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1. A novel method for performing antigenic vaccine matching for foot-and-mouth disease in absence of the homologous virus/ **Sirdar, Mohamed M.; Fosgate, Geoffrey T.; Blignaut, Belinda; Gummow, Bruce; Shileyi, Bernard; Lazarus, David D.; Mutowembwa, P.; van der Merwe, Danica; Heath, Livio**. Vaccine. ISSN:0264-410X 35 (2019) v.37 Issue. 35 p.5025-5034 Vaccine

DOI: 10.1016/j.vaccine.2019.07.002

Link: http://www.sciencedirect.com/science/article/pii/S0264410X19308801

Abstract: Foot-and-mouth-disease (FMD) is a highly contagious transboundary animal disease that has negative consequences on regional and international trade. Vaccination is an important approach for FMD control and an essential consideration is the degree of cross-protection conferred by the vaccine against currently circulating field viruses. The objective of this study was to evaluate a new vaccine matching technique that does not require knowledge concerning the homologous vaccine virus. As a proof of concept, the vaccine-match was assessed for 41 FMD field viruses isolated from southern Africa over a 25-year period. A diverse group of 20 SAT1 and 21 SAT2 FMDV isolates collected from cattle and wildlife during 1991–2015 were selected for this study. Virus neutralization tests were performed against two sets of pooled sera for each serotype: vaccinated cattle sera (4–16 weeks post-vaccination) and convalescent cattle sera (3 weeks post-experimental challenge). Novel r1-values were calculated as the ratio of the titre of the vaccinated sera to the titre for convalescent cattle sera. A validation r1-value was calculated based on an assumption concerning the true homologous vaccine virus. There was a strong positive correlation between r1-values for the novel and the validation methods for SAT1 viruses (Spearman's rho = 0.84, $P < 0.01$) and a very strong correlation for SAT2 viruses (Spearman's rho = 0.90, $P < 0.01$). In addition, there was moderate to good agreement between the novel and validation methods for both serotypes based on a r1-value cut-off of 0.3, which is presumed to represent a good vaccine-match. The agreement between methods using prevalence-adjusted and bias-adjusted kappa (PABAK) was 0.67 and 0.84 for SAT1 and SAT2 viruses, respectively. The new r1-value method provides a feasible, alternative vaccine matching approach that could benefit FMD control in southern Africa.

Keyword: FMD; R-value; Southern African Territories (SAT); Vaccine matching; VNT

2. Comparison of treatment protocols for bovine respiratory disease in high-risk, newly received beef calves/ **Ball, J.J.; Kegley, E.B.; Sarchet, J.; Powell, J.G.**. Applied Animal Science. ISSN:2590-2865 3 (2019) v.35 Issue. 3 p.278-283 Applied Animal Science

DOI: 10.15232/aas.2018-01836

Link: http://www.sciencedirect.com/science/article/pii/S2590286519300485

Abstract: ABSTRACT Objective This research evaluated the effects of different antibiotic treatment protocols on performance, morbidity, antibiotic usage, and cost in high-risk, newly received beef calves. Materials and Methods Crossbred male calves (n = 176; BW = 232 ± 1.6 kg) were stratified by BW and castration status and assigned randomly to 1 of 2 treatments in a randomized complete block design. Calves were administered either 2.5 mg/kg of BW of tulathromycin (TUL, Draxxin, Zoetis, Florham Park, NJ) with a 7-d post-metaphylactic treatment or 10 mg/kg of BW of tilmicosin (TIL, Micotil, Elanco Animal Health, Greenfield, IN) with a 1-d post-metaphylactic treatment. Clinical attitude scores [0 (normal) to 4 (moribund)] were assigned daily to assess morbidity and when ≥ 1, and if rectal temperature exceeded 40°C, an antibiotic was administered per preplanned protocol. Calves that received TUL on d 0 received ceftiofur with a 7-d post-treatment interval, and those that received TIL received enrofloxacin with a 3-d

post-treatment interval. A final antibiotic was administered to calves that were pulled a second time and met the treatment criteria. Results and Discussion Percentage morbidity was greater for the first treatment, the second treatment, and relapse in TIL compared with TUL ($P < 0.0001$). Initial antibiotic cost was greater in calves administered TUL compared with TIL ($P < 0.0001$). Both first- and second-treatment antibiotic costs were greater in TIL compared with TUL ($P \leq 0.0003$). However, there were no differences across treatments in overall antibiotic cost ($P = 0.51$), exclusive of labor or chute charges. Implications and Applications Metaphylactic treatment protocols did not affect growth performance, but differences were found in the percentage of calves treated for clinical bovine respiratory disease and in number of antibiotics used.

Keyword: beef cattle; bovine respiratory disease; morbidity; tilmicosin; tulathromycin

3. Effect of cold plasma on the techno-functional properties of animal protein food ingredients/ **Pérez-Andrés, Juan M.; Álvarez, Carlos; Cullen, P.J.; Tiwari, Brijesh K.**. Innovative Food Science & Emerging Technologies. ISSN:1466-8564 (2019) v.58 Issue. p.102205 Innovative Food Science & Emerging Technologies

DOI: 10.1016/j.ifset.2019.102205

Link: http://www.sciencedirect.com/science/article/pii/S1466856419300426

Abstract: Proteins, as food ingredients, are employed in the food industry, not only for their high nutritional value, but also because of their techno-functional properties. Modifications of their native structure due to the action of external factors such as pH, temperature or processing by emerging technologies, can lead to changes in their functionality; and consequently, their applicability. The present study investigates the effects of cold atmospheric air plasma on the techno-functional properties of two common food ingredients (haemoglobin and gelatine from pork), and a novel source of functional proteins extracted from a meat co-product (bovine lung protein). Significant effects were found for their functional, rheological and gelling properties. However, the effects were found to depend on the native structure and nature of the protein. The findings point to the specific nature of plasma-protein interactions and the need for individual proteins to be studied as a function of plasma conditions. Industrial relevance text Cold plasma is increasingly being investigated as a non-thermal technology for food and other biological applications such as primary agriculture and medicine. In addition to microbial and pest decontamination, it can be also be used to modify the functionality of food ingredients to achieve the desired properties of a specific food product.

Keyword: Cold atmospheric plasma; Emulsifying; Food proteins; Functional properties; Rheological properties; Solubility

4. Fifty-Eight Years and Counting: High-Impact Publishing in Computational Pharmaceutical Sciences and Mechanism-Based Modeling/ **Amidon, Gregory E.; Anderson, Bradley D.; Balthasar, Joseph P.; Bergstrom, Christel A.S.; Huang, Shiew-Mei; Kasting, Gerald; Kesisoglou, Filippos; Khinast, Johannes G.; Mager, Donald E.; Roberts, Christopher J.; Yu, Lian**. Journal of Pharmaceutical Sciences. ISSN:0022-3549 1 (2019) v.108 Issue. 1 p.2-7 Journal of Pharmaceutical Sciences

DOI: 10.1016/j.xphs.2018.11.002

Link: http://www.sciencedirect.com/science/article/pii/S0022354918307020

Abstract: With this issue of the Journal of Pharmaceutical Sciences, we celebrate the nearly 6 decades of contributions to mechanistic-based modeling and computational pharmaceutical sciences. Along with its predecessor, The Journal of the American Pharmaceutical Association: Scientific Edition first published in 1911, JPharmSci has been a leader in the advancement of pharmaceutical sciences beginning with its inaugural edition in 1961. As one of the first scientific journals focusing on pharmaceutical sciences, JPharmSci has established a reputation for publishing high-quality research articles using computational methods and mechanism-based modeling. The journal's publication record is remarkable. With over 15,000 articles, 3000 notes, and more than 650 reviews from industry, academia, and regulatory agencies around the world, JPharmSci has truly been the leader in advancing pharmaceutical sciences.

Keyword: absorption, distribution, metabolism, and excretion (ADME); biophysical model(s); mathematical model(s); mechanistic modeling; model(s); modeling; molecular modeling; pharmacokinetic-pharmacodynamic (PKPD) modeling; physiologically based pharmacokinetic (PBPK) modeling

5. Effects of greenhouse roofs on thermal comfort, behaviour, health, and finishing performance of commercial Zebu steers in cold-arid environments/ **Valadez-Noriega, M.; Mendez-Gomez-Humarán, M.C.; Rayas-Amor, A.A.; Sosa-Ferreyra, C.F.; Galindo, F.; Miranda-de la Lama, G.C.**. Journal of Veterinary Behavior. ISSN:1558-7878 (2019) v. Issue. p. Journal of Veterinary Behavior

DOI: 10.1016/j.jveb.2019.10.012

Link: http://www.sciencedirect.com/science/article/pii/S1558787819301571

Abstract: The aim of this study was to determine the effects of two housing systems (thermal plastic greenhouse roofs -PGR- vs without roof-PWR) on health, welfare and finishing performance of Zebu steers in cold-arid environments. A total of 880 animals were included in the study, these were divided in two independent studies. For the first study, 260 steers were used (effect on steers welfare) and 620 steers for the second study (effect on steers performance). Steers in the PWR treatment showed a trend of standing during 12:00 to 14:59 h, which was considered the hottest period of the day and the steers that were standing showed a trend for feed intake. On the other hand, the steers in the PGR treatment showed a trend of lying down ($P<0.001$) and ruminating ($P=0.031$) during the same period of the day; additionally, more steers were drinking in PGR than in PWR treatment. Survival analysis of physical health indicated that the number of healthy steers decreased as the number of days increased, more sick steers were observed in PWR treatment ($P<0.05$). Finally, steers in PGR achieved different ($P<0.001$) final body weight (599.7+46.4 kg), then steers in PWR treatment (569.0+31.6 kg). The steers in PWR showed higher feed intake ($P<0.001$); nonetheless, the steers in PGR treatment showed higher average daily gain ($P<0.001$) and higher feed conversion efficiency ($P<0.001$). Under the winter conditions were the temperatures fluctuated from a high of 33.9 °C to a low of -2.7 °C, the use of thermal plastic greenhouse roofs demonstrated an improvement of steers' welfare, health, the average daily gain and feed conversion efficiency.

