 0.05$). At 70 d of age, the relative weight of the liver in group V and the relative weight of the gizzards of groups III, IV and V were significantly increased ($P < 0.05$). At 91 d of age, the relative weight of the liver in groups IV and V and the relative weight of the spleen of group III were significantly higher than those of the control group ($P < 0.05$). There were no significant differences in the concentration of albumin, alkaline phosphatase, blood urea nitrogen, glucose or total protein among all groups at 70 and 90 d of age ($P > 0.05$). Under these experimental conditions, it is recommended that the substitution level of WPCS-BE should be 20%-30%, which can improve the growth performance of Taizhou geese and has no negative effect on the slaughter performance or serum parameters.



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sciforum-109757: Energy metabolites and glycemic curve of sheep fed with different fiber levels in extruded roughage

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Objective: To evaluate the energy metabolites and the glycemic curve of sheep fed with corn silage or different fiber levels in extruded roughage. **Material and Methods:** The experiment was conducted at the Small Ruminants Sector of Federal University of Uberlândia, Minas Gerais, Brazil. Twenty Santa Inês were used, with body weight of 64 kg and 4 years old, allocated in metabolic cages. The animal was distributed in a randomized design and fed *ad libitum* with (1) corn silage, (2) extruded roughage Foragge® with 52.5% (including virginiamycin as an additive), and (3) 60%, (4) 65%, and (5) 70% Urochloa (no additives added) at 8:00 am and 4:00 pm, during five experimental period of 15 days (10 days of adaptation and 5 days of collection). Blood samples were collected before feeding by venipuncture of the jugular vein using Vacutainer® tubes on days 11, 13, and 15 of the experimental periods. The data were subjected to normality and homoscedasticity tests, followed by analysis of variance, contrast for (1) roughage source and (2) additive addition in extruded roughage, and regression for the levels of extruded roughage ($P \leq 0.05$). **Results:** There was no effect of roughage on cholesterol (57.7 mg dL^{-1} ; $P = 0.34$). However, the corn silage increased the triglyceride ($32.67 \text{ vs. } 16.81 \text{ mg dL}^{-1}$, $P=0.01$) and reduced the glucose ($49.00 \text{ vs. } 63.62 \text{ mg dL}^{-1}$; $P=0.03$) compared to the forage as a source of roughage. The additive and levels of extruded roughage (60; 65 and 70%) did not affect blood metabolites ($P > 0.05$). No significant differences were found between sampling times (08:00 am; 11:00 am; 02:00 pm; 05:00 pm e 08:00 pm; $59,78 \text{ mg dL}^{-1}$; $P=0.59$) or for the treatment vs. time interaction ($P=0.95$). **Conclusion:** The use of extruded forage results in higher triglyceride and glucose levels compared to corn silage, indicating a greater energy supply.



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sciforum-109593: Impact of a commercial additive for early weaning of calves without adaptation protocols

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In order to evaluate the additive r-zeta® (Zorion US LLC) included in pelleted feed to regulate intake, an experiment was carried out at INTA in Concepción del Uruguay with 48 British calves. They were weaned at 4.1 months of age and 110.6 kg LW and were distributed into four treatment groups (two repetitions/treatment, six calves/repetition): Control + hay: daily supply of pelletized feed + alfalfa hay (ratio: 80:20); Control: daily supply of pelletized feed; SF + hay: self-feeder with pelletized feed with r-zeta® additive + daily supply of alfalfa hay independently (20% of the estimated daily consumption); and SF: self-feeder with pelletized feed with r-zeta® additive. In all cases, the balanced pelletized feed was formulated to be an isoprotein and isoenergetic. The additive composition consists of specific flavorings for ruminants that regulate intake, products that minimize thermal stress, enzymes, microorganisms that modulate the microbiota, liver protectors and anti-inflammatories. In the control groups, 1% of the LW initial feed was offered, and the food supply was gradually increased until a remainder was obtained after 24 h. The weight of all animals was recorded at 7-day intervals to determine the ADG and the TKG. The dry matter intake (DMI) and feed conversion ratio (FCR) were estimated. The ADG was similar between treatments (1.2 kg/animal); however, the TKG was higher for the SF treatment compared to the Control + hay treatment (81.5 vs. 68.8 kg/animal, respectively). The calves presented similar daily intake, but the intake as a function of the LW (%) was lower in the Control group (2.9 vs. 3.2 % LW). The conversion was better in calves fed with SF compared to Control + hay and SF + hay (3.1 vs. 3.7 kg DM/kg LW). The inclusion of the r-zeta® additive in the pelletized feed allowed for the early weaning of calves without adaptation protocols or the use of hay.



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sciforum-109620: Including up to 15% pomegranate by-product in the diet does not affect physiological parameters in dairy goats

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This experiment aimed to study the effect of the inclusion of different proportions (0, 5, 10, and 15% dry matter) of ensiled pomegranate by-product in dairy goat diets on dry matter intake (DMI), water intake (WI), milk yield, and reference physiological parameters. A total of 80 goats were selected and divided into 8 groups of 10 animals each (4 treatments × 2 plots) with homogeneous physiological characteristics. After a pre-experimental blood and milk sampling, four additional milk samplings were taken fortnightly, and one more blood sample was collected at the end of the experiment. Milk yield (Lactocorder®, WMB AG, Switzerland), milk composition, and somatic cell count (SCC) (CombiFoss™7DC, Foss, Denmark) were analyzed. Hematological variables were evaluated using the ElementHT5 analyzer (SCILVET, Spain), and plasmatic metabolites were analyzed with the rapid diagnostic disk “Diagnóstico II” for ElementRC3X (SCILVET, Spain). Statistical analysis was performed using a mixed linear model (Proc. Glimmix, SAS v9.4), considering the covariate effect in pre-experimental sampling, treatment (4 levels), experimental sampling (4 levels), and their interaction (16 levels), with plots nested within treatments. For blood samples, only two levels of sampling were considered. The goat was considered the random effect. Regarding productive indices, the sampling and covariate were significant ($P < 0.05$). For DMI and WI, treatment and sampling were significant, while their interaction was only significant for DMI. Concerning physiological parameters, only sampling was significant but not biologically relevant. A decline in milk yield was observed, corrected when considering its composition (FPCM), along the experiment. DMI was lower in the highest inclusion treatment (15%). WI was inversely proportional to pomegranate inclusion. Feed efficiency had no significant effect on milk yield. SCC declined in the highest inclusion treatments (10% and 15%). No physiological parameters showed significant changes due to the new diet. Pomegranate silage can be included by up to 15% DM in dairy goats' diets short-term, although long-term experiments are needed. This study was supported by the Valencian Government (CIAICO/2021/301).



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sciforum-108865: New VitaBloom® product range: microalgae combined with probiotics for green water, rotifer nutrition, and live feed enrichment

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The development of microalgae products to solve larviculture challenges is essential to advance the fast-growing aquaculture sector. Combining different microalgae and probiotics is a powerful tool to improve animal nutrition and enhance biological performance, resilience to pathogens, and fish stress coping abilities. Products were used with a green water technique, rotifer cultivation, and live feed enrichment (rotifers and artemia). VitaBloom® Green Water (VGW) was applied to *Argyrosomus regius* larviculture until weaning, and compared to live *Nannochloropsis* sp. ($n=3$). Larvae at 19 days post fertilization (dpf) showed a significant reduction in skeletal malformations affecting phenotypes (24%) compared to the control (50%), displaying similar survival (20dpf). *Vibrionaceae* (TCBS) in water also decreased ($1.23\text{Log}_{10}\text{CFU/ml}$ vs. $1.93\text{Log}_{10}\text{CFU/ml}$). The stress-inducing challenge of transportation was carried out post-weaning. Larvae cultured with VGW revealed higher survival ($93.0\pm1.3\%$) compared with controls ($68.2\pm18.3\%$). Rotifers were batch cultured with VitaBloom® Rotifers+ (VR) or a commercial product (CP). VR showed a significantly reduced decantation ($0.16\pm0.03\text{cm}$) and agglomeration ($0.05\pm0.04\%$) compared to controls ($0.28\pm0.07\text{cm}$ and $0.5\pm0.4\%$, respectively), significantly improving rotifer growth rate ($266\pm16.7\%$) and amictic females ($28.8\pm7.5\%$) compared to the CP ($160\pm13.2\%$ and $23.3\pm9.8\%$, respectively). Rotifers and artemia were enriched with VitaBloom® Enrich (VE) or a CP for *Sparus aurata* larviculture until weaning ($n=4$). Although there were no significant differences, larvae fed with live feed enriched with VE revealed $18.7\pm7.3\%$ of larvae survival at weaning, while larvae fed with live feed enriched with the CP resulted in $15.5\pm7.7\%$ survival at weaning. The synergetic effect of the three VitaBloom® products was tested in *S. aurata* larviculture until weaning compared to larvae cultured with three CPs ($n=3$). Larvae fed with VitaBloom® showed higher survival at weaning ($11.0\pm2.3\%$) compared to controls ($6.6\pm5.0\%$). These innovative, sustainable, and efficient products are essential in improving larvae survival, which constrains the productivity and growth of the vital aquaculture industry.



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sciforum-109594: Performance of steers with finishing diets with r-zeta® additive to regulate intake

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The objective was to evaluate the performance of steers with different diet alternatives containing the r-zeta® additive (Zorion US LLC). A total of 54 Hereford steers (335.8 kg LW) were assigned to three treatments (two repetitions/treatments): 1) control: adaptation ration with a corn-based diet with protein concentrate (PC; 45% crude protein) and salt for intake control (78:15:7 ratio); 2) corn + PCt: self-feeder with whole corn grain and r-zeta® protein concentrate (80:20 ratio); and 3) PB_{r-zeta®}: self-feeder with pelletized balanced feed with the additive. The r-zeta® composition consists of flavorings for regulate intake, products that minimize thermal stress, enzymes, microorganisms that modulate the microbiota, liver protectors, and anti-inflammatories. Diets were formulated to be isonitrogenous and isoenergetic and were offered in self-feeders. The ADG, TKG, intake, and conversion were estimated. Indicators associated with thermal comfort were observed. The experiment ended at 70 days when the animals reached 430 kg LW and were sent to slaughter to estimate the carcass yield. In all groups, the ADG was similar (1.2 to 1.4 kg/animal/d). The intake in the control was higher (10.8 vs. 7.8 kg DM/animal/d); therefore, the conversion was also higher (8.0 vs. 5.1 to 6.0 kg DM/kg LW) compared to the groups with the additive. The control group presented a higher rate of respiration per minute compared to the corn + r-zeta® CP treatment (91 vs. 78 rpm) and also a higher frequency of panting. Carcass yield was similar between groups (58.5%; $p=0.7188$). In conclusion, animals can be fattened without adaptation protocols. The performance and thermal comfort improve with additive inclusion in finishing diets.



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sciforum-109756: Protein metabolites of sheep fed with corn silage or different fiber levels in extruded roughage

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Introduction: Different sources of roughage and nutritional strategies (additives and processing) can alter the metabolism of animals. **Objective:** To evaluate the protein metabolism of sheep fed with corn silage or different fiber levels in extruded roughage. **Material and Methods:** The experiment was conducted at the Small Ruminants Sector of Federal University of Uberlândia, Minas Gerais, Brazil. Twenty Santa Inês were used, with body weight of 64 kg and 4 years old, allocated in metabolic cages. The animal was distributed in a randomized design and fed *ad libitum* with (1) corn silage, (2) extruded roughage Foragge® with 52.5% (including virginiamycin as an additive), and (3) 60%, (4) 65%, and (5) 70% Urochloa (no additives added) at 8:00 am and 4:00 pm, during five experimental period of 15 days (10 days of adaptation and 5 days of collection). Blood samples were collected before feeding by venipuncture of the jugular vein using Vacutainer® tubes on days 11, 13, and 15 of the experimental periods. The data were subjected to normality and homoscedasticity tests, followed by analysis of variance, contrast for (1) roughage source and (2) additive addition in extruded roughage, and regression for the levels of extruded roughage ($P \leq 0.05$). **Results:** No effect of roughage on creatinine (0.82 mg dL^{-1} ; $P=0.52$) and total protein (5.54 g dL^{-1} ; $P=0.26$) was observed. However, there was a significant effect of roughage source on urea levels (26.06 vs. 35.87 mg dL^{-1} , silage and forages, respectively; $P=0.02$), albumin (3.07 vs. 3.51 g dL^{-1} ; $P=0.04$), and uric acid (0.29 vs. 0.13 mg dL^{-1} ; $P=0.01$). The additive and levels of extruded roughage (60; 65 and 70%) did not affect blood metabolites. **Conclusion:** The use of extruded roughage results in higher plasma urea, albumin, and uric acid levels compared to corn silage, indicating differences in protein metabolism between the two roughage sources.



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sciforum-110116: The Innovative Use of *Lamiaceae* Extracts in Animal Feeding-Stuffs and Nutritional Supplementation: A Patent-Based Analysis

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The use of medicinal and aromatic plants, particularly those from the *Lamiaceae* family, has gained remarkable attention in animal nutrition due to their bioactive compounds such as phenolics, terpenes, and flavonoids. These compounds offer multiple benefits, including antimicrobial, antioxidant, and growth-promoting properties, making them ideal candidates for incorporation into feeding products and nutritional supplements specially adapted for animals. This study presents a comprehensive patent analysis to investigate the innovation landscape surrounding feeding-stuffs formulated with *Lamiaceae* extracts. Patent data were collected from specialized databases and analyzed based on key International Patent Classification (IPC) codes: A23K (feeding-stuffs adapted for animals) and A61K36/53 (*Lamiaceae* family's plants). The analysis covered patent documents published between 1977 and 2024, including patent applications, granted patents, and other document types. The results reveal a steady increase in patenting activity, with significant peaks observed in 2008, 2018, and 2021, reflecting the growing interest in natural feed formulations. China emerged as the leading jurisdiction, followed by the United States and Japan. Major applicants, including Nestlé SA and Ralco Nutrition INC, demonstrated a strong focus on leveraging *Lamiaceae* extracts in animal nutrition. The technological fields identified through IPC classifications emphasized the role of *Lamiaceae* and its derivatives in advancing sustainable animal nutrition. This study highlights the innovation potential of *Lamiaceae*-based feeding-stuffs, underlining their importance in enhancing livestock health and productivity while contributing to eco-friendly agricultural practices. Future research should explore synergistic applications and field validations to optimize their usage in commercial animal nutrition.



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Session B. Animal genetics and genomics

sciforum-109724: Genetic evaluation with major gene in Tunisian Barbarine Sheep

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The objective of this work was to use the approximate probabilities computed by iterative peeling to include genotype information at the $FecX^{bar}/BMP15$ major gene in a prolific line of Barbarine sheep, of which a few animals were genotyped. This line is raised at the experimental station of the Tunisian National Institute for Agronomic Research (INRAT) and a selection program for prolificacy has been carried out since 1979. The $FecX^{bar}/BMP15$ mutation responsible for prolificacy and ovulation rate was identified, but this information is not considered in the actual selection program of this line. Data consisted of 2794 litter size (LS) records of 1014 females from 1989 to 2019 and 4372 animals in the pedigree. Probabilities for each possible Fec/X^{bar} genotype for animals with unknown genotypes were estimated based on iterative peeling equations using the Alphapeel software. Then, heritability (h^2) and estimated breeding values (EBVs) were calculated with two models: i) a classic model without genotype information, and ii) a model including the imputed genotypes as a fixed effect. All parameters were estimated using the Gibbs sampling methodology as implemented in the TM software, and LS was modeled as a discrete variable. h^2 was estimated as 0.14 for both models. The correlation between estimated breeding values in both models was 0.99. These results indicate that including $FecX^{bar}/BMP15$ has no impact on the genetic evaluation for this prolific line. Nevertheless, further work on genotyping a larger number of animals will be required.



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sciforum-109750: Analysis of beta-Casein variants in Brown Swiss cattle from northern Peru

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In Peru, dairy farming is a key industry, providing significant employment and contributing to the economy. In 2020, Peru produced over 2 million tons of fresh cow's milk, with a steady annual growth of around 5.77%. To date, an evaluation of the protein beta-Casein with its A1 and A2 variants has not been conducted in cattle populations from northern Peru. Here, we collected blood samples for DNA extraction from 100 female Brown Swiss individuals from the geographical department of Piura. A specific primer was used for DNA amplification for sequencing using the Sanger method. The results revealed a prevalence of A1 and A2 alleles in the local Brown Swiss population. A total of 16.13% had the A1A1 genotype, 44.09% had the A1/A2 genotype, and 39.78% had the A2/A2 genotype. This study also highlights the importance of improving milk quality and the role of A2 milk in responding to emerging health concerns. However, challenges such as socioeconomic barriers, a lack of knowledge, and insufficient technical support hinder the adoption of A2 milk production technologies. For long-term success, the involvement of farmers, consumer awareness, and support from the government, public institutions, and the private sector are necessary. The growing demand for A2 milk calls for strategic marketing, producer training, and the formation of business associations to boost competitiveness and meet market needs, while ensuring small producers are not negatively impacted by this shift. We hope this work stimulates a constant evaluation of cows in the Peruvian dairy industry, aiming to develop modern breeding programs that favor mainly small-scale producers.



