

CONTENTS

ANIMAL WELL-BEING AND BEHAVIOR

- Susceptibility to keel bone fractures in laying hens and the role of genetic variation
 Laura Candelotto, Ariane Stratmann, Sabine G. Gebhardt-Henrich, Christina Rufener,
 Teun van de Braak, and Michael J. Toscano..... 3517
- Effects of different types of dark brooders on injurious pecking damage and production-related traits at
 rear and lay in layers
 A. B. Riber and D. A. Guzman..... 3529
- Perch use by broiler breeders and its implication on health and production
 S. G. Gebhardt-Henrich, M. J. Toscano, and H. Würbel..... 3539

GENETICS AND GENOMICS

- Gastrointestinal microbial population of turkey (*Meleagris gallopavo*) affected by hemorrhagic
 enteritis virus
 Sara D'Andreano, Armand Sàncchez Bonastre, Olga Francino, Anna Cuscó Martí,
 Cristina Lecchi, Guido Grilli, Davide Giovanardi, and Fabrizio Ceciliani..... 3550

IMMUNOLOGY, HEALTH, AND DISEASE

- Abnormal histopathology, fat percent and hepatic apolipoprotein A I and apolipoprotein B₁₀₀ mRNA
 expression in fatty liver hemorrhagic syndrome and their improvement by soybean lecithin
 Yalu Song, Jiming Ruan, Junrong Luo, Tiancheng Wang, Fei Yang, Huabin Cao,
 Jianzhen Huang, and Guoliang Hu..... 3559
- Dietary effects of *Bacillus subtilis* fmbj on the antioxidant capacity of broilers at an early age
 Lili Zhang, Kaiwen Bai, Jingfei Zhang, Wen Xu, Qiang Huang, and Tian Wang 3564

Research Notes

- CD4+ T cells dominate the leukocyte infiltration response initiated by intra-dermal injection of
 phytohemagglutinin into growing feathers in chickens
 K. S. Sullivan and G. F. Erf..... 3574
- Impact of a *Macleaya cordata*-derived alkaloid extract on necrotic enteritis in broilers
 G. D. Xue, S. B. Wu, M. Choct, A. Pastor, T. Steiner, and R. A. Swick 3581

MANAGEMENT AND PRODUCTION

- Nutrient composition and retention in whole turkeys with and without added solution
 J. R. Williams, J. M. Roseland, Q. V. Nguyen, J. C. Howe, K. Y. Patterson,
 P. R. Pehrsson, and L. D. Thompson..... 3586
- Comparison of hatching egg characteristics, embryo development, yolk absorption, hatch window, and
 hatchability of Pekin Duck eggs of different weights
 A. Ipek and A. Sozcu..... 3593
- Differences in egg nutrient availability and embryo development in white layer breeder genotypes
 E. E. Onbaşılar, M. Kahraman, O. Ahlat, Ö. F. Güngör, A. Çalik, S. Taban,
 and S. Yalçın 3600
- Immunocastration as an alternative to caponization: evaluation of its effect on body and bone
 development and on meat color and composition
 M. A. G. Quaresma, I. C. Antunes, M. F. Ribeiro, S. Prazeres, R. J. B. Bessa,
 and P. Martins da Costa..... 3608

METABOLISM AND NUTRITION

- Comparative estimation of inevitable endogenous ileal flow of amino acids in Pekin ducks under varying
 dietary or physiological conditions and their significance to nutritional requirements for amino acids
 D. O. Akinde..... 3616