Keyword: Performance; Behaviour; Health; Greenhouse-roofs; Thermal comfort; Zebu steers

6. Deoxynivalenol induced apoptosis and inflammation of IPEC-J2 cells by promoting ROS production/ **Kang, Ruifen; Li, Ruonan; Dai, Pengyuan; Li, Zhaojian; Li, Yansen; Li, Chunmei**. Environmental Pollution. ISSN:0269-7491 (2019) v.251 Issue. p.689-698 Environmental Pollution

DOI: 10.1016/j.envpol.2019.05.026

Link: http://www.sciencedirect.com/science/article/pii/S0269749119300739

Abstract: Deoxynivalenol (DON) frequently detected in a wide range of foods and feeds, inducing cytotoxicity to animals and humans. To investigate the underlying mechanism of DON-induced apoptosis and inflammation in porcine small intestinal epithelium, intestinal porcine epithelial cells (IPEC-J2 cells) were chosen as objects, and were treated by different concentrations (0 μg/mL, 0.2 μg/mL, 0.5 μg/mL, 1.0 μg/mL, 2.0 μg/mL, 4.0 μg/mL, 6.0 μg/mL) of DON. The results showed that DON induced cytotoxicity of IPEC-J2 cells in a dose-dependent manner, which is demonstrated by decreasing cell viability. Compared with the control group, DON treatment increased the expressions of genes associated with inflammation and apoptosis, such as interleukin-1 beta (IL-1β), cyclooxgenase-2 (COX-2), interleukin-6 (IL-6), tumour necrosis factor-alpha (TNF-α), caspase-3, caspase-8, caspase-9, and decreased the cell anti-oxidative status. Protein immunofluorescence showed increased expression of caspase-3, nuclear factor kB (NF-κB) and phosphorylated NF-κB in IPEC-J2 cells. DON increased the content of intracellular reactive oxygen species (ROS) of IPEC-J2 cells. N-Acetyl-L-cysteine (NAC), a commonly used antioxidant, blocked DON-induced ROS generation, alleviated the DON-induced apoptosis and inflammation. These results suggested that DON-induced impairment of IPEC-J2 cells is possibly due to increased ROS production, and expressions of genes and proteins associated with apoptosis and inflammation.

Keyword: Deoxynivalenol; Inflammation; Apoptosis; ROS; IPEC-J2 cells

7. Differences in the thermal sensitivity and seminal quality of distinct ovine genotypes raised in tropical conditions/ **Moura, Ana Beatriz Bossois; Brandão, Felipe Zandonadi; Esteves, Sérgio Novita; Nunes de Souza, Guilherme; Fonseca, Jeferson Ferreira da; Pantoja, Messy Hannear Andrade; Romanello, Narian; Botta, Daniela; Giro, Alessandro; Garcia, Alexandre Rossetto**. Theriogenology. ISSN:0093-691X (2019) v.123 Issue. p.123-131 Theriogenology

DOI: 10.1016/j.theriogenology.2018.09.037

Link: http://www.sciencedirect.com/science/article/pii/S0093691X18308756

Abstract: For different ovine breeds to maximize their reproductive capacity in countries with tropical climate, it is important to evaluate their potential for thermal resilience and consequences on their reproductive traits. Therefore, the objective of this study was to evaluate the effect of thermal environment temperatures of climate seasons in a tropical climate region on the surface temperatures of the scrotum, testicular biometric characteristics, seminal quality and serum testosterone concentration of rams of different genotypes. Breeders of four different genotypes (Dorper, n = 8, Texel, n = 8, Santa Inês, n = 9 and Morada Nova, n = 8) were used throughout the four climate seasons. Higher thermal challenge was recorded in the spring and summer. In the summer increase in scrotal surface temperature was detected by infrared thermography ($P < 0.05$), mainly in the regions of the distal testicular pole and tail of the epididymis. The animals of the Texel genotype had higher rectal temperature in the summer. In spring, this genotype also had the highest testicular pole (32.2 ± 0.5 °C; $P < 0.05$) and distal (29.9 ± 0.4 °C; $P < 0.05$) temperatures and a higher mean testicular temperature (31.7 ± 0.4 °C; $P < 0.05$). The Morada Nova genotype showed a higher surface temperature gradient between testicular poles (2.96 ± 0.1 °C; $P < 0.05$), especially in spring. Genotype-dependent thermal sensitivity was detected for the thermal gradient between the testicular poles, reflecting the seminal quality. There was a positive correlation of the thermal gradient between testicular poles with sperm membrane integrity and negative correlation with total sperm defects. The Texel genotype showed less progressive motility and higher percentage of sperm defects. There was no difference in testosterone concentration between genotypes and in the different seasons ($P > 0.05$). Thus, the indigenous genotypes showed a greater capability to

maintain the scrotum-testicular thermoregulation. Dorper animals resembled the indigenous sheep genotypes, in terms of seminal characteristics, unlike Texel animals, which showed lower adaptability and lower seminal quality.

Keyword: Semen; Infrared thermography; Testicular thermoregulation

8. Key research priorities for the future of marine science in New Zealand/ **Jarvis, Rebecca M.; Young, Tim**. Marine Policy. ISSN:0308-597X (2019) v.106 Issue. p.103539 Marine Policy

DOI: 10.1016/j.marpol.2019.103539

Link: http://www.sciencedirect.com/science/article/pii/S0308597X18309059

Abstract: New Zealand's marine and coastal environments are of significant ecological, economic, cultural and social value. Yet a multitude of threats, disjointed legislation, and considerable knowledge gaps continue to limit the country's ability to effectively manage its marine ecosystems and resources. As such, it is important to identify the key research priorities that can best support progress towards more relevant and informed decision-making. Here we present the results of the New Zealand Marine Science Horizon Scan, which identified the ten highest priority research questions for the future of marine science in New Zealand across nine themes: 1) fisheries and aquaculture, 2) biosecurity, 3) climate change, 4) marine reserves and protected areas, 5) ecosystems and biodiversity, 6) policy and decision-making, 7) marine guardianship, 8) coastal and ocean processes, and 9) other anthropogenic factors. These key research priorities can be used to complement ongoing marine science activities, develop new and important areas of research, encourage opportunities for collaboration, and improve transparency around research and decision-making. Not only will answering these questions bridge existing knowledge gaps in marine science, but they can also be used to design research programmes that make the greatest contributions to the future of marine conservation, policy, and management in New Zealand.

Keyword:

9. Cutaneous p38 mitogen-activated protein kinase activation triggers psoriatic dermatitis/ **Sakurai, Kenji; Dainichi, Teruki; Garcet, Sandra; Tsuchiya, Soken; Yamamoto, Yosuke; Kitoh, Akihiko; Honda, Tetsuya; Nomura, Takashi; Egawa, Gyohei; Otsuka, Atsushi; Nakajima, Saeko; Matsumoto, Reiko; Nakano, Yuri; Otsuka, Masayuki; Iwakura, Yoichiro; Gri**. Journal of Allergy and Clinical Immunology. ISSN:0091-6749 4 (2019) v.144 Issue. 4 p.1036-1049 Journal of Allergy and Clinical Immunology

DOI: 10.1016/j.jaci.2019.06.019

Link: http://www.sciencedirect.com/science/article/pii/S0091674919308322

Abstract: Background Psoriasis is a chronic inflammatory skin disease characterized by IL-17-mediated immune responses. p38 is known to be highly activated in the psoriatic epidermis; however, whether p38 is involved in the development of psoriasis is unclear. Objective We sought to demonstrate that activation of p38 mitogen-activated protein kinase is sufficient to induce psoriatic inflammation in mice and that cutaneous p38 activities are the topical therapeutic targets for psoriasis. Methods A p38 activator, anisomycin, was applied daily to murine skin. Transcriptomic analyses were performed to evaluate the similarities of the skin responses to those in human psoriasis and the existing animal model. BIRB796, a small-molecule inhibitor targeting p38 activities, was applied to the murine psoriatic models topically or to human psoriatic skin specimens ex vivo. Results Topical treatment with anisomycin

induced key signatures in psoriasis, such as epidermal thickening, neutrophil infiltration, and gene expression of Il1a, Il1b, Il6, Il24, Cxcl1, Il23a, and Il17a, in treated murine skin. These responses were fully abrogated by topical treatment with BIRB796, and were reduced in IL-17A–deficient mice. Transcriptomic analyses demonstrated the similarities of anisomycin-induced dermatitis to human psoriasis and imiquimod-induced murine psoriatic dermatitis. Furthermore, BIRB796 targeting of p38 activities reduced expression of psoriasis-related genes in both human keratinocytes stimulated with recombinant IL-17A in vitro and psoriatic skin specimens ex vivo. Conclusion Therefore our findings suggest that cutaneous p38 activation can be a key event in patients with psoriasis and a potential topical therapeutic target of a small molecule.

Keyword: Psoriasis; anisomycin; IL-17; p38 mitogen-activated protein kinase

10. Knowledge, attitudes, and practices relevant to zoonotic disease reporting and infection prevention practices among veterinarians — Arizona, 2015/ **Venkat, Heather; Yaglom, Hayley D.; Adams, Laura**. Preventive Veterinary Medicine. ISSN:0167-5877 (2019) v.169 Issue. p.104711 Preventive Veterinary Medicine

DOI: 10.1016/j.prevetmed.2019.104711

Link: http://www.sciencedirect.com/science/article/pii/S0167587718305208

Abstract: Veterinarians play a crucial role in zoonotic disease detection in animals and prevention of disease transmission; reporting these zoonoses to public health officials is an important first step to protect human and animal health. Evidence suggests veterinarians and their staff are at higher risk for exposure to zoonoses because of possible interactions with infected animals. We examined the knowledge, attitudes, and practices of veterinarians regarding zoonotic disease reporting to public health agencies and associated infection prevention (IP) practices such as personal protective equipment (PPE) use, and the need for targeted education and outreach for veterinarians in Arizona. An online questionnaire was developed and distributed by email in September 2015 and was available through November 2015 to all 1,100 members of the Arizona Veterinary Medical Association. Chi-square and logistic regression analyses were performed. In total, 298 (27%) veterinarians from all 15 Arizona counties completed the survey; the majority (70%) were female, practiced small animal medicine (84%), and reported practicing veterinary medicine for ≥10 years (75%). Only 57% reported they knew when to report a suspected zoonotic disease and 60% reported they knew how to make that type of report. The majority said they would report rabies (97%), plague (96%), and highly pathogenic avian influenza (91%) to a state agency. Most respondents reported using PPE (e.g., masks, face shields, and gloves) when performing a surgical procedure (96%) or necropsy (94%), although fewer reported using PPE for handling clinically ill animals (37%) or healthy animals (17%). Approximately 70% reported always using PPE when in contact with animal birthing fluids, urine, or feces, and 47% for contact with animal blood, saliva, or other body fluids. Veterinarians who agreed that they knew the appropriate actions to protect themselves from zoonotic disease exposures were more likely to report always washing their hands before eating or drinking at work (OR = 3.81, 95% confidence interval (CI) [1.97–7.35], $P < 0.01$). Responses for when to make a report and how to report were not significantly different by gender, years of practice, or holding additional degrees, but did differ by practice type, age, and number of veterinarians in the practice. Small animal veterinarians were less likely to report knowing when to make a report compared to other veterinarians ($P < 0.01$). Respondents demonstrated suboptimal zoonotic disease reporting and IP practices, including PPE use. Public health agencies should improve outreach and education to veterinarians to facilitate better zoonotic disease prevention practices and reporting.