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sciforum-110758: Analysis of Ecuadorian Montbeliarde dairy cattle population revealed an increased inbreeding rate and genetic diversity loss

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The introduction of the Montbeliarde dairy breed in Ecuador started in the 1990s with the objective of improving the production performance of other dairy breeds. The objective of this study was to analyze the population structure, inbreeding and genetic diversity of the Montbeliarde breed using official pedigree information from the Montbeliarde Association of Ecuador. The total population included 1,584 females and 210 males. Three databases were considered: historical (all individuals= 1,794), current (individuals born between 2011-2021= 896) and reference (individuals with known sire and dam within the current population= 857). Population structure variables were: pedigree completeness index (PCI), number of equivalent (GEq), complete (GCom) and maximum (GMax) generations and generation interval (GI). DG variables were: inbreeding (F), inbreeding increment (ΔF), average relatedness (AR), co-ancestry (C), Non-random mating (α), effective population size (Ne) and genetic conservation index (GCI). The gene origin probability variables were: number of founders (f), effective number of founders (fe) and ancestors (fa), number of equivalent genomes (fg), fe/fa and fg/fa ratio and DG losses. The databases were analyzed by ENDOG and POPREP software. PCI in the historical population compared to the current population increased from 89.1 to 96.7% (sire pathway) and from 48.5 to 53.4% (dam pathway) while the GI increased from 7.2 to 7.9 years in the historical and current population, respectively. Moreover, $F=1.53\%$, $AR=2.91\%$, $\Delta F=0.14\%$, $C=1.46\%$, $\alpha=-0.0094$; $GCI=3.65$, and $Ne=56$ (2014) values were obtained. Gene origin probability in the reference population was $f=372$, $fa=35$, $fe=121.71$, $fg=38.06$, $fg/fe=0.31$ showing a GD loss due to unequal contribution of founders (0.41%) and bottleneck and genetic drift (1.31%). In conclusion, the Ecuadorian Montbeliarde cattle population displayed a relatively low diversity and quite high genetic relationship. Inbreeding level of the population increased over time. The introduction of new purebred bloodlines is important to minimize the inbreeding levels ensuring the long-term conservation of this breed to prevent the GD loss.



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sciforum-110752: Assessing inbreeding and genetic diversity in South American Brown Swiss cattle: The Ecuadorian experience

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The Brown Swiss cattle is the second most important dairy breed in Ecuador. Genetic improvement programs require monitoring population structure and genetic diversity (GD) over time. The objective was to analyze the current structure and GD of the Brown Swiss breed in Ecuador. The genealogical database of the Ecuadorian Brown Swiss Association, with 30,332 females and 5,846 males was used. Three databases were designed: historical (all individuals= 36,178), current (individuals born between 2014-2023= 3,698) and reference (individuals with known sire and dam within the current population= 3,016). Population variables: pedigree completeness index (PCI), number of equivalent (GEq), complete (GCom) and maximum (GMax) generations and generation interval (GI). DG variables: inbreeding (F), inbreeding increment (ΔF), average relatedness (AR), co-ancestry (C), Non-random mating (α), effective population size (Ne) and genetic conservation index (GCI). The gene origin probability variables: number of founders (f), effective number of founders (fe) and ancestors (fa), number of equivalent genomes (fg), fe/fa and fg/fa ratio and DG losses. The databases were analyzed by ENDOG and POPREP software. PCI in the historical population ranged between 68.0-16.3% and between 81.7-63.9% in the current population (1st to 6th generation, respectively). GEq in the current population was 2.61 while the GI decreased from 6.85 to 5.70 years in the historical (n=10,655) and current (n=1,582) population, respectively. In addition, F=2.35%, AR=2.23%, ΔF = 0.41%, C= 1.12%, α =0.0125; GCI=10.41, and Ne= 120 (2015-2020) values were observed. Gene origin probability in the reference population was f=1,384, fa=40, fe=157.60, fg=24.86, fg/fe=0.16 showing an important GD loss (2.01%) due to unequal contribution of founders (0.32%) and bottleneck and genetic drift (2.01%). In conclusion, despite the slight reduction of GI and low F, ΔF , Ne and AR values, an important GD loss showed the urgent need for optimal management of mating schemes when using closely related individuals.



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sciforum-109816: Effects of the polycyclic aromatic hydrocarbon benzo[k]fluoranthene at two temperatures in 3D-cultured rainbow trout RTL-W1 cells

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Freshwater habitats are affected by prevalent pollutants, like polycyclic aromatic hydrocarbons (PAHs), and by increasing temperatures due to global warming. Monolayer (2D) cultures of fish cell lines like the liver-derived RTL-W1 are commonly used to investigate toxicological effects. However, 3D systems reproduce more efficiently *in vivo* responses and may be more valuable in ecotoxicological research.

An RTL-W1 3D model (60,000 cells/well) was generated using 96-well ultra-low attachment (ULA) plates. Mature, 10-day-old spheroids were exposed to control, solvent control (0.1% DMSO), and 10 nM and 100 nM of benzo[k]fluoranthene (BkF) at 18 °C and 23 °C. After a 4-day exposure, spheroids were assessed for viability (lactate dehydrogenase (LDH) and Alamar Blue assays), biometry, histology (optical and electron microscopy), and mRNA expression of target genes related to xenobiotic metabolism (cytochrome P450 (CYP)1A, CYP3A27, aryl hydrocarbon receptor (AhR), glutathione S-transferase (GST), uridine diphosphate–glucuronosyltransferase (UGT), catalase (CAT), multidrug resistance-associated protein 2 (MRP2) and bile salt export protein (BSEP). Protein expression of CYP1A was also assessed by immunocytochemistry (ICC).

Temperature and BkF exposure did not alter the spheroids' viability or biometry. Nevertheless, in electron microscopy, more aspects of cell degeneration were noticed at 23 °C. CYP1A expression increased in both BkF conditions and AhR only in the higher concentration. Regarding UGT, temperature and BkF interactively modelled its expression, which markedly increased in the 100 nM condition at 23 °C. In contrast, CYP3A27, MRP2, and BSEP expression were lower at 23 °C. CAT and GST were not affected by temperature or BkF. ICC for CYP1A showed a dose-dependent increase.

The results suggest that RTL-W1 spheroids may be a handy novel model for *in vitro* research on liver effects of BkF/PAHs and temperature, namely on detoxifying genes.

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sciforum-110672: Estimation of Genetic Parameters and Weighted Single-Step Genome-Wide Association Studies for Fertility Traits in Holstein Cattle Using Liquid Chip

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Introduction

The liquid chip based on Genotyping by Target Sequencing (GBTS) technology can detect a wide range of variations (e.g., SNPs, InDels) and offers high efficiency, low cost, broad adaptability, and flexible application. Reproductive traits are crucial functional traits in dairy cows. Intense selection for milk production traits, coupled with the negative genetic correlation between reproductive and milk production traits, has led to a decline in reproductive performance, decreased reproductive rates, increased veterinary treatment rates, and higher culling rates. Given the low heritability of reproductive traits, exploring genomic selection methods to enhance the accuracy of reproductive trait predictions is significant. This study estimates genetic parameters and performs weighted single-step genome-wide association studies (wssGWAS) to identify genes associated with three fertility traits in the Chinese Holstein population: number of services for heifers (NS_H), interval from calving to first services (ICF), and calving interval (CI).

Materials and Methods

Phenotypic records for NS_H, ICF, and CI are 134,141, 345,751, and 238,277, respectively. A total of 5,545 cattle have liquid chips (166,009 SNPs + 7,518 InDels), while 18,226 have 150K chips, which were imputed to the liquid-phase chip level and merged after quality control. Genotype data for 13,690 individuals across 103,262 loci were analyzed. An animal model was used for NS_H, while ICF and CI employed a repeatability model. A weighted single-step genome-wide association method with 20 adjacent SNPs as sliding windows was implemented.

Results

Heritability estimates for NS_H, ICF, and CI are 0.049, 0.029, and 0.064, respectively. Ten window regions associated with fertility traits were identified across seven chromosomes, with candidate genes including *OVOS2*, *TESK1*, and *HSPA14*.

Conclusion

These findings provide a foundation for future research into the genetic mechanisms underlying fertility traits, contributing to accurate genomic predictions in the Chinese Holstein population.



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sciforum-109530: First Insight into the Genetic Diversity and Phylogenetic Analysis of Trichomonadida species Infesting *Gallus gallus domesticus* (Aves: Phasianidae) in Tunisia

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Trichomonadida are flagellated protozoa that infect a wide range of vertebrate species, including poultry such as *Gallus gallus domesticus*. These pathogens hold significant veterinary importance due to their role in the emergence of diseases that can severely reduce productivity and cause substantial financial losses. Traditional methods for identifying these protozoa are limited by the subtle morphological variations between species. Molecular studies on Trichomonadida species in North African poultry are scarce. This study is the first to investigate the genetic diversity and phylogenetic relationships of Trichomonadida species in Tunisian poultry farms using a multilocus molecular approach (18S rRNA and α -actinin1), providing valuable insights into their epidemiology. Based on the analysis of 18S rRNA sequences, the Tunisian samples were divided into four main clades. The first clade, identified as *H. meleagridis*, was detected in caecal samples and genomic DNA of *H. gallinarum* nematodes from ten Tunisian localities. This clade was further subdivided into two distinct clusters, designated genotype 1 and genotype 2. Analysis of both nuclear markers revealed that all Tunisian haplotypes clustered with those from France, belonging to genotype 2, with a genetic distance of 4% (18S rRNA) between the two clusters. Furthermore, the analysis revealed the coexistence of *H. meleagridis* and *P. wenrichi* protozoa infecting *H. gallinarum*, suggesting a potential mixed infection. Additionally, other Trichomonadida species, including *Simplicomonas* sp. and *T. gallinarum*, were detected in the caecal samples. Phylogenetic analysis (ML) demonstrated a close genetic relationship between *H. meleagridis* and *P. wenrichi*, as well as between *Simplicomonas* sp. and the *Monoceromonas-Tritrichomonas* group. Both genotypes 1 and 2 of *H. meleagridis* exhibited a sister-group relationship with *P. wenrichi*, suggesting a shared evolutionary origin. This study represents the first investigation into the genetic diversity of Trichomonadida species in Tunisian poultry, highlighting the utility of the 18S rRNA locus for evaluating genetic variation and identifying potential mixed infections.



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sciforum-109473: Genetic Insights into Thermotolerance: Identifying miRNA Variants Linked to Heat Stress Resilience in Dairy Cows

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Introduction: Heat stress poses a significant challenge to the dairy sector, leading to substantial losses due to its detrimental effects on both milk production and reproductive performance. In response to high temperatures, cows have developed various protective mechanisms to mitigate the adverse consequences of heat stress. Some cows maintain their productive and reproductive capabilities during hot summer conditions and are considered thermotolerant, making them potential candidates for selective breeding programs aimed at enhancing heat resilience. **Methods:** In the present study, we conducted a comprehensive analysis by collecting samples from both thermotolerant and thermosensitive cows, employing a whole-genome sequencing approach to elucidate the unique genetic variants that distinguish the two groups. After identifying group-specific variants, we focused on variants within miRNA genes using miRNASNP v4. **Results:** We successfully identified 15 variants in thermotolerant cows, including 1 novel variant, across 15 distinct miRNAs. Five of these variants were located in mature miRNAs, potentially disrupting their structure and functionality. Subsequent analyses (Gene Ontology and KEGG) indicated that several of these variants could also influence miRNA-mRNA interactions, thereby impacting various molecular pathways, including metabolic pathways, the MAPK signaling pathway, the Ras signaling pathway, and mitophagy. **Conclusions:** This research provides valuable insights into the underlying mechanisms associated with thermotolerance in dairy cattle. Understanding the role of these miRNA variants may lead to innovative approaches in livestock management, ultimately contributing to improved animal welfare and productivity under changing climatic conditions.



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sciforum-109635: Genomic Breakthroughs in Animal Genetics: Enhancing Productivity, Disease Resistance, and Health

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Advancements in animal genetics and genomics have significantly transformed our understanding of livestock and wildlife biology, providing powerful tools for enhancing productivity, disease resistance, and overall animal health. Through genomic technologies, such as next-generation sequencing, genome-wide association studies (GWASs), and gene editing techniques, researchers are able to identify, map, and modify genes linked to key traits, enabling more precise and efficient breeding programs. In livestock production, genomic selection allows for the rapid identification of animals with desirable traits, such as higher milk yield, lean meat production, or improved feed efficiency, helping to meet the demands of a growing global population while minimizing environmental impact. In addition to production gains, genomics plays a pivotal role in enhancing animal resilience against diseases. Identifying genetic markers associated with disease resistance enables selective breeding for healthier livestock populations, reducing dependency on antibiotics and leading to more sustainable farming practices. Gene editing technologies, such as CRISPR, offer further potential to introduce beneficial traits or eliminate hereditary diseases, accelerating genetic improvement in ways previously unattainable through traditional breeding.

Moreover, genomics has crucial applications in wildlife conservation, providing insights into genetic diversity, population structure, and evolutionary adaptations. These insights guide conservation efforts to protect endangered species, mitigate the impact of habitat loss, and preserve biodiversity. The integration of genomics into animal breeding and conservation represents a critical step towards achieving sustainable animal production systems and biodiversity conservation.

This review explores the advancements, applications, and ethical considerations in animal genetics and genomics, highlighting the transformative potential of these technologies in modern agriculture and conservation.



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sciforum-109749: Genomic profiling of production traits of the Arequipa fighting cattle in Peru

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Cattle in Arequipa are mainly used for milk and beef production, and agricultural labor, representing an important component in the economic sector. On the other hand, during at least the last 150 years, farmers in Arequipa selected their cattle based on docility and fighting skills due to cultural traditions. It is worth mentioning this tradition does not involve cattle injury. Our previous molecular work showed that these individuals known as “Arequipa Fighting Bull” (AFB) belong to a different population, demonstrating that these individuals very likely correspond to another breed. However, very little is known about the productive traits of this population. We collected hair follicle samples from 95 AFB individuals to perform a genomic profile using the Igenity Beef tests (males + females) and Igenity Basic tests (females only). DNA extraction was carried out on all samples; however, only 60 individuals (28 females, F, and 32 males, M) were suitable for molecular work. To obtain the genetic profile, an analysis was performed using SNP markers through Igenity Beef and Igenity Basic. Multiple correspondence analysis grouped individuals based on their Igenity Beef rank; that is, bottom 25%, maternal, terminal, and top 25%. Individuals PBT_ARE 013 (F) and PBT_ARE 012 (M) scored the highest on the Igenity Production index. That is, they possess good maternal traits with gain and carcass characteristics. The Igenity Basic genomic test resolved three groups of female individuals. Moreover, this test reported that BB, the most favorable genotype, is present in very low frequency (5%). PBT_ARE 024 possesses the best dairy yield traits (fat and protein). This study represents the first assessment of production traits of the AFB. We expect these results to provide insights for establishing a modern cattle breeding program in Arequipa, optimizing beef and dairy production and promoting sustainable development in the Peruvian livestock industry.



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sciforum-109693: Interspersed repeated element analysis of *Camelus dromedarius* lactoferrin gene

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Lactoferrin (LF) is an iron-binding glycoprotein essential to the mammalian innate immune system. Its concentration varies significantly across species and lactation stages. Camel milk contains substantially higher levels of LF compared to bovine milk.

The *Camelus dromedarius* lactoferrin gene is structured in 17 exons and 16 introns. However, there is no available information on interspersed repeated elements, or retrotransposons. These elements are valuable genetic markers and offer insights into phylogenetic relationships, population structure, and evolutionary processes.

This study aims to identify and characterize interspersed repeated elements within the dromedary lactoferrin gene using the Repeat Masker bioinformatic tool.

A total of 20 elements were identified, including 6 SINEs, 11 LINEs, 1 LTR, and 2 hAT-Charlie/DNA elements. Short interspersed repeat elements were dispersed in introns 1, 13, and 15, while long interspersed elements spread over introns 1, 2, 6, 9, 10, 13, 14, and 16. hAT-Charlie/DNA elements were found in introns 2 and 16, while long terminal repeats were located in intron 12. A comparative analysis with the bovine lactoferrin gene revealed that the latter contains a higher number of interspersed repeated elements (33), 9 of which were SINEs and 18 of which were LINEs, 2 long terminal repeats, and 4 hAT-Charlie/DNA. This variation may be due to potential differences in evolutionary history or regulatory mechanisms.



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sciforum-105059: Isolation and Molecular Characterization of Class II novel genotype of Newcastle disease virus from field outbreaks in Mizoram, NER, India

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Newcastle disease in its most virulent form affects the poultry population of all ages. Such an infection causes a huge economic loss to the poultry industry. A study was conducted in the Selesih, Melthum, and Zemabawk districts in Mizoram this year in which phylogenetic analysis was carried out to determine the circulating strains in Mizoram. Detailed necropsy was conducted on the poultry carcasses collected from the above farms. Gross and histopathological changes were observed in all vital organs which were suggestive of Newcastle disease, and suspensions from the suspected tissue samples were inoculated in 9-10-day-old embryonated eggs for isolation of the Newcastle disease virus. The isolates were tested by targeting and amplification of the full-length fusion glycoprotein of the Newcastle disease virus of 1662 bp in length by using reverse transcriptase-polymerase chain reaction. The full-length amplicons were sequenced and phylogenetic analysis was carried out using phylogenetic analysis tools like MEGA7. The analysis of the amino acid sequences present at the fusion cleavage site and phylogenetic tree suggested that the virus circulating in the remote districts of Mizoram belonged to a velogenic strain with sequences at the fusion cleavage site from positions 113-117 as RRQKR'F and belonged to a new genotype XXII as per the updated phylogenetic nomenclature system. The new genotype XXII was further classified into two subgenotypes under the updated classified nomenclature system as XXII.1 and XXII.2.



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sciforum-110287: PUNICA GRANATUM L. MAINTAINS SUPEROXIDE DISMUTASE EXPRESSION IN VITRIFIED BOVINE OVARIAN TISSUE

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Introduction

Ovarian tissue vitrification is an alternative for the preservation of germplasm banks in animals with high zootechnical value. However, despite its efficacy, the technique has some limitations due to the high cytotoxicity of cryoprotectants, which cause damage to ovarian follicles. One of the mechanisms involved in this damage is oxidative stress, characterized by an imbalance between free radicals and antioxidant enzymes such as SOD. Therefore, this study aimed to evaluate the potential of *Punica granatum*, a well-known potent antioxidant, during the vitrification of bovine ovarian tissue on Superoxide dismutase (SOD) gene expression.

