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BALAI BESAR PELATIHAN KESEHATAN HEWAN

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Perpustakaan BBPKH Cinagara

Jl. Snakma Cisalopa Desa Pasir Buncir Kecamatan Caringin Kabupaten Bogor.

Email: Perpustakaan.bbpkhcinagara@gmail.com

Web: <https://kikp.pertanian.go.id/bbpkh>

203. Imputation of non-genotyped individuals using their genotyped progeny implementing machine learning algorithm/ **Bojnord, Naeem Rastin; Honarvar, Mahmood; Aminafshara, Mehdi; Kashan, Nasser Emam Jomeh.** Gene Reports. ISSN:2452-0144 (2019) v.16 p.100435Gene Reports

DOI: 10.1016/j.genrep.2019.100435

Link: <http://www.sciencedirect.com/science/article/pii/S2452014419300779>

Abstract: The objective of this study was to investigate the accuracy of imputation of a non-genotyped parent using genotype information from his/her progenies. 100 sires which were considered as ungenotyped individuals were simulated and randomly mated with females, hence 100 families including one sire with different number of genotyped progenies (2, 3, 4, 5, 6, 10 or 15) were simulated. The considered genome comprised 5 chromosomes of 1 M each. The number of the number of markers was set to 5000 for whole genome. The sires in families. Support Vector Machine (SVM) and Random Forest (RF) Methods were implemented to predict the sire's genotypes using their progeny's genotypes in several different dosage of progenies. The results revealed that for genomic predictions at least, the genotypes of 6 progeny provide sufficiently high accuracy of imputation (allele concordance rate of 0.9963 and 0.9882 for RF and SVM respectively).

Keyword: Machine learning; Genomic; Imputation; Non-genotype

204. Hepatotoxicity of Telfaria occidentalis root extracts on wistar albino rat/ **Ogunmoyole, Temidayo; Oladele, Funmilola Comfort; Aderibigbe, Ayonbo; Johnson, Olaitan Daniel.** Heliyon. ISSN:2405-8440 5(2019) v.5 p.e01617Heliyon

DOI: 10.1016/j.heliyon.2019.e01617

Link: <http://www.sciencedirect.com/science/article/pii/S2405844019314768>

Abstract: The present study investigates the toxicity of Telfaria occidentalis root extracted with different solvents. This was with a view to validating its widely acclaimed use as poison in traditional parlance. Air-dried powdered root of Telfaria occidentalis was extracted separately with distilled water, methanol and diethyl ether. Twenty albino rats were randomly placed into four groups of five animals per group: Group I served as the positive control and were administered distilled water only while groups II, III and IV animals were administered 50 mg/kg body weight of aqueous, methanolic and diethyl ether extracts respectively for two weeks. Activities of aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), superoxide dismutase and catalase were assayed in the liver homogenate and serum. Levels of total cholesterol, HDL-cholesterol, LDL-cholesterol as well as lipid peroxidation were also measured in the liver and serum of animals. Results showed that the level of AST, ALT, ALP as well as LDL-cholesterol and HDL-cholesterol in the serum of group IV animals increased significantly relative to the control group. Antioxidant enzyme biomarkers such as catalase and superoxide dismutase as well as lipid peroxidation were significantly increased in the serum of group IV animals relative to the control. The study concluded that toxicity of root extract of Telfaria occidentalis is solvent-dependent.

Keyword: Toxicology; Biochemistry

205. The protective effect of edaravone on memory impairment induced by chronic sleep deprivation/ **Alzoubi, Karem H.; Al Mosabih, Heba S.; Mahasneh, Amjad F.** Psychiatry Research. ISSN:0165-1781 (2019) v.281 p.112577Psychiatry Research

DOI: 10.1016/j.psychres.2019.112577

Link: <http://www.sciencedirect.com/science/article/pii/S016517811931251X>

Abstract: Sleep plays a critical role in body health maintenance, whereas sleep deprivation (SD) negatively affects cognitive function. Cognitive defects mainly memory impairment resulting from sleep deprivation were related to an increase in the level of oxidative stress in the body, including the brain hippocampus region. Edaravone is a potent free radical scavenger having antioxidant effect. In the current study, edaravone's ability to prevent SD induced cognitive impairment was tested in rats. Animals were sleep deprived 8 h/day for 4 weeks. Concurrently, edaravone was administrated intraperitoneally for four weeks. Animals performance during cognitive testing was evaluated to display if edaravone has a role in the prevention of sleep deprivation induced memory impairment. Additionally, the role of antioxidant biomarkers glutathione peroxidase (GPx), catalase, glutathione (GSH), oxidized glutathione (GSSG), GSH/GSSG in this effect was investigated. The results showed that SD impaired both short- and long- term memories, and chronic edaravone administration prevented such effect. Additionally, edaravone prevented decreases in hippocampal GPx, catalase, GSH/GSSG ratio and normalized increases in GSSG levels, which were impaired by SD model. In conclusion, current result showed a protective effect of edaravone administration against SD induction that could be related to edaravone's ability to normalizing mechanisms related to oxidative balance.

Keyword: Oxidative stress; Memory; Maze; Edaravone; Sleep deprivation

206. Noradrenergic and dopaminergic involvement in novelty modulation of aversive memory generalization of adult rats/ **Lima, Karine Ramires; da Silva de Vargas, Liane; Ramborger, Bruna; Roehrs, Rafael; Sevenster, Dieuwke; Izquierdo, Iván; D'Hooge, Rudi; Mello-Carpes, Pâmela B.** Behavioural Brain Research. ISSN:0166-4328 (2019) v.371 p.111991Behavioural Brain Research

DOI: 10.1016/j.bbr.2019.111991

Link: <http://www.sciencedirect.com/science/article/pii/S0166432819303201>

Abstract: The generalization of aversive memory can be defined as the phenomenon in which a situation similar to (but distinctive from) a previous aversive event triggers an avoidance response. This phenomenon has been suggested to play a role in several psychological disorders. In this study, we investigate the effects of novelty on the generalization of fear memories, and the involvement of noradrenergic and dopaminergic systems in this process. For this study we used male Wistar rats (3 months old, 300–400 g). The participation of each neurotransmitter system was evaluated separately (two set of experiments). In each experimental set, the animals were divided in groups (8 animals each): (i) control, (ii) novelty, and, (iii) antagonist + novelty group (timolol, a β -adrenergic antagonist, or SCH23390, a D1/D5 dopaminergic antagonist, in the first and in the second set of experiments, respectively). Additionally, to investigate whether novelty exposure increases the levels of noradrenaline and/or dopamine in the hippocampus fifteen animals were divided in three groups (5 animals each): (i) naïve, (ii) control; and, (iii) novelty. To examine aversive memory, and generalization of aversive memory, we trained adult male Wistar rats in an inhibitory avoidance (IA) memory task and after in a modified inhibitory avoidance (MIA). Before the MIA training some of the animals were exposed to environmental novelty (open field). Immediately before this novelty exposure, some animals received intrahippocampal infusion of timolol (β -adrenergic antagonist), SCH23390 (D1/D5 antagonist) or vehicle to evaluate the involvement of noradrenergic and dopaminergic systems. Finally, to evaluate aversive

memory and generalization of aversive memory respectively, half of the animals in each group were tested on IA and half on MIA. We confirmed that the exposure to novelty blocks the generalization of aversive memory, but moreover, demonstrated that this process involves activation of β -adrenergic and dopaminergic D1/D5 pathways. We additionally observed that exposure to novelty raises hippocampal levels of noradrenaline and dopamine. This suggests that these neurotransmitters not only influence long-term memory (LTM) as such, but also aversive memory generalization.

Keyword: Hippocampus; Dopaminergic system; Fear generalization; Noradrenergic system; Novelty

207. Robustness of simple avian population trend models for semi-structured citizen science data is species-dependent/ **Boersch-Supan, Philipp H.; Trask, Amanda E.; Baillie, Stephen R.** Biological Conservation. ISSN:0006-3207 (2019) v.240 p.108286Biological Conservation

DOI: 10.1016/j.biocon.2019.108286

Link: <http://www.sciencedirect.com/science/article/pii/S000632071930802X>

Abstract: Accurate and robust population monitoring is essential to effective biodiversity conservation. Citizen scientists are collecting opportunistic biodiversity records on unprecedented temporal and spatial scales, vastly outnumbering the records achievable from structured surveys. Opportunistic records may exhibit spatio-temporal biases and/or large heterogeneity in observer effort and skill, but the quantity-quality trade-offs between surveys and less structured schemes remain poorly understood. Recent work has advocated the use of simple trend models for opportunistic biodiversity records. We examine the robustness of population trends of common United Kingdom birds derived from two citizen-science schemes; BirdTrack, an opportunistic recording scheme, and the structured Breeding Bird Survey (BBS). We derived reporting rate trends from BirdTrack lists using simple statistical models which accounted for list-level effort covariates but not for preferential sampling, and compared them to abundance and occurrence trends derived from BBS survey data. For 90 out of 141 species, interannual changes in reporting rates were positively correlated with trends from structured surveys. Correlations were higher for widespread species and those exhibiting marked population change. We found less agreement among trends for rarer species and those with small or uncertain population trajectories. The magnitude of long-term changes in reporting rates was generally smaller than the magnitude of occupancy or abundance changes, but this relationship exhibited wide scatter, complicating the interpretability of reporting rate trends. Our findings suggest that simple statistical models for estimating population trends from opportunistic complete lists are robust only for widespread and common species, even in a scheme with many observers and extensive coverage.