Keyword: Reporting; Zoonoses; Zoonotic disease; Infection prevention; Veterinary public health

11. Sex differences in the expression of calcitonin gene-related peptide receptor components in the spinal trigeminal nucleus/ **Ji, Yadong; Rizk, Alexandra; Voulalas, Pamela; Aljohani, Hanan; Akerman, Simon; Dussor, Gregory; Keller, Asaf; Masri, Radi**. Neurobiology of Pain. ISSN:2452-073X (2019) v.6 Issue. p.100031 Neurobiology of Pain

DOI: 10.1016/j.ynpai.2019.100031

Link: http://www.sciencedirect.com/science/article/pii/S2452073X18300217

Abstract: Background and purpose Calcitonin gene-related peptide (CGRP) plays an important role in migraine pathophysiology. CGRP acts primarily by activating a receptor composed of 3 proteins: calcitonin receptor-like receptor (CLR), receptor activity-modifying protein 1 (RAMP1), and receptor component protein (RCP). We tested the hypothesis that sex differences exist in protein levels of two key components of this CGRP receptor: CLR and RCP. Methods We used specific antibodies to assess baseline protein levels of CLR and RCP in the spinal trigeminal nucleus caudalis (SpVc) and upper cervical spinal cord of both male and female rats. We also tested if manipulations that knock-down the expression of RCP in SpVc, using locally-mediated gene transfer of short hairpin RNA (shRNA), ameliorate pain in an animal model of intracranial migraine-like pain induced by chemical noxious stimulation of the meninges. To assess pain, we used tests of ongoing pain (rat face grimace test and freezing behavior) and tests of facial mechanical hypersensitivity and allodynia. Results There was no difference in CLR levels between male and female animals ($p > 0.11$) in SpVc and the upper cervical cord. However, female animals exhibited greater baseline levels of RCP (up to 3-fold higher) compared to males ($p < 0.002$). The knock-down of RCP expression in SpVc attenuated mechanical facial allodynia induced by chemical noxious stimulation of the meninges, but had little effect on ongoing pain behaviors in female and male animals. Conclusions RCP is an integral component of the CGRP receptor and may play a key role in mediating CGRP induced central sensitization after noxious stimulation of the meninges. RCP expression in the SpVc and upper cervical cord is sexually dimorphic, with higher levels of expression in females. This dimorphism may be related to the increased incidence of migraines in females–a hypothesis that should be tested in the future.

Keyword: Migraine; Allodynia; CGRP; Headache; Meninges; Trigeminal

12. Integrative plasma proteomic and microRNA analysis of Jersey cattle in response to high-altitude hypoxia/ **Kong, Zhiwei; Zhou, Chuanshe; Li, Bin; Jiao, Jinzhen; Chen, Liang; Ren, Ao; Jie, Hongdong; Tan, Zhiliang**. Journal of Dairy Science. ISSN:0022-0302 5 (2019) v.102 Issue. 5 p.4606-4618 Journal of Dairy Science

DOI: 10.3168/jds.2018-15515

Link: http://www.sciencedirect.com/science/article/pii/S0022030219302516

Abstract: ABSTRACT Blood has been widely collected and analyzed for diagnosing and monitoring diseases in humans and animals; a range of plasma proteins and peptide can be used as biomarkers to describe pathological or physiological status. Changes in the environment such as high-altitude hypoxia (HAH) can lead to adaptive changes in the blood system of mammals. However, the adaptation mechanism induced by HAH remains unclear. In this study, we used 12 multiparous Jersey cattle (400 ± 35 kg, average 3 yr old, dry period). We applied an iTRAQ (isobaric tags for relative and absolute quantitation) proteomics approach and microRNA (miRNA) microarray to explore differences in the plasma proteomic and miRNA profiles of Jersey cattle exposed to HAH conditions in Nyingchi, Tibet (altitude 3,000 m) and HAH-free conditions in Shenyang, China (altitude 50 m). Such quantitative proteomic strategies are suitable for accurate and comprehensive prediction of miRNA targets. In total, 264 differentially expressed proteins (127 upregulated, fold-change >1.2; 137 downregulated, fold-change <0.8) and 47 differential

miRNAs (25 upregulated, fold-change >2; 22 downregulated, fold-change <0.5) were observed in the HAH-stressed group compared with the HAH-free group. Integrative analysis of proteomic and miRNA profiles demonstrated that the biological processes associated with differentially expressed proteins were immune response, complement system, and conjugation system. Integrative analysis of canonical pathways showed that most were associated with acute phase response signaling (z-score = −0.125), liver X receptor/retinoid X receptor (LXR/RXR) activation pathway (z-score = 1.134), coagulation system (z-score = −0.943), and complement system (z-score = −0.632). The current results indicated that Jersey cattle exposed to HAH could adapt to that condition through regulation of inflammatory homeostasis by inhibiting the acute phase response, coagulation system, and complement system and promoting LXR/RXR activation.

Keyword: high-altitude hypoxia; Jersey cattle; microRNA analysis; plasma proteomics

13. Protective effects of alpha stone on monosodium glutamate-induced uterine hyperplasia in female wistar rats/ **Oyebode, Olubukola T.; Obiekwe, Martin E.; Olorunsogo, Olufunso O.**. Journal of Ayurveda and Integrative Medicine. ISSN:0975-9476 (2019) v. Issue. p. Journal of Ayurveda and Integrative Medicine

DOI: 10.1016/j.jaim.2019.05.001

Link: http://www.sciencedirect.com/science/article/pii/S0975947618305825

Abstract: Background Uterine leiomyomas (fibroids), a menace of the reproductive age, is characterized by proliferation of smooth muscle cells (hyperplasia) of the uterus. Alpha Stone Decoction is a poly-herbal formulation that is used for the shrinkage and prevention of uterine fibroids in folkore medicine. Objectives We investigated the efficacy and safety of Alpha Stone Decoction (ASD), on monosodium glutamate (MSG) induced uterine hyperplasia. Materials and methods Twenty-eight mature virgin female rats were randomly divided into four study groups: A-control B- MSG (200 mg/kgbw), C- MSG + ASD (100 mg/kgbw) and D- ASD 100 mg/kgbw alone. The administration was carried out by as a single daily dose via intraperitoneal route for 14 days. Total protein, triglycerides, estradiol (estrogen), progesterone, and total cholesterol levels in sera were determined using appropriate kits. Uterine hyperplasia was assessed via histomorphometric method using the mitotic image plus software to compute the fibroblast cell count density while the uteri and ovaries of animals were stained with mason-tricon stain for histological examination. Results Administration of MSG for 14 days resulted heavy deposits of collagen connective tissue within the myometrium layers of the uteri. ASD significantly ($p < 0.05$) reduced fibroblast cell count in MSG-treated animals and also protected against MSG-induced damage observed in the myometrium of the uteri and ovaries of the animals. Significant increases ($p < 0.05$) in levels of total protein; triglycerides, progesterone, cholesterol and estrogen in the MSG-treated animals were ameliorated following administration of ASD. Conclusion These findings suggest that ASD contains bioactive agents which reversed MSG-induced uterine hyperplasia. It may therefore be useful in reducing the proliferation of fibroblast cells and managing other symptoms associated with uterine myoma.

Keyword: Hormones; Monosodium glutamate; Cell count density; Collagen; Lipids

14. Regulation of dietary astragalus polysaccharide (APS) supplementation on the non-specific immune response and intestinal microbiota of sea cucumber Apostichopus japonicus/ **Song, Xiaojun; Feng, Zhengfu; Zhang, Yanping; Zhu, Wei**. Fish & Shellfish Immunology. ISSN:1050-4648 (2019) v.94 Issue. p.517-524 Fish & Shellfish Immunology

DOI: 10.1016/j.fsi.2019.09.049

Link: http://www.sciencedirect.com/science/article/pii/S1050464819309337

Abstract: Astragalus polysaccharide (APS) plays important roles in antibacterial, antiviral and antiparasitic activities in mammals, birds and aquatic animals. However, the relationship between non-specific immune responses and intestinal microbiota in sea cucumber (Apostichopus japonicus) after dietary APS supplementation has not been reported to date. Here, the effect of dietary APS supplementation on the non-specific immune response and intestinal microbial composition and species distribution of sea cucumber was explored. We found that although there was no significant effect on sea cucumber growth, the enzymatic activity and expression level of immune- and antioxidant-related genes changed after dietary APS supplementation. Furthermore, the intestinal microbial composition and species distribution of sea cucumber were different at the phylum and genus levels after dietary APS supplementation. The phyla Proteobacteria and Bacteroidetes were significantly different between the APS2 group and CK group. The results of PCA and PCoA analysis also showed that the APS2 group was significantly different compared to the other groups. Finally, analysis of the relationship between non-specific immune responses and the intestinal microbiota showed that the expression level of NF-κB was significantly correlated with intestinal microbiota at the genus level. This finding suggests that dietary APS supplementation might affect the non-specific immune response and intestinal microbiota of sea cucumber through the NF-κB signalling pathway; the appropriate added level was 800 mg/kg. Taken together, our results lay a foundation for further understanding the relationship between non-specific immune responses and intestinal microbial of sea cucumber.

Keyword: Intestinal microbiota; Immune response; APS

15. Austwickiosis in Captive African Spurred Tortoises (Geochelone sulcata) Co-infected with Cryptosporidium ducismarci/ **Rostad, Sara J.; Brandão, João; Ramachandran, Akhilesh; Chien, Rory C.; Confer, Anthony W.**. Journal of Comparative Pathology. ISSN:0021-9975 (2019) v.173 Issue. p.1-7 Journal of Comparative Pathology

DOI: 10.1016/j.jcpa.2019.09.008

Link: http://www.sciencedirect.com/science/article/pii/S0021997519302907

Abstract: Summary Dermatophilosis has been described in many animals since it was first reported in 1915. In 2010, the genus and species associated with chelonid dermatophilosis was reclassified as Austwickia chelonae. Here we discuss a series of four submissions consisting of eight juvenile African spurred tortoises (Geochelone sulcata) from a large breeding facility. Submissions began in December 2016 and continued to June 2017 and then again in November 2018. Clinical signs were originally noted in December of 2015 and consisted of facial swelling and mandibular necrosis that led to complete disarticulation of the mandibles from the skull. Affected animals were emaciated with minimal gastrointestinal contents and several had soft faeces. The facial and head lesions were caused by A. chelonae. Additionally, co-infection with Cryptosporidium ducismarci was discovered within the small intestine. This report gives information on the pathology and pathogenicity of A. chelonae and characterizes the first reported cases of cryptosporidiosis in African spurred tortoises.