Methodology

To this, fragments of bovine ovarian cortex were vitrified with 10 µg/mL of ethanolic extract from *Punica granatum* (EE-PG) and stored in liquid nitrogen for 5 days. After warming, the tissues were incubated for 24 hours to assess the resumption of cellular metabolism and subsequently stored at -80°C for qPCR analysis.

Results

There was no significant difference when comparing the use of 10 µg/mL of EE-PG with the fresh control and vitrified control groups. This indicates that the EE-PG maintained SOD expression levels. SOD is an enzyme responsible for the first line of cellular antioxidant defense. It catalyzes the conversion of the superoxide anion into a less harmful product, hydrogen peroxide, which possibly contributes to reducing damage and preserving follicular structures.

Conclusion

In summary, the addition of 10 µg/mL of EE-PG to the vitrification solution maintains SOD expression in vitrified bovine ovarian tissue, making it a promising alternative for preserving reproductive potential.



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sciforum-109511: SNP-Based heritability of morphological traits in the Pura Raza Español Horse

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Conformation traits are very important in the Pura Raza Español (PRE) horse. Although most of them have medium to high heritability, there is a great interest in obtaining highly reliable estimates of heritabilities. The objective of this study was to estimate the heritabilities (h^2) of conformation traits in PRE horses with three different approaches. The dataset consisted of 7152 morphological records and 41,888 animals in the pedigree, obtained from the *Royal National Association of Spanish Horse Breeders* (ANCCE). A total of 4057 animals were genotyped with 60,136 SNPs and included in the analysis. Measurements from six zoometric traits were analysed: height at withers (HW), scapular–ischial length (SiL), length of back (LB), dorso-sternal diameter (DsD), thoracic perimeter (TP), and perimeter of anterior cannon bone (PACB). Firstly, heritabilities were estimated with a classical approach with pedigree-based REML and single-step GREML with the HiBlup v1.3.1 software. Then, SNP-based heritabilities were estimated using GREML, accounting for patterns of regional linkage disequilibrium (LD) with the LDAK 5.2 software program. The largest heritability estimates were obtained when we employed REML or ssGREML analysis in this population. *Heritabilities were similar for all traits for REML and ssGREML, and their estimates oscillated between 0.33 (0.03) for DSD and PACB and 0.77 (0.035) for HW. Except for HW, the SNP-based heritabilities were smoother than those from REML and ssGREML and they varied between 0.21 (0.03) for DsD and 0.49 (0.031) for SiL.* It is also notable that in the LDAK model, the h^2 estimation improved in most of the analysed traits, which was reflected in the decrease in the standard errors. These results suggested that in the case of these traits where there is high LD, it is necessary to adjust for the LD to correct the overestimation of heritability.



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sciforum-109459: The first insight into the genetic structure of the Monogenean *Sparicotyle chrysophrii* from Gilthead Sea Bream (*Sparus aurata*) Along the Tunisian Coasts

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Sparicotyle chrysophrii (Van Beneden & Hesse, 1863) Mamaev, 1984 is a monogenean ectoparasite that specifically infects *Sparus aurata* Linnaeus, 1758. This parasite can cause parasitic diseases, leading to significant mortality, especially in aquaculture. The examination of the morpho-anatomical characteristics of ectoparasites infesting *S. aurata* across seven Tunisian sites confirmed the presence of *S. chrysophrii*. However, few molecular studies have been conducted on this monogenean, and its genetic variability remains poorly understood. This work provides the first molecular characterisation and phylogenetic analysis of *S. chrysophrii* from the Tunisian coasts, examining both wild and cage-reared hosts using two molecular markers: the large subunit ribosomal RNA (28S) and mitochondrial COI genes. The analysis of nuclear ribosomal 28S sequences revealed no intraspecific genetic variation, resulting in a strongly supported monophyletic group. The COI sequences were grouped into a monophyletic clade clustering specimens from both the northern Mediterranean (France, Adriatic Sea, Italian and Spanish coasts) and the southern Mediterranean (Algeria), showing no significant phylogenetic ramification. The haplotype network showed no distinct haplogroups, implying strong genetic flow between farmed and wild fish populations, as reflected by low nucleotide diversity (0.00445) relative to high haplotype diversity (0.821). Shared haplotypes indicated the potential for pathogen transmission between wild and cultured hosts along the Tunisian coasts. The AMOVA across the three regions (north, central, and south of Tunisia) showed that 0% of the total variation was attributed to differences among the groups, 7.62% to differences among populations within groups, and 92.77% to differences within populations. These findings indicate the absence of genetic structuring within the *S. chrysophrii* population. This study demonstrates that the species disperses homogeneously and does not face significant barriers, likely due to the high gene flow occurring among parasite populations, facilitated by the dispersion potential of the host.



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Session C. Sustainable animal physiology and reproduction

sciforum-109705: Developmental impact of neonicotinoid imidacloprid in chicken embryos

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Introduction

Imidacloprid is a neonicotinoid designed to target the nicotinic acetylcholine receptors of invertebrate insects but may affect the development of vertebrates. Nicotine is known to alter vertebrate development. Avian species may also be of particular risk of exposure to neonicotinoids from environmental pesticides and ingestion of contaminated insects and freshwater species.

Methods

We evaluated the impact of environmental relevant imidacloprid (10 µg/mL) exposure on vertebrate embryo development using a chicken egg assay and compared that with the effects of saline or nicotine exposure (0, 10 and 100 µg/mL). Research grade, specific-pathogen-free (SPF) eggs were injected on day 0 and harvested on day 14 of development. Egg weight, embryo weight and body morphometrics were compared between the treatment groups.

Results

Eggs treated with nicotine had an overall (10 - 20%) lower survival rate ($P = 0.05$). Embryos exposed to 10 µg/mL nicotine that remained viable at 14 days did not differ significantly from controls. Embryos exposed to 100 µg/mL exhibited reductions in limb development ($P = 0.01$) and altered head circumference ($P = 0.009$). Reductions in limb length were noted in imidacloprid exposed embryos ($P = 0.054$). Embryo weight was significantly reduced in the imidacloprid exposed embryos relative to controls ($P = 0.034$). Tissues were harvested to determine histological changes as a result of imidacloprid.

Conclusions

Evaluating the developmental impact of nicotine and imidacloprid in the chicken embryo assay highlights the potential effects of environmental exposure in poultry and other vertebrates.



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sciforum-110563: Estrus pre-synchronisation (pre-Synch) using high long-acting progesterone doses in Fixed-Time Artificial Insemination (FTAI) protocols: effects on pregnancy rate in *Bos indicus* COWS

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Fixed-Time Artificial Insemination (FTAI) protocols are crucial for improving *Bos indicus* cattle. The aim of this study was to assess the effect of high long-acting progesterone (pre-synch) doses in FTAI protocols and its impact on pregnancy rate (PR) in *Bos indicus* cattle. Brahman cows (n=100) were randomly divided into two groups, FTAI-C (C; conventional-protocol; n= 50) and FTAI-P4 (PP4; experimental-Pre-Synch-protocol, using high long-acting progesterone (P4) dose; n=50). A concentration of 200 mg of P4 was applied on Day -8 of the PP4 protocol. On Day 0, the progesterone device (CIDR-1.38 g intravaginal) and Estradiol Benzoate (E2B= 2.0 mg I.M.) were applied in both protocols. On Day 8, the cows received PGF2 α (500 μ g D-cloprostenol I.M.) + eCG (400 I.U., I.M.) + Estradiol cypionate (E2C= 1 mg I.M.). The CIDR was removed 12h later. Cows showed estrus at 36h post-CIDR removal and the FTAI was performed at 52h (cows showing estrus) and 60h (cows without estrus + GnRH application: 2,500 I.U.). Ovarian evaluation was performed on Day -8 (application of long-acting P4), Day 0 (CIDR application), Day 8 (implant removal), and Day 10 (estrus). PR was evaluated on Day 40. Ovarian diameter (OD), number of follicles (NFLs) follicle diameter (FLD), number of corpora lutea (NCL), and diameter of corpora lutea (CLD) were scored. Data were analyzed by GLMM (SPSS® 25, IBM Corp., USA). No differences were observed between C and PP4 regarding OD, FLD, NFL, CLD, and NCL on Day -8 ($p > 0.05$); however, differences were observed in OD, NFL, and CLD on Day 0 ($p 0.05$). Differences were observed in OD, NFL, FLD, and CLD between protocols on Day 8 and in OD and CLD on Day 10 ($p 0.05$). Finally, no differences between C (23/50; PR= 46%) and PP4 (31/50; PR= 62%) were observed ($p = 0.06$). In conclusion, ovarian structures were similar in both protocols. Although PR slightly improved when using the PP4-pre-Synch protocol, differences between protocols were not significant in *Bos indicus* cattle. This study was supported by DIRGI-CP2022-005.



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sciforum-109407: Comparative evaluation of sperm parameters of European and Africanized drones in Caatinga biome

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Bees play an essential role in pollination, as well as producing honey and other bee products. With over 20,000 known species, bees differ morphologically and physiologically, which emphasizes the need for knowledge about the biology and reproductive parameters of different species to promote management adjustments. Therefore, the objective was to compare the semen quality of European (*Apis mellifera*) with that of Africanized honeybee drones (*Apis mellifera* L.) raised in the Caatinga biome. This study was conducted at the Experimental Station (5°03'37" S; 37°23'50" W) of the Federal Rural University of the Semiarid Region (UFERSA) in Mossoró, RN, Brazil. Nine European bee drones and 16 Africanized bee drones, approximately 25 days old, were used. Semen collection was performed using the endophallus eversion technique, manually stimulated by abdominal pressure. The parameters analyzed included motility (light microscopy), membrane integrity (fluorescent probes: Hoechst 342 and propidium iodide), and functional integrity of the plasma membrane (hypo-osmotic test, 0 mOsm/L). Data, expressed as the mean $\pm$ standard error of the mean, were compared using the Mann–Whitney test (hypo-osmotic test) and Student's t-test (for other parameters), using GraphPad Prism® software version 9.3 (GraphPad Software Inc., San Diego, CA, USA), at 5% significance. Both species presented a sperm motility around 90%, with a membrane integrity of $82.4 \pm 2.5\%$ for European drones and $81.1 \pm 2.4\%$ for Africanized drones. In European drones, the functional integrity of the plasma membrane was $93.4\% \pm 1.8\%$, while for Africanized drones, it was $91.6 \pm 1.5\%$. For none of the parameters was there a statistical difference between the species ($P > 0.05$), which presented excellent sperm quality. In conclusion, it was demonstrated that there is a similarity between the sperm parameters of European and Africanized bees, which indicates the possibility of applying similar reproductive managements.



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sciforum-110655: Effect of Light Color during Incubation on Post-hatch Serotonin and Corticosterone Concentration in Gerze Turkish Indigenous Chickens

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Exposing broiler chicken eggs to light during incubation can influence hatchability, stress levels, and overall chick welfare after hatching. Therefore, this study aimed to determine the effect of different-colored lights applied during incubation on serotonin and corticosterone hormone concentrations related to post-hatch chicken welfare. Gerze Turkish Indigenous chicken eggs were incubated under no light (dark; n: 108), green light (n: 114), red light (n: 114), and white (n: 114) light for 18 days. All chicks from each treatment group were fed for 120 days. Plasma corticosterone levels were evaluated using a commercially available ELISA kit (detection range 0.1-40 ng/mL, Chicken Corticosterone ELISA ^{BT LAB}). Plasma 5-HT levels were also measured using a commercially available ELISA kit (analytic range 0.5-150ng/mL, 5-HT BT LAB Chicken Serotonin ELISA Kit), following the standard procedures. Red-light-incubated chicks had the lowest (P0.05) plasma corticosterone. Dark-incubated chicks had higher (P0.05) plasma serotonin concentrations than green- and white-incubated chicks. However, green-incubated chicks had lower (P0.05) plasma serotonin concentrations than red- and dark-incubated chicks. These results indicate that different-colored light applications during incubation altered post-hatch serotonin and corticosterone concentrations. This work was supported by the Ondokuz Mayıs University (Project no: BAP04-A-2024-4803) Scientific Research Coordination Unit.



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sciforum-109787: Evaluation of quality of grass carp (*Ctenopharyngodon idella*) sperm during short-term storage

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Short-term storage allows for the safe transportation and handling of gametes for short periods, ranging from hours to weeks. This method facilitates gamete storage, enables sperm selection for breeding programs, and contributes to creating gene banks. In this study, we evaluated the motility time and percentage of motile spermatozoa in grass carp (*Ctenopharyngodon idella*) at intervals of 0, 24, 48, 72, and 96 hours after storage at a chilled temperature of 4 °C. Semen from eight mature males, with a mean weight of 7837.5 ± 1132.5 g, was used for this purpose. For the sampling process, the fish were anesthetized using clove powder extract. Semen was then collected by applying gentle pressure to the abdominal region. Half a mL of each semen sample was placed in plastic tubes and stored under chilled conditions without dilution in a storage medium. The examination of these samples was conducted at various times after storage. The results indicate that 48 hours after chilled storage, there was a significant difference in the percentage of motile spermatozoa compared to the initial time ($P = 0.05$). Furthermore, there were significant differences in motility time from 72 hours after chilled storage compared to the initial time ($P = 0.05$). All semen samples remained active for up to 48 hours after being chilled. After 96 hours of storage, the mean activity in the three remaining samples was $20.0 \pm 10.0\%$. According to the results, the best quality of the samples was observed within 24 hours of chilled storage. Therefore, storing grass carp semen in chilled conditions for up to 24 hours can facilitate the artificial insemination process in hatchery centers.



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sciforum-110146: Modelling of Mechanistic Systems to Predict and Monitor Animal Health and Production: Case Study of Laying Hens

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Antibiotic and pesticide usage in poultry requires careful monitoring to prevent residues while maintaining bird health and productivity. Mechanistic modelling approaches provide sophisticated tools for understanding and optimizing bird health and production systems. This study presents integrated frameworks for analysing chemical toxicity in laying hens through the modelling of hormonal balance and physiological responses.

We adapted and extended mathematical models initially designed for chemical toxicity risk assessment in avian species. To model physiological processes in pharmacokinetics (PK—what the body does to the drug) and pharmacodynamics (PD—what the drug does to the body), we employed ordinary differential equations to describe the evolution of drug concentrations and their effects over time. To elucidate the interaction between PK and PD in laying hens upon exposure to hypothetical endocrine-disrupting chemicals, our modeling incorporated endocrine dynamics on the ovulation cycle over weeks.

The developed model could predict organ-specific compound distribution and temporal dose–response patterns of hormonal homeostasis disruption. Our simulations demonstrate how altered hormonal levels influence egg production, including scenarios of 50% reduced productivity. This study further revealed how disrupted ovulation cycles affect pesticide pharmacokinetics in laying hens' eggs. Our PKPD modelling predictions provide quantitative metrics applicable to food safety evaluation for human health. The adverse outcome pathway framework was utilized to illustrate processes and enhance understanding of animal health in a harmonized and transparent manner.

Our systems modelling approach provides a mechanism-based framework incorporating biological processes to elucidate the production dynamics of hens upon exposure to chemicals. Future work will focus on integrating in vitro as well as legacy in vivo data to calibrate models for different avian species. Overall, the integrative modelling effort can advance the One Health vision of protecting human, animal, and environmental health in a sustainable way.



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sciforum-108946: Short-term in vitro culture of canine ovarian tissue after cryopreservation by different techniques

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The application of different ovarian tissue vitrification techniques has been highlighted as an alternative to promote the formation of female germplasm banks. Given the scarcity of studies in canine species, this study aimed to use in vitro culture as an evaluation tool for different ovarian tissue vitrification techniques in female dogs. Five pairs of ovaries were collected from adult females. They were fragmented and subjected to vitrification using an ovarian tissue cryosystem (OTC) or adapted needle immersed vitrification (NIV). Fresh and vitrified fragments were cultured in vitro and evaluated for nine days for preantral follicle viability using a Trypan blue dye and morphology through classic histology. The ultrastructural integrity of the ovarian tissue was checked by scanning electronic microscopy. The data were expressed as the mean and standard error and were compared using the Tukey test ($P < 0.05$). The fresh control group presented $77.2 \pm 2.81\%$ viability, similar to that of the control, cultured for 9 days ($72.6 \pm 1.8\%$), and also similar to both OTC ($85.7 \pm 3.6\%$) and NIV ($75.7 \pm 2.8\%$) treatments immediately after thawing. After 09 days of culture, however, viability in the OTC group dropped to $64.6 \pm 16.2\%$ (**P 0.05**), while NIV maintained $72.8 \pm 7.2\%$ viability. For primordial preantral follicles morphology, there was no significant difference between the fresh control ($85.5 \pm 7.3\%$) and heated OTC ($91.7 \pm 5.4\%$), but after 09 days of culture, the OTC group ($34.1 \pm 9.0\%$) showed a significant decrease ($P < 0.05$), while NIV preserved their morphological integrity ($63.6 \pm 6.7\%$). Regarding other follicle categories, no differences were observed among vitrification techniques. Through ultrastructural evaluation, disorganization patterns were observed for stromal cells of ovarian tissue at the use of OTC. In conclusion, the NIV technique allowed for a more efficient preservation of canine ovarian tissue than OTC.