Keyword: Citizen science; Avian ecology; Biodiversity monitoring; Breeding bird survey; List-length analysis; Population trend

208. Modeling the role of carrier and mobile herds on foot-and-mouth disease virus endemicity in the Far North Region of Cameroon/ **Schnell, Patrick M; Shao, Yibo; Pomeroy, Laura W; Tien, Joseph H; Moritz, Mark; Garabed, Rebecca.** Epidemics. ISSN:1755-4365 (2019) v.29 p.100355Epidemics

DOI: 10.1016/j.epidem.2019.100355

Link: <http://www.sciencedirect.com/science/article/pii/S1755436518301713>

Abstract: Foot and mouth disease virus (FMDV) is an RNA virus that infects cloven-hoofed animals, often produces either epidemic or endemic conditions, and negatively affects agricultural economies worldwide. FMDV epidemic dynamics have been extensively studied, but understanding of drivers of disease persistence in areas in which FMDV is endemic, such as most of sub-Saharan Africa, is lacking. We present a spatial stochastic model of disease dynamics that incorporates a spatial transmission kernel in a modified Gillespie algorithm, and use it to evaluate two hypothesized drivers of endemicity: asymptomatic carriers and the movement of mobile herds. The model is parameterized using data from the pastoral systems in the Far North Region of Cameroon. Our computational study provides evidence in support of the hypothesis that asymptomatic carriers, but not mobile herds, are a driver of endemicity.

Keyword: Foot-and-mouth disease virus; Asymptomatic carrier; Endemic; Gillespie algorithm; mobile herd; Transmission kernel

209. Effect of aging on the availability of amino acids from an immune-enhancing diet (IED) after a surgical stress in rats/ **Tennoune, N.; Ventura, G.; Le Plenier, S.; Choisy, C.; Neveux, N.; Nakib, S.; Sarfati, G.; Raynaud-Simon, A.; Cynober, L.; De Bandt, J.P.**. Clinical Nutrition. ISSN:0261-5614 (2019) v. p.Clinical Nutrition

DOI: 10.1016/j.clnu.2019.12.007

Link: <http://www.sciencedirect.com/science/article/pii/S0261561419331760>

Abstract: Summary Background & aims Dietary amino acid (AA) requirements increase after a surgical stress while the systemic AA availability from the diet decreases with age, due to splanchnic sequestration. While immune-enhancing diets (IEDs) have been recommended for the nutritional management of surgical patients, the systemic bioavailability of their AA supply has not been evaluated in elderly surgical patients. This was determined in surgically-stressed IED-fed aged rats. Methods Thirty-four 5-month- or 21-month-old male Sprague–Dawley rats were used. After a gastrostomy and placement of a jugular vein catheter and a one-week recovery period, the animals underwent two 24 h-enteral feedings with an arginine-enriched IED (Impact®, Nestlé Health Science) before (healthy state) and 18 h after a standardized laparotomy, used as a model of surgical stress. During enteral nutrition, blood samples were repeatedly collected to measure plasma AA bioavailability (incremental areas under the curve) at 2, 5 and 24 h. Surgical stress was evaluated from urinary catecholamines and plasma protein profile. Results Whatever the age or stress situation, IED feeding was associated with decreased plasma glycine and increased alanine, proline and arginine. Aging was mainly associated with a delayed plasma AA accumulation in the first hours after the initiation of enteral nutrition. Stress was associated with higher plasma arginine increase and lower histidine, methionine, phenylalanine and tyrosine accumulation. Age and stress interactions seem limited. Conclusions AA bioavailability from an arginine-enriched IED seems to be maintained whatever age and stress situation. Aging appears to be mainly associated with a delay in plasma AA accumulation probably related to age-associated splanchnic sequestration of AAs. Additional effects of surgical stress per se seem limited.

Keyword: Aging; Amino acid availability; Arginine; Immunonutrition

210. Determination of the Toxic Level of Dietary Mercury and Prediction of Mercury Intake and Tissue Mercury Concentrations in Broiler Chickens Using Feather Mercury Concentrations/ **Kim, J.H.; Lee, H.K.; Park, G.H.; Choi, H.S.; Ji, S.Y.; Kil, D.Y.**. Journal of Applied Poultry Research. ISSN:1056-6171 4(2019) v.28 p.1240-1247Journal of Applied Poultry Research

DOI: 10.3382/japr/pfz090

Link: <http://www.sciencedirect.com/science/article/pii/S1056617119322895>

Abstract: SUMMARY The current experiment was conducted to determine the toxic level of dietary mercury (Hg) and to predict Hg intake and tissue Hg concentrations in broiler chickens from feather Hg concentrations. A total of 800 3-d-old broiler chickens (400 male and 400 female birds) were allotted to one of 80 battery cages in 2 × 5 factorial arrangements of sex and 5 concentrations of Hg in diets with 0, 50, 100, 250, or 500 mg/kg. The mercury chloride was used to increase Hg concentrations in diets. Experiment lasted for 32 d. There were no interactions between sex and dietary treatments for all measurements. A greater than 250 mg/kg Hg had negative effects on broiler performance. The one-slope broken-line analysis with dietary Hg concentrations and BW gain revealed that a greater than 209 mg/kg Hg in diets was toxic to broiler chickens. Feather Hg concentrations were greater than liver and breast Hg concentrations across all treatments, indicating that the feather is the most responsive tissue to dietary Hg concentrations. Accordingly, the equations for predicting daily Hg intake and Hg concentrations in the liver and breast were generated from Hg concentrations in the feather. Resulting equations indicated that feather Hg concentrations are good predictors of both Hg intake and Hg concentrations in the liver and breast. In conclusion, the toxic level of Hg is near to 200 mg/kg in broiler diets. The Hg intake and Hg concentrations in the liver and breast can be precisely predicted from Hg concentrations in the feather.

Keyword: broiler chicken; mercury concentration in body tissue; prediction equation; toxicity of dietary mercury

211. Targeting CD34+ cells of the inflamed synovial endothelium by guided nanoparticles for the treatment of rheumatoid arthritis/ **Colombo, Federico; Durigutto, Paolo; De Maso, Luca; Biffi, Stefania; Belmonte, Beatrice; Tripodo, Claudio; Oliva, Romina; Bardini, Paola; Marini, Giada M.; Terreno, Enzo; Pozzato, Gabriele; Rampazzo, Enrico; Bertrand, Jessica; Feuerstein, Bernd; Javurek, .** Journal of Autoimmunity. ISSN:0896-8411 (2019) v.103 p.102288Journal of Autoimmunity

DOI: 10.1016/j.jaut.2019.05.016

Link: <http://www.sciencedirect.com/science/article/pii/S0896841119301052>

Abstract: Despite the advances in the treatment of rheumatoid arthritis (RA) achieved in the last few years, several patients are diagnosed late, do not respond to or have to stop therapy because of inefficacy and/or toxicity, leaving still a huge unmet need. Tissue-specific strategies have the potential to address some of these issues. The aim of the study is the development of a safe nanotechnology approach for tissue-specific delivery of drugs and diagnostic probes. CD34 + endothelial precursors were addressed in inflamed synovium using targeted biodegradable nanoparticles (tBNPs). These nanostructures were made of poly-lactic acid, poly-caprolactone, and PEG and then coated with a synovial homing peptide. Immunofluorescence analysis clearly demonstrated their capacity to selectively address CD34 + endothelial cells in synovial tissue obtained from human, mouse, and rat. Biodistribution studies in two different animal models of rheumatoid arthritis (antigen-induced arthritis/AIA and collagen-induced arthritis/CIA) confirmed the selective accumulation in inflamed joints but also evidenced the capacity of tBNP to detect early phases of the disease and the preferential liver elimination. The therapeutic effect of methotrexate (MTX)-loaded tBNPs were studied in comparison with conventional MTX doses. MTX-loaded tBNPs prevented and treated CIA and AIA at a lower dose and reduced administration frequency than MTX. Moreover, MTX-loaded tBNP showed a novel mechanism of action, in which the particles target and kill CD34 + endothelial progenitors, preventing neo-angiogenesis and, consequently, synovial inflammation. tBNPs represent a stable and safe platform to develop highly-sensitive imaging and therapeutic approaches in RA targeting specifically synovial neo-angiogenesis to reduce local inflammation.

Keyword: CD34 cells; Neoangiogenesis; Rheumatoid arthritis; Targeted nanoparticles; Targeted therapy

212. Microbiological air quality in free-farrowing housing systems for sows/ **Lühken, E.; Nicolaisen, T.; Stracke, J.; Schulz, J.; Kemper, N.** Veterinary and Animal Science. ISSN:2451-943X (2019) v.8 p.100065 Veterinary and Animal Science

DOI: 10.1016/j.vas.2019.100065

Link: <http://www.sciencedirect.com/science/article/pii/S2451943X19301164>

Abstract: This study investigates air hygienic characteristics of housing systems without fixation for lactating sows, with a focus on microbiological air quality. For animal welfare considerations, free-farrowing systems have been developed to replace those with farrowing crates (FC) and are currently available on the market. A group housing system (GH) for six lactating sows, a single loose-housing system (LH), and a conventional system with FC were tested. By maintaining similar management conditions, microbiological air quality was examined in eight batches with 148 farrowings in total with samplings at the beginning, in the middle, and at the end of the occupancy period of 33 days. No significant differences between the systems were observed in the concentration of total airborne bacteria (TAB), haemolytic streptococci (HS), molds, or yeasts. However, the concentrations of TAB and HS increased significantly over time. Additionally, significant correlations were detected for LH and FC between TAB and HS, and between TAB and carbon dioxide; significant correlations between TAB and inside temperature and total animal weight were revealed only in GH. Significant correlations between TAB and both the dust and inside humidity parameters were found only in FC. Given these results, it was shown that the free-farrowing systems used here do not necessarily lead to poorer microbiological air quality.