Keyword: African spurred tortoise; cryptosporidiosis

16. Effect of copper and zinc source on finishing performance and incidence of foot rot in feedlot steers/ **Hilscher, F.H.; Laudert, S.B.; Heldt, J.S.; Cooper, R.J.; Dicke, B.D.; Jordon, D.J.; Scott, T.L.; Erickson, G.E.**. Applied Animal Science. ISSN:2590-2865 1 (2019) v.35 Issue. 1 p.94-100 Applied Animal Science

DOI: 10.15232/aas.2018-01779

Link: http://www.sciencedirect.com/science/article/pii/S2590286519300072

Abstract: ABSTRACT A commercial feedlot study was conducted to compare a combination of inorganic and organic copper and zinc trace minerals (CON) to basic copper chloride and zinc hydroxychloride trace minerals (BCHZ) on performance, carcass characteristics, and incidence of foot rot in feedlot cattle. Crossbred steer calves (n = 1,471, initial BW 273 ± 10 kg) were housed in 16 pens with average head count of 92 steers (71 to 159 steers) per pen. Pens were blocked by origin and assigned randomly to 1 of 2 treatments (8 pens per treatment). Treatments consisted of adding 25 (growing) or 19 (finishing) mg/kg of copper and 136 (growing) or 108 (finishing) mg/kg of zinc to the diet. The CON consisted of copper sulfate and 65% zinc sulfate and 35% zinc methionine, whereas BCHZ consisted of basic copper chloride and zinc hydroxychloride trace minerals. Data were analyzed using the Glimmix procedure of SAS. There was a 4-kg significant difference in initial BW; thus, initial BW was used as a covariate. There were no differences in DMI, ADG, final BW, or G:F ($P \geq 0.14$). Hot carcass weight, DP, and USDA QG also were unaffected ($P \geq 0.17$) by source of trace mineral supplementation. There were no differences ($P \geq 0.28$) in total morbidity or foot rot treatments in terms of total number of pulls or re-treated animals when comparing CON with BCHZ. Cattle that received basic copper chloride and zinc hydroxychloride trace mineral supplement performed similar to cattle that received a conventional mineral program.

Keyword: zinc; feedlot; copper; hydroxychloride; organic; trace mineral

17. CRISPR/Cas9-mediated MSTN gene editing induced mitochondrial alterations in C2C12 myoblast cells/ **Wang, Lamei; Ma, Sen; Ding, Qiang; Wang, Xiaolong; Chen, Yulin**. Electronic Journal of Biotechnology. ISSN:0717-3458 (2019) v.40 Issue. p.30-39 Electronic Journal of Biotechnology

DOI: 10.1016/j.ejbt.2019.03.009

Link: http://www.sciencedirect.com/science/article/pii/S0717345819300156

Abstract: Background Myostatin (MSTN) negatively regulates muscle mass and is a potent regulator of energy metabolism. However, MSTN knockout have affect mitochondrial function. This research assessed the mitochondrial energy metabolism of Mstn−/+ KO cells, and wondered whether the mitochondria biogenesis are affected. Results In this study, we successfully achieved Mstn knockout in skeletal muscle C2C12 cells using a CRISPR/Cas9 system and measured proliferation and differentiation using the Cell-Counting Kit-8 assay and qPCR, respectively. We found that MSTN dysfunction could promote proliferation and differentiation compared with the behaviour of wild-type cells. Moreover, Mstn KO induced an increase in KIF5B expression. The mitochondrial content was significantly increased in Mstn KO C2C12 cells, apparently associated with the increases in PGC-1α, Cox1, Cox2, ND1 and ND2 expression. However, no differences were observed in glucose consumption and lactate production. Interestingly, Mstn KO C2C12 cells showed an increase in IL6 and a decrease in TNF-1α levels. Conclusion These findings indicate that MSTN regulates mitochondrial biogenesis and metabolism. This gene-editing cells provided favourable evidence for animal breeding and metabolic diseases. How to cite: Wang L, Ding Q, Ma S, et al. CRISPR/Cas9-mediated MSTN gene editing Induced Mitochondrial Alterations in C2C12 myoblast Cells. Electron J Biotechnol 2019;40. https://doi.org/10.1016/j.ejbt.2019.03.009

Keyword: Differentiation; CRISPR/Cas9; Proliferation; Myostatin; Genome-editing; Intracellular organelles; Metabolism regulation; Mitochondria biogenesis; Mitochondria metabolism; Short RNAs; Skeletal muscle

18. Science teachers' worldviews in the age of the digital revolution: Structural and content analysis/ **Tsybulsky, Dina; Levin, Ilya**. Teaching and Teacher Education. ISSN:0742-051X (2019) v.86 Issue. p.102921 Teaching and Teacher Education

DOI: 10.1016/j.tate.2019.102921

Link: http://www.sciencedirect.com/science/article/pii/S0742051X18307601

Abstract: In this qualitative study, we examined the worldviews that contemporary science teachers demonstrate in relation to the digital revolution. The main goal of the study was to gain insight into participants' worldviews as related to the digital revolution, specifically, the contents and structure of their worldviews. The data collection method consisted of in-depth interviews with 30 in-service high-school science teachers. Study findings revealed three different categories of the way teachers perceived their own place and role vis-à-vis the digital revolution: 1) outside observers; 2) circumspect participants; 3) conscientious participants.

Keyword: Beliefs; Digital revolution; Pedagogical practices; Science teachers; Structural analysis; Worldviews

19. Effect of roxarsone metabolites in chicken manure on soil biological property/ **Yao, Lixian; Huang, Lianxi; Bai, Cuihua; Zhou, Changmin; He, Zhaohuan**. Ecotoxicology and Environmental Safety. ISSN:0147-6513 (2019) v.171 Issue. p.493-501 Ecotoxicology and Environmental Safety

DOI: 10.1016/j.ecoenv.2019.01.017

Link: http://www.sciencedirect.com/science/article/pii/S014765131930020X

Abstract: Roxarsone (ROX), an organoarsenic feed additive, occurs as itself and its metabolites including As(V), As(III), monomethylarsonic acid (MMA) and dimethylarsinic acid (DMA) in animal manure. Animal manure improves soil biological property, whereas As compounds impact microorganisms. The integral influence of animal manure bearing ROX metabolites on soil biological quality is not clear yet. Herein, the effect of four chicken manures excreted by chickens fed with four diets containing 0, 40, 80 and 120 mg ROX kg−1, on soil biological attributes. ROX addition in chicken diets increased total As and ROX metabolites in manures, but decreased manure total N, ammonium and nitrate. The elevated ROX metabolites in manures increased soil total As, As species and total N, and increased first and then decreased soil nitrate and nitrite, but did not affect soil ammonium in manure-applied soils. The promoting role of both soil As(III) and ammonium on soil microbial biomass carbon and nitrogen, respiration and saccharase activity, were exceeded or balanced by the inhibiting effect of soil nitrate. The suppression of soil catalase activity by soil As(V) was surpassed by the enhancement caused by soil nitrate and nitrite. Soil urease, acid phosphatase and polyphenol oxidase activities were not suitable bioindicators in the four manure-amended soils. Soil DMA did not affect soil biological properties, and MMA was not detectable in all manure-amended soils. The above highlights the complexity of joint influence of soil As and N on biological attributes. Totally, when ROX is used at allowable dose in chicken diet, soil biological quality would be suppressed in manure-amended soil.

Keyword: Animal manure; As species; Roxarsone; Soil biological quality; Soil enzyme; Soil nitrogen

20. Interaction of the immune-inflammatory and the kynurenine pathways in rats resistant to antidepressant treatment in model of depression/ **Duda, Weronika; Curzytek, Katarzyna; Kubera, Marta; Connor, Thomas J.; Fagan, Eimear M.; Basta-Kaim, Agnieszka; Trojan, Ewa; Papp, Mariusz; Gruca, Piotr; Budziszewska, Bogusława; Leśkiewicz, Monika; Maes, Michael; Lasoń, Władysław**. International Immunopharmacology. ISSN:1567-5769 (2019) v.73 Issue. p.527-538 International Immunopharmacology

DOI: 10.1016/j.intimp.2019.05.039

Link: http://www.sciencedirect.com/science/article/pii/S1567576919310999

Abstract: The kynurenine pathway (KP), a major route of tryptophan catabolism, may be associated with the pathophysiology of depressive disorders. KP is responsible for ca. 99% of brain tryptophan metabolism via its degradation to kynurenine (KYN) catalyzed by indoleamine 2,3-dioxygenase (IDO). Some cytokines, such as interferon-γ (IFN-γ) and interleukin (IL)-6 are potent inducers of IDO. KYN is further converted by kynurenine aminotransferase (KAT) to the more neuroprotective kynurenic acid or by kynurenine 3-monooxygenase (KMO) to neurotoxic 3-hydroxykynurenine. The aim of the present study was to delineate whether the administration of imipramine (IMI) to rats subjected to chronic mild stress (CMS) may reverse behavioral changes induced by CMS in association with changes in immune-inflammatory markers and KP. We confirmed that the CMS procedure modeled one of the main symptoms of depression, i.e. anhedonia, and administration of IMI for 5 weeks resulted in a significant reduction in anhedonia in a majority of animals (CMS IMI-R animals), whereas 20% of animals did not respond to IMI treatment (CMS IMI-NR animals). We established that CMS procedure increased IFN-γ and IDO mRNA and decreased KAT II mRNA expression in the rat cortex. In the cortex and hippocampus, IMI treatment and non-responsiveness to IMI (in CMS IMI-NR animals) were associated with increased IL-6 mRNA expression. In the spleen, CMS increased production of IFN-γ and IL-6 proteins, while these cytokines were decreased by IMI in CMS IMI-R animals. Chronic IMI administration to CMS rats decreased IDO and KMO mRNA and protein expression and increased KAT II/KMO mRNA and protein ratio in IMI responders (CMS IMI-R) in comparison to CMS rats. In CMS IMI-NR rats, a significant increase in IDO mRNA expression and protein level in comparison with IMI responders was observed. Our findings indicate that resistance to therapeutic action of IMI could be explained by a deficiency of the inhibitory properties of IMI on IDO, KMO and KYN synthesis in the cortex. We conclude that the antidepressant activity of IMI may, at least in part, be explained by modulatory activities on the KAT II/KMO ratio in brain areas.