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sciforum-110832: Single Prostaglandin F2 α Injection in Barbari Goats: Ovarian Dynamics and Alterations in the Relationship of Estradiol-17 β and Progesterone with Standing Estrus, Preovulatory Follicles, and Ovulation

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The objective of the current study was to evaluate the plasma endocrine profiles and ovarian follicular dynamics resulting from a single, random injection of PGF2 α given to Barbari goats during the breeding season. B mode ultrasonography was used to monitor ovarian dynamics every 12 hours, while bucks with aprons were employed to identify standing estrus every 6 hours. Additionally, blood samples were collected every 12 hours for hormonal analysis, which included measurements of progesterone and estradiol 17 β . The goats were classified into three groups: early responders (n = 7), intermediate responders (n = 6), and late responders (n = 6), with significant differences observed (p < 0.05) in the initiation of standing estrus and ovulation in conjunction with PGF2 α administration. Remarkably, the peak plasma concentration of estradiol 17 β was observed twelve hours prior to ovulation. While the average size of the ovulatory follicle and the duration of standing estrus were comparable across groups (p > 0.05), early responders showed a quicker degeneration of the corpus luteum compared to their intermediate and late counterparts (p < 0.05). Variability in estradiol 17 β levels and dominant follicle diameter was significantly different among the groups (p < 0.05), whereas progesterone concentrations remained stable (p = 0.065). Furthermore, fluctuations in progesterone levels over time were significant (p < 0.05), suggesting that the interplay of hormonal and follicular dynamics during the luteal phase affects both the timing and duration of estrus and ovulation in Barbari goats after PGF2 α treatment.



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sciforum-109703: Sperm morphological, morphometric and ultrastructural aspects of European (*Apis mellifera*) and Africanized (*Apis mellifera* L.) honeybee drones

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Considering physiological and reproductive differences between European (*Apis mellifera*) and Africanized (*Apis mellifera* L.) honeybees, understanding sperm characteristics is essential for the application of assisted reproductive techniques. This work aimed to compare the morphological, morphometric and ultrastructural characteristics of spermatozoa from European and Africanized honeybee drones in the Caatinga biome. The experiment was conducted at the Laboratory of Animal Germplasm Conservation, Federal Rural University of the Semi-Arid Region (UFRSA), in Mossoró, RN, Brazil (5°03'37"S;37°23'50"W), in July-August/2024. Semen was collected from 9 European and 16 Africanized mature honeybee drones using the endophallus eversion technique. Samples were stained with rose Bengal solution to assess the percentage of normal spermatozoa under a light microscope and to measure the head, flagellum and total length using digital analysis software. Scanning electron microscopy was used to analyze sperm ultrastructure. Data were expressed as the mean $\pm$ standard error and compared by Student's t-test for sperm morphology and the Mann–Whitney test for morphometric parameters (P0,05). The percentages of normal spermatozoa in the Africanized and European drones were $12.06 \pm 1.01\%$ and $10.89 \pm 1.66\%$, respectively, with no statistical difference; curled tail was the most prevalent defect observed. Morphometric measurements revealed significantly longer sperm heads in European drones ($10.04 \pm 0.03 \mu\text{m}$) compared to Africanized drones ($9.33 \pm 0.04 \mu\text{m}$; P 0.05), although the flagellum and total length did not show significant differences, with a total length of approximately $260 \mu\text{m}$ in both groups, aligning with the literature values. Ultrastructural evaluation allowed for a detailed identification of the conical acrosomal vesicle and the defined nucleus surface, which was not easily possible with conventional rose Bengal staining. In the head–flagellum coupling, the major mitochondrial derivative and the axoneme were visualized in parallel, but no differences were identified between groups. Although there is a morphometric difference in spermatozoa between European and Africanized drones, particularly in terms of head length, the overall morphological and ultrastructural characteristics are similar, suggesting a comparable basis for future applications in reproductive biotechnologies.



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Session D. Environmental challenges to animals and precision livestock farming

sciforum-108573: A neural network to identify the usage of mechanical brushes by dairy cows

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Mechanical brushes are a strategy to improve the welfare of dairy cows; however, measuring brush usage is a complex and time-consuming task. This study aimed to develop an artificial neural network (ANN) to identify dairy cows' usage of mechanical brushes using image capture. The database (503 images) was built with publicly available images (e.g., Google Images and YouTube) and manually divided into two folders: 1 - "Using Brush" (251 images) and 2 - "Not Using" (252 images). The ANN performed image resizing, preprocessing of the images and convolutional training over 10 epochs with 16 steps for data processing and machine learning, resulting in a total data loss of 0.0074 with an accuracy of 0.998. The ANN algorithms and image processing software were implemented using the Python programming language and open-source libraries TensorFlow, Keras, and Python Screen Capture. A data augmentation strategy (e.g. rotation and filters) was used to build the test datasets. ANN validation was performed based on its errors and successes in three distinct tests, resulting in a precision of 0.75, recall 0.62, and an average processing time of 40 milliseconds per image. In a farm environment, where cows need to be continuously monitored, the moderate precision of 0.75 can allow detection of relevant behaviors, such as the frequency of brush use. This information can be used to evaluate and improve animal welfare by ensuring cows are using the brushes as intended, which can lead to reduced stress and increased comfort. Monitoring brush usage may also offer insights into cow health and productivity. Our findings indicate that the developed convolutional learning neural network has the capacity to contribute to the field of animal behavior study and assist in identifying the usage of mechanical brushes by dairy cows, as it demonstrated processing speed and accuracy.



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sciforum-110634: Causal inference reveals long-term impact of health events on production performance in Holstein cattle

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Health events represent a key constraint to farm sustainability in the dairy industry. Previous research tended to focus on short-term milk loss during disease periods. However, in the long term, milk yield is usually not fully recovered even after the disease is cured. In this context, our study aimed to quantify the long-term impacts of health events on milk yields through causal inference strategies. We collected high-throughput session milk yield records for a total of 37,246 Holstein cattle in China from 2020 to 2024, and 40,699 health event records. Three causal inference strategies were used to perform unbiased inference of causal effects on long-term milk losses, including propensity score matching (PSM), overlap weighting (OW), and convergent cross-mapping (CCM). PSM and OW estimated causal effects by balancing pre-existing confounders between diseased and healthy cows by matching or weighting to achieve conditions like randomization. CCM was used to detect causal relationships between two short time series of milk yield and inter-session variability during diseased and healthy periods. The confounders included herd–year–season, parity, stillbirths, calving ease, the number of inseminations, and the genetic levels of milk yield and resilience. Overall, the association between milk yield and inter-session variability was enhanced by all diseases. During the period of single disease, daily milk yield decreased by an average of 16.06% and the causal effect of different diseases ranged from 11.17% (reproductive disorders) to 24.76% (digestive disorders). After curing, the impacts of the five diseases (udder health, reproductive disorders, metabolic disorders, digestive disorders, and hoof health) on production performance were 7.88%, 4.99%, 4.06%, 8.42%, and 8.00%, respectively. The long-term effect of the second disease onset would be weakened to 3.28%. In summary, this study confirms the long-term impact of health events on production performance and shows the potential of causal inference to serve as a powerful tool for precision livestock farming.



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sciforum-110299: Climate Resilience in Livestock Farming: Egypt Model

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Nowadays, the growth in the human population is putting pressure on the livestock industry, especially in developing countries, requiring a corresponding surge in livestock production to meet the demand for human consumption. Climate change is considered a challenge to the livestock industry as it affects livestock health and welfare. Resilience means an animal's ability to cope with different challenges such as the environment and to be minimally affected or return rapidly to their normal health and production state. Thus, it is necessary to develop management practices for climate resilience, including the implementation of heat mitigation strategies in addition to helping farmers comprehend climate change and its impact on their agricultural systems.

Egypt is highly vulnerable to climate change; thus, adapting to the adverse impacts of climate change is an imperative necessity. The FAO roundtable workshop with the Egyptian dairy industry under the Scaling up Climate Ambition on Land use and Agriculture (SCALA) program that was held in Cairo in April 2024 stated that to ensure the long-term sustainability of livestock farming, a comprehensive Climate Smart Livestock (CSL) approach is necessary. Therefore, to consolidate all aspects of climate change in one document, Egypt prepared its National Climate Change Strategy (NCCS) 2050 to be a basic reference that ensures the integration of the climate change dimension into the general planning of all sectors. In this review, Egypt's efforts toward climate resilience in livestock production according to their national climate change strategy were discussed. This was achieved by gathering relevant information from recent publications collected from databases such as Scopus, Web of Science and PubMed. Publications were reviewed, and a summarization of mitigation strategies implemented under changing climatic conditions was made. The main strategies were outlined including using fans and water sprays to lower head loads, in addition to nutritional interventions to decrease methane emissions.



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sciforum-109510: Comparison of mathematical functions in modelling lactation curves based on automatic milking system records in Spanish Florida dairy goat

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The aim of this study was to compare models for describing the overall and individual lactation curves in a Florida dairy goat herd to determine which mathematical model would be the better fit.

The automatic milking system (AMS) allows the determination of the individual production of each milking throughout the whole lactation. The original dataset included 104,231 milking records of 206 does obtained by AMS (an average of 505.9 milking per animal, with a mean milk yield of 1.12 ± 0.69 kg per milking). In this study, the analysis of lactation curves was applied to the daily milk production records from kidding to 240 days of lactation (an average of 239 daily records per animal, with a mean daily milk yield of 2.28 ± 1.14 kg).

A total of six functions (Wood, Wilmink, Ali and Schaeffer, Cobby and Le Du, Cappio-Borlino, and cubic splines) were used to model overall and individual lactation curves as a function of days in milk. Environmental factors including the number of lactations, month of kidding, and type of kidding, which significantly affect the lactation curve, were also incorporated into the models.

The goodness of fit of the models was evaluated based on the BIC (Bayesian information criterion). A cubic Spline function provided the best fit and offered an accurate description of the overall curve (followed by the Wilmink and the Wood models). In the case of the individual lactation curve, the Spline model showed the best fitting performance for 62.74% of the total animals (followed by the Wood model at 25% and the Wilmink model at 10.78%). Results from this study will provide insight into a better understanding of the lactation curve of Florida dairy goats and will serve as a tool for better herd management and selection.



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sciforum-110490: Composting as an alternative to improve the circularity of poultry systems: a case study in Mexico

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This study evaluates the impact of composting on the circularity of a poultry system in Mexico, specifically at the farm *Avícolas Campesinos Bondojito* (ACB), located in Huichapan, Hidalgo. A systems thinking approach was used to analyze the technological, social, and economic components of the poultry system and to characterize its by-products, such as poultry manure, based on their physicochemical properties and viability as biofertilizers. The composting process was experimentally evaluated by monitoring temperature, pH, and electrical conductivity (EC) at the pilot scale. The agro-inputs produced were analyzed to assess their quality as biofertilizers. Additionally, the Nested Circularity Framework was applied to evaluate the impact of composting on biomass production, energy efficiency, and nutrient recycling under two waste management scenarios. The results identified poultry manure as the primary by-product of the system, with 74.6 Mg per cycle and a composition of 36.7%_C, 3.27%_N, 1.51%_P, and 2.9%_K; a pH of 7.62; an EC of 1062 $\mu\text{S}\cdot\text{cm}^{-1}$; and a C:N ratio of 11.34:1, which limited its use as direct fertilizer due to instability. Composting improved its viability as an agro-input by increasing the C:N ratio (to 31.84) through mixing it with carbon-rich materials, which enhanced the thermal evolution, sanitization, and nutrient availability, particularly that of nitrogen (from 102.3 to 258.2 ppm of N). Ultimately, integrating poultry manure composting and an agricultural subsystem within the poultry production system could significantly enhance the farm's circularity. This would include better biomass utilization (the additional production of 7.72 Mg of oat grain and 9.6 Mg of straw), reduced reliance on external inputs (straw for bedding), and increased energy efficiency (56% vs 44%). These strategies suggest composting optimizes waste management and contributes to a more sustainable and efficient production system.



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sciforum-109727: Daily Mean Temperature Humidity Index drives water intake but not visits or duration at water trough in beef cattle

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This study investigated the influence of thermal environment on the drinking behavior of beef cattle using electronic water troughs. Forty-six weaned male Caracu calves (mean±SD: 247±230 days old, 226±35 kg body weight) were evaluated over a 68-day feed efficiency test during the dry season in São Paulo State, Brazil. Housed in a collective pen, the calves had access to 12 electronic feeders and four water troughs. The system recorded the number of visits to water troughs, duration of drinking events (in seconds), and water intake (kg). The drinking behaviors were summarized by day to create one observation per day per animal. The Temperature Humidity Index (THI), adjusted for wind speed and solar radiation, was calculated using data from a local weather station. Daily mean THI and 3-day moving averages of daily mean and maximum THI values were calculated. Linear regression models were used to determine which THI measure best-predicted drinking behavior. Random effects of day and individual animals were incorporated to refine the model fit. All analyses were performed using R, with model selection based on the lowest Akaike information criterion (AIC) and highest R^2 value. The results indicate that the daily mean THI was the best predictor of drinking behaviors, though it had no significant effect on the number of visits ($p=0.55$) or event duration ($p=0.90$). The number of visits was better explained by animals ($p<0.05$, $R^2=0.31$), while the duration of events was better explained by day ($p<0.001$, $R^2=0.43$). However, daily mean THI influenced water intake ($p<0.001$); for each unit increase in THI, calves were 7% more likely to increase their water intake. Overall, while water intake was sensitive to changes in daily mean THI, the number of visits and event duration were better explained by day and by animal factors.



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Session E. Sustainable animal welfare, ethics and human-animal interactions

sciforum-110572: Microplastics contamination in European anchovy (*Engraulis encrasicolus*) from the Romanian Black Sea coast—an emerging environmental threat

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Nowadays, microplastics are ubiquitous in the environment and are increasingly observed in species of economic interest such as crustaceans, mussels or fish. As a semi-enclosed sea, with a unique environment and biota inhabiting it, the Black Sea is no exception to this global issue, in recent years being considered one of the most polluted European seas.

For the first time, within this study, we investigated the accumulation of microplastics in a fish species of economic interest present in the Romanian coastal area (NW Black Sea). Microplastics presence was assessed in the gastro-intestinal tract of 90 individuals, collected from several locations on the Romanian coast (Tuzla, Agigea and Corbu), using the 10% potassium hydroxide (KOH) chemical digestion method, following MSFD TG-ML recommendations (Galgani et al., 2023).

We found a frequency of occurrence (FO%) of ingested microplastics ranging between 73 and 90%, with a mean of 1.6-3.4 items/individual, with fibers being the predominant type of ingested microplastics.

In this context, our results fill an important gap, as there was no other information on microplastics ingestion in economically valuable fish from the Romanian coast of the Black Sea.

Given the high level of microplastics in the European anchovies, an economically valuable species of fish, there is a concern and a necessity to understand the impact of microplastics on food webs and human health.



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sciforum-104799: Effects of varied photo-period durations and Red Korean Ginseng extract supplementation on growth performance, feed efficiency, and health status in New Zealand White Rabbits

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Thirty-six New Zealand White rabbits at six weeks of age were kept at the animal house of PMAS-UAAR for 42 days and divided into 0 groups (T1 (Control), T2 (200 mg/Kg body weight), T3 (300 mg/Kg Body weight), T4 (300 mg/Kg Body weight)), and red Korean ginseng extracts were use). Two lightning regimes (L1, normal daylight length hours; L2, 18 hours) were applied. Sampling was performed for growth performance, carcass properties and etiology. Mean higher live body weight (1.273 Kgs), higher feed intake (38.47 gms) and higher feed conversion ratio (3.25) were noticed in T4, while the lowest values were in control (1.215 kg, 26.65 gms, and 4.78). The highest growth rate was noted in T4, the mean carcass weight was higher in control (5.35), and the lowest carcass weight was in T3 (4.17). Rabbit fur quality, comfort factor and fur diameter were higher in T2 under L1, but spin fineness and medulations were higher under T4 with L2. The loss of rabbit meat through the drip was higher in the control group and lowest in T3. The loss of rabbit meat from cooking was higher in T2 (22.76) and the lowest was in T3 (18.59). The T4 rabbits showed aggression and less efficiency while the T2 rabbits showed friendly, social behaviour with good instincts. Ginseng supplementation at a concentration of 300mg improves performance and etiology in NZW rabbits.



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sciforum-110103: Farmed fish welfare in Egypt: Surveying current practices and future directions for tilapia culture

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This study aimed to map the status of tilapia farming in Egypt's Nile Delta region, particularly the knowledge, attitudes, and practices (KAPs) of Egyptian tilapia farmers towards the current state of animal welfare in the sector and the major challenges they face in their daily operations. To this end, a survey was conducted of tilapia farmers across different regions, asking about their farming practices, feed management, health and safety measures, and the economic aspects of tilapia farming. We found that just 11 % of the surveyed tilapia farmers had received some sort of training on the importance of animal welfare, while 76 % said they could benefit from such training. Farmers perceived maintaining good water quality as the most important metric for achieving good tilapia welfare. However, they were significantly less willing and able to intervene on this factor compared to other factors, such as changing feeding practices, minimising handling, and carrying out veterinary checks. In addition, we found evidence of better production outcomes for farmers that had received welfare training, with significantly fewer of them reporting high mortality rates and significantly fewer reporting frequent poor growth.

Most farmers expected the Egyptian tilapia production sector to continue to grow and intensify. We present the data as an overview of Egyptian tilapia farmers' knowledge, attitudes, and practices relating to fish welfare and as a basis for future efforts to improve the welfare of farmed tilapia in Egypt given the lack of awareness around this topic and the fact that it is gaining increasing importance elsewhere. We can see a need for establishing minimum animal welfare standards in Egyptian tilapia farming, either through regulators or certification schemes. There is also a clear need for establishing training programmes that cover animal health and welfare aspects in aquaculture.



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sciforum-108891: Imagining Other Species' Pains: Four Challenges

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A central problem in animal ethics concerns the weighting of nonhuman pains. In one view, we should not cause any nonhuman pain without a very good reason. In a competing view, we should balance nonhuman pain against human benefits. I assume here, for the purpose of argument, that the competing view is correct. To balance things, we need to know what each one weighs. There are four challenges to knowing the weight of animal pain: motivation, scope, content, and method. In this paper, I survey each challenge while trying to imagine a cow's and a shrimp's pains.