Impacts of dietary calcium, phytate, and phytase on inositol hexakisphosphate degradation and inositol phosphate release in different segments of digestive tract of broilers	
W. Li, R. Angel, S.-W. Kim, K. Brady, S. Yu, and P. W. Plumstead.....	3626
Evaluation of encapsulated sodium butyrate on growth performance, energy digestibility, gut development, and <i>Salmonella</i> colonization in broilers	
J. D. Liu, H. O. Bayir, D. E. Cosby, N. A. Cox, S. M. Williams, and J. Fowler	3638
Meta-analytic study of organic acids as an alternative performance-enhancing feed additive to antibiotics for broiler chickens	
G. V. Polycarpo, I. Andretta, M. Kipper, V. C. Cruz-Polycarpo, J. C. Dadalt, P. H. M. Rodrigues, and R. Albuquerque.....	3645
Effects of dietary threonine supplementation on intestinal barrier function and gut microbiota of laying hens	
X. Y. Dong, M. M. M. Azzam, and X. T. Zou.....	3654
Effects of a high dose of microbial phytase and myo-inositol supplementation on growth performance, tibia mineralization, nutrient digestibility, litter moisture content, and foot problems in broiler chickens fed phosphorus-deficient diets	
D. Farhadi, A. Karimi, Gh. Sadeghi, J. Rostamzadeh, and M. R. Bedford	3664
Growth performance and gastrointestinal responses of broiler chickens fed corn-soybean meal diet without or with exogenous epidermal growth factor upon challenge with <i>Eimeria</i>	
E. Kim, H. Leung, N. Akhtar, J. Li, J. R. Barta, Y. Wang, C. Yang, and E. Kiarie.....	3676
Review	
Factors affecting adipose tissue development in chickens: A review	
Guoqing Wang, Woo Kyun Kim, Mark A. Cline, and Elizabeth R. Gilbert	3687
MICROBIOLOGY AND FOOD SAFETY	
Application of bacteriophages to reduce <i>Salmonella</i> contamination on workers' boots in rendering-processing environment	
C. Gong, X. Jiang, and J. Wang.....	3700
Advanced Oxidation Process sanitization of hatching eggs reduces <i>Salmonella</i> in broiler chicks	
A. C. Rehkopf, J. A. Byrd, C. D. Coufal, and T. Duong	3709
Characteristics of <i>Escherichia coli</i> isolated from broiler chickens with colibacillosis in commercial farms from a common hatchery	
H. Ozaki, Y. Matsuoka, E. Nakagawa, and T. Murase	3717
Phytochemicals reduce aflatoxin-induced toxicity in chicken embryos	
Hsin-Bai Yin, Chi-Hung Chen, Michael J. Darre, Ann M. Donoghue, Dan J. Donoghue, and Kumar Venkitanarayanan	3725
Prediction of egg freshness during storage using electronic nose	
Samuel M. Yimenu, J. Y. Kim, and B. S. Kim	3733
MOLECULAR AND CELLULAR BIOLOGY	
Non-Invited Review	
Recent advances in avian egg science: A review	
Philippe B. Wilson.....	3747
PHYSIOLOGY AND REPRODUCTION	
Influence of age and housing systems on properties of tibia and humerus of Lohmann White hens: Bone properties of laying hens in commercial housing systems	
P. Regmi, N. Nelson, R. C. Haut, M. W. Orth, and D. M. Karcher.....	3755
Research Notes	
Dual functioning ovaries and atresia in chickens. Is it a coincidence?	
D. A. T. Sutherland, C. F. Honaker, and P. B. Siegel.....	3763
Role of vasoactive intestinal peptide during the transition from incubation behavior to rearing behavior in the female native Thai chicken	
S. Namken, P. Sinpru, B. Kamkrathok, N. Sartsoongnoen, and Y. Chaiseha.....	3768

PROCESSING AND PRODUCTS

Characteristics of global organic matrix in normal and pimpled chicken eggshells	
Z. Liu, L. Song, F. Zhang, W. He, and R. J. Linhardt	3775
Isothermal gelation behavior of myofibrillar proteins from white and red chicken meat at different temperatures	
S. Glorieux, L. Steen, H. Paelinck, I. Foubert, and I. Fraeye	3785
Physical and chemical characteristics of meat from broilers raised in 4 different rearing systems, stored under freezing for up to 12 months	
A. Giampietro-Ganeco, C. M. Owens, J. L. M. Mello, R. A. Souza, F. B. Ferrari, P. A. Souza, and H. Borba	3796