Keyword: Cytokines; IFN-γ; Imipramine; Indoleamine 2,3-dioxygenase; Kynurenine 3-monooxygenase; Kynurenine aminotransferase; Kynurenine pathway

21. Performance of Doppler shift compensation in bats varies with species rather than with environmental clutter/ **Zhang, Yu; Lin, Aiqing; Ding, Jianan; Yang, Xinyao; Jiang, Tinglei; Liu, Ying; Feng, Jiang**. Animal Behaviour. ISSN:0003-3472 (2019) v.158 Issue. p.109-120 Animal Behaviour

DOI: 10.1016/j.anbehav.2019.10.008

Link: http://www.sciencedirect.com/science/article/pii/S0003347219303288

Abstract: The performance of vocal motor control is crucial for vocal communication; however, its evolution and ecological drivers are largely unknown. Doppler shift compensation (DSC), which has been found only in bats, represents an excellent model for studying the mechanisms and evolution of vocal control. We tested whether

species that are more dependent on DSC for pulse–echo separation have a more precise DSC and whether changes in environmental clutter would result in adjustments in DSC performance. We recorded the echolocation and flight behaviour of the greater horseshoe bat, Rhinolophus ferrumequinum, and the great leaf-nosed bat, Hipposideros armiger, flying through a corridor and a window in turn. The DSC precision in H. armiger was significantly lower than that of R. ferrumequinum; the offset between the reference frequency and resting frequency, however, was not significantly different between the two species. We also studied the DSC of H. armiger flying through windows of different sizes. Their flight speed decreased significantly with reduced window size. However, DSC precision and the offset did not vary significantly with window size. Our results suggest that DSC is more precise in rhinolophids, which have a higher demand for pulse–echo separation by DSC, than in hipposiderids. Changes in environmental clutter do not necessarily result in adjustments of DSC performance. Functional importance associated with high-performance vocal control may be critical in shaping the precision of vocal control in the course of evolution. Instead, habitat clutter encountered by vocalizing animals may not play an important role.

Keyword: bats; Doppler shift compensation; echolocation; environmental clutter; vocal control

22. Differences in prevalence of welfare indicators in male and female turkey flocks (Meleagris gallopavo)/ **Ferrante, Valentina; Lolli, Susanna; Ferrari, Lorenzo; Watanabe, Tatiane Terumi Negrão; Tremolada, Carlo; Marchewka, Joanna; Estevez, Inma**. Poultry Science. ISSN:0032-5791 4 (2019) v.98 Issue. 4 p.1568-1574 Poultry Science

DOI: 10.3382/ps/pey534

Link: http://www.sciencedirect.com/science/article/pii/S0032579119300847

Abstract: ABSTRACT Previous research has shown that the transect walks (TW) method provide a practical and effective approach to welfare assessment in broiler and turkey farms. This method for turkey welfare assessment is reasonable in terms of time demands within minimal costs. Furthermore, TW approach resembles the routine checks used by farmers. The overall aim of this study was to verify the feasibility of the TW method as potential practical tool for on-farm welfare assessment in turkeys during the fattening period. A total of 14 commercial turkey farms (8 male and 6 female flocks) of the same genetic strain (British United Turkeys [B.U.T.] - Big 6) with similar management standard procedures were evaluated. Bird ages at evaluation ranged from 122 to 138 D and 90 to 103 D old, for males and females, respectively. Two independent assessors walked slowly on randomized longitudinal paths (transects) within each house, while recording the prevalence of birds showing any of the 12 welfare and health indicators considered: immobility, lameness, wounds, small size, featherless, dirtiness, sick, terminally ill, dead, and behavioral indicators, such as, aggression towards mate, interaction with humans and mating. The effect of assessor, gender, and interaction assessor by gender was evaluated by using ANOVA. Reliability of the method was noted by the effect of gender ($P < 0.001$) for immobility, lameness, wounds, and dirtiness indicators. Male flocks showed higher prevalence of immobility (0.035±0.004% vs. 0.004±0.001%), lameness (2.269±0.108% vs. 1.253±0.051%), wounds (0.288±0.014% vs. 0.127±0.009%), and dirtiness (0.050±0.004% vs. 0.022±0.004%) as compared to female flocks. Differences among assessors were relatively minor, with differences detected only for back and tail wounds, dirtiness, aggression towards mate, and interaction with humans. This study reports advantages and limitations of this method for welfare assessment on-commercial turkey flocks and it is the first description of the Italian welfare profile of turkey's commercial flocks.

Keyword: animal-based indicators; on-farm protocol; turkey; welfare assessment

23. A transboundary study of spatiotemporal patterns of livestock predation and prey preferences by snow leopard and wolf in the Pamir/ **Din, Jaffar Ud; Nawaz, Muhammad Ali; Mehmood, Tahir; Ali, Hussain; Ali, Aziz; Hasan Adli, Durriyyah Sharifah; Norma-Rashid, Yusoff**. Global Ecology and Conservation. ISSN:2351-9894 (2019) v.20 Issue. p.e00719 Global Ecology and Conservation

DOI: 10.1016/j.gecco.2019.e00719

Link: http://www.sciencedirect.com/science/article/pii/S2351989419301106

Abstract: Livestock depredation by the snow leopard and the wolf is an eliciting human-carnivore conflict across their overlapping ranges and augments the economic burden of the disadvantaged agro-pastoralist communities who share the mountain ecosystem with the carnivores. Hence, understanding of the patterns and drivers of the conflict is essential to establish informed conservation measures. Human-carnivore conflict is poorly understood in the transboundary region of Pamir, covering Afghanistan, Pakistan, and Tajikistan. In this paper, we have investigated the spatiotemporal dynamics of livestock depredation and prey selection by the snow leopard and the wolf, through a questionnaire survey of trans-border pastoralist communities living around the Pamir Knot. Our results revealed an explicit seasonal and spatial variation in livestock depredation by snow leopard and wolf across the study sites. The mixed-effect regression model reflected the effect of the valley and season-valley interactions to be influential over the predation count. The snow leopard contrary to the wolf showed more spatial variability for predation in Afghan Pamir as compared to Pakistan and Tajik Pamir. Similarly, the snow leopard predation on livestock varied over time as compared to the wolf. On the temporal scale, the snow leopard was exclusively crepuscular, while the wolf was found to be an opportunist. Both the predators preferred young animals over adults. Amongst livestock type, sheep and goat accounted for 92% offtake. Our results reinstate that livestock predation by these two large carnivores is a serious conservation issue in the Pamir. We recommend short and long term conservation measures and promotion of transboundary cooperation to protect the snow leopard and sympatric predators in tandem with safeguards for mountain livelihoods.

Keyword:

24. Techno-economic assessment of anaerobic co-digestion of livestock manure and cheese whey (Cow, Goat & Sheep) at small to medium dairy farms/ **Mostafa Imeni, Seyed; Pelaz, Lara; Corchado-Lopo, Carlos; Maria Busquets, Anna; Ponsá, Sergio; Colón, Joan**. Bioresource Technology. ISSN:0960-8524 (2019) v.291 Issue. p.121872 Bioresource Technology

DOI: 10.1016/j.biortech.2019.121872

Link: http://www.sciencedirect.com/science/article/pii/S0960852419311022

Abstract: Anaerobic digestion of manure is a common practice; however, the low biogas yield of manure can hamper the profitability of systems in small to medium farms. An increase in biogas yield could be achieved by co-digesting animal manure with co-substrates such as cheese whey. A Techno-economic assessment of anaerobic co-digestion of animal manure and cheese whey (cow, goat and sheep), has been carried out. The results obtained showed that for a farm with 250 adult cattle heads, the revenues generated in an anaerobic mono-digestion process are not able to offset the initial required investment. However, the co-digestion of manure with 30% of cheese whey showed a good economic performance and positive returns (Net Present values >0, Internal Rate of Return >11% and a Return of the investment in <10 years). Electricity selling price and biogas production are the key parameters to determine the profitability of the system.

Keyword: Animal manure; Anaerobic digestion; Cheese whey; Economic assessment; Net present value

25. Effect of density-dependent individual movement on emerging spatial population distribution: Brownian motion vs Levy flights/ **Ellis, John; Petrovskaya, Natalia; Petrovskii, Sergei**. Journal of Theoretical Biology. ISSN:0022-5193 (2019) v.464 Issue. p.159-178 Journal of Theoretical Biology

DOI: 10.1016/j.jtbi.2018.12.016

Link: http://www.sciencedirect.com/science/article/pii/S0022519318306064

Abstract: Individual animal movement has been a focus of intense research and considerable controversy over the last two decades, however the understanding of wider ecological implications of various movement behaviours is lacking. In this paper, we consider this issue in the context of pattern formation. Using an individual-based modelling approach and computer simulations, we first show that density dependence ("auto-taxis") of the individual movement in a population of random walkers typically results in the formation of a strongly heterogeneous population distribution consisting of clearly defined animal clusters or patches. We then show that, when the movement takes place in a large spatial domain, the properties of the clusters are significantly different in the populations of Brownian and non-Brownian walkers. Whilst clusters tend to be stable in the case of Brownian motion, in the population of Levy walkers clusters are dynamical so that the number of clusters fluctuates in the course of time. We also show that the population dynamics of non-Brownian walkers exhibits two different time scales: a short time scale of the relaxation of the initial condition and a long time scale when one type of dynamics is replaced by another. Finally, we show that the distribution of sample values in the populations of Brownian and non-Brownian walkers is significantly different.

Keyword: Animal movement; Density-dependence; Individual-based modelling; Long transients; Pattern formation

26. Investigating the role of interleukin 10 on Eimeria intestinal pathogenesis in broiler chickens/ **Arendt, Maria; Elissa, Jonathan; Schmidt, Natalie; Michael, Emily; Potter, Nicole; Cook, Mark; Knoll, Laura J.**. Veterinary Immunology and Immunopathology. ISSN:0165-2427 (2019) v.218 Issue. p.109934 Veterinary Immunology and Immunopathology

DOI: 10.1016/j.vetimm.2019.109934

Link: http://www.sciencedirect.com/science/article/pii/S0165242719300182

Abstract: Eimeria species are intestinal protozoan parasites that cause lack of production, malabsorption and mortality in floor raised chickens. Administering an oral antibody to interleukin 10 (aIL-10) reduces the symptoms of coccidiosis in broilers, indicating interleukin 10 (IL-10) is key to Eimeria pathology. IL-10 is an anti-inflammatory cytokine and acts as a stand down signal to reduce inflammation and host pathology during disease. Related protozoan parasites exploit IL-10 to reduce pathogen-damaging host inflammatory responses. We hypothesize that IL-10 is increased during Eimeria infection through an unknown host-pathogen interaction, and by feeding aIL-10 to neutralize excess IL-10 the bird is allowed to mount an effective immune response to Eimeria. To determine the effects of aIL-10 during the intestinal immune response, intestinal pathology and the relationship between IL-10, interferon gamma (IFNγ) and Eimeria infection were evaluated in this study. In both experiments, broilers were administered either a 10x dose of Advent® Eimeria vaccine or saline. Duodenum, jejunum and cecum samples were collected, processed, stained and examined under a microscope. Evaluation of intestinal histomorphology during aIL-

10 administration showed minimal differences in birds fed aIL-10 during infection compared to animals fed a control antibody during Eimeria infection. To further evaluate aIL-10's positive effect during infection, immunofluorescent histochemistry was performed on chicken intestines days 3-7 post Eimeria infection for IL-10 and IFNγ presence in intestinal mucosa in control and infected birds, in regions with and without visible Eimeria burden. IL-10 and IFNγ had significant changes between days 4.5-7 post-infection in birds fed aIL-10 compared to animals fed a control antibody. Overall we found that the duodenum had increased IL-10 presence and increased IFNγ presence, and the jejunum and cecum had decreased IL-10 presence and decreased IFNγ presence. These differences in spatial regulation of IL-10 and IFNγ may indicate Eimeria species induce slightly different cytokine responses.