This paper begins with an introduction and then discusses four challenges:

Motivation: Imagining is difficult;

Scope: Not all animals feel pain;

Content: Their pains may not be like ours;

Method: Perhaps the arts can help.

The introduction asks, why is it important to imagine another species' pain? But I do not spend much time on this one. While scientists once assured us that no nonhumans were truly sentient, that tune changed decades ago. The scientific problem now is not to determine which vertebrates feel pain, but how best to measure (Mogil, 2019; Mogil et al., 2020), prevent (Dawkins, 2021; Marian Stamp, 2006; Rollin, 1998, 1989) and treat it (Public Health Service, 2010; for a contrary view: Murray, 2008). Pain is subjective; as Nagel might put it, there is something it is like to be in pain (Nagel, 1974).

Since pain hurts, since animals mind it, and since we cause a lot of it, causing pain raises ethical questions. I assume that we ought to do what we can to minimize the pain we cause others. That said, we are typically not motivated to prevent pain unless we somehow feel it. In the fourth section, Method, I suggest that the creative arts may help us both understand and feel other species' pains.



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sciforum-109582: An assessment of reptile husbandry information available in licensed pet shops across England

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Over the past two decades, there has been a substantial increase in pet reptile ownership, yet empirical research on their complex biological needs remains limited, leading to conflicting opinions on their suitability as pets. This lack of research, combined with limited access to specialist veterinary services, often results in an over-reliance on anecdotal husbandry knowledge shared among owners, which can sometimes be contradictory. Previous research by the RSPCA indicates that novice reptile owners trust advice from vendors, such as pet shops, above all other sources of information. Given the wide availability of reptiles in diverse types of pet shops (e.g., general pet shops, specialist stores, garden centres, aquarists), this raises questions about whether the care advice provided is consistent or contains contradictions.

To investigate this, 146 pet shops across England were visited and assessed using a mystery shopper model to record care advice. This advice was compared against RSPCA care guidelines as benchmarks and scored to evaluate variations or contradictions between shops. An ordinal regression analysis showed that shop type had a near-significant effect on the scores ($p = 0.082$); specifically, aquarist shops had 4.50 times lower odds of receiving a high score compared to reptile specialist shops, a statistically significant difference ($p = 0.017$). Multiple Chi-squared Goodness-of-fit tests identified key areas where advice varied or contradicted benchmark guidelines, particularly regarding enclosure requirements, tortoise hibernation, animal aggression, and the importance of registering with a veterinarian.

This study highlights areas where further empirical research is needed to fill knowledge gaps and where animal welfare organisations may need to target educational campaigns. Providing consistent, evidence-based care advice could help prevent issues and promote sustainable reptile welfare.



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sciforum-109592: Comfort conditions in feedlot to improve animal welfare and carcass yield

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The aim of this study was to determine the effects of space and the feeding system during the fattening period on the stress biomarkers, performance and carcass yield of steers. A total of 48 Hereford steers with a 214.0 kg live weight (LW) were stocked into eight pens (with six animals/pen) according to the pen size and feeding system: 100DS (100 m²/animal and a daily food supply), 100SF (100 m²/animal and self-feeders), 10DS (10 m²/animal and a daily food supply) and 10SF (10 m²/animal and self-feeders). The finishing diet contained 77% whole grain corn, 20% ground grain corn, 2% slow-release urea and 1% mineral premix. Blood samples were collected from each steer 6 days before the start of the fattening period and at 0, 1, 7, 14, 21 and 35 days from the start of the experiment to measure their white blood cell counts and plasma cortisol and glucose. Dry matter intake (DMI) and average daily gain (ADG) were recorded to determine the feed conversion ratio (FCR). The steers were slaughtered at a 370 – 390 kg LW in a slaughterhouse. Hot carcass weight was measured after the removal of kidney pelvic fat, and the carcass yield was calculated (at 7% dressing). The data were analyzed using a general linear model (Tukey's test, $\alpha=0.05$). No interaction between factors or feeding system effects was detected for white blood cells ($p=0.7386$), cortisol ($p=0.6331$) or glucose ($p=0.9734$). The white blood cell count was higher in the confined animals on days 7 (46.5 vs. 27.4 $10^3/\mu\text{l}$) and 21 (138.4 vs. 123.4 $10^3/\mu\text{l}$). The plasma cortisol concentration also increased across 10DS and 10SF on day 21 (>1.5 mg/dl). Treatment effects were not detected for DMI ($p=0.0447$), ADG ($p=0.97373$) or FCR ($p=0.8404$). Allotting space affected the carcass yield, as animals with more space presented higher values (61.7% vs. 60.3%; $p=0.0010$). In summary, the comfort conditions during the fattening period may affect animal welfare, even with a similar animal performance. Furthermore, more space being available is important to improving the carcass yield.



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sciforum-109458: Cortisol levels in Mohair fiber: a stress evaluation in Angora goats

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Hair cortisol concentration (HCC) is a retrospective marker of stress; its quantification is a valuable tool due to the simple, non-invasive sampling method and its representation of prolonged stress periods. Another key attribute of fiber quality is the mean fiber diameter (MFD). We aimed to study HCC levels and MFD variation across two growth periods of Mohair fiber. Fiber samples were collected from 14 goats raised under extensive conditions (EP: extensive period—90 days) and then transitioned to a winter trial with free-range feeding (IP: intensive period—83 days). At the beginning of the IP, fiber was dyed at the base (dye binding). At the end of the IP, dyed fibers were cut and analyzed using OFDA2000 equipment to determine the initial and final MFD, allowing the calculation of the daily rate of diameter change (MFDR, $\mu\text{m}/\text{day}$). Steroid extraction was performed using organic solvents to quantify cortisol levels by high-performance liquid chromatography. Data were analyzed using a paired samples t-test with a 5% significance level.

During the EP, animals had a higher cortisol concentration ($1.4 \pm 0.23 \text{ ng/mL}$) than during the IP ($0.5 \pm 0.12 \text{ ng/mL}$). A lower MFDR ($-0.008 \pm 0.004 \text{ }\mu\text{m}/\text{day}$) was also observed in the EP compared to the IP ($0.015 \pm 0.004 \text{ }\mu\text{m}/\text{day}$). These findings suggest greater nutrient availability at the follicular level during the IP, resulting in increased MFD and reduced HCC. Despite being kept in a smaller space with reduced mobility and higher stocking density during winter, access to shelter, food, and water in both quantity and quality contributed to reduced cortisol levels and a higher MFDR, indicating improved animal welfare.



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sciforum-109384: Development of a Comprehensive Evaluation Grid for Dairy Cow Welfare in Organic Farms

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Evaluating animal welfare (AW) in dairy farming remains a complex challenge due to the numerous indicators involved. This study aims to develop a specific evaluation grid for dairy cows, incorporating measurement methods tailored to each indicator, to provide a reliable and reproducible assessment.

The study was conducted in three organic dairy farms in western France. A sample of 21 cows per farm was observed by two evaluators one day per week over a 10-week period. The selected indicators covered five categories: feeding, housing, health, behavior, and stress, in line with the five fundamental freedoms of animal welfare. A "high-medium-low" scale was applied to each indicator, and inter- and intra-observer reproducibility was assessed using the Kappa concordance coefficient.

The results show notable variability in the reproducibility of the indicators. Health indicators, such as skin lesions (Kappa = 0.82) and coughing (Kappa = 0.72), demonstrated high reproducibility, confirming their reliability for assessing AW. Conversely, indicators related to cleanliness, such as leg cleanliness, showed lower reproducibility (Kappa 0.5), possibly due to the influence of environmental or behavioral factors. Similarly, behavioral indicators, such as responsiveness to human stimuli, presented moderate reproducibility, suggesting day-to-day fluctuations and highlighting the need to standardize observation conditions to improve precision. Positioning charts show that health indicators require minimal improvement, while those related to housing and behavior are of higher priority.

The proposed grid allows for prioritizing interventions on farms to enhance AW, although certain limitations remain. The study recommends additional outdoor observations to refine the assessment and address the limitations posed by indicators affected by indoor housing conditions.



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sciforum-109599: Environmental enrichment, are we doing enough? A systematic review of protocols in rats and mice

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Introduction

Environmental enrichment has gained increasing relevance in the last decades to improve animal wellbeing which is particularly relevant in laboratory animals. Nonetheless while mandatory in European legislation, classical laboratory animals care and maintenance protocols do not include enrichment. Hence, our goal was to review the environmental enrichment protocols currently in rats and mice.

Methods

Five databases (PubMed, Science Direct, Scopus, Web of Science and EBSCO) were searched using the keywords "environmental enrichment" AND (pain OR nociception) AND (rat OR rats OR mouse OR mice) from inception to 30th of August 2024. The quality assessment of studies was performed using the ARRIVE guidelines. Data management and analysis was performed in Microsoft Excel.

Results

Overall the quality of the studies was considered moderate. The environmental enrichment protocols implemented varied significantly between rats and mice, not only in terms of total number of enrichment items but also in relation to the type of enrichment used for each species. Importantly, a great number of studies stated performing environmental enrichment but failed to report the type of enrichment used.

Conclusions

Despite the importance of implementing environmental enrichment in pre-clinical studies being recognized, there is a significant variation in protocols between laboratories, highlighting the need for standardization.



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sciforum-109017: Gender effects in Brazilian livestock advisors' attitudes toward dairy cattle welfare and cow–calf contact

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Public concerns over animal welfare have increased scrutiny of the early separation of calves from cows. Overall, women are generally more supportive of practices allowing prolonged cow–calf contact, potentially due to their greater empathy in terms of animal welfare. This study examines how gender affects Brazilian livestock advisors' attitudes toward promoting dairy welfare practices, particularly cow–calf contact systems. By analyzing gender-based differences, this research highlights how advisors' perspectives may influence the adoption of welfare practices aligned with public expectations. Hence, the aim of this study was to assess the effect of gender on Brazilian livestock advisors' attitudes towards their role in promoting dairy cattle welfare. Through an online questionnaire featuring a three-point Likert scale, we investigated topics related to general dairy cattle welfare and the role of advisors in mediating between societal demands and dairy production practices. The effect of gender on the Likert-scale responses was analyzed using an Ordinal Regression Analysis. The results from the Likert scale are presented as the percentages of participants for each Likert-scale option and the predicted mean values $\pm$ standard deviation. The participants ($n=176$) were predominantly male (59%) and aged between 18 and 35 years (58%). In general, 81% of the participants acknowledged the influence of public pressure on dairy farming practices (Likert 2.74 ± 0.5), and the majority (71%) stated that farmers are consistently provided with information on animal welfare practices (Likert 2.65 ± 0.6). Almost all of the participants (91%) felt fully responsible for helping to address animal welfare issues (Likert 2.89 ± 0.4). There was a trend ($p=0.06$) of men self-reporting a higher knowledge (Likert 2.76 ± 0.6) of animal welfare compared to that in women (Likert 2.6 ± 0.7). Conversely, the women showed more positive attitudes (Likert 2.54 ± 0.7 ; $p=0.009$) than men (Likert 2.22 ± 0.8) toward discussing systems that allow cow–calf contact. In conclusion, while men tend to perceive themselves as more knowledgeable about animal welfare, they are less inclined to engage in discussions about cow–calf contact.



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sciforum-110696: Inter-Quarter Variation in the Prevalence and Severity of Teat-End Hyperkeratosis in Dairy Cows

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Teat-end hyperkeratosis (THK) is a common welfare issue in dairy cows, causing pain and discomfort. It is closely linked to both the udder morphology and the milking system. This study aimed to assess whether the prevalence of THK differs between the fore- and hindquarters of dairy cows. A total of 492 cows ($n = 1,968$ teats) from a commercial dairy farm in Évora, Portugal, were evaluated for THK. The presence and severity of THK were scored on a scale of 1 (no lesion) to 4 (very rough skin). Cows were classified into one of the following categories: forequarters affected, hindquarters affected, both quarters affected, or all teats affected. Data were analysed using the Kruskal–Wallis test, followed by Dunn’s post hoc test in R. Of the 288 cows (58.5%) with THK, 22 had lesions only in the forequarters, 7 in the hindquarters, 5 in both quarters, and 254 in all teats. Notably, the severity of THK was lower in cows with lesions on all teats (2.2 ± 0.03) compared to those with lesions confined to the forequarters (3.14 ± 0.09), hindquarters (3.0 ± 0.16), or both quarters (3.0 ± 0.19). This study found a high prevalence of THK affecting all teats, regardless of the quarter, suggesting a significant influence from the milking system. However, the severity of THK was greater when only one to three teats were affected, potentially reflecting variations in the morphology of individual teats within the same udder.



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sciforum-109721: Overview of gastrointestinal pill temperature monitoring in mammals

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The gastrointestinal (GI) pill is an innovative tool for monitoring core body temperature (T_c) in both human and animal studies, offering insights into thermoregulation and exertional heat stress. Traditional approaches to monitoring T_c in athletes often involve rectal thermistors, skin temperature sensors, or subjective measures of heat perception. However, the GI pill provides a non-invasive, accurate, and continuous measurement of T_c , which is particularly beneficial during field exercises.

GI pills are widely used due to their ease of administration and reliability during exercise, outperforming serial rectal temperature (T_{re}) measurements in terms of precision and practicality. In animals, GI pills have been used to monitor T_c in elephants and dogs during exercise, as well as in cattle at rest.

Research has extended into equine studies, where the GI pill has been used to monitor core temperature in horses during rest and transport and, notably, during field exercise. Our group studied the use of the GI pill during different types of field exercise in horses; this unique method breaks new ground because it includes the first studies to focus on the continuous monitoring of core body temperature in sport horses during work and competition in the open air ("in the field"). Earlier laboratory-based studies employed treadmills and more invasive temperature measurement methods.

In our studies, the GI pill showed that different exercise types produce distinct thermoregulatory responses, with significant inter-individual variability in thermo-regulation among horses. This variability underscores the importance of individual monitoring in assessing and managing heat stress, as well as the complexity of mammalian thermoregulation, influenced by numerous intrinsic factors. This study will provide an overview of existing GI pills and their use in mammals. The application of the GI pill has the potential to advance heat illness prevention and improve animal welfare, making it a vital tool in both human and veterinary sports science.



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sciforum-109324: Perception of Brazilian livestock advisors toward cow–calf contact on dairy farms: a preliminary study

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Advisors play a key role in advancing the dairy industry by helping farmers adopt practices that improve animal welfare and align with societal values. The effectiveness of knowledge transfer depends on the information that advisors have. Exploring their perceptions of new practices, such as the cow–calf system, helps expand the understanding of how these practices might be received in the industry. This preliminary study aimed to explore Brazilian livestock advisors' perceptions of systems that allow cow–calf contact after milking. Since data collection is ongoing, we present here the responses obtained so far for the Southeast region. Participants (n=57) answered an online questionnaire that included sociodemographic questions and a 3-point Likert scale. Participants were randomly assigned to one of two cow–calf contact (CCC) systems: Full-contact (Full-CCC, n=26), where calves could suckle, and cows could nurse or Partial-contact (Part-CCC, n=31), limited to smelling and licking. Data were analyzed descriptively, and the results are presented as percentages. Most participants (56%) were between 18 and 35 years old, with 51% being men. Most participants (62%) disagreed with the Full-CCC system, as 73% felt it was not beneficial for cows or calves and would not recommend it to dairy farmers. Perceptions on Part-CCC were conflicting: 42% agreed, 26% were neutral, and 32% disagreed. Nonetheless, most felt that Part-CCC is not beneficial for cows (58%) or calves (48%), but 52% would recommend it. Considering animal quality of life, 33% viewed Full-CCC positively, 40% were neutral, and 27% saw it as poor. In contrast, 73% felt that animals experience a good quality of life under Part-CCC. Our findings suggest advisors' perceptions of CCC systems vary, with more positive views toward systems that do not allow calves to suckle. This insight highlights the importance of exploring the knowledge and viewpoints of professionals in the dairy chain to expand the debate on cow–calf systems in the industry.



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sciforum-107935: Public Perceptions of Shade Provision for Dairy Cows: Silvopastoral and Agrivoltaic Systems

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To align the dairy industry with public opinion, it is essential to understand perceptions of natural living versus animal welfare. One sustainable farming practice is the use of photovoltaic panels for dual purposes: generating electricity and providing shade to dairy cows. This study explores public perceptions regarding shade provision for dairy cows raised on pasture. We received 200 responses from the general public in southeastern Brazil through an online questionnaire that included sociodemographic questions and a three-point Likert scale. Participants were randomly assigned to one of two situations: the Silvopastoral System (SPS, n=100), where cows have access to shade from trees or the Agrivoltaic System (AgriPV, n=100), where cows have access to shade from photovoltaic panels. Data were analyzed descriptively, and the results are presented as percentages. Percentages were calculated by dividing the number of responses in each Likert scale by the total number of responses and multiplying by 100. The participants were predominantly women (52%), were aged between 18 and 35 years old (53%), had an undergraduate degree (90%) and lived in an urban area (85%). Regardless of their situation, most participants had a positive perception toward raising cows on pasture (SPS: 90%; AgriPV: 81%) and their welfare (SPS: 89%; AgriPV: 76%). Most (82%) viewed the SPS as a natural environment, while perceptions of AgriPV varied, with 38% seeing it as artificial and 35% being neutral. Interestingly, 64% of the participants believed that cows on the SPS are unlikely to feel fear, while perceptions of AgriPV varied, with 35% stating that cows can feel fear and 33% believing they are unlikely to. Meanwhile, 73% believe that cows are likely to experience happiness in the SPS, compared to 50% in AgriPV. We conclude that participants value access to pasture but prioritize the natural environment provided by trees, as it is associated with positive emotional experiences.