Keyword: Air quality; Animal hygiene; Farrowing systems; Fungi; Haemolytic streptococci; Total airborne bacteria

213. Genetic analysis of skinfold thickness and its association with body condition score and milk production traits in Chinese Holstein population/ **Zhang, H.; Liu, A.; Li, X.; Xu, W.; Shi, R.; Luo, H.; Su, G.; Dong, G.; Guo, G.; Wang, Y.** Journal of Dairy Science. ISSN:0022-0302 3(2019) v.102 p.2347-2352 Journal of Dairy Science

DOI: 10.3168/jds.2018-15180

Link: <http://www.sciencedirect.com/science/article/pii/S0022030219300074>

Abstract: ABSTRACT The skin has many important roles in dairy cattle, and skinfold thickness could be used as an indicator of body fat deposition. The objectives of this study were to estimate genetic parameters of skinfold thickness and to explore its association with body condition score (BCS) and milk production traits in a Chinese Holstein population. Skinfold thicknesses over the neck (STN) and the last rib (STR), BCS, and test-day records of milk production traits were available for 6,416 lactating Holstein cows in the summers of 2015 and 2016 in Beijing, China. Multi-trait animal models were used to estimate variance and covariance components using the DMU software. The average STN was 7.15 ± 1.28 mm, and the average STR was 11.76 ± 1.95 mm (mean $\pm$ standard deviation). Estimated heritability was 0.13 ± 0.03 for STN and 0.26 ± 0.04 for STR. We detected a high genetic correlation (0.79 ± 0.08 ; heritability $\pm$ standard error) between STN and STR. Genetic correlations between skinfold thickness and BCS were low to moderate: 0.18 between STR and BCS, and 0.33 between STN and BCS. Genetic correlations between skinfold thickness and milk yield, milk fat percentage, and milk protein percentage were negligible, ranging from -0.02 to 0.15 . Collectively, skinfold thickness is characterized as a trait with moderate heritability. Skinfold thickness is

sensitive to changes in body condition or fat deposition across parities and lactation stages in milking cows, and we confirmed the complementary nature of skinfold thickness and BCS genetically as well as phenotypically by comparing their changing trends throughout lactation and across lactations. The use of skinfold thickness, together with BCS, can assist in the monitoring of changes in body fat deposition to achieve higher management precision.

Keyword: heritability; body condition score; genetic correlation; skinfold thickness

214. Formyl peptide receptor 1 signalling promotes experimental colitis in mice/ **Di Paola, Rosanna; Fusco, Roberta; Gugliandolo, Enrico; D'Amico, Ramona; Cordaro, Marika; Impellizzeri, Daniela; Perretti, Mauro; Cuzzocrea, Salvatore.** Pharmacological Research. ISSN:1043-6618 (2019) v.141 p.591-601Pharmacological Research

DOI: 10.1016/j.phrs.2019.01.041

Link: <http://www.sciencedirect.com/science/article/pii/S1043661818318255>

Abstract: Inflammatory bowel disease is characterised by intricate immune cell interactions with tissue cells and such cross-talks can become deregulated. The formyl peptide receptor 1 (Fpr1) is expressed by both immune and stromal cells including epithelial cells. We evaluated the development of the physiopathology of the DNBS induced colitis in Fpr1 KO mice on the C57BL/6 genetic background compared to C57BL/6 genetic background animals. We have assessed both macroscopic and histological markers of the diseased, together with the immunohistochemical and molecular changes. DNBS-treated Fpr1 KO mice showed a i) reduction in weight loss, ii) lower extent of colon injury and iii) an increase in MPO activity. Molecular analyses indicated that in absence of Fpr1 there was reduced NF- κ B translocation into the nucleus, cytokines levels, FOXP3 and GATA3, CD4, CD8 and CD45 expression as well as a dysregulation of TGF- β signalling. In addition, the colon of DNBS-injected Fpr1 KO mice displayed a lower degree of expression of Bax and higher expression of Bcl-2 compared correspondent WT mice. Finally, intravital microscopy investigation of the microcirculation post-DNBS instillation revealed a lower degree of neutrophil-endothelial cell rolling and adhesion - mediated by P-selectin and ICAM-1 – in Fpr1 KO mice. All the main outcome in the study have a P-value, statistical significance of evidence, less than 0.05. We provide evidence for an important pathogenic role of mouse Fpr1 in experimental colitis, an outcome effected through modulation of immune cell recruitment together with a modulation of local cellular activation and survival.

Keyword: Animals; Immunity; Colitis; Formyl peptide receptor 1

215. Managing ammonia emissions using no-litter flooring system for broilers: Environmental and economic analysis/ **Boggia, Antonio; Paolotti, Luisa; Antegiovanni, Patrich; Fagioli, Filippo Fiume; Rocchi, Lucia.** Environmental Science & Policy. ISSN:1462-9011 (2019) v.101 p.331-340Environmental Science & Policy

DOI: 10.1016/j.envsci.2019.09.005

Link: <http://www.sciencedirect.com/science/article/pii/S1462901119308779>

Abstract: Climate change necessitates close consideration of the impact of human activities, and especially an assessment of the emissions of pollutants. The livestock industry, and in particular that of poultry, is recognized as being responsible for the greatest share of ammonia emissions in the environment, and for this reason various strategies have been considered recently to reduce emission levels in this sector. In this work an innovative farming system without litter was analyzed, the AviHome Flooring System, the topic of an experiment funded by the Region

of Umbria as part of the 2014–2020 Rural Development Program. The objective is to verify the properties of the AviHome Flooring system, as regards the reducing of ammonia emissions and productive and economic performance, as well as some parameters for assessing animal welfare. Using the Life Cycle Assessment and Life Cycle Costing methods, it was possible to consider environmental and economic aspects jointly in comparison with the traditional intensive poultry farming system. The analysis demonstrated that the use of the system leads to an actual improvement in animal welfare and a lower environmental impact of the farm, without negatively affecting the farm's economic performance. We observed a reduction of ammonia emission on the functional unit (one kg of meat) in the system with AviHome Flooring system (11.8 g per kg of meat) compared to traditional one (15.2 g per kg of meat).

Keyword: Climate change; Life cycle assessment; Ammonia emission control; Broiler production system

216. The role of Earth and environmental science in addressing sustainable development priorities in Eastern Africa/
Gill, Joel C.; Mankelow, Joseph; Mills, Keely. Environmental Development. ISSN:2211-4645 (2019) v.30 p.3-20
Environmental Development

DOI: 10.1016/j.envdev.2019.03.003

Link: <http://www.sciencedirect.com/science/article/pii/S2211464518302641>

Abstract: Here we synthesise the results of three participatory workshops to explore sustainable development priorities in eastern Africa, and discuss these in the context of Earth and environmental science. The planet is a core pillar of sustainable development, and the engagement of Earth and environmental scientists is vital to achieving the UN Sustainable Development Goals (SDGs). In 2017, the British Geological Survey gathered 76 delegates from 48 organisations at three workshops in Nairobi (Kenya), Lusaka (Zambia), and Dar es Salaam (Tanzania). Using the SDGs as a reference tool, participants (i) identified development priorities at regional (eastern Africa) and national scales, (ii) explored the Earth and environmental science research and data needs to help address these, and (iii) co-designed relevant science-for-development projects. Participants identified sustainable development priorities to be basic (or immediate) needs, including zero hunger (SDG 2), education (SDG 4), ending poverty (SDG 1), and water and sanitation (SDG 6). Participants also described examples of Earth and environmental science research, training, technologies, monitoring and management to support sustainable development. Emerging themes included environmental data (collection, management, integration, access), policy and regulations (integrating environmental science, and policy coherence), resource management (degradation, pollution and environmental protection), and scientific education and understanding (training, knowledge exchange, public understanding of science). A comparative synthesis of existing regional and national development strategies indicates that current narratives of development interventions do not fully capture the opportunities from environmental data integration and policy coherence. Greater engagement with and by the Earth and environmental science community could help to advance these themes to support sustainable development in eastern Africa. This would support efforts to reduce environmental degradation, improve natural resource management, and inform the utilisation of natural resources to improve economic growth and social wellbeing.

Keyword: Environmental science; Environmental management; Data integration; Earth science; Eastern Africa; Sustainable development

217. Latent toxoplasmosis aggravates anxiety- and depressive-like behaviour and suggest a role of gene-environment interactions in the behavioural response to the parasite/ **Bay-Richter, Cecilie; Petersen, Eskild; Liebenberg, Nico; Elfving, Betina; Wegener, Gregers.** Behavioural Brain Research. ISSN:0166-4328 (2019) v.364 p.133-139Behavioural Brain Research

DOI: 10.1016/j.bbr.2019.02.018

Link: <http://www.sciencedirect.com/science/article/pii/S0166432818316826>

Abstract: Toxoplasma gondii (TOX) is an intracellular parasite which infects warm-blooded animals including humans. An increasing number of clinical studies now hypothesize that latent toxoplasmosis may be a risk factor for the development of psychiatric disease. For depression, the results have been varied and we speculate that genetic background is important for the response to latent toxoplasmosis. The main objective of this study was to elucidate gene – environment interactions in the behavioural response to TOX infection by use of genetically vulnerable animals (Flinders sensitive line, FSL) compared to control animals (Flinders resistant line, FRL). Our results show that all infected animals displayed increased anxiety-like behaviour whereas only genetically vulnerable animals (FSL rats) showed depressive-like behaviour as a consequence of the TOX infection. Furthermore, peripheral cytokine expression was increased following the infection, primarily independent of strain. In the given study 14 cytokines, chemokines, metabolic hormones, and growth factors were quantified with the bead-based Luminex200 system, however, only IL-1 α expression was affected differently in FSL animals compared to FRL rats. These results suggest that latent TOX infection can induce anxiety-like behaviour independent of genetic background. Intriguingly, we also report that for depressive-like behaviour only the vulnerable rat strain is affected. This could explain the discrepancy in the literature as to whether TOX infection is a risk factor for depressive symptomatology. We propose that the low grade inflammation caused by the chronic infection is related to the development of behavioural symptoms.