Keyword: Broiler chicken; Coccidiosis; Interferon gamma; Interleukin-10

27. Grain source and chromium supplementation: Effects on health, metabolic status, and glucose-insulin kinetics in Holstein heifer calves/ **Habibi, Z.; Karimi-Dehkordi, S.; Kargar, S.; Sadeghi, M.**. Journal of Dairy Science. ISSN:0022-0302 10 (2019) v.102 Issue. 10 p.8941-8951 Journal of Dairy Science

DOI: 10.3168/jds.2019-16619

Link: http://www.sciencedirect.com/science/article/pii/S0022030219307039

Abstract: ABSTRACT Carbohydrate-rich diets may increase urinary excretion of chromium (Cr) and the need to supplement the diet with Cr to meet animal requirements. The present study was performed to examine the effect of the type of grain (corn vs. barley) and Cr-methionine supplementation on health-related variables, blood levels of metabolites and hormones related to energy metabolism, and insulin sensitivity in Holstein calves. Forty-eight newborn heifers (3 d of age) were assigned randomly to 4 diets in a 2 × 2 factorial arrangement. Experimental diets were either corn-based (CBD) or barley-based (BBD) diets supplemented with 0 or 0.05 mg/kg of metabolic body weight. Chromium was provided in milk before weaning (d 3–73 of age) and in prewarmed water after weaning (d 74–94 of age). There was no interaction between the type of grain and Cr on the health-related variables and blood metabolites and hormones. Type of grain did not affect fecal score, respiration rate, and rectal temperature; however, there were tendencies for higher diarrhea occurrence (odds ratio = 1.69) and lower chance of having pneumonia (odds ratio = 0.49) in calves fed BBD versus CBD despite longer duration of diarrhea (0.54 d) and shorter days with pneumonia (0.63 d) in calves fed BBD. Calves supplemented with Cr had lower fecal score during the preweaning and overall periods and respiration rate throughout the study. Supplemental Cr decreased the duration (0.63 d) and chance of having pneumonia (odds ratio = 2.01). Calves fed BBD had lower blood levels of urea N during the postweaning period, with no changes in other blood variables between CBD and BBD. Tendencies were detected for lower blood levels of β-hydroxybutyric acid during the preweaning and overall periods and higher cortisol in Cr-supplemented calves. Chromium supplementation increased insulin clearance rate and decreased the time to half-maximal concentration and the area under the curve in BBD but not CBD calves. The calves were generally healthy, and the type of grain did not affect the health and blood variables related to energy metabolism. However, Cr supplementation increased fecal consistency, decreased respiration rate and days with pneumonia, and increased insulin sensitivity when added to BBD.

Keyword: calf; chromium-methionine; insulin sensitivity; starch source

28. Estimation of Live Weight by Body Measurements in the Miranda Donkey Breed/ **Quaresma, Miguel; Bacellar, Daniel; Leiva, Bélen; Silva, Severiano R.**. Journal of Equine Veterinary Science. ISSN:0737-0806 (2019) v.79 Issue. p.30-34 Journal of Equine Veterinary Science

DOI: 10.1016/j.jevs.2019.05.014

Link: http://www.sciencedirect.com/science/article/pii/S0737080619301078

Abstract: The use of the measurement of heart girth (HG), in locations where a scale is not available, with the application of weight estimation formulas or special weight tapes, is well established as a practical and accurate way to estimate the live weight (LW). Although several studies were performed to correlate donkey body measurements and LW, none of these was done in the large frame European donkey breeds. When using smaller frame breeds formulas, the tendency was to underestimate the live weight of larger frame breeds. The sample used in this study consisted of 65 Miranda breed donkeys, with ages ranging from 4 days to 15.4 years (6.6 ± 4.4 years). The studied population mean LW was 280.8 ± 106.1 kg (32.5–475.5 kg); the mean height was 127.4 ± 14.7 cm (69–157.5 cm); the mean body length (BL) was 131.4 ± 25.3 cm (59–184 cm); and the mean HG was 143.8 ± 23.1 cm (71–175 cm). All the correlations between LW and the body measurements taken were statistically significant ($P < .001$), but the degree of accuracy was higher in the HG ($r = 0.937$) than in the BL ($r = 0.915$) or height ($r = 0.894$). The formula that best estimates the LW was performed by Quadratic model and was based on the HG measurement: $LW = 98.138–3.0386 \times HG + 0.0293 \times HG2$ (LW in kilogram; HG in centimeter). The formula found can be used to create a weighing tape, adapted to large frame European donkey breeds, to be used to estimate weight and better adapt medication dosages and carried load for each animal.

Keyword: Donkey; Body type; Heart girth; Weight estimation

29. The signal transducer and activator of transcription 6 (STAT-6) mediates Th2 inflammation and tissue damage in a murine model of peanut-induced food allergy/ **Cardoso, C.R.; Provinciatto, P.R.; Godoi, D.F.; Fonseca, M.T.; Ferreira, B.R.; Teixeira, G.; Cunha, F.Q.; Pinzan, C.F.; da Silva, J.S.**. Allergologia et Immunopathologia. ISSN:0301-0546 6 (2019) v.47 Issue. 6 p.535-543 Allergologia et Immunopathologia

DOI: 10.1016/j.aller.2019.02.006

Link: http://www.sciencedirect.com/science/article/pii/S0301054619300503

Abstract: Introduction Food allergies are inflammatory conditions mediated by Th2 and probably STAT-6 dependent immune responses. Objective and design Here we investigated the role of Signal Transducer and Activator of Transcription 6 (STAT-6) in development of inflammation in peanut allergy. Methods To induce food allergy, wild-type (WT) and mice deficient for STAT-6 (Stat6−/−) were sensitized with peanut proteins and challenged with peanut seeds. Results WT animals lost weight and refused the peanut diet, in contrast to Stat6−/− mice, which had a better maintenance of body weight and more regular seeds' consumption. The augmented peanut-specific IgG, IgG1 and IgE in the allergic WT was abolished in Stat6−/− animals that also presented increased IgG2a. There was an overall reduction in the gut mediators in the absence of STAT-6, including those related to inflammatory and Th2 responses, in contrast to a rising counter regulatory and Th1 reaction in Stat-6−/− mice. These animals had IFN-γ and IL-10 similar to WT after the four-week challenge. Most interestingly, Stat-6−/− mice had no intestinal damage, in contrast to WT animals, which had inflammatory infiltrate, tissue destruction, epithelial exulceration, edema, congestion and loss of villous architecture in the small gut segments. Conclusions STAT-6 plays an important role in the establishment of the Th2 inflammatory responses and intestinal damage in peanut allergy.

Keyword: Food allergy; Gut inflammation; STAT-6

30. Leishmania infection in lagomorphs and minks in Greece/ **Tsakmakidis, Ioannis; Pavlou, Christoforos; Tamvakis, Androniki; Papadopoulos, Theologos; Christodoulou, Vasiliki; Angelopoulou, Katerina; Dovas, Chrysostomos I.; Antoniou, Maria; Anastasakis, Christos; Diakou, Anastasia**. Veterinary Parasitology: Regional Studies and Reports. ISSN:2405-9390 (2019) v.16 Issue. p.100279 Veterinary Parasitology: Regional Studies and Reports

DOI: 10.1016/j.vprsr.2019.100279

Link: http://www.sciencedirect.com/science/article/pii/S2405939018302545

Abstract: Greece is an endemic country for human and canine leishmaniosis. Studies about the role of lagomorphs and minks in the epidemiology of the diseases are, so far, limited. The aim of the present study was to investigate the prevalence of Leishmania infection in these animals, in different areas of the country. Samples from 393 domestic and wild rabbits, 90 hares and 200 minks were collected and examined by cytology (spleen imprints) and serology (ELISA), while spleen samples of 116, 56 and 95 of the rabbits, hares and minks, respectively, were examined by a PCR assay targeting the ITS1 region. For every animal examined a form was created, recording information like date, area, animal species, sex, etc. All imprint smears examined were negative, while serology revealed infection in 7.6% (C.I. 5.0–10.3%) rabbits, 6.7% (C.I. 1.5–11.8%) hares and 20% (C.I. 14.5–25.5%) minks. Infection was confirmed by molecular methods in 2.6% (C.I. 0.0–5.5%), 3.6% (C.I. 0.0–8.4%) and 2.1% (C.I. 0.0–5.0%) of the animals, respectively. The statistical analysis showed that minks are most likely to be seropositive and that in rabbits, the breeding method (i.e. homestead reared animals) was associated with infection. Because of the proximity of lagomorphs and minks to humans and dogs it is necessary to further elucidate their role in the epidemiology of leishmaniosis.

Keyword: Greece; Hares; Minks; Rabbits

31. Cardiac involvement in trypanosomiasis in sheep experimentally infected by Trypanosoma vivax (Ziemman, 1905)/ **Batista, Jael Soares; Araújo Júnior, Hélio Noberto de; Moura, Gabriela Hémylin Ferreira; Góis, Rayr Cezar de Souza; Paiva, Kaliane Alessandra Rodrigues de; Silva, Jardel Bezerra da; Costa, Wirton Peixoto; Menezes, Manuela Costa de; Nunes, Francisco Vitor**. Experimental Parasitology. ISSN:0014-4894 (2019) v.205 Issue. p.107714 Experimental Parasitology

DOI: 10.1016/j.exppara.2019.05.008

Link: http://www.sciencedirect.com/science/article/pii/S0014489418300766

Abstract: The objective of the present study was to evaluate the clinical signs, electrocardiographic signs and evolution of histopathological lesions in the heart of sheep experimentally infected by Trypanosoma vivax during the acute and chronic phases of infection as well as to investigate the presence of parasitic DNA in the heart using polymerase chain reaction (PCR). Twenty-two male sheep were divided into the following four groups: G1, which consisted of six sheep infected by T. vivax that were evaluated until 20 days post-infection (dpi; acute phase); G2, which consisted of six sheep infected by T. vivax that were evaluated until 90 dpi (chronic phase); and G3 and G4 groups, which each consisted of five uninfected sheep. At the end of the experimental period, electrocardiographic evaluations and necroscopic examinations were performed. Fragments of the heart were collected and stained by Hematoxylin-Eosin and Masson's trichrome, and the fragments were also evaluated by PCR for T. vivax. G2 animals presented clinical signs suggestive of heart failure and electrocardiogram alterations characterized by prolonged P, T and QRS complex durations as well as by a cardiac electrical axis shift to the left and increased heart rate. In these

animals, mononuclear multifocal myocarditis and interstitial fibrosis were also observed. PCR revealed positivity for T. vivax in two G1 animals and in all G2 animals. Thus, these findings suggested that T. vivax is responsible for the occurrence of cardiac lesions, which are related to heart failure, electrocardiographic alterations and mortality of the infected animals.