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sciforum-110653: Research on Zhuangzi's Philosophy of Animal Ethics

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Zhuangzi, a significant figure in Chinese Daoist philosophy, possesses a rich body of thought on animal ethics. Some scholars even argue that the text "Zhuangzi" is the earliest relatively systematic work on animal ethics in China. Generally speaking, Zhuangzi emphasizes conforming to nature and opposes human interference with the normal life activities of natural beings or the destruction of their innate characteristics. He acknowledges the intrinsic value of animals. Specifically, the philosophical foundation of Zhuangzi's view on animals can be summarized in two main points: First, "viewing things through the Dao, there is no distinction between noble and humble." Zhuangzi believes that the "Dao" gave rise to all things in the world; humans, animals, and other forms of life, despite having different manifestations, inherently contain the essence of the Dao. Second, the unity of all things. Zhuangzi holds that the "Dao" connects all beings into an interlinked organic whole, where both humans and animals are indispensable components. Therefore, Zhuangzi argues that while adhering to the overall order of nature, one must respect the equality of individual lives. From a practical perspective, Zhuangzi advocates for respecting the inherent nature of animals, opposing the suppression of this nature for human needs or turning animals into objects of human servitude. Furthermore, he insists on adhering to the ethical principle of non-action (wu wei), discouraging excessive interference with nature and disrupting the ways animals live.



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sciforum-109619: Rethinking environmental enrichment for dairy calves: improvements for basic biological needs?

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An appropriate rearing environment for calves in dairy farms is essential for their healthy development and welfare. However, in the dairy industry, calf environments are often barren and lack sufficient stimulation. Environmental enrichment is commonly defined as modifications to animal environments that improve biological functioning, yet many so-called enrichment practices for calves are responses to basic needs rather than environmental improvements. This study aimed to critically discuss the environmental enrichment approach versus the fulfillment of basic needs, advocating that essential provisions for natural behaviors should be viewed as fundamental requirements rather than enrichment. Natural behaviors, such as social interaction, suckling, and grazing, are behaviors that calves are highly motivated to perform. When deprived of the opportunity to express these behaviors, calves may develop abnormal behaviors like non-nutritive sucking. Offering milk through teats is often considered nutritional enrichment compared to systems that conventionally offer milk through buckets. For instance, when milk is not offered through teats, calves may engage more frequently in compensatory non-nutritive sucking, such as sucking on pen structures or cross-sucking (when pair- or group-housed). Similarly, restricted access to grazing can lead to oral stereotypies like tongue rolling. Given that cattle are gregarious animals, social isolation is unthinkable and has been shown to negatively impact their welfare. Environmental enrichment should go beyond satisfying these basic needs, providing additional environmental stimuli to enhance exploration and well-being for calves whose basic biological needs are already met. This distinction underscores that meeting the full spectrum of natural behaviors is crucial, and only after addressing these needs should further enrichment strategies be implemented to promote optimal welfare in dairy calves.



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sciforum-106466: Sanctuaries as Living Laboratories: Exploring Animal Autonomy and Reproductive Ethics in Italian Multispecies Communities

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In recent decades, growing interest in interspecies dynamics has sparked significant debate in the social sciences, challenging the traditional human/animal dichotomy. This shift, driven by the achievements of the animal rights movement advocating for the elimination of production cages, raises important questions on how to relocate livestock into environments that respect its needs. A key aspect of this transformation is the rise of animal sanctuaries, which have notably expanded in Italy, inspired by North American models. These sanctuaries prioritize animals' intrinsic agency, in contrast to the controlled breeding systems typical of agricultural settings. As living laboratories, many sanctuaries opt for sterilization to prevent overpopulation, raising ethical concerns about bodily autonomy and reproductive rights. While intended to prevent exploitation, this approach prompts reflection on whether sterilization itself violates animal autonomy or is necessary to prevent further harm. These dilemmas highlight the existing tension between promoting animal well-being and respecting their bodily integrity. Moreover, the concept of reproductive rights for animals, traditionally reserved for humans, challenges conventional ideas of autonomy and consent in multispecies communities. By addressing these complex issues, sanctuaries offer a valuable platform for rethinking ethical human/animal relationships and exploring how to best respect animal agency within frameworks of care.



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sciforum-109854: SharkHI: a Novel Pipeline for Health Index Calculation of Carcharodon Carcharias.

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Migration paths of the Carcharodon Carcharias (Great White Shark) are disproportionately altered by human-induced stressors on oceanic health, where ecosystem's trophically cascade from rapidly changing environments. Current solutions to aid the erupting coastal food chain manually track white sharks (the primary indicator of ocean quality) with short term biomarkers. Unfortunately, modern solutions are expensive in mass, unreasonable in the long term, and harmful to white sharks. Thus, we present SharkHI: a deep learning system to detect, track, and predict shark health from video footage. Trained on the Ocean Predatory Lab (OPL) dataset, SharkHI provide a neural network model to predict white shark health conditions in a safe, inexpensive, and accurate manner, while proving a novel approach to calculate shark health more effectively. This system includes a convoluted neural network binary classifier to isolate viable shark image frames, and a pose detection network to track 5 key points for health condition calculation. SharkHI delivers a generalizable model proven to enable predictive conclusions on regional oceanic health conditions worldwide. Additionally, SharkHI explores an additional methodology using the center body of the white shark, without the need for the nose, pectoral/dorsal fins, or caudal keel in frame, vastly improving viable image frames for calculation. With SharkHI, an innocuous pipeline is prevalent to bridge foundational conclusions on necessary understandings of both shark and oceanic health globally.



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Session F. Sustainability of products derived from animals

sciforum-109711: Heavy metal risk in marine animals and seafood consumers in Spain

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Marine animals are threatened by heavy metals, representing a risk for their populations near ports and other polluted environments. At the same time, the heavy metals that have accumulated in species exploited by fisheries represent a risk for seafood consumers as a result of bioaccumulation and biomagnification processes. When these metals enter an ecosystem, they can accumulate in the tissues of living organisms. As smaller organisms are consumed by larger predators, the concentration of heavy metals increases at each trophic level, potentially reaching dangerous levels in humans who are at the top of the food chain. This bioaccumulation and biomagnification phenomenon underscores the importance of monitoring and regulating heavy metal emissions to protect both the environment and public health. In this study, we have created a map of heavy metal risks associated with seafood animal species consumed in the SW Bay of Biscay region of Asturias (Spain) based on the scientific literature available. The region of Asturias is well known for its long tradition of coal mining and strong industrialization periods, especially in the Avilés region. Differences between species and fishing areas, with some products surpassing safe concentration limits, highlight the current heavy metal threat for both marine animals and consumers in this region.



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sciforum-109612: Analysis of volatile organic compounds (VOCs) in dog food using gas chromatography-mass spectrometry (GC-MS) and the correlation with dog appetite

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The well-being of pet dogs is a top priority for their owners, and food plays a crucial role in ensuring their contentment. In the pet food industry, the primary goal is to develop appealing food products for dogs, with factors such as appearance, taste, smell, and texture all playing significant roles. Among these, the scent of the food is particularly important and can influence a dog's eating habits. To enhance the appeal of dog food and preserve its aroma during storage, manufacturers often incorporate palatability enhancers.

The objective of this study was to characterize the volatile organic compounds (VOCs) in commercial dog pellet food products that may influence canine appetite, using headspace-solid phase microextraction coupled with gas chromatography-mass spectrometry (HS-SPME/GC-MS). The VOCs in dog food were primarily composed of aldehydes, particularly hexanal. Additionally, 2-pentylfuran and 2,6-dimethylpyrazine were identified in both dried chicken and dog pellet food. These compounds are likely products of the oxidation of unsaturated fatty acids or the Maillard reaction during processing, especially with protein sources like chicken meal. Furthermore, dog pellet food contained butylated hydroxytoluene (BHT), an antioxidant additive that helps inhibit these oxidative reactions.

Therefore, compounds such as hexanal, heptanal, octanal, 2-pentylfuran, and 2,6-dimethylpyrazine could serve as potential markers for identifying chicken ingredients in dog food and may be linked to sensory properties that influence palatability.

In conclusion, this research explores various aspects of sustainability in relation to animal-derived products, including animal welfare, production efficiency, and technological innovations that affect health and nutritional factors.



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sciforum-109614: Characterization of aroma compounds in commercialized chicken meat (*Arbor acres*) using gas chromatography–olfactometry–mass spectrometry (GC-O-MS)

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This research investigates the volatile organic compounds (VOCs) that affect the flavor and quality of *Arbor acres* chicken, focusing on the pectoralis muscle and hip cuts. Using gas chromatography–olfactometry–mass spectrometry (GC-O-MS) for qualitative analysis, this study compared the volatile profiles of cooked and raw chicken samples. Preparation techniques included static headspace (SHS) and headspace solid-phase microextraction (HS-SPME), with HS-SPME proving particularly effective in isolating key compounds that influence meat flavor.

The results showed that cooked chicken had higher concentrations of potentially harmful substances compared to raw samples, indicating that cooking alters meat composition. HS-SPME identified over ten VOCs associated with flavor quality and spoilage, including aldehydes like hexanal, heptanal, octanal, nonanal, and decanal. These aldehydes, known for their rancid or grassy odors, were identified through mass spectral matching, retention index (RI) values (770-890), and real-time sniffing evaluations by trained analysts.

The increased aldehyde levels in cooked chicken highlight how cooking processes can elevate both beneficial and undesirable VOCs, affecting flavor and freshness. While aldehydes are typically linked to lipid oxidation, their higher concentration in cooked samples suggests a need for optimized cooking and storage methods to preserve desired flavors and minimize off-flavors.

This study provides valuable insights into the VOC profiles of chicken meat and demonstrates the effectiveness of SHS and HS-SPME techniques in food quality analysis. The findings contribute to advancing flavor analysis and improving the sensory quality of poultry products. These insights have broad implications for future research on VOCs in meat, the development of processing standards, and quality control strategies aimed at enhancing consumer satisfaction with poultry products.



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sciforum-109697: Gender Effect on Carcass and Meat Quality Characteristics in Gerze Native Chickens

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Introduction

In order to meet the world's poultry meat demand, it is necessary to produce birds with fast growth characteristics and high carcass yield. For scientists and the breeders improving the meat quality is one of the most important aim. The studies on native breeds is essential to evaluate the value of these breeds. Many researchers have reported studies comparing gender and slaughter weights, meat yield, and quality in poultry such as chickens, but Gerze genotype.

Methods

This study aimed to evaluate the gender effect on the carcass and meat quality traits in Gerze native chicken. The animal material was consist of 20 male and 20 female Gerze native chickens. One-way analysis of variance was used to evaluate the data.

Results

As a results, we found cold carcass weights as 1012.60 ± 22.95 g and 702.76 ± 20.33 g for male and female chickens with statistically significant difference ($p < 0.01$). The gender effect was found statistically insignificant ($p > 0.05$) for all color values on pectoralis major and gastrocnemius muscles. There were no differences between the genders ($p > 0.05$) for freezing loss, drip loss, cooking loss, and water holding capacity. Results also showed that there were no statistical differences between the genders ($p > 0.05$) for hardness, adhesiveness, springiness, cohesiveness, gumminess, chewiness, and resilience. **Conclusion:** Results showed that there were no differences between male and female Gerze native chickens for meat quality traits.



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sciforum-109699: Identification of appetite-stimulant potent aroma volatile organic compounds from commercial dog pellet food using comprehensive two-dimensional gas chromatography--time-of-flight mass spectrometry (GCxGC-TOF/MS) analysis

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To enhance the taste of dry dog food pellets, dog food attractants (DFAs) have been developed and added to many formulations to improve flavor and other sensory properties, ultimately boosting acceptance by dogs.

The objective of this study was to identify the key aroma and flavor compounds in DFAs that significantly enhance the flavor of dog food. A thermal desorption unit, combined with comprehensive two-dimensional gas chromatography--time-of-flight mass spectrometry (GCxGC-TOF/MS), was used for the analysis of volatile organic compounds (VOCs). Volatile compounds in three commercial dog pellet food samples from unknown brands were fed to three Thai Ridgebacks and successfully identified through qualitative analysis. This was done by comparing experimental mass spectrometry (MS) data and first-dimensional retention index (¹I) values with those from the NIST 2022 database and existing literature using GCxGC. The process resulted in a total of 320 identified peaks

Using the thermal desorption extraction technique, the major VOCs identified in the dog pellet food included pentane (sweet, gasoline-like odor), o-cymene, acetophenone (sweet, pungent taste and orange odor), hexanal (fresh grass odor), and 2-formylbenzoic acid, with peak areas ranging from 7.56×10^7 to 4.59×10^8 . Hexanal, identified as a key volatile compound in dog food, was found to have a positive correlation with dog food consumption.

These findings provide valuable insights into the use of comprehensive 2D GCxGC-TOF/MS for the qualitative analysis of VOCs in dog pellet food samples in future studies.

In conclusion, odor plays a crucial role in a dog's food preferences, and understanding how technological innovations focusing on key aroma compounds influence a dog's food intake is essential for health and nutrition considerations. The production of appetizing dog food that is fully consumed can help reduce food waste, which would otherwise contribute to greenhouse gas emissions and unnecessary resource use, thereby increasing its perceived value.



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sciforum-109666: Meat quality of red deer (*Cervus elaphus*) farmed in organic system

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In recent years, the interest in venison and organic food has increased. This is a result of the increased awareness of the impact of nutrition on health and is also associated with the dissemination of information about the harmful effects of some components of mass-produced food and about epidemics that have affected farm animals in recent years. The aim of this study was to compare the meat quality of loin and leg cuts from red deer kept in the organic farm system. The animal housing and feeding system complied with the Organic Agriculture Act and EU Regulation 2018/848. Six hinds and six stags of the same age and body weight of 150 kg $\pm$ 5.2 kg were randomly selected for the study. Leg and loin samples were taken to assess the quality of the meat. The meat quality was assessed using standard methods. The data were analyzed using the Statistica program. Two-factor analysis of variance was used to compare differences between mean values. The differences were considered statistically significant at p0.05. The loin had a higher cholesterol content than the leg. There were no significant differences in the content of protein, fat, saturated fatty acids, and polyunsaturated fatty acids between the analyzed cuts. The loin was characterized by a significantly higher content of zinc and iron and a lower content of calcium and magnesium, compared to the leg. Compared to the meat of the females, the meat from the male red deer had a significantly higher iron content. The content of components determined in meat provides information about the similarities and differences in the chemical profile of important culinary elements in venison. This knowledge can help in the selection of cuts with high nutritional value and pro-health properties, meeting the requirements of the prevention of lifestyle diseases.



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sciforum-109746: STUDY OF TOXIC AND ESSENTIAL METALS IN HONEY TO apiculture and consumer SAFETY

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Background

Honey is an apicultural product consumed for its high nutritional value and beneficial properties. This sustainable food is considered also a useful bio-indicator of environmental pollution. Among various contaminants, the presence of toxic metals in honey, as a consequence of anthropic activities, can alter its mineral profile. The aim of this study was to determinate the mineral content in honey, analyze the residual levels of toxic metals according to EU Regulations, and evaluate essential microelement intake through its consumption.

Methods

Honey samples of different floral origins (wildflower, citrus, chestnut, honeydew, erika), collected in apiaries of Calabria (Italy), were digested with HNO₃ (70%) and H₂O₂ (30%) and submitted to ICP-MS analysis for the determination of toxic metals and metalloids (Cd, Pb, As), and essential microelements (Cu, Zn, Se, Fe, Mn, Co). Data were significant at values P0.05 and P0.01.

Results

The result showed the presence of minerals analyzed (> LOD) in all samples, with the highest levels of Pb (range 0.0792 - 0.1250 mg/kg) among toxic metals and a normal range of essential microelements. From a toxicological assessment, in most of the samples, Pb levels exceeded the MRLs (0.1 mg/kg) fixed by EU Regulation 2023/915, corresponding to significant percentages of Provisional Tolerable Weekly Intake (PTWI). Considering the nutritional and health aspect, instead, the concentration of essential micro-elements in honey represented a good percentage of Recommended Daily Allowance (RDA).

Conclusion

This study documented the presence of toxic metals in honey analyzed and Pb levels higher than MRL, posing possible risk to consumers. The content of essential micro-elements, however, provided an adequate nutritional intake through honey consumption. Therefore, the study of mineral profiles can be a valid method of monitoring the environmental pollution of areas where beekeeping farms are sited, and of assessing the quality and safety of honey for consumer health.

References

EU Regulation 2023/915



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sciforum-110669: Tech4RegenAg: a project at the forefront of sustainable dairy farming

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Animal production, cattle in particular, has been pointed out as a major source of pollution, namely in greenhouse gas emissions and water contamination with nitrogen. Indeed, it is because of this that livestock sectors, such as dairy farming, have been the target of incentives by the Dutch government (EUR 700M in total) to compensate farmers who voluntarily close livestock sites. Regenerative agriculture (RegenAg) has the potential to provide the sustainability that the dairy industry craves, and depends on, to ensure its long-term maintenance.

Tech4RegenAg is a project that aims to demonstrate the beneficial effects of RegenAg in soil health and milk quality. Also, recommendations will be presented to policymakers that effectively regulate RegenAg at the European level. The demonstration of these benefits will be carried out in commercial farms in order to illustrate this potential in “real-life” settings, and in various contexts. The soil microbiome and physical–chemical properties will be analysed in relation to the accumulation of metabolites in the milk, which reflect its healthy and nutritious profile. Consumer studies will be carried out in order to determine the consumer’s perception of regenerative agriculture and the best way to convey the benefits of RegenAg-produced milk and/or other dairy products within the framework of different marketing strategies.

The project will actively engage various stakeholders, including farmers, policymakers, academics, NGOs, and start-ups that are active participants in the RegenAg movement. Tech4RegenAg will harness their knowledge to maximize impact and create awareness to its importance, in order to comply with the ambitions set out by the European Green Deal, and to promote healthy and sustainable food production.