Keyword: Cytokines; Depression; Anxiety; Gene-environment interactions

218. Assessment of the body development kinetic of broiler breeders by non-invasive imaging tools/ **Grandhayé, Jérémy; Lecompte, François; Staub, Christophe; Venturi, Eric; Plotton, Ingrid; Cailleau-Audouin, Estelle; Ganier, Patrice; Ramé, Christelle; Brière, Sylvain; Dupont, Joelle; Froment, Pascal.** Poultry Science. ISSN:0032-5791 9(2019) v.98 p.4140-4152Poultry Science

DOI: 10.3382/ps/pez112

Link: <http://www.sciencedirect.com/science/article/pii/S0032579119307072>

Abstract: ABSTRACT In order to determine the body composition of parental broilers during growth from hatching to adulthood (32 wk of age), we evaluated the kinetics of fattening, growth rate, reproduction parameters, and body composition of the animals by using non-invasive tools such as medical imaging (ultrasound and CT scan) and blood sample analysis. The use of CT scanner allowed us to monitor the development of the body composition (fatness, bone, muscle, ovary, and testis growth) of these same animals. These analyses were accompanied by biochemical blood analyses such as steroids, metabolites, and some adipokines concentration. Difference in the body composition between males and females appeared at 16 wk of age. From 20 wk of age, shortly before the onset of lay, the females had 1.6-fold more adipose tissues than males ($P < 0.001$) and 8-fold more elevated plasma triglycerides levels. In addition, females, from 16 wk of age, presented a weakened bone quality in comparison to males ($P < 0.001$). The ratio of the tibia volume/tibia length was 33.2% lower in female compared to male chicken at 32 wk of age ($P < 0.001$). However, the pectoral muscle had the same volume in both sexes. The production of steroids by gonad started at 16 wk of age for both sexes, and the testis and ovary development could be measured by imaging tools at

24 wk. The follicle development was correlated to the ovarian fat tissue ($r = 0.80$) and fatness. In conclusion, the use of CT scanner and ultrasound system has allowed investigate the body composition of live animals and actual parental breeds with to the aim of using them for genetic selection.

Keyword: broiler; metabolism; development; tomography; ultrasound

219. Assessment of the usefulness of bacterial cellulose produced by *Gluconacetobacter xylinus* E25 as a new biological implant/ **Kończowska, Magdalena; Siondalski, Piotr; Kowalik, Maciej Michał; Pęksa, Rafał; Długa, Aldona; Zajac, Wacław; Dederko, Paulina; Kołodziejewska, Ilona; Malinowska-Pańczyk, Edyta; Sinkiewicz, Izabela; Staroszczyk, Hanna; Śliwińska, Agata; Stanisławska, Alic.** Materials Science and Engineering: C. ISSN:0928-4931 (2019) v.97 p.302-312Materials Science and Engineering: C

DOI: 10.1016/j.msec.2018.12.016

Link: <http://www.sciencedirect.com/science/article/pii/S0928493118311822>

Abstract: Bionanocellulose (BNC) is a clear polymer produced by the bacterium *Gluconacetobacter xylinus*. In our current study, "Research on the use of bacterial nanocellulose (BNC) in regenerative medicine as a function of the biological implants in cardiac and vascular surgery", we carried out material analysis, biochemical analysis, in vitro tests and in vivo animal model testing. In stage 1 of the project, we carried out physical and biological tests of BNC. This allowed us to modify subsequent samples of bacterial bionanocellulose. Finally, we obtained a sample that was accepted for testing on an animal model. That sample we define BNC1. Patches of BNC1 were then implanted into pigs' vessel walls. During the surgical procedures, we evaluated the technical aspects of sewing in the bioimplant, paying special attention to bleeding control and tightness of the suture line and the BNC1 bioimplant itself. We carried out studies evaluating the reaction of an animal body to an implantation of BNC1 into the circulatory system, including the general and local inflammatory reaction to the bioimplant. These studies allowed us to document the potential usefulness of BNC as a biological implant of the circulatory system and allowed for additional modifications of the BNC to improve the properties of this new implantable biological material.

Keyword:

220. Role of Myeloperoxidase of northern snakehead (*Channa argus*) in *Aeromonas veronii* infection/ **Chen, Chong; Yang, Bintong; Abbas Raza, Sayed Haidar; Zhang, Dongxing; Wu, Tonglei; Zhang, Zhiqiang; Ullah, Irfan; Khan, Rajwali; Yang, Guilian; Wang, Chunfeng; Wang, Guiqin; Shan, Xiaofeng; Kang, Yuanhuan; Qian, Aidong.** Microbial Pathogenesis. ISSN:0882-4010 (2019) v.135 p.103622Microbial Pathogenesis

DOI: 10.1016/j.micpath.2019.103622

Link: <http://www.sciencedirect.com/science/article/pii/S088240101930926X>

Abstract: Absract Myeloperoxidase (MPO) is a ferrous lysosomal protein with many immune functions that belongs to the heme peroxidase enzyme. In this study, the functions of MPO in the northern snakehead (*Channa argus*) were investigated by cloning an MPO cDNA sequence with a full length of 3181 bp. Homology analysis showed that northern snakehead MPO gene had the highest (81%) homology with mandarin fish (*Siniperca chuatsi*). In healthy northern snakehead, the MPO gene was expressed in the head-kidney, kidney, heart, gill, spleen, liver, and muscles but not midgut. After the northern snakehead was infected with *Aeromonas veronii*, the MPO gene expression varied

in different tissues with low level in spleen, liver, gill and muscle, fluctuated in kidney and head-kidney and showed high level in heart. The result indicated that MPO might play an important role in the antimicrobial immune response of the northern snakehead.

Keyword: gene; Expression analysis; Northern snakehead ()

221. Roads and urban areas as physiological stressors of spiny-tailed lizards, *Uromastyx acanthinura*/ **Kechnebbou, Marwa; Martín, José; Chammem, Mohsen; Arregui, Lucía; Nouira, Said.** Journal of Arid Environments. ISSN:0140-1963 (2019) v.170 p.103997Journal of Arid Environments

DOI: 10.1016/j.jaridenv.2019.103997

Link: <http://www.sciencedirect.com/science/article/pii/S0140196319300886>

Abstract: Disturbances caused by roads or urbanization can have a significant impact on wildlife populations. However, it remains unclear whether these human activities can be stressors for wild populations of reptiles. We analyzed and compared plasma corticosterone and fecal corticosterone metabolites in male and female spiny tailed lizards (*Uromastyx acanthinura*) that were found at different distances from roads and urban areas in Tunisia (N. Africa). Levels of plasma corticosterone and fecal corticosterone metabolites of the same individuals measured with an enzyme immunoassay kit were highly and significantly correlated. This indicated that non-invasive measures of stress levels are equally useful for these types of studies. Males had higher plasma corticosterone than females, and these levels were higher in autumn than in summer and spring in both sexes. Moreover, levels of corticosterone in plasma and corticosterone metabolites in feces were significantly higher when the capture site was closer to roads or urban areas. These results suggest that the alteration of the natural habitat and the disruption caused by road traffic increase stress hormone levels in *U. acanthinura* lizards. Understanding how free-living animals are influenced by human perturbations could help direction and involvement of conservation strategies for endangered species.

Keyword: corticosterone; Human disturbance; Non-invasive measures; Reptile conservation; Stress response

222. Effect of Licuri cake supplementation on performance, digestibility, ingestive behavior, carcass traits and meat quality of grazing lambs/ **Bagaldo, A.R.; Miranda, G.S.; Soares Júnior, M.S.F.; de Araújo, F.L.; Matoso, R.V.M.; Chizzotti, M.L.; Bezerra, L.R.; Oliveira, R.L.** Small Ruminant Research. ISSN:0921-4488 (2019) v.177 p.18-24Small Ruminant Research

DOI: 10.1016/j.smallrumres.2019.05.020

Link: <http://www.sciencedirect.com/science/article/pii/S0921448819300963>

Abstract: This study evaluated the effect of Licuri cake (LC) supplementation replacing soybean meal in concentrate on performance, digestibility, ingestive behavior, carcass traits and meat quality of grazing lambs. Thirty-two uncastrated Santa Inês lambs with a mean body weight (BW) of 24.7 ± 0.9 kg were distributed into 4 treatment diets in a randomized design. Lambs were fed Aruana grass (*Panicum maximum* cv. Aruana) as roughage and supplemented with a concentrate composed of ground corn, soybean meal and mineral premix. Licuri (*Syagrus coronata*) cake was added to concentrate at 0 (control), 87.0 (LOW), 174 (MED), and 260 (HIGH) g/kg of dietary DM. Lambs supplemented with LC did not affect DM *Panicum maximum* intake ($P > 0.05$). However, there was a linear increase ($P < 0.001$) in the concentrate mixture and total intake of ether extract (EE) and neutral detergent fiber (NDF).

The total intake of non-fibrous carbohydrates (NFC) and crude protein (CP) intake of concentrate supplementation decreased ($P < 0.001$) by LC inclusion. The CP total intake quadratically decreased by LC inclusion. The digestibilities of DM, CP and EE were not influenced ($P > 0.05$) by LC inclusion. However, the digestibility of NFC and NDF ($P < 0.05$) decreased with the inclusion of LC. Licuri cake inclusion promoted a linear reduction in the time spent feeding and a linear increase in the time spent ruminating, DM, CP and NDF feeding efficiency and NDF rumination. However, DM and CP rumination efficiency presented a linear reduction ($P < 0.05$). Licuri cake inclusion in concentrate mixture up to 174 g/kg DM improved final BW, total weight gain and average daily gain (ADG) and feed conversion ($P < 0.001$). No differences ($P > 0.05$) on carcass traits, morphometric measurements, weight of commercial cuts, cooking weight loss, shear force, sarcomere length, moisture, ash and protein content of the longissimus lumborum were observed among treatments. There was a quadratic increase ($P = 0.03$) on the lipid content of meat lamb. The inclusion of LC in the diet of lambs linearly increased the a^* ($P = 0.007$), b^* ($P = 0.091$) and C^* ($P = 0.011$) color index of the meat. It is recommended the medium level of LC (174 g/kg DM) replacing soybean meal in concentrate of grazing lambs because increases the time spent eating, final weight and ADG of animals and improved the feed conversion rate without change most of the carcass traits and meat quality.