Keyword: PCR; Cardiac lesions; Clinicopathological correlations; Electrocardiogram

32. Geographical distribution and risk factors for Echinococcus granulosus infection in peri-urban wild dog populations/ **Harriott, Lana; Gentle, Matthew; Traub, Rebecca; Cobbold, Rowland; Soares Magalhães, Ricardo**. International Journal for Parasitology: Parasites and Wildlife. ISSN:2213-2244 (2019) v.10 Issue. p.149-155 International Journal for Parasitology: Parasites and Wildlife

DOI: 10.1016/j.ijppaw.2019.08.005

Link: http://www.sciencedirect.com/science/article/pii/S2213224419301269

Abstract: The transmission of zoonotic pathogens associated with wildlife in peri-urban environments can be influenced by the interplay of numerous socioecological factors. Echinococcus granulosus is known to be common within peri-urban wild dog populations however knowledge of the factors that influence its presence is limited. We investigated the demographic distribution of adult cestode abundance (ACA: defined as the product between prevalence of infection and adult cestode infection intensity) and the role of the physical environment, climate and individual factors in determining the geographical variation of E. granulosus infection in wild dog populations from southeast Queensland and surrounds. Our results align with previous studies that show significant E. granulosus aggregation in that 15.8% of peri-urban wild dogs sampled were responsible for ∼70% of the total adult cestode infection intensity. On average, female dogs were found to have a higher ACA than male dogs, and the average ACA generally decreased with age. Significant geographical variation was found in the prevalence of E. granulosus, with a strong propensity for clustering. The average size of clusters was 22.5 km. The probability of finding E. granulosus infection significantly increased with maximum temperature, relative humidity, and rainfall, and after accounting for individual and climatic variables, the model accounted for the majority of the spatial dependence in prevalence. Our predictive map of E. granulosus prevalence in peri-urban wild dogs confirms that E. granulosus is highly endemic in the eastern Australia study area. The prediction map provides a useful tool for targeting potential disease management strategies in peri-urban areas, where broad scale management of wild dog populations is difficult to implement.

Keyword: Dingo; Public health; Zoonosis; Hydatid; Wild dog

33. William (bill) peterson's contributions to ocean science, management, and policy/ **Schwing, Franklin B.; Sissenwine, Michael J.; Batchelder, Harold; Dam, Hans G.; Gómez-Gutiérrez, Jaime; Keister, Julie E.; Liu, Hui; Peterson, Jay O.**. Progress in Oceanography. ISSN:0079-6611 (2019) v. Issue. p.102241 Progress in Oceanography

DOI: 10.1016/j.pocean.2019.102241

Link: http://www.sciencedirect.com/science/article/pii/S0079661119304215

Abstract: In addition to being an esteemed marine ecologist and oceanographer, William T. (Bill) Peterson was a dedicated public servant, a leader in the ocean science community, and a mentor to a generation of scientists. Bill

recognized the importance of applied science and the need for integrated “big science” programs to advance our understanding of ecosystems and to guide their management. As the first US GLOBEC program manager, he was pivotal in transitioning the concept of understanding how climate change impacts marine ecosystems to an operational national research program. The scientific insight and knowledge generated by US GLOBEC informed and advanced the ecosystem-based management approaches now being implemented for fishery management in the US. Bill held significant leadership roles in numerous international efforts to understand global and regional ecological processes, and organized and chaired a number of influential scientific conferences and their proceedings. He was passionate about working with and training young researchers. Bill’s academic affiliations, notably at Stony Brook and Oregon State Universities, enabled him to advise, train, and mentor a host of students, post-doctoral researchers, and laboratory technicians. Under his collegial guidance they became critical independent thinkers and diligent investigators. His former students and colleagues carry on Bill Peterson’s legacy of research that helps us understand marine ecosystems and informs more effective resource stewardship and conservation.

Keyword: Climate change; Fisheries management; GLOBEC; Marine ecosystems; mentoring; Northeast Pacific; Oregon; PICES; Salmon; Zooplankton

34. Effects of ethanol extract from Bidens pilosa L. on spontaneous activity, learning and memory in aged rats/ **Wang, Gong-Wu; Cao, Jun; Wang, Xiao-Qin**. Experimental Gerontology. ISSN:0531-5565 (2019) v.125 Issue. p.110651 Experimental Gerontology

DOI: 10.1016/j.exger.2019.110651

Link: http://www.sciencedirect.com/science/article/pii/S0531556519301573

Abstract: Background Bidens pilosa L., a herbal medicine, is rich in flavonoids, but its anti-aging effect on neurocognitive functions is not well understood. In the present study, we investigated the effects of ethanol extract from Bidens pilosa L. (EEBP) on spontaneous activity, learning and memory in aged rats. Methods Forty aged (21.90 ± 0.22 months) and 10 young (10 weeks) adult male Sprague-Dawley rats were divided into 5 groups, which were respectively treated orally with 0 mg/kg (young and aged control), 25 mg/kg, 50 mg/kg and 100 mg/kg of EEBP for 30 days consecutively. Then, the animals were examined with open-field, passive avoidance and Morris water maze tasks. Results In the open-field task, compared with the aged control, the EEBP animals exhibited more rearing (50 mg/kg, $P < 0.01$) and urination (50 mg/kg, $P < 0.01$), but less defecation ($P < 0.05$). In the passive avoidance task, the retention latencies were longer than those in the training phase in all other groups ($P < 0.01$) except the aged control ($P > 0.05$). Compared with the young control, the retention latency of the aged control decreased ($P < 0.01$), but that of the EEBP animals increased again ($P < 0.05$ vs. aged control). In the Morris water maze, the EEBP animals had shorter latency (100 mg/kg) and had more crossing times (25 mg/kg) in seeking the platform position ($P < 0.05$, vs. aged control). Conclusion The results suggested that EEBP could affect the spontaneous activity and improve memory in aged animals and could have potential advantages for cognition improvement in aged populations.

Keyword: Aged rat; L.; Morris water maze; Open field; Passive avoidance; Sprague-Dawley rat

35. Free-range rearing density for male and female Milanino chickens: carcass yield and qualitative meat traits/ **Cerolini, Silvia; Vasconi, Mauro; Abdel Sayed, Ahmad; Iaffaldano, Nicolaia; Mangiagalli, Maria G.; Pastorelli, Grazia; Moretti, Vittorio M.; Zaniboni, Luisa; Mosca, Fabio**. Journal of Applied Poultry Research. ISSN:1056-6171 4 (2019) v.28 Issue. 4 p.1349-1358 Journal of Applied Poultry Research

DOI: 10.3382/japr/pfz058

Link: http://www.sciencedirect.com/science/article/pii/S1056617119323013

Abstract: SUMMARY The Milanino is a heavy Italian chicken breed and represents an important genetic resource for alternative production systems. In order to support its promotion in the market according to consumer expectations on healthy nutrition and animal welfare, this trial aims to study the slaughter performance and the meat quality in male and female Milanino chickens kept at different rearing density in a separate-sex free-range system. A total of 140 birds (70M:70F) were reared in outdoor pens from 75 to 235 d of life according to the following experimental groups (35 birds/group): M2) males in 2 m2/bird; F2) females in 2 m2/bird; M10) males in 10 m2/bird; F10) females in 10 m2/bird. At 235 d of age, 6 birds per group were slaughtered. Slaughter performance and meat quality were assessed. The Milanino chicken is characterized by high carcass weight and carcass yield among local chicken breeds, and a rearing density of 10 m2/bird is recommended for male birds to obtain heavier carcasses. Milanino meat appears bright and intensely colored, and it is characterized by high protein and low fat contents compared with the standard broiler meat. Total lipids of Milanino meat are characterized by a healthy fatty acid composition, corresponding to a high PUFA/SFA ratio. Milanino breast meat is a good supply of nutraceutical PUFA with a positive low n-6/n-3 PUFA ratio. The ability of the Milanino breed either to synthesize or to transfer to tissue a high quantity of PUFA relevant for human health could be a key factor for its economic valorization.

Keyword: autochthonous chicken breed; fatty acids; free-range; meat composition; rearing density

36. Nutritional impact of nano-selenium, garlic oil, and their combination on growth and reproductive performance of male Californian rabbits/ **Abdel-Wareth, A.A.A.; Ahmed, A.E.; Hassan, H.A.; Abd El-Sadek, M.S.; Ghazalah, A.A.; Lohakare, J.**. Animal Feed Science and Technology. ISSN:0377-8401 (2019) v.249 Issue. p.37-45 Animal Feed Science and Technology

DOI: 10.1016/j.anifeedsci.2019.01.016

Link: http://www.sciencedirect.com/science/article/pii/S0377840118305212

Abstract: This study aimed to investigate the effects of nano-selenium (nano-Se), garlic oil, and their combination on nutrients digestibility, semen quality, serum testosterone and metabolites of male Californian rabbits. A total of 80 rabbits (120 days of age) were randomly distributed into four treatment groups of 20 rabbits each. Treatment groups were fed a control diet, a control diet supplemented with nano-Se (400 μg/kg), control diet supplemented with garlic oil (700 mg/kg), or control diet supplemented with combination of nano-Se (400 μg/kg) and garlic oil (700 mg/kg). The feeding trial lasted for 60 days. The results showed that improvements were observed in body weight (BW) gain and feed conversion ratio (FCR) in nano-Se treated group than non-supplemented group, and an interaction effect was observed on final BW of rabbits. The digestibility of all measured nutrients were significantly higher ($P < 0.01$) for animals fed nano-Se, garlic oil, and the combination group compared to their non-supplemented counterparts. Furthermore, semen characteristics were significantly improved ($P < 0.01$) in nano-Se and garlic oil supplemented groups compared to non-supplemented groups. Likewise, supplementation of nano-Se, garlic oil, and their combination significantly improved liver and kidney functions as indicated from serum metabolites, and increased serum testosterone hormone levels. Therefore, it can be concluded that nano-Se or garlic oil and their combination improved the nutrients digestibility, semen quality, kidney and liver functions, and testosterone levels in male rabbits.