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Session G. One health: Improve Disease Manifestation and Management in Animals, Humans, and the Environment

sciforum-106846: Collateral Damage: Secondary Exposure to Anticoagulant Rodenticides in European Nocturnal Birds of Prey

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Anticoagulant rodenticides (ARs) are biocides that disrupt normal blood clotting by inhibiting the vitamin K cycle in the liver, leading to death through internal bleeding. Although these compounds primarily target rodents, they can also pose a risk to non-target species such as nocturnal birds of prey, which often consume rodents. To investigate secondary exposure to ARs, it is essential to focus on species that specialize in hunting rodents, particularly nocturnal raptors. In addition to their rodent-based diet, nocturnal birds of prey are among the most widespread avian species in Europe and thrive in both rural and urban environments, making them ideal sentinel species for various ecotoxicological studies. While numerous studies have examined secondary AR exposure in raptors across the globe, there is still no clear evidence of impacts at the population level. This work aims to highlight how ARs have affected wild nocturnal birds of prey in Europe over the past few decades, identify the species most affected, and summarize how these compounds function, as well as the primary clinical signs or lesions observed in poisoned birds. A total of 19 studies, published between 1983 and 2021, were included in this review, meeting all the selection criteria. These 19 studies provided 44 observations of various species and covered eight types of anticoagulant rodenticides. Moving forward, greater care should be taken in the use of anticoagulants for rodent control in areas where avian predators may consume poisoned prey. Some ARs can be extremely toxic to predators, posing a significant risk to species already facing threats, underscoring the need for new, environmentally friendly alternatives.



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sciforum-109615: Alteration of the gut microbiome of the common carp (*Cyprinus carpio* L., 1758) mediated by probiotics and yeast prebiotic

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The current study aimed to examine the relative impact of dietary supplementation on the intestinal microbiota of common carp, *Cyprinus carpio* L., 1758. Different types of dietary supplements, including the probiotic *Pediococcus acidilactici*, the yeast probiotic *Saccharomyces cerevisiae*, and a yeast-based multi-strain prebiotic, were tested at a concentration of 0.1% (1.0 g/1 kg). A total of 96 carps with an average body weight of 932±163 g were distributed in 12 fish tanks (1000 L), with 8 fish/tank. Fish received the experimental diet for 40 days. At the end of the trial, fish feces were withdrawn and the total bacterial community in the gut of common carp was analyzed using Illumina's NGS targeting the 16S rRNA gene. The Krona phyla richness pie chart showed that 11 bacterial phyla were recorded in fish fed the yeast prebiotic, with the top 3 phyla being Fusobacteria, Firmicutes, and Proteobacteria. Similarly, 10 phyla were found in fecal samples from carp fed *P. acidilactici*, with the top 3 phyla being Proteobacteria, Firmicutes, and Fusobacteria. Also, carp fed *S. cerevisiae* recorded nine phyla, the top three phyla being Fusobacteria, Firmicutes, and Proteobacteria. However, carp fed the basal diet only showed 14 phyla, with the most abundant phyla being Fusobacteriota, Bacteroidota, and Proteobacteria. This study concluded that the examined feed supplements can cause alteration in the composition of the gut microbiome of the carps reared in a recirculating system.



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sciforum-109725: Analysing aquatic invertebrate health in terms of Artificial Light at Night (ALAN)

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Introduction

Artificial Light at Night (ALAN) is a recent concern for researchers working on anthropogenic impacts on the wildlife ecosystem, health, and biodiversity. The concern associated with ALAN in an aquatic ecosystem is that it disrupts the natural dark–light cycle (DLC), which is essential for invertebrate health and maintaining ecological balance. In this study, we attempted to understand those adverse consequences by analysing grooming behaviour, a well-established indicator of neurological stress in animals.

Methodology

A population of freshwater prawn species (*Macrobrachium lamarrei*), a highly abundant species in the Asian subcontinent, was considered the model organism for our study. The prawns were exposed to artificial light from the sunset to the morning time (except the natural light exposure during the day time). The collective grooming (CG) pattern in the experimental population was calculated in a real-time kinetic manner. The data were analysed by comparing controlled and ALAN-treated prawns, using their CG percentages.

Results

The results indicated that being exposed to extended artificial light induces a significant increase in the CG activity in the prawns in comparison to the population with a normal DLC. From the 12th to the 72nd hour, there was an exponential elevation in CG that was higher than in the controlled environment. This was followed by a fluctuating and inconsistent increase until the 5th day. On the 6th and 7th days, the CG pattern remained consistent and was still higher than that in the controlled environment.

Conclusion

This study intends to highlight the physiological health hazards associated with light pollution in a prawn population, emphasizing the stability and biodiversity of the aquatic ecosystem. Precisely, we target the freshwater arthropods which represent the aquatic invertebrates for the assessments of anthropogenic effects on aquatic ecosystems. We want to demonstrate how prolonged artificial light exposure can affect the brain behaviour circuit of *Macrobrachium lamarrei*.



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sciforum-109726: Assessment of aquatic arthropod health in terms of heavy metal contamination: using *Macrobrachium lamarrei* as a representative

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Introduction

Biogeoaccumulation of hazardous elements are an issue of concern for researchers. The geological deposition of hazardous heavy metals has a substantial impact on the ecosystem health, animal health and public health. Different metal bioaccumulation leads to different metal-induced effects on animals. This poses a long-term health risk to the general public. In the Indian subcontinent, particularly in the West Bengal area, prawns are a highly abundant species with high nutritional value. The majority of the prawns that are typically transported to urban areas for sale come from these rural regions. Thus, we are interested in determining the heavy metal contamination profiles in edible prawns like *Macrobrachium lamarrei*.

Methodology

Prawns (*Macrobrachium lamarrei*) of average size were selected from their natural habitat (freshwater ponds) and were analysed via trace metal analysis in their edible tissue (muscle). The Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) technique was used to determine the content of heavy metals in prawn samples from a rural region in West Bengal, India.

Result

Heavy metal contamination of non-industrial rural soils and pond sediments is alarming. In terms of the bioaccumulation of trace metals, prawns (*Macrobrachium lamarrei*) have been estimated to accumulate notable concentrations of zinc (Zn), followed by copper (Cu) and manganese (Mn). With respect to the most hazardous heavy metals (or metalloids), the prawns were assessed and showed that the accumulation levels of arsenic (As) are the highest, followed by cadmium (Cd). However, there were no traces of lead contamination in the prawns.

Conclusion

This study aimed to determine aquatic invertebrate health (animal health) using freshwater prawns (*Macrobrachium lamarrei*) as a representative of edible aquatic organisms. This is a study on the food safety aspects of *Macrobrachium lamarrei*, which is appreciated as a food item in different countries of the continent of Asia.



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sciforum-110650: Cattle face detection based on YOLOv11 Deep Learning

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The application of deep learning techniques has become a current research hot topic in livestock farming. The facial detection of cattle enables the identification of cattle and the study of facial data (eye monitoring) to further determine the health status of the cattle. At present, the detection of cattle faces remains a challenge due to the diversity of cattle farm environments. In this study, we gathered indoor and outdoor facial data of cattle in different postures, including standing, lying, eating, and walking, and constructed a dataset consisting of 1200 cattle faces. Building on this, this paper proposes a cattle face detection model based on YOLOv11. In order to improve the model's ability to detect multi-scale information, this paper introduces the CBAM attention mechanism model. In addition, we add the GFPN network to the neck network for the detection of small target information. To further improve the generalisation ability of the model in diverse scenarios, we use ATFL to replace the traditional cross-entropy loss function in YOLOv11. The model proposed in this paper effectively detects cattle faces in various postures, both indoors and outdoors. This advancement will serve as a foundational resource for individual cattle identification, disease monitoring, and the autonomous management of cattle farms within the context of smart farming.



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sciforum-091870: Evaluation of *Staphylococcus aureus* Prevalence and Antimicrobial Resistance in Rabbit Infections: Public Health Concerns

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Staphylococcus aureus, a well known human pathogen, is increasingly recognized as a significant cause of infections in various animal species, including rabbits. Its growing prevalence and the development of resistance to multiple antibiotics, resulting from their excessive and incorrect use, represents a significant threat to public health. Therefore, the main objectives of this study were to assess the presence of methicillin-sensitive *S. aureus* (MSSA) and methicillin-resistant *S. aureus* (MRSA) in rabbits with infections and to determine their antimicrobial resistance, shedding light on potential public health implications.

In this study, 79 samples were collected from rabbits with infections from different farms in northern Portugal. Eight MRSA strains were randomly selected and then tested against 14 antimicrobial agents, including penicillin, cephalosporins, fluoroquinolones, aminoglycosides, macrolides, tetracyclines, oxazolidinones, and other miscellaneous agents. Susceptibility testing was carried out using the agar disc diffusion method, as recommended by the EUCAST and CLSI guidelines.

Of the 79 samples, 35 were from pododermatitis, of which 31.43% corresponded with MRSA and 17.14% with MSSA. Of the 33 samples from mastitis, 45.45% were MRSA and 15.15% were MSSA. The abscess samples (eight) had 25% MRSA and 12.5% MSSA. None of the metritis samples (three) tested positive for MRSA or MSSA. Of the strains selected, 37.5% were resistant to penicillin, ciprofloxacin, gentamicin, tobramycin, erythromycin, and clindamycin. Only 12.5% showed resistance to kanamycin, tetracycline, and trimethoprim-sulfamethoxazole. None of the strains studied showed resistance to ceftiofur, linezolid, chloramphenicol, fusidic acid, or mupirocin.

These results highlight the need to monitor and control *S. aureus* in rabbits for both animal welfare and public health, given the antibiotic resistance challenges. Some strategies are therefore needed to alleviate these problems, from the appropriate and conscientious use of antimicrobials, reinforcement of infection control measures, and surveillance of antimicrobial resistance. Future studies should investigate the potential routes of transmission between rabbits, humans, and the environment to better inform control measures



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sciforum-096035: Exposure of stray and hunting dogs to SARS CoV-2 in Campania, southern Italy

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Evidence of SARS-CoV-2 exposure has been reported across the world in a variety of animal species, including pets. Pets are particularly predisposed to contracting the virus due to their close contact with their owners. This occurrence was common during the COVID pandemic. Recent evidence has proven that dogs are less susceptible to this virus than cats, and usually they produce antibodies rather than shed the virus after contagion. In this work, the seroprevalence of SARS CoV-2 was determined in hunting and stray dogs in Campania, southern Italy. A total of 112 dogs without any symptoms were included and tested with two distinct commercial ELISAs. In total, 5 of 112 animals (4.6%) tested positive. All the antibody-positive animals were stray animals. Each animal's feces and blood were examined using a real-time PCR that targeted two different coding regions. No animal tested positive in molecular investigations, indicating dogs' passive role in this infection when they do not exhibit clinical symptoms. Pets have been, and continue to be, prone to SARS-CoV-2 infection as a result of their close relationship with humans. This study assessed the seroprevalence of shelter dogs in southern Italy. The findings demonstrate a presence of SARS CoV-2 in this dog community, leading to the conclusion that contact with infected humans is sufficient to transfer the virus to dogs.



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sciforum-108471: Farm-specific effects in predicting mastitis by applying machine learning models to automatic milking system (AMS) data

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Introduction

Mastitis, a prevalent and costly disease in dairy farming, significantly impacts milk production and quality. Early and accurate prediction of mastitis is crucial for effective herd management and minimizing economic losses. This study investigated the effects of farm-specific factors on the accuracy of mastitis predictions by applying machine learning (ML) models to AMS data.

Methods

We collected and analyzed a large dataset consisting of 2.73 million observations over the period of 2019–2022, from two dairy farms in Germany. Six ML algorithms, i.e., Logistic Regression, Support Vector Machines, Decision Tree, Random Forest, Multi-Layer Perceptron Neural Networks and Gradient Boosting Decision Tree, were applied to predict mastitis occurrence, with a focus on understanding how farm-specific factors like herd size, management practices, and farm environment influence prediction accuracy.

Results

For training and testing on both farms combined, the accuracy, sensitivity and specificity were estimated at 0.89–0.93, 0.79–0.92 and 0.89–0.93, respectively. When training and testing both individual farms separately, the accuracy, sensitivity and specificity estimates were (i) 0.85–0.93, 0.73–0.91 and 0.85–0.93 for the large farm, and (ii) 0.89–0.96, 0.63–0.89 and 0.89–0.96 for the small farm, respectively. However, after training the models on the combined dataset over a period of three years (2019–2021) and testing on each farm individually for year 2022, the accuracy, sensitivity and specificity estimates were (i) 0.78–0.94, 0.85–0.98 and 0.78–0.94 (large farm), and (ii) 0.92–0.98, 0.70–0.96 and 0.92–0.98 (small farm), respectively. The analysis determined that sensitivity scores for the large farm and accuracy, sensitivity and specificity scores for the small farm improved significantly by training models on combined data but testing each farm separately.

Conclusion

Our findings suggest that training ML models on a combined database and testing with an approach tailored to each farm's unique characteristics seem to be a feasible approach to improve mastitis prediction.



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sciforum-110937: First detection of human-associated microsporidia species in urban and suburban pigeons in the city of Leicester and surrounding areas, UK.

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The potential zoonotic transmission route of *Enterocytozoon bieneusi* and *Encephalitozoon* spp. (*E. intestinalis*, *E. hellem* and *E. cuniculi*) is under discussion. Following the detection of human-related microsporidia in dog faecal samples collected in Leicester city centre (UK) in January 2016, we monitored the presence of human-related microsporidia in 628 fresh pigeon faecal samples collected in urban and suburban areas of Leicester between summer 2017 and summer 2018, as this invasive species closely interacts with humans, especially with susceptible individuals such as children or the elderly. The presence of microsporidian spores was assessed using Weber's chromotrope stain. Microsporidian species were detected in all samples by SYBR Green real-time PCR with melting curve analysis after DNA extraction by spore disruption using Fast-Prep for soil® following previous methodologies. Spores were observed in 104 samples, with 81 testing positive by molecular methods. Specifically, *E. bieneusi* was detected in 13 samples, while 26, 17 and 9 samples tested positive for *E. intestinalis*, *E. hellem* and *E. cuniculi*, respectively. Moreover, 16 samples were positive for *E. hellemlintestinalis*. Despite being the species with clearer zoonotic implications, the lower presence of *E. cuniculi* in the pigeons could be logical, as this species has not been found in similar studies, e.g., in pigeons monitored in public parks in Madrid, Spain. Although our results suggest a moderate presence of these microsporidian species in pigeons in Leicester, the prevalence is slightly lower than that reported in the literature. However, the prevalence found may represent a potential risk to residents and visitors to the city of Leicester and its surrounding areas, particularly when they flap their wings, as this movement may facilitate the resuspension of their faeces with debris and other topsoil materials. Further studies monitoring these parasites in the intestines of pigeons are needed to properly characterise the risks identified.



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sciforum-108448: Identification of *Lactobacillus reuteri* P2M1 from Swine and Evaluation of its Probiotic Function in Vitro

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The aim of this study was to evaluate the biological characteristics and in vitro probiotic function of *Lactobacillus reuteri* P2M1 from swine, to determine the probiotic potential of the strain, and explore the possibility of its application in livestock production. In this study, a strain of lactic acid bacteria (P2M1) isolated from healthy pig feces was biochemically identified, and molecular biological identification was performed using bacterial 16S rDNA sequence PCR amplification and sequencing techniques. The growth curve and acid production curve of the strain were drawn to evaluate the tolerance of the strain to acid and bile salts, and the sensitivity of the strain to antibiotics was detected. The free radical-scavenging ability and extracellular polysaccharide production of the strain were determined, and then the in vitro safety test was performed to evaluate the safety of the strain to mice. The results showed that the strain P2M1 was *Lactobacillus reuteri*. It had the glycolysis ability, the logarithmic growth phase was 2~10 h, and the pH was stable between 4.0 and 4.1 after 20 h. It has good low-pH and bile salt tolerance, and is sensitive to common antibiotics. the DPPH, ABTS and hydroxyl radical-scavenging rates of the fermentation supernatant of the strain were significantly higher than those of the intact cell suspension (P0.05), which were 88.79%, 93.52% and 92.15%, respectively. The yield of crude extracellular polysaccharide was 339.82 mg·L⁻¹. No death or organ lesions were observed in mice after intragastric administration of 0.2 mL of live *Lactobacillus reuteri* P2M1 solution at a concentration of 1×10⁹ CFU·mL⁻¹ per day for two weeks. It is concluded that *Lactobacillus reuteri* P2M1 has a short logarithmic growth period, rapid growth of cell concentration, high yield of extracellular polysaccharides, good probiotic and antioxidant properties, and safety *in vitro*, and can be used as a candidate strain for probiotic preparations.



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sciforum-109472: Investigation of clinical presentations and clinicohistopathological correlations of spontaneous hepatic lobe torsion and clinical outcomes after hepatic lobectomy in domestic rabbits (*Oryctolagus cuniculus*)

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Hepatic lobe torsion is an uncommon disease that has been described in various species, such as humans, dogs, and rabbits. Torsion causes vascular occlusion that leads to hepatic necrosis and death in the worst cases. Predisposing factors to this include external trauma, a congenital absence of hepatic ligaments, rabbit gastrointestinal syndromes, hepatitis infection, and environmental stress, which have been proposed as a risk factor for hepatic lobe torsion. The objectives of this study are to describe the histopathology grading scores, clinicopathologic findings, and clinical presentations. Rabbits were diagnosed from September 2022 to January 2023 (n = 20). The diagnosis was made upon clinical presentations, physical examinations, Colour Flow Doppler (CFD), Complete Blood Count (CBC), and serum biochemicals. Hepatic lobectomy was performed to remove the affected hepatic lobe. Samples were processed and stained with Hematoxylin and Eosin (H&E). All rabbits had acute onset, such as depression, pale mucous membrane, and abnormal gut sounds. The use of CFD revealed a decreased in or absence of blood flow in all cases. The gross lesion revealed severe acute hemorrhage and hematoma. Average BUN, creatinine, ALT, AST, and heterophils were higher than normal values. Hb, HCT, MCHC, platelets, and lymphocytes were lower than normal. All rabbits were diagnosed with severe acute diffuse necrotic hemorrhagic hepatitis and severe coagulative necrosis. Anaemia and thrombocytopenia were commonly presented (90%). The outcome of the percentage of survival rate after hepatic lobectomy was (16 from 20 rabbits) 80%. The present study demonstrated that early detection using GI signs, CFD, clinicopathologic, and hepatic lobectomy is a crucial point in successful treatment, as is using histopathologic scores for describing severity. For further investigation, the relationship between environmental stress from climate change, viral transmission from humans to rabbits, and other zoonotic diseases that relate to hepatic lobe torsion from hepatitis must be researched, and preventive measures must be found in the future.