Keyword: Shear force; By-Products; Color index; Loin

223. Twenty-eight-day repeated oral doses of sodium valproic acid increases neural stem cells and suppresses differentiation of granule cell lineages in adult hippocampal neurogenesis of postpubertal rats/ **Watanabe, Yousuke; Nakajima, Kota; Ito, Yuko; Akahori, Yumi; Saito, Fumiyo; Woo, Gye-Hyeong; Yoshida, Toshinori; Shibutani, Makoto.** Toxicology Letters. ISSN:0378-4274 (2019) v.312 p.195-203Toxicology Letters

DOI: 10.1016/j.toxlet.2019.05.013

Link: <http://www.sciencedirect.com/science/article/pii/S0378427419301444>

Abstract: Developmental exposure to valproic acid (VPA), a model compound for experimental autism, has shown to primarily target GABAergic interneuron subpopulations in hippocampal neurogenesis of rat offspring. The VPA-exposed animals had revealed late effects on granule cell lineages, involving progenitor cell proliferation and synaptic plasticity. To investigate the possibility whether hippocampal neurogenesis in postpubertal rats in a protocol of 28-day repeated exposure is affected in relation with the property of a developmental neurotoxicant by developmental exposure, VPA was orally administered to 5-week-old male rats at 0, 200, 800 and 900 mg/kg body weight/day for 28 days. At 900 mg/kg, GFAP+ cells increased in number, but DCX+ cells decreased in number in the granule cell lineages. Moreover, CHRN2+ cells and NeuN+ postmitotic neurons decreased in number in the hilus of the dentate gyrus. Transcript level examined at 900 mg/kg in the dentate gyrus was increased with Kit, but decreased with Dpsyl3, Btg2, Pvalb and Chrn2. These results suggest that VPA increased type-1 stem cells in relation to the activation of SCF-KIT signaling and suppression of BTG2-mediated antiproliferative effect on stem cells. VPA also decreased type-3 progenitor cells and immature granule cells probably in relation with PVALB+ interneuron hypofunction and reduced CHRN2+ interneuron subpopulation in the hilus, as well as with suppression of BTG2-mediated terminal differentiation of progenitor cells. Thus, the disruption pattern of VPA by postpubertal exposure was different from developmental exposure. However, disruption itself can be detected, suggesting availability of hippocampal neurogenesis in detecting developmental neurotoxicants in a 28-day toxicity study.

Keyword: Rat; Developmental neurotoxicity (DNT); Hippocampal neurogenesis; Valproic acid (VPA); γ -Aminobutyric acid (GABA)-ergic interneuron

224. Dexamethasone-loaded chitosan-based genipin-cross-linked hydrogel for prevention of cisplatin induced ototoxicity in Guinea pig model/ **Yüksel Aslier, Nesibe Gül; Tağaç, Aylin Altınışık; Durankaya, Serpil Mungan; Çalışır, Meryem; Ersoy, Nevin; Kırkım, Günay; Yurdakoç, Kadir; Bağrıyanık, Hüsnü Alper; Yılmaz, Osman; Sütay, Semih; Güneri, Enis Alpin.** International Journal of Pediatric Otorhinolaryngology. ISSN:0165-5876 (2019) v.122 p.60-69International Journal of Pediatric Otorhinolaryngology

DOI: 10.1016/j.ijporl.2019.04.003

Link: <http://www.sciencedirect.com/science/article/pii/S016558761930165X>

Abstract: Objectives The aim of this study was to investigate the protective effects of a sustained release form of dexamethasone (dex) loaded chitosan-based genipin-cross-linked hydrogel (CBGCH) in a guinea pig model of cisplatin (CP) induced hearing loss. Methods Implantation of CBGCH was made by intratympanic (IT) injection. Ototoxicity was produced by intraperitoneal (IP) single dose of 14 mg/kg CP. Animals were randomly divided into four groups with 6 guinea pigs in each. Group 1 received only IP CP; group 2 received only IT dex-loaded CBGCH injections. Group 3 and group 4 received IP CP, plus IT nondrug CBGCH and IT dex-loaded CBGCH respectively 24 h prior to IP CP injections. Distortion product otoacoustic emissions (DPOAEs) and auditory brainstem response (ABR) measurements were obtained before the treatments and solely ABR measurements were done after 3 and 10 days. The ultrastructural effects were investigated by scanning electron microscopy (SEM) analysis. Results The postCP ABR thresholds at 4, 8, 12, 16, 32 kHz frequencies were significantly better in group 4 than groups 1 and 3 ($p < 0.05$). The comparison of time effective ABR thresholds between groups 1 and 4 and between groups 3 and 4 showed significantly lower ABR thresholds in group 4 ($p < 0.05$). The SEM analysis showed that stereocilia of inner and outer hair cells were preserved in group 4, almost like group 2, whereas cytotoxic degenerations were noted in groups 1 and 3. Conclusions Intratympanic administration of dex-loaded CBGCH has been shown to provide functional and structural protection against CP-induced ototoxicity.

Keyword: Dexamethasone; Guinea pig; Cisplatin; Genipin; Hydrogel; Ototoxicity

225. Navigating and negotiating borders: Western pre-service teachers' experiences of teaching science in a non-western setting/ **Fitzgerald, Angela.** Teaching and Teacher Education. ISSN:0742-051X (2019) v.82 p.96-105Teaching and Teacher Education

DOI: 10.1016/j.tate.2019.03.013

Link: <http://www.sciencedirect.com/science/article/pii/S0742051X18316950>

Abstract: The subculture of science has 'borders' that many find difficult to negotiate. These borders become more complex the further understandings of science are from traditional western perspectives. This paper examines the experiences of two western pre-service teachers' teaching science in a non-western context --the Cook Islands-- using data gathered through interviews and learning logs. The lens of 'border crossing' has been used to make sense of these teachers' learning to teach experiences as it provides insights into the ways in which the participants negotiated such crossings over time. This research highlights the importance of recognising the positive interactions and potential for diverse experiences within a cultural context.

Keyword: Science education; Border crossing; Non-western contexts; Pre-service teacher education; Ways of knowing

226. Exploring the relationship between personality and social interactions in zoo-housed elephants: Incorporation of keeper expertise/ **Williams, Ellen; Carter, Anne; Hall, Carol; Bremner-Harrison, Samantha.** Applied Animal Behaviour Science. ISSN:0168-1591 (2019) v.221 p.104876Applied Animal Behaviour Science

DOI: 10.1016/j.applanim.2019.104876

Link: <http://www.sciencedirect.com/science/article/pii/S0168159119301364>

Abstract: Individual animal personalities affect experiences of zoo environments, and thus potentially welfare. Incorporating keeper knowledge of animal personality in a reliable way has great value in optimising welfare in zoo-housed animals. Assessment of animal personality has been used to predict group compatibility and social relationships in a number of species including rhinoceros, gorilla and chimpanzees, and there is potential to do the same with zoo elephants. This study identified elephant personalities using keeper ratings, and investigated the relationship between personality and social interactions in zoo elephants. Behavioural data were collected over a period of 12 months at seven study facilities (January 2016 – February 2017). Subjects were 10 African (1 male: 9 females) and 19 Asian (3 male: 16 female) elephants housed at zoos and safari parks in the UK and Ireland. Each subject was rated using an elephant personality assessment questionnaire, comprising 21 personality adjectives with a visual analogue scale. Personality assessments were completed by 27 keepers. Reliability across keepers was established for nine adjectives and a principal components analysis revealed three personality components: 'attentiveness', 'sociable' and 'engaged with the environment'. Correlations were observed between keeper scores of sociability and social interactions ($p < 0.05$). Elephants considered more sociable by keepers interacted positively with a greater proportion of elephants in the herd than less sociable elephants ($p < 0.05$). Current Secretary of States Standards of Modern Zoo Practice (SSSMZP) elephant management guidelines include the need for long-term management plans, including elephant behavioural profiles and herd compatibility assessments. The results show that sociability as identified by keepers relates to social interactions, illustrating the importance of inclusion of personality assessment in management plans. Future work should build on these findings; applying keeper ratings of elephant personality to a larger sample size, and exploring its potential as a predictive tool in compatibility assessments. Such a measure would help to increase the chance of successful social group formation contributing to positive zoo elephant welfare.