Keyword: Reproductive performance; Nanotechnology; Liver function; Male rabbits; Nutrient digestibility

37. Genomic evaluation of resistance to Haemonchus contortus in a South African Dohne Merino flock/ **Dlamini, N.M.; Visser, C.; Snyman, M.A.; Soma, P.; Muchadeyi, F.C.**. Small Ruminant Research. ISSN:0921-4488 (2019) v.175 Issue. p.117-125 Small Ruminant Research

DOI: 10.1016/j.smallrumres.2019.04.020

Link: http://www.sciencedirect.com/science/article/pii/S0921448818305170

Abstract: The aim of this study was to use genome-wide SNP data to investigate phenotypic and genetic differences in resistance to Haemonchus contortus between resistant and susceptible South African Dohne Merino sheep. The participating farm (Wauldby) has a history of heavy H. contortus challenge and implemented a selection strategy for resistance to H. contortus in 2011. Faecal egg count (FEC), body condition scores (BCS) and Famacha© scores (FAM) were recorded annually on lambs from weaning in January until the end of June from 2011 to 2014. Animals with FAM scores of ≥ 2.5 or BCS scores < 1.5 were subjected to anthelmintic treatment and recorded as "Dosed" animals. Animals (196) were selected for genotyping based on EBV for FEC and classified into Case and Control groups on the basis of whether they were dosed or not. The Grootfontein Dohne Merino flock has never been subjected to selection for resistance to gastrointestinal parasites and 48 animals were selected on FEC for genotyping. DNA obtained from blood samples were genotyped using the Illumina® Ovine SNP50 BeadChip. Principal component analysis (PCA) resulted in four distinct genetic clusters, with the Grootfontein sheep population clustering separately. The Wauldby animals in Cluster 3 had significantly lower FEC and higher BCS than the animals in Clusters 2 and 4. FEC breeding values of 114 ± 97, -629 ± 84 and -2 ± 45 were recorded for PCA-based Genetic cluster 2, 3 and 4 animals, respectively. The majority (88%) of animals in Cluster 3 were the progeny of sires from the resistant line. The average number of runs of homozygosity (ROH) was 44, 46, 54 and 47 per animal for Clusters 1, 2, 3 and 4 respectively. The highest number of ROHs was found on chromosomes 1, 2, 3, 4, 6, 9 and 10, on which QTL for resistance traits have been identified previously. Sires in Genetic cluster 3 were highly resistant and can be used in a breeding program to develop H. contortus resistant sheep. The results indicated genetic variation in host resistance against H. contortus in the Wauldby flock and breeding for resistance against nematodes is feasible.

Keyword: Genomic; Gastrointestinal nematodes; Body condition score; Faecal egg count; Famacha score

38. Process mapping of vaccines: Understanding the limitations in current response to emerging epidemic threats/ **Drury, Georgina; Jolliffe, Siobhan; Mukhopadhyay, Tarit K.**. Vaccine. ISSN:0264-410X 17 (2019) v.37 Issue. 17 p.2415-2421 Vaccine

DOI: 10.1016/j.vaccine.2019.01.050

Link: http://www.sciencedirect.com/science/article/pii/S0264410X19301264

Abstract: Vaccination remains the most successful and effective mechanism of pathogen control. However, their development and deployment in epidemic settings have been limited, and the 2015 Ebola outbreak in West Africa identified several bottlenecks linked to a lack of investment in pathogen research, infrastructure or regulation. Shortly after this outbreak, the UK Government established the UK Vaccine Network to ensure the UK is better prepared to respond to pathogens outbreaks of epidemic potential. As part of their work, the network commissioned the creation of a Vaccine Development Tool (http://www.vaccinedevelopment.org.uk/) to serve as a guide to the key stages in vaccine development. The tool also set out to capture the key, rate-limiting bottlenecks in the development of vaccines against emerging infectious disease such that corrective action could be taken, be it through research, funding, infrastructure and policy, both in the UK and internationally. The main research bottlenecks were related to

understanding pathogen biology, identification of appropriate animal models and investment in the manufacturing sciences, especially into process development. Infrastructure gaps in GMP manufacturing and fill-finish were also identified and limitations in GMO regulation and regulatory and ethical approvals, especially for outbreak pathogens required new policy initiatives. The UK Vaccine Network has since begun work to correct for these limitations with a series of funding calls and development programmes. This paper seeks to summarise the Vaccine Development Tool and its key findings.

Keyword: Development pipeline; Emergency response; Priority pathogens; Vaccine development tool

39. Prediction of enteric methane production, yield and intensity of beef cattle using an intercontinental database/ **van Lingen, Henk J.; Niu, Mutian; Kebreab, Ermias; Valadares Filho, Sebastião C.; Rooke, John A.; Duthie, Carol-Anne; Schwarm, Angela; Kreuzer, Michael; Hynd, Phil I.; Caetano, Mariana; Eugène, Maguy; Martin, Cécile; McGee, Mark; O'Kiely, Padraig; Hünerbe**. Agriculture, Ecosystems & Environment. ISSN:0167-8809 (2019) v.283 Issue. p.106575 Agriculture, Ecosystems & Environment

DOI: 10.1016/j.agee.2019.106575

Link: http://www.sciencedirect.com/science/article/pii/S0167880919301914

Abstract: Enteric methane (CH4) production attributable to beef cattle contributes to global greenhouse gas emissions. Reliably estimating this contribution requires extensive CH4 emission data from beef cattle under different management conditions worldwide. The objectives were to: 1) predict CH4 production (g d−1 animal−1), yield [g (kg dry matter intake; DMI)−1] and intensity [g (kg average daily gain)−1] using an intercontinental database (data from Europe, North America, Brazil, Australia and South Korea); 2) assess the impact of geographic region, and of higher- and lower-forage diets. Linear models were developed by incrementally adding covariates. A K-fold cross-validation indicated that a CH4 production equation using only DMI that was fitted to all available data had a root mean square prediction error (RMSPE; % of observed mean) of 31.2%. Subsets containing data with ≥25% and ≤18% dietary forage contents had an RMSPE of 30.8 and 34.2%, with the all-data CH4 production equation, whereas these errors decreased to 29.3 and 28.4%, respectively, when using CH4 prediction equations fitted to these subsets. The RMSPE of the ≥25% forage subset further decreased to 24.7% when using multiple regression. Europe- and North America-specific subsets predicted by the best performing ≥25% forage multiple regression equation had RMSPE of 24.5 and 20.4%, whereas these errors were 24.5 and 20.0% with region-specific equations, respectively. The developed equations had less RMSPE than extant equations evaluated for all data (22.5 vs. 23.2%), for higher-forage (21.2 vs. 23.1%), but not for the lower-forage subsets (28.4 vs. 27.9%). Splitting the dataset by forage content did not improve CH4 yield or intensity predictions. Predicting beef cattle CH4 production using energy conversion factors, as applied by the Intergovernmental Panel on Climate Change, indicated that adequate forage content-based and region-specific energy conversion factors improve prediction accuracy and are preferred in national or global inventories.

Keyword: Methane emission; Dietary variables; Empirical modeling; Forage content; Geographical region

40. Epidemiology of Cryptosporidium infection in different hosts in Nigeria: A meta-analysis/ **Odeniran, Paul Olalekan; Ademola, Isaiah Oluwafemi**. Parasitology International. ISSN:1383-5769 (2019) v.71 Issue. p.194-206 Parasitology International

DOI: 10.1016/j.parint.2019.04.007

Link: http://www.sciencedirect.com/science/article/pii/S1383576918304616

Abstract: Cryptosporidium is a medical and veterinary significant protozoan parasite that infects all classes of vertebrates. Environmental contamination with infective oocyst increases the risk of transmission to susceptible host. Estimates of Cryptosporidium prevalence in humans and animals are lacking in Nigeria, therefore a systematic review and meta-analysis were performed to understand the epidemiology of the disease over a period of 30 years using publications from EMBASE, Ovid MEDLINE, Web of Science, AJOL and Google Scholar databases. Studies that met the inclusion criteria of Cryptosporidium infections under the preferred reporting items for systematic reviews and meta-analyses (PRISMA) checklist were analysed. Point estimates prevalence and subgroup analyses based on potential risk factors and diagnostic techniques were evaluated at 95% confidence interval (CI). A total of 64 eligible studies published between 1987 and 2017 were selected for meta-analysis. The prevalence of Cryptosporidium infection using quality effects model among human, cattle, sheep, goat, pigs, laboratory animals and birds was estimated as 15.0, 26.1, 16.6, 26.0, 20.1, 9.0 and 7.2%, respectively. The high report of C. parvum subtype family IIc indicates the importance of anthroponotic transmission of Cryptosporidium in Nigeria. Heterogeneity of subgroup (regions, species) and risk factors (HIV status, age, gender, faecal type) analyses were determined. The pooled prevalence of Cryptosporidium spp. in different hosts were high and linked with several risk factors such as environmental contamination and animal contact. There is need for increased awareness on the prevalence of the disease to provide strategies that mitigate the disease in humans and animals.

Keyword: Prevalence; Nigeria; Meta-analysis; Vertebrates

41. Production performance and economic traits of silkworms (Bombyx mori L., 1758) fed with mulberry tree leaves (Morus alba, var. Ichinose) significantly differ according to hybrid lines/ **Samami, R.; Seidavi, A.; Eila, N.; Moarefi, M.; Ziaja, D.J.; Lis, J.A.; Rubiu, N.G.; Cappai, M.G.**. Livestock Science. ISSN:1871-1413 (2019) v.226 Issue. p.133-137 Livestock Science

DOI: 10.1016/j.livsci.2019.06.015

Link: http://www.sciencedirect.com/science/article/pii/S187114131930280X

Abstract: Production performance of silkworm (Bombyx mori L., 1758) play a pivotal role in sericulture industry and good quality cocoon represents the economic driver of farms. Silkworms are monophagus insects and differences between cocoon characteristics may depend both on mulberry tree leaves quality as well as on genetic selection of hybrid lines. While a huge work was carried out to identify the best feeding sources to optimize yields, genetic types of silkworms with desirable production and economic traits were studied to a limited extent to date. This experimental feeding trial was carried out using a commercial variety of mulberry tree leaves (Morus alba var. Ichinose) to feed a total of 1600 silkworms in 4 replicates, allotted into 32 box consisting of 50 larvae each. Feed consumption, manure production and feed conversion ratios were monitored throughout the experimental period across five instars of 8 hybrid lines (200 larvae each). Efficiency, Profitability and Eco-compatibility were identified as criteria to evaluate the best performing hybrid lines: in descending order hybrids 32 × 31, 153 × 154 and 104 × 103 have appeared the best in terms of feed conversion ratio to larva weight gain and to cocoon weight, shell to cocoon ratio and wet manure per g of dry matter intake per silkworm. Our results point to promising outcomes as to animal selection to improve yields of silk production at farm level. Sustainable and modern sericulture industry can therefore point to raise genetically selected hybrid lines of silkworms together with opportune feeding practices, to optimize feed conversions and rationalize manure in farms.

Keyword: Analytical hierarchy process; Cocoon; Digestive efficiency; Hybrid line; Silk

INDEKS PENGARANG

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