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sciforum-109794: Isolation and characterization of class II Newcastle disease from circulating strains in Mizoram, NER, India

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Abstract

Background: Newcastle disease is a highly virulent emerging disease affecting the poultry population irrespective of age, sex, breed and other characteristics. It is a highly mutating virus that is globally widespread and comes under the category of transboundary diseases. Despite strict vaccination practices even in remote areas, this virus causes high mortality (90-100%), leading to huge economic losses in the poultry industry.

Methods

This study focusses on the discovery of the novel vaccine resistant mutants for the elimination of the virulence of the disease among the flocks in Mizoram, which is in the NER, India. Prevalent outbreaks were reported in the Selesih, Zemabawk, Melthum districts of Mizoram from October to December 2021. Clinical signs of Newcastle disease were manifested, and the carcasses were brought to the department. They were eviscerated for clinico-pathological examinations. Representative tissue samples were collected for molecular detection using reverse transcriptase polymerase chain reaction targeting the whole length of Fusion gene (1662 base pairs). Homogenized isolates of the positive samples were sequenced and analyzed phylogenetically.

Results

The results showed that the isolates belonged to the novel genotype XXII of Newcastle disease virus as per the updated nomenclature system of classification. The XXII genotype was subdivided into sub-genotype XXII.1 and sub-genotype XXII.2.

Conclusions

The rapid isolation and identification of the disease was of great importance in the present study due to the emerging nature of the virus.



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sciforum-109714: Micronucleus Test in Limpets from Asturias Marinas

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In recent decades, the surging human population and expanding economic activities have led to a significant rise in maritime traffic, exerting heightened pressure on marine environments and the establishment of new marine trade routes. This rise in maritime traffic puts additional pressure on marine environments, with fuel spills thought to play a key role in environment deterioration. In this paper, we conducted a micronucleus test on 48 limpets of the genus *Patella* collected from four different marinas. Additionally, we collected 48 limpets of the genus *Patella* from a fifth site and exposed them to ship contaminants (fuels and cleaning products) for five days before conducting the MN test. Furthermore, we analyzed arsenic, cadmium, mercury, and lead (As, Cd, Hg, and Pb, respectively) in four water samples from the five sites. Our findings revealed that limpets from Gijón had the highest micronucleus count, followed by limpets from Avilés, Nalón, and Ribadesella. Limpets exposed to petrol showed the highest micronucleus count, followed by those exposed to diesel, ecological soap, and the control group. There were no statistical differences between limpets exposed to ecological soap and the control group. As was detected in all water samples, while Cd, Hg, and Pb were only found in samples from Avilés marina. These results support the hypothesis that maritime traffic may significantly contribute to the genotoxic effects of local marine fauna.



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sciforum-094493: Mitigating the Impact of Lyme Disease on One Health: A Holistic Approach

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Lyme disease is a tick-borne infection caused by borrelia bacteria with essential implications for animals, humans, and the environment. This disease is transmitted to humans by infected blood-feeding ticks of the Ixodes genus. The disease is characterized by a red rash on the skin known as erythema migrans (EM) and leads to serious conditions if left untreated. Lyme disease is a chief example of the interconnectedness of animals, humans, and the environment. The rise of Lyme disease as a public health threat emphasizes the need for collaborative One Health approaches for the effective management of diseases. A One Health approach addresses the nature of the disease by considering human health, animal health, and ecological factors. Early detection of disease is a critical component of One Health. The use of advanced technologies such as AI by employing computer vision and a convolutional neural network (CNN) to identify ticks that are carriers of Lyme disease will enhance epidemiological surveillance and disease management strategies. Tick control measures using a One Health approach are crucial in mitigating Lyme disease. Tick control measures include the knowledge of ecological processes that affect tick populations, the development of sustainable interventions, and the promotion of public health awareness through research on ticks' behavior and disease transmission. The role of One Health in controlling Lyme disease cannot be ignored. One Health has the potential to significantly reduce the risk of Lyme disease in affected populations by implementing collaborative efforts such as surveillance, interdisciplinary research, and intervention strategies.



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sciforum-106113: Paradigms in the Environmental State Systems of SEA region: Stepping Up Interventions on SDG3, SDG14, and SDG15

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Environmental state systems plays a major role in environmental conservation and biodiversity preservation. The lack of policy-wide interventions across ASEAN countries, which proliferation of "the built environment" scenarios have established invisible conflict with the wildlife and biodiversity hotspots. For long periods of time since the establishment of 17 Sustainable Development Goals (SDGs), there is no accelerated process to fixed regulatory practices as environmental state are often contested or lack of collaborative action across multi-stakeholders. This work assesses the developments and foreground of the rational reason signaling for more conscious planning concerning the ecological environment, including enhancing the governance landscape. The methodology in this research incorporates a scenario analysis and phenomena assessment, across diverse ASEAN countries such as Malaysia and Indonesia. The assessment in this study highlights the saddening scenario of health threats to the wildlife, ecological systems, and marine systems. Additionally, the built environment conditions in SEA further expedites the transitioning of climate change effects, and other potential disease due to lack of hygiene or safety cares. Environmental state systems is perceived to be a useful concept in this study to forward agendas where health, wellbeing, and equity for wildlife, biodiversity, or human-nature systems are effectively managed. This work is useful for interdisciplinary scientist, researchers, and scholars studying environmental policy subjects.



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sciforum-109709: Revealing Digenean Diversity in Marine Fish from Southern Thailand

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Parasite infections pose a significant threat to the health of fish and the sustainability of fisheries, impacting both the ecological balance and the economic value of marine fish populations. Despite this, comprehensive data on the prevalence of helminths in these hosts, including digenean trematodes, remain scarce in Thailand. Previous studies have focused on only a few species of marine fish and have had limited taxonomic precision in identifying the detected parasites. This study aims to fill this knowledge gap by providing baseline data on the diversity of digeneans across a variety of marine fish species. From July to August 2024, a parasitological survey was conducted in the Gulf of Thailand. More than two hundred marine fish, representing over 50 fish species, were analyzed for the presence of parasites. Each fish was dissected to search for trematodes, and isolated worms were preserved for taxonomic studies. Subsequently, the recovered trematodes were studied in the laboratory using standard parasitological techniques to determine their taxonomic status. The findings revealed that 26.4% of the fish were infected with digenean trematodes. These trematodes belonged to five families: Acanthocolpidae, Allocreadiidae, Bucephalidae, Hemiuridae, and Lepocreadiidae. Several of the reported trematodes are cited for the first time in Thailand. These results offer valuable insights into the presence and taxonomy of digenean trematodes in this understudied region. This study underscores the need for continued research to further understand the helminth communities of marine fishes in the Gulf of Thailand.



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sciforum-096037: Serological and molecular survey of Q fever in the dog population in southern Italy

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Q fever epidemiology in ruminants was established, but the contribution of other species (including pets) is still controversial. In fact, this species, like cats, can be involved (even if rarely) in the transmission of Q fever to humans. In this work, we investigated the exposure and molecular prevalence of Q fever in the dog population of Campania, southern Italy. A total of 268 serum and 197 whole blood samples were collected from different categories of dogs. A multi-species ELISA was first used to assess the presence of antibodies, and, only on positive animals, further ELISA (phases I and II) and immunofluorescence assays were performed. About 6% of animals had specific antibodies against *Coxiella burnetii*, even if only four dogs tested positive in phase-specific ELISAs. The evaluation of risk factors did not identify any risk factors correlated with higher seroprevalences. A total of five blood samples were positive (real-time PCR), even though only two were confirmed by end-point PCR and sequencing. The sequencing revealed the similarity of the isolates with other strains described in dogs, in dog's ticks, and ruminants in the same study area. In this study, we demonstrated how dogs are also exposed to *Coxiella burnetii*. Moreover, we demonstrated how surveillance of this pathogen is important at various levels and in different populations.



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sciforum-100906: Seropositivity of toxoplasmosis in slaughtered dairy cattle at abattoirs in the Eastern Cape Province, South Africa

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Toxoplasmosis is a significant public health concern, primarily associated with consuming raw or undercooked dairy products. However, there is limited knowledge concerning the seroprevalence of *Toxoplasma gondii* in dairy cattle slaughtered in high-throughput abattoirs intended for human consumption in South Africa. This study aimed to determine the seropositivity of toxoplasmosis in dairy cattle slaughtered at three high-throughput abattoirs. In 2023, 150 blood samples were randomly collected from dairy cattle at three high-throughput abattoirs in the Eastern Cape Province, South Africa. The seropositivity was significantly higher in abattoir B (East London), which had 30% positive dairy cattle. No significant difference was observed in abattoirs A (Port Elizabeth) and C (Queenstown). In animals younger than 3 years, 22% were infected with *t. gondii*. The Friesland breed showed more susceptibility than jersey and crossbreed breeds. The chi-square test was used to determine associations between the prevalence of toxoplasmosis, where low seropositivity resulted from the data, showing the disease to be less likely to occur. This research represents one of the few studies on the seropositivity of *T. gondii* in dairy cattle in South Africa. While the prevalence of infection was found to be low from the seropositivity results of the dairy animals, our findings underscore the potential public health implications associated with *T. gondii* in dairy cattle based on the low level of knowledge on the disease. The study results were found to be less significant; the null hypothesis was accepted. Recognizing the significance of *T. gondii* infection in dairy products is critical. This study contributes to our understanding of the prevalence of *T. gondii* in South African dairy cattle, highlighting the need for continued monitoring and control measures to ensure the safety of dairy products for consumers.



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sciforum-109745: Seroprevalence study of *Ehrlichia canis* and *Anaplasma phagocytophilum* in feral cats in Autonomous Community of Madrid

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Bacteria of the genera *Anaplasma* and *Ehrlichia*, both belonging to the family *Anaplasmataceae*, are obligate intracellular, Gram-negative bacteria. *Rhipicephalus sanguineus* and *Ixodes ricinus* ticks act as vectors for these pathogens. *R. sanguineus* is typically found in Mediterranean areas, while *I. ricinus* is referred to as the “winter tick” due to its preference for cooler climates. Currently, diagnostic techniques are predominantly focused on pathogens affecting canines, which presents a significant challenge in the detection of infectious diseases in felines. Serological cross-reactivity between certain microorganisms is a potential concern, and clinicians do not usually have access to suitable tests for cat-specific pathogens.

The objective of this study was to assess the seroprevalence of *Ehrlichia canis* and *Anaplasma phagocytophilum* in feral cats (*Felis silvestris catus*) in the community of Madrid using serological techniques such as enzyme-linked immunosorbent assay (ELISA) and indirect immunofluorescence assay (IFA) tests. The influence of environmental factors and the most appropriate diagnostic method for this species were also determined. Blood from 293 cats was collected in four sampling areas in Madrid: Las Rozas, Arroyomolinos, Fuenlabrada, and Torreldones, between February and October, 2022.

The results indicate that 51% of the cats tested positive for *Ehrlichia canis* IFAT, 5.46% were positive by ELISA, and 3.75% by both tests. For *Anaplasma phagocytophilum*, 34.47% tested positive by IFAT, 3.41% by ELISA, and 3.07% by both methods. The highest seroprevalence for both pathogens was observed in Torreldones, particularly during spring, in young adult male cats.

This study confirms the circulation of *E. canis* and *A. phagocytophilum* in feral cats in Madrid. It also highlights a higher seroprevalence detected using IFAT, which showed low concordance with the ELISA technique. However, molecular diagnostics are needed to determine its reliability in feline species.



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sciforum-110938: Strengthening capacity for food surveillance of human pathogenic microsporidian spores on pig farms in Makeni, Sierra Leone

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Following the detection of microsporidia in animal faeces collected from different farms in Bombali District, Sierra Leone (SL), in April 2019, we began implementing a multi-stage project to build medical parasitology capacity at the University of Makeni (UniMak, SL) to address potential future risks from these opportunistic parasites. UniMak academics introduced novel practicals for the detection of microsporidia in different BSc Public Health modules in 2020/21 and followed a blended approach using the *e-Parasitology* package (<http://parasitology.dmu.ac.uk/>). Students processed thirty-six fresh stool samples from pigs provided by the SL Department of Agriculture and Food Security from a nearby farm (Makeni) in 2021. Students prepared smears in a class II biosafety cabinet and learned to perform trichrome staining for spore detection. Further fresh faecal samples were collected from four pigs in summer 2022 to investigate temporal variation.

The students showed a high level of confidence as soon as they entered the laboratory. They were able to carry out all the different practical steps quickly. A high level of accuracy was observed in the students' detection of spores present in 14/36 (38.8%) of the stool smears monitored, which would be consistent with the prevalence of microsporidia previously detected by our group (7/12; 58%) using SYBR Green real-time PCR on 12 pig stool samples collected in 2019. One of the samples collected in 2022 was positive for spores of the genus *Encephalitozoon*. In addition, structures compatible with *Encephalitozoon* spp. were observed in another pig. These results are similar to those observed in 2019, suggesting a moderate circulation of *Encephalitozoon* spp. in the monitored farms, highlighting a potential risk to the Sierra Leonean population. The different phases and strategies used seem to have been successful in building capacity to prepare future UniMak professionals to manage microsporidian infections in Sierra Leone.



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sciforum-110882: Understanding climate change and zoonotic diseases: canine leishmaniasis as a case study

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Leishmaniasis is a vector-borne disease transmitted to animals/humans by sandflies. Temperature, rainfall and humidity can affect sandflies in a variety of ways, with air temperature being the most important factor affecting the metabolism, development, survival and capacity of these vectors. Climate change facilitates the geographical distribution of leishmaniasis vectors, including in Europe (Germany and Belgium). Regions with high climatic suitability will be at risk of the increased occurrence of leishmaniasis, especially if this is combined with high social vulnerability. Collaboration between medical/health practitioners, veterinarians, public health/epidemiology experts and the general public is key to the effective control of *Leishmania* parasites, with education being a critical aspect to avoid vector exposure. We are developing virtual resources to strengthen the detection/prevention of this disease, available on the e-Parasitology[®] website (<http://parasitology.dmu.ac.uk/>). A virtual clinical case of a pet dog co-infected with *Leishmania* and *Toxocara* was tested in final-year veterinary students during their clinical rotation. A total of 68.2% (n=26/160; 2020/21; Complutense University of Madrid, Spain) stated that they had learned to diagnose infections in small animals (4.5% disagreed), and 63.7% stated that they had learned strategies for preventing and treating leishmaniasis in dogs. These resources were introduced into the BSc Environmental Sciences programme at the University of Alcalá (UAH, second-year module of "Environmental Toxicology", 2023/24) to reinforce learning about the impact of climate change on the emergence of zoonotic diseases, including the increase in and spread of sandfly populations due to warming. In a second practical seminar, these UAH students were asked to work in mini-groups to develop a research project/proposal to address a current environmental risk of their choice in six different two-hour sessions. Although preliminary, these resources could be effective in facilitating students to acquire the appropriate skills to detect and prevent infections of important parasitic diseases such as leishmaniasis, despite their background in parasitology.



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sciforum-105754: Using chicken (fowl) immunoglobulins to fight horse pasteurellosis in the Zoo in Baku

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In our research work, we used type-Y chicken antibodies in treatment and prevention of pasteurellosis in horses. Currently, our knowledge and experience of chicken antibodies use to fight variety of human and animal disease of different ethologies is growing. In September 2022, five Karabakh horses were transformed to a zoo in Baku from Horse factory located 320 km away. One horse died on the third day after the arrival. Bacterial investigation of parenchymal organs indicated *Pasteurella multocida*. As a preventing treatment for other horses, we used an intramuscular injection medicament of immunoglobulins IgY, extracted from fowl egg yolk, hyperimmunised with Pastanarm-8 containing antigen Pasteurellosis. The purpose of the research is to study the use of type-Y immunoglobulins, extracted from chicken egg yolk, hyperimmunised with a vaccine against pasteurellosis of agricultural animals.

1 yo chickens are hyperimmunised with Pastanarm-8 vaccine, containing eight antigens of various infection triggers, Pasteurellosis among them. After extraction of the immunoglobulins by deposition with ammonium sulphate and then distilled water dialysis, by Bradford method, we found that in 1ml solution there are 50 mg of immunoglobulins. The solution is intramuscularly injected to each horse in a doze of 160 ml.

Daily thermometry and clinical tracking of the horses showed that deviation from the norm started to disappear from the second day. However, problems were discovered in the neighbouring paddock, containing sheep and goat, that were served by the same personal. Two sheep died. Clinical and laboratory research shoed that pastoraes was the cause. Methodic action to liquidate Pasteurellosis among the zoo animals were taken immediately. After 14 days, an all inclusive Pastanarm-8 vaccination was conducted. Pasteurellosis epizootic among the zoo animals was eliminated. Successful use of chicken immunoglobulins in prevention of Pasteurellosis indicates that it is possible to use it as an alternative to horse serum, which has several negative features.



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