Keyword: Personality; Social behaviour; Welfare; Keeper expertise; Social relationships; Zoo elephants

227. Heritability of immunity traits and disease resistance of bighead catfish, *Clarias macrocephalus* Günther, 1864/ **Srisapoome, Prapansak; Chatchaiphan, Satid; Bunnoy, Anurak; Koonawootrittriron, Skorn; Na-Nakorn, Uthairat.** Fish & Shellfish Immunology. ISSN:1050-4648 (2019) v.92 p.209-215Fish & Shellfish Immunology

DOI: 10.1016/j.fsi.2019.05.060

Link: <http://www.sciencedirect.com/science/article/pii/S105046481930628X>

Abstract: Disease outbreak is a major obstruction for intensive aquaculture worldwide. One of the promising solutions is genetic improvement by selective breeding, providing that a sufficient proportion of additive genetic variance (measured by heritability- h^2) of disease resistance traits exists. In addition, immunity traits are of interest as potential indirect targeted traits for disease resistance. In this study, the genetic parameters of resistance to *Aeromonas hydrophila* were reported for the first time in the bighead catfish, *Clarias macrocephalus* Günther, 1864 which is an important parental species for the production of the commercially important hybrid *C. macrocephalus* × *C. gariepinus*. The analyses were performed on 736 data records obtained from 74 full-sib families

(31 half-sib families) produced by factorial mating design. The results showed that the heritability of survival rate after disease (*Aeromonas hydrophila*) challenge (intraperitoneal injection with 0.1 ml containing 1×10^6 CFU/ml of *A. hydrophila*) was low to moderate (0.05 ± 0.02 – 0.27 ± 0.15). The immune traits (bactericidal activity-BA, lysozyme activity-LA, and alternative complement activity-ACH50) had low to moderate heritability ($h^2_{BA} = 0.05 \pm 0.02$; $h^2_{LA} = 0.16 \pm 0.04$; $h^2_{ACH50} = 0.31 \pm 0.06$) while heritability of hematocrit (Hct) was also low ($h^2_{Hct} = 0.17 \pm 0.04$). The results suggested the possibility to improve resistance to *A. hydrophila* by selection, while the possibility to use immunity traits as indirect selection criteria for disease resistance is still unclear.

Keyword: Immunity; Disease resistance; Additive genetic variance; Genetic parameter; Walking catfish

228. Economic viability of finishing lambs in the feedlot using bovine cheese whey as a dietary ingredient/ **Pinheiro Rogério, Marcos Cláudio; Martins, Espedito Cezário; Shiotsuki, Luciana; Fernandes Franco Pompeu, Roberto Cláudio; Muir, James Pierre; Araújo, Alexandre Ribeiro; de Sousa Oliveira, Delano; Lima Magalhães, José Lochaider; Campos, Warley Éfrem; Facó.** Small Ruminant Research. ISSN:0921-4488 (2019) v.170 p.131-136Small Ruminant Research

DOI: 10.1016/j.smallrumres.2018.11.018

Link: <http://www.sciencedirect.com/science/article/pii/S0921448818310058>

Abstract: The aim of this study was to evaluate the economic viability of finishing Morada Nova in two feedlot systems: with and without inclusion of bovine cheese whey in the diet. Extrapolation was performed to a module of 240 lambs per year based on a three-cycle production system (each cycle with 100 days). The use of bovine cheese whey resulted in better economic viability. Reduction of labor costs and improvement of the lambs' sale price at the end of the finishing phase were major factors.

Keyword: Agro-industrial byproducts; Economics; Ruminants and sheep

229. Neuroprotective effect of ghrelin in methamphetamine-treated male rats/ **Fallahi, Solmaz; Babri, Shirin; Farajdokht, Fereshteh; Ghiasi, Rafighe; Soltani Zangbar, Hamid; Karimi, Pouran; Mohaddes, Gisou.** Neuroscience Letters. ISSN:0304-3940 (2019) v.707 p.134304Neuroscience Letters

DOI: 10.1016/j.neulet.2019.134304

Link: <http://www.sciencedirect.com/science/article/pii/S0304394019303775>

Abstract: This study aimed to investigate the effects of ghrelin, as a neuroprotective agent, on cognitive impairment and apoptosis pathway in methamphetamine-treated male rats. Sixty adult male Wistar rats were randomly divided into six groups ($n = 10$): Saline/Saline (SS), Saline/Ghrelin (SG), Methamphetamine/Simultaneous Saline (MSS), Methamphetamine/Simultaneous Ghrelin (MSG), Methamphetamine/Delayed Saline (MDS), and Methamphetamine/Delayed ghrelin (MDG). Methamphetamine (5 mg/kg) and ghrelin (5 nM/kg) were injected intraperitoneally. Spatial and passive avoidance memories were evaluated by Morris water maze (MWM) and Shuttle box, respectively. Hippocampal expression levels of Cytochrome-C, Caspase 3, and Bax/Bcl-2 ratio were evaluated by Western blotting. TUNEL assay was performed to detect hippocampal neuronal apoptosis. Our results showed that time spent in the target quadrant in MSS group was less than the control group. However, simultaneous ghrelin treatment could increase it. Ghrelin treatment reversed methamphetamine effects on hippocampal protein

expression of Caspase 3 and Cytochrome-C, and BAX/Bcl-2 ratio. TUNEL assay showed an increase in the number of apoptotic cells in methamphetamine-treated animals, while ghrelin treatment decreased apoptosis. These results indicate that ghrelin treatment could improve spatial memory and reduce neuronal apoptosis in the hippocampus of methamphetamine-treated animals.

Keyword: Apoptosis; Hippocampus; Memory; Ghrelin; Methamphetamine

230. Association of colistin residues and manure treatment with the abundance of mcr-1 gene in swine feedlots/ **Xia, Xi; Wang, Zheng; Fu, Yulin; Du, Xiang-dang; Gao, Binwen; Zhou, Yuqing; He, Junjia; Wang, Yang; Shen, Jianzhong; Jiang, Haiyang; Wu, Yongning.** Environment International. ISSN:0160-4120 (2019) v.127 p.361-370Environment International

DOI: 10.1016/j.envint.2019.03.061

Link: <http://www.sciencedirect.com/science/article/pii/S0160412018330952>

Abstract: Background The extensive use of colistin in swine production may have contributed to the recent emergence of corresponding mobile resistance gene mcr-1. The use of colistin as a feed additive was banned in China in April 2017. Objectives To examine the occurrence of colistin and dissemination of mcr-1 in swine feedlots before and after the colistin ban and effects of different manure treatments. Methods Environmental samples were collected from swine feedlots before (December 2016) and after (December 2017) the colistin ban. Colistin concentrations were determined by ultra-high performance liquid chromatography coupled to tandem mass spectrometry. The prevalence of mcr-1 were determined by quantitative PCR analysis, while bacterial community composition was investigated by 16S rRNA sequencing. Results In 2016, colistin was detected in feed and fresh manure samples at 67 mg/kg and 17 mg/kg, respectively, but was absent from all samples in 2017. In 2016, the relative abundance of mcr-1 in fresh manure was lower than that in solid samples after natural drying, while a higher relative abundance was detected in fresh manure samples compared with biogas slurry samples. A strong correlation between colistin concentration and relative abundance of mcr-1 was observed in fresh manure. The samples collected in 2017 showed a lower relative abundance of mcr-1 compared with those collected in 2016. Bacterial community analysis showed that the abundance of Enterobacteriaceae, which act as a vehicle and reservoir of mcr-1, increased with natural drying but decreased with anaerobic digestion. Conclusions The presence of colistin exerts direct selection pressure for the accumulation of mcr-1 in manure, while the ban on colistin likely halted the dissemination of mcr-1 on pig farms. Anaerobic digestion is an effective waste treatment process for removing mcr-1, which might be mainly driven by the shift in bacterial community structure.

Keyword: Bacterial community; - gene; Colistin; Swine feedlot; Wastewater treat process

231. Ultrasound: A Valuable Translational Tool to Measure Postvoid Residual in Awake Rats?/ **Sartori, Andrea M.; Schwab, Martin E.; Kessler, Thomas M..** European Urology Focus. ISSN:2405-4569 (2019) v. p.European Urology Focus

DOI: 10.1016/j.euf.2019.11.016

Link: <http://www.sciencedirect.com/science/article/pii/S2405456919303578>

Abstract: Background Ultrasound is generally used to measure postvoid residual (PVR) in daily clinical practice for a basic assessment of voiding dysfunction. In animal research, however, PVR is measured mostly by expelling the urine with gentle squeezing of the bladder. Objective To assess the translational value of measuring PVR by ultrasound in awake rats with the aim of obtaining directly comparable data sets in patients and rodent models. Design, setting, and participants A prospective animal study was conducted in 10 rats with large, incomplete thoracic spinal cord injury resulting in severe bladder impairment. Lower urinary tract function was assessed by urodynamics with implanted bladder catheter and external urethral sphincter electrodes, allowing for repeated measurements over time. Immediately after the last micturition cycle in the urodynamic investigation, PVR was first assessed by ultrasound using a 7.5 MHz linear probe and then by manually expelling the urine via gentle pressure on the abdomen. Outcome measurements and statistical analysis PVR was measured by ultrasound and by manually expelling the urine. Paired t test was used to analyze the difference between the two measurements 1 and 2 wk after spinal cord injury. Results and limitations PVR assessed by ultrasound was equal to and not statistically different from the volumes obtained by manual expulsion in intact rats, both before injury and during the first 2 wk after spinal cord injury (intact: 0.16 ± 0.07 vs 0.14 ± 0.09 ml, $p = 0.08$; week 1: 1.67 ± 0.53 vs 1.71 ± 0.55 ml, $p = 0.67$; week 2: 1.16 ± 0.35 vs 0.98 ± 0.43 ml, $p = 0.11$). The main limitation of ultrasound for measuring PVR is the restricted availability of ultrasound machines in animal research laboratories. Conclusions Ultrasound is a valuable translational tool to measure PVR in awake rats reflecting the situation in humans. Patient summary We measured postvoid residual by ultrasound in awake rats, analogous to clinical examination in humans. Ultrasonography provided similar values to the generally used manual bladder expulsion.

Keyword: Spinal cord injury; Awake rats; Postvoid residual; Ultrasonography

232. How water, wind, waves and ice shape landscapes and landforms: Historical contributions to geomorphic science/ **Gardner, James.** Geomorphology. ISSN:0169-555X (2019) v. p.106687Geomorphology

DOI: 10.1016/j.geomorph.2019.02.031

Link: <http://www.sciencedirect.com/science/article/pii/S0169555X1930073X>

Abstract: Research over approximately 200 yr on the geomorphic effects of the force of water, wind, waves and ice is reviewed. In a changed scientific, technological, institutional and socio-political context, several trends emerge. Increased focus on measurement of processes from the 1930s onwards was facilitated by new technologies, leading eventually to a blurring of disciplinary boundaries and the emergence of geomorphology as an Earth system science. Human impact research and applications have blossomed and are contributing to an emerging understanding of the Anthropocene. Absolute dating techniques have reinvigorated landform and landscape evolution research, while remote sensing and geospatial science generally have enhanced observation, measurement and modeling of terrestrial and planetary surface and subsurface forms and processes. The historical record demonstrates that geomorphology has attained scientific vigour and societal relevance through fascinating journeys of curiosity, exploration, mapping, measurement, modeling and explanation.

Keyword: Anthropocene; Aeolian; Coastal; Earth system science; Fluvial; Glacial; Periglacial

233. Protective role of dryland rearing on netting floors against mortality through gut microbiota-associated immune performance in Shaoxing ducks/ **Zhao, Yan; Li, Xiuhong; Sun, Siwei; Chen, Li; Jin, Junjie; Liu, Suzhen; Song, Xianzhang; Wu, Chunqin; Lu, Lizhi.** Poultry Science. ISSN:0032-5791 10(2019) v.98 p.4530-4538Poultry Science

DOI: 10.3382/ps/pez268

Link: <http://www.sciencedirect.com/science/article/pii/S003257911947973X>

Abstract: ABSTRACT Dryland rearing on netting floors (DRNF) is a new rearing method for ducks, which could prevent duck excreta from polluting water bodies. However, the influence of DRNF on duck production and immune performance remains poorly understood. In this study, 2,280 Shaoxing ducks, an egg-type breed of Sheldrake in China, were chosen and randomly divided into 2 groups to investigate the effects of DRNF on duck farming. During the experimental laying rates, feed-egg ratios, and mortality rates of the 2 groups were calculated and recorded. Serum immune parameters, including thymus index, spleen index, levels of immunoglobulin G (IgG), interleukin 1 β (IL-1 β), and tumor necrosis factor α (TNF- α), were determined. Sequencing of the 16S rRNA gene was used to analyze the variability of gut microbiota in the duck ileum and cecum. The results showed that DRNF significantly reduced the mortality rate of the ducks and increased the thymus index ($P < 0.05$), compared to the control. No other significant differences were detected in productional and immune indices ($P > 0.05$). The 16S rRNA sequencing results revealed differentially enriched microbial compositions in the ileum and cecum, which might be responsible for the improved immune function of Shaoxing ducks. For example, an increase in Lactobacillaceae (family), Anaerotruncus (genus), Saccharibacteria (phylum), Flavobacteriaceae (family), and a reduction in Anaerobiospirillum (genus), Lachnospiraceae (family), Blautia (genus) was revealed in the DRNF ducks. In conclusion, DRNF could alter gut microflora, enhance duck immune system, and reduce mortality in Shaoxing ducks.

Keyword: 16S rRNA; dryland rearing on netting floors; gut microbiota; immune performance; Shaoxing duck

234. Comprehensive literature review of the sources of infection and transmission routes of *Coxiella burnetii*, with particular regard to the criteria of “evidence-based medicine”/ **Koehler, Lisa Marie; Kloppert, Bärbel; Hamann, Hans-Peter; El-Sayed, Amr; Zschöck, Michael.** Comparative Immunology, Microbiology and Infectious Diseases. ISSN:0147-9571 (2019) v.64 p.67-72Comparative Immunology, Microbiology and Infectious Diseases

DOI: 10.1016/j.cimid.2019.02.004

Link: <http://www.sciencedirect.com/science/article/pii/S0147957119300384>

Abstract: The present review aims to compile the currently available literature since 1936 according the sources of infection of the Q fever pathogen (*Coxiella* (C.) *burnetii*) as well as the transmission from animal to man and also from human to human. In terms of quality and validity, the existing publications were reviewed systematically. For this purpose, firstly a structured literature search was carried out using various databases and search engines supplemented by a manual literature search. For critical appraisal, 1444 relevant publications were identified for the moment and evaluated. A total of 73 publications describing a transmission of *C. burnetii* from animals to man or a human-to-human transmission were discovered. The identified publications are 29 case series, two case reports, 21 cohort studies and 21 case-control studies. With regard to the sources of infection, 25 publications describing the transmission of *C. burnetii* from sheep to humans could be identified.

Keyword: Zoonosis; Q fever; Evidence-based medicine; Mode of infection

235. Conservationists' moral obligations toward wildlife: Values and identity promote conservation conflict/ **Bruskotter, Jeremy T.; Vucetich, John A.; Dietsch, Alia; Slagle, Kristina M.; Brooks, Jeremy S.; Nelson, Michael P..** Biological Conservation. ISSN:0006-3207 (2019) v.240 p.108296Biological Conservation

DOI: 10.1016/j.biocon.2019.108296

Link: <http://www.sciencedirect.com/science/article/pii/S0006320719312595>

Abstract: Recent debate among scholars reveals potential rifts in the conservation community concerning the moral bases of conservation, and the nature of humanity's obligations to nature. We reasoned that conflict within the conservation community could stem both from divergent values and identification with relevant interest groups. We used secondary data from three recent studies that quantify wildlife value orientations, belief in the intrinsic value of wildlife, and perceived moral obligations to wildlife among US residents and self-identified conservationists. Results indicate the vast majority (>75%) of conservationists both endorse the idea that wildlife possess intrinsic value, and that humans have an obligation to treat wild animals with concern for their welfare – ideas that are consistent with, though not unique to, compassionate conservation. Further, we found that both mutualism value orientations and identification with other interest groups relevant to conservation (e.g., animal rights, hunting) were moderately correlated with beliefs about an individuals' obligations toward wildlife—providing evidence that both values and identity are sources of social conflict within the conservation community. Identity could provide a mechanism linking individual-level, cognitive processes with group-level processes (e.g. emergence) that promote both within-group conformity and between-group conflict, but more research is needed to unravel causality.

Keyword: Values; Social identity; Conflict; Ethics; Moral obligation; Value orientations

236. Modeling the transmission dynamics of foot and mouth disease in Amhara region, Ethiopia/ **Belayneh, Negus; Molla, Wasse; Mesfine, Mekides; Jemberu, Wudu T..** Preventive Veterinary Medicine. ISSN:0167-5877 (2019) v. p.Preventive Veterinary Medicine

DOI: 10.1016/j.prevetmed.2019.04.002

Link: <http://www.sciencedirect.com/science/article/pii/S0167587718308833>

Abstract: Foot and mouth disease (FMD) is contagious, acute viral disease of all cloven-hoofed animals. The disease is endemic in Ethiopia and causes multiple outbreak every year all over the country. While it is important to understand to the transmission dynamics of FMD outbreaks for appropriate control intervention, no such study has been done in Ethiopia. Thus, the aims of this study were to estimate the basic reproduction number (R_0) of FMD and simulate FMD transmission dynamics of FMD in Amhara region of Ethiopia. Basic reproduction number (R_0) was estimated from age stratified sero-prevalence data through maximum likelihood estimation. A stochastic SIR (susceptible-infectious-recovered) compartmental FMD model was formulated and parameterized using literature and age stratified sero-prevalence field data. The R_0 of FMD in the region was estimated to be 1.27 (95%CI: 1.20–1.34). The simulation of the SIR model showed only 24% (95% CI: 16–32%) of the infection introduced in the region caused major outbreaks. Out of the major outbreaks 25% of them tend to persist in the region. Major outbreaks cause 38.9% (95% CI: 38.8–39.1%) morbidity and 0.0019% (95% CI: 0.0018–0.0020%) mortality in cattle and the outbreaks stayed for an average of 690 days (95%CI: 655–727). Validation of the model prediction with farmer's field experience indicated a fairly similar result especially for the predicted morbidity caused by outbreaks. This study revealed low transmission of FMD within the Amhara region cattle population indicating not very high vaccination coverage is needed, if control through vaccination is envisaged at regional level. However, owing to several simplified assumptions made during the modeling, this conclusion should be taken cautiously.

Keyword: R; FMD; Amhara region; Modeling; SIR

237. Long term features of diabetic retinopathy in streptozotocin-induced diabetic Wistar rats/ **Naderi, Asieh; Zahed, Reza; Aghajanpour, Leila; Amoli, Fahimeh Asadi; Lashay, Alireza.** Experimental Eye Research. ISSN:0014-4835 (2019) v.184 p.213-220Experimental Eye Research

DOI: 10.1016/j.exer.2019.04.025

Link: <http://www.sciencedirect.com/science/article/pii/S0014483518308121>

Abstract: Diabetic retinopathy is a complication of diabetes and a leading cause of vision loss among working-age adults. To assess whether the Wistar rat with Streptozotocin (STZ)-induced diabetes is a suitable animal model of human proliferative diabetic retinopathy we evaluated the vascular changes to assess the diabetic retinopathy (DR) stages in this model. After two weeks of intraperitoneal STZ (55 mg/kg) injection in male Wistar rats (270–300 g), they were considered diabetic with persistent blood glucose levels ≥ 16.65 mmol/L. The diabetic and control rats were investigated after 1, 3, 6 and 9 months by electroretinography, Evans blue assay, dextran fluorescence retinal angiography, and retinal histopathological studies. Retinal vascular permeability in the diabetic groups increased significantly in all diabetic groups. The amplitude of a- and b-waves decreased significantly in all diabetic groups compared with the age-matched control groups. The latent time of a-waves in the diabetic groups was delayed at 3 months of diabetes and this delay remained relatively constant till 9 months following the onset of diabetes. Although the latent time of b-wave in the diabetic groups increased slightly, a significant difference was found right at 9 months of diabetes. Vascular density and branching point numbers significantly decreased in the diabetic eyes at 3 and 6 months while they increased at 9 months, which was not significant. Intraretinal hemorrhage and ischemic changes were detected in the half of diabetic rats after 6 months and considered as preproliferative stage of diabetic retinopathy. Although preproliferative changes were detected in all diabetic rats at 9 months, half of them showed vitreous neovascularization attached to retina and retinal folds which can be considered as proliferative stage of DR. Intraretinal hemorrhage, extensive leakage of fluorescein, retinal folds, and vitreous neovascularization were the most prominent findings of severe and proliferative diabetic retinopathy in a fraction of the STZ-induced diabetic rats which were comparable to that of the human patients. STZ-induced diabetic rats can be considered to be a potentially useful model for studies on pathogenesis and treatment of diabetic retinopathy in human.

Keyword: Animal model; Diabetes; Streptozotocin; Diabetic retinopathy; Retinal neovascularization

238. The role of sheep production in the livelihoods of Mexican smallholders: Evidence from a park-adjacent community/ **Estevez-Moreno, Laura X.; Sanchez-Vera, Ernesto; Nava-Bernal, Gabino; Estrada-Flores, Julieta G.; Gomez-Demetrio, William; Sepúlveda, Wilmer S..** Small Ruminant Research. ISSN:0921-4488 (2019) v.178 p.94-101Small Ruminant Research

DOI: 10.1016/j.smallrumres.2019.08.001

Link: <http://www.sciencedirect.com/science/article/pii/S0921448819301361>

Abstract: Traditional sheep production is part of the livelihood activities of natural resources' users in some protected areas. The aim of this study was to identify livelihood profiles of sheep producing households, in a park-adjacent community of central Mexico, using both production orientation and households' strategies for access to sheep as key analytical categories. Data were collected through a questionnaire administered to a total of 62 sheep producing households, a hierarchical cluster analysis was performed and four household profiles were identified and described including additional socio-economic and sheep production-related characteristics: "Fatteners", "Small breeders", "Shepherd breeders" and "Non-shepherd breeders". The "shepherd breeders" were highly linked to sheep farming

in terms of the human capital engaged in this activity, the income they obtained from it and the way they used it. The “non-shepherd breeders” seemed to be mainly farmers linked to sheep production through joint livestock ventures. “Fatteners” complemented sheep production with non-agricultural activities, under a production system that tends to be more intensive, and “small breeders” combined the extensive management of animals with non-agricultural employment. Shepherding was more frequently performed by the groups of breeders compared with the fatteners. The case of the Ojo de Agua community provides new insights for the analysis of the role of livestock in rural livelihoods and the implications of protected areas' management on the wellbeing of their inhabitants and users.

Keyword: Livelihoods; Access strategies to assets; Park-adjacent community; Production orientation Nevado de Toluca; Sheep production

239. A cynomolgus monkey model of temporal lobe epilepsy/ **Chen, Ting; Deng, Yu; Sha, Longze; Shen, Yan; Xu, Qi.** Brain Research Bulletin. ISSN:0361-9230 (2019) v.144 p.187-193Brain Research Bulletin

DOI: 10.1016/j.brainresbull.2018.11.001

Link: <http://www.sciencedirect.com/science/article/pii/S0361923018305677>

Abstract: Temporal lobe epilepsy (TLE) with hippocampal sclerosis is the most common type of drug-resistant epilepsy. Non-human primates are attractive models for studying the pathogenic mechanisms of TLE, with the goal of developing new drugs and interventions. In this study, we developed and tested a Cynomolgus monkey (*Macaca fascicularis*) model of TLE. A total of 5 Cynomolgus monkeys received 3–4 weekly unilateral hippocampal injections of kainic acid (KA) to induce repetitive acute seizures. Animals were monitored via video and electroencephalography (EEG) to assess KA-induced acute seizures and subsequent spontaneous recurrent epileptiform discharges (SREDs). During acute seizures, EEG recording showed bursts of generalized spike discharges arising from the temporal lobe ipsilateral to the KA injection. Three months later, we detected abundant interictal epileptiform discharges (IEDs) during pentobarbital induced anesthesia. Furthermore, two monkeys exhibited synchronized epileptiform discharges accompanied by symptoms mimicking absence seizures. No obvious convulsive symptoms were observed in any monkeys. Overall, our data indicate successful development of a Cynomolgus monkey model of TLE via unilateral hippocampal injection of KA.

Keyword: Animal model; Kainic acid; Temporal lobe epilepsy; Cynomolgus monkey

240. Nutraceutical effect of vitamins and minerals on performance and immune and antioxidant systems in dairy calves during the nutritional transition period in summer/ **Bordignon, Rael; Volpato, Andreia; Glombowsky, Patrícia; Souza, Carine F.; Baldissera, Matheus D.; Secco, Rodrigo; Pereira, Wanderson A.B.; Leal, Marta L.R.; Vedovatto, Marcelo; Da Silva, Aleksandro S.** Journal of Thermal Biology. ISSN:0306-4565 (2019) v.84 p.451-459Journal of Thermal Biology

DOI: 10.1016/j.jtherbio.2019.07.034

Link: <http://www.sciencedirect.com/science/article/pii/S0306456519302098>

Abstract: We aimed to determine whether the use of injectable vitamins and minerals improves growth performance and immune and antioxidant responses in dairy calves during pre- and post-weaning period in summer. Twenty dairy

calves (45 days of age) were randomized to two groups (10 each): control group (CON) and treated group [TREAT; injection providing 0.20, 0.80, 0.20, 0.10, 35 and 1 mg/kg of copper, zinc, manganese selenium, and vitamins A and E, during two periods (15 days pre- and 15 days post-weaning)]. The animals were weighed and blood samples were collected on days 1, 15, 30 and 45 of the study. Levels of serum copper, selenium, zinc, and manganese were measured on day 1; and the results showed that calves were not deficient in these minerals. The TREAT group had greater BW gain during the final third of the experiment. There was an increase in total leukocyte numbers as a result of elevation in neutrophil counts (day 45) and monocytes (days 30 and 45) in the TREAT group. This group also had lower reactive oxygen species (ROS) content (days 15, 30 and 45) and lipid peroxidation (LPO; days 15 and 45). Furthermore, the TREAT group had greater antioxidant capacity against peroxyl radicals (ACAP; days 15 and 30), activities of the enzymes glutathione peroxidase (GPx; days 15, 30 and 45) and superoxide dismutase (SOD; day 15), concentrations of total serum proteins (day 30), serum globulin (days 15 and 30), ceruloplasmin (day 15), tumor necrosis factor-alpha (TNF- α), interleukin-1, (IL-1; days 30 and 45) and interferon gamma (IFN γ ; day 45), compared to CON group. High respiratory rates during hot times of the day in all study calves was suggestive of heat stress. Taken together, the data suggest that mineral and vitamins injections increased the growth performance and boosted the antioxidant and immunological systems of dairy calves during the diet transition period in summer.

Keyword: Performance; Oxidative stress; Immunity; Antioxidant system; Calves; Metaphylactic effect; Thermal stress

241. Influence of landscape matrix on urban bird abundance: evidence from Malaysian citizen science data/ **Puan, Chong Leong; Yeong, Kok Loong; Ong, Kang Woei; Ahmad Fauzi, Muhd Izzat; Yahya, Muhammad Syafiq; Khoo, Swee Seng.** Journal of Asia-Pacific Biodiversity. ISSN:2287-884X 3(2019) v.12 p.369-375Journal of Asia-Pacific Biodiversity

DOI: 10.1016/j.japb.2019.03.008

Link: <http://www.sciencedirect.com/science/article/pii/S2287884X19300020>

Abstract: Large cities in the tropics often comprise a myriad of manmade and natural elements that influence wildlife composition. Based on a citizen science-based project conducted in 2015, this study examined the combined effects of landscape factors on the bird assemblages in Kuala Lumpur and its conurbation, Peninsular Malaysia. A total of 48 species including 2,599 individual birds were recorded; the majority of which (>80%) were species of open habitat. Generalized linear mixed model indicated that the area of green cover had the strongest influence on number of individuals. Specifically, the abundance of individuals was increased by the presence of river corridors and roadside reserves. Areas located further away from water bodies and with less green cover had fewer birds. Our findings highlight the importance of incorporating a varied landscape matrix into urban planning so as to maintain urban bird diversity and demonstrate the usefulness of citizen science in biodiversity monitoring.

Keyword: Urbanization; Generalized linear mixed model; Green cover; Kuala Lumpur; Urban bird habitat

242. In vivo bioluminescence imaging of labile iron pools in a murine model of sepsis with a highly selective probe/ **Feng, Ping; Ma, Lin; Xu, Feng; Gou, Xueyan; Du, Lupei; Ke, Bowen; Li, Minyong.** Talanta. ISSN:0039-9140 (2019) v.203 p.29-33Talanta

DOI: 10.1016/j.talanta.2019.05.017

Link: <http://www.sciencedirect.com/science/article/pii/S0039914019305016>

Abstract: Iron plays an essential role in biological system. An approach for in vivo imaging of this metal ion is needed to investigate its complex contributions to physiological and pathological processes. Herein, we present a bioluminescent probe FP-1 as a powerful tool for targeting Fe²⁺ detection in vitro and in vivo. The turn-on sensing scheme is based on the caged strategy of luciferin-luciferase system. FP-1 not only can detect accumulations of exogenous Fe²⁺ in living animal, but also has the capability of monitoring labile endogenous Fe²⁺ levels in animal model of sepsis. Implementation of this technique provides a valuable opportunity for understanding underlying mechanisms of Fe²⁺ in biological processes and disease states.

Keyword: Bioluminescent probe; imaging; Luciferin-luciferase system; Iron (II)

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