

CONTENTS

ANIMAL WELL-BEING AND BEHAVIOR

- Associations among gait score, production data, abattoir registrations, and postmortem tibia measurements in broiler chickens
K. E. Kittelsen, B. David, R. O. Moe, H. D. Poulsen, J. F. Young, and E. G. Granquist..... 1033

GENETICS AND GENOMICS

- Increased copy number of *SOCS2* gene in Chinese gamecocks
H. Bi, G. Yi, and N. Yang 1041
Molecular characterization of chicken infectious anemia virus from contaminated live-virus vaccines
Yang Li, Yan Hu, Shuai Cui, Jiayuan Fu, Yixin Wang, Zhizhong Cui,
Lichun Fang, Shuang Chang, and Peng Zhao 1045

IMMUNOLOGY, HEALTH, AND DISEASE

- In ovo supplementation of probiotics and its effects on performance and immune-related gene expression in broiler chicks
Chasity M. Pender, Sungwon Kim, Tiffany D. Potter, Miranda M. Ritzi,
Mark Young, and Rami A. Dalloul 1052
H9N2-specific IgG and CD4⁺CD25⁺ T cells in broilers fed a diet supplemented with organic acids
In Kyu Lee, Suhan Bae, Min Jeong Gu, Sun Jong You, Girak Kim, Sung-Moo Park,
Woon-Hee Jeung, Kwang Hyun Ko, Kyung Jin Cho, Jung Sun Kang,
and Cheol-Heui Yun 1063
Comparative effects of *in ovo* versus subcutaneous administration of the Marek's disease vaccine and pre-placement holding time on the post-hatch performance of Ross 708 broilers
E. D. Peebles, T. M. Barbosa, T. S. Cummings, J. Dickson, S. K. Womack,
and P. D. Gerard 1071
Effect of aflatoxin experimental ingestion and *Eimeria* vaccine challenges on intestinal histopathology and immune cellular dynamic of broilers: applying an Intestinal Health Index
A. L. Kraieski, R. M. Hayashi, A. Sanches, G. C. Almeida, and E. Santin 1078
High resolution melting (HRM) analysis as a new tool for rapid identification of *Salmonella enterica* serovar Gallinarum biovars Pullorum and Gallinarum
Xingxing Ren, Ying Fu, Chenggang Xu, Zhou Feng, Miao Li, Lina Zhang,
Jianmin Zhang, and Ming Liao 1088
Isolation, identification, and hexon gene characterization of fowl adenoviruses from a contaminated live Newcastle disease virus vaccine
Yang Li, Jiayuan Fu, Shuang Chang, Lichun Fang, Shuai Cui, Yixin Wang,
Zhizhong Cui, and Peng Zhao 1094
Gp85 genetic diversity of avian leukosis virus subgroup J among different individual chickens from a native flock
Yang Li, Jiayuan Fu, Shuai Cui, Fanfeng Meng, Zhizhong Cui, Jianhua Fan,
Shuang Chang, and Peng Zhao 1100

MANAGEMENT AND PRODUCTION

- Effects of two different broiler flooring systems on production performances, welfare, and environment under commercial production conditions
H. Li, X. Wen, R. Alphin, Z. Zhu, and Z. Zhou 1108

METABOLISM AND NUTRITION

- Gene expression of amino acid transporter in pigeon (*Columba livia*) intestine during post-hatch development and its correlation with amino acid in pigeon milk
X. Y. Zhang, N. N. Zhang, X. P. Wan, L. L. Li, and X. T. Zou 1120

Taushinone II A protects against pulmonary arterial hypertension in broilers Guoliang Hu, Yalu Song, Shanlin Ke, Huabin Cao, Caiying Zhang, Guangfu Deng, Fei Yang, Sihui Zhou, Pei Liu, Xiaoquan Guo, and Ping Liu.....	1132
Effect of different amylases on the utilization of cornstarch in broiler chickens Jianmin Yuan, Xingyu Wang, Dafei Yin, Maofei Wang, Xiaonan Yin, Zhao Lei, and Yuming Guo.....	1139
Effects of dietary fat source and supplemental lysophosphatidylcholine on performance, immune responses, and ileal nutrient digestibility in broilers fed corn/soybean meal- or corn/wheat/soybean meal-based diets S. Allahyari-Bake and R. Jahanian.....	1149
Effects of dietary vitamin E type on the growth performance and antioxidant capacity in cyclophosphamide immunosuppressed broilers K. Cheng, Z. H. Song, X. C. Zheng, H. Zhang, J. F. Zhang, L. L. Zhang, Y. M. Zhou, and T. Wang.....	1159
Additive effects of fibroblast growth factor 23 neutralization and dietary phytase on chick calcium and phosphorus metabolism Z. Z. Ren, D. E. Bütz, A. N. Wahhab, A. J. Piepenburg, and M. E. Cook	1167
Efficacy of <i>Bacillus subtilis</i> and bacitracin methylene disalicylate on growth performance, digestibility, blood metabolites, immunity, and intestinal microbiota after intramuscular inoculation with <i>Escherichia</i> <i>coli</i> in broilers M. Manafi, S. Khalaji, M. Hedayati, and N. Pirany	1174
Effects of dietary fats on egg quality and lipid parameters in serum and yolks of <i>Shan Partridge Duck</i> Xue Du, Yali Liu, Lizhi Lu, Weiqun Wang, Tao Zeng, Yong Tian, Xiaoqin Xu, Jianliang Shen, Dong Niu, and Yingru Lu	1184
Effects of mulberry leaves on production performance and the potential modulation of antioxidative status in laying hens W. C. Lin, M. T. Lee, S. C. Chang, Y. L. Chang, C. H. Shih, B. Yu, and T. T. Lee.....	1191
Interaction between xylanase and phytase on the digestibility of corn and a corn/soy diet for broiler chickens V. G. Schramm, J. F. Durau, L. N. E. Barrilli, J. O. B. Sorbara, A. J. Cowieson, A. P. Félix, and A. Maiorka	1204
Effects of betaine on biological functions in meat-type ducks exposed to heat stress S. O. Park and W. K. Kim.....	1212
The effect of four different feeding regimens from rearing period to sexual maturity on breast muscle protein turnover in broiler breeder parent stock Karen Vignale, Justina V. Caldas, Judy A. England, Nirun Boonsinchai, Phiphop Sodsee, Monticha Putsakum, Erik D. Pollock, Sami Dridi, and Craig N. Coon	1219
Effect of whole flax seed and carbohydrase enzymes on gastrointestinal morphology, muscle fatty acids, and production performance in broiler chickens K. Denise Apperson and Gita Cherian.....	1228
Effect of different dietary methionine levels on the growth performance and tissue redox parameters of turkeys J. Jankowski, M. Kubińska, J. Juśkiewicz, A. Czech, K. Ognik, and Z. Zduńczyk	1235
Comparative performance of broilers fed diets containing DAS-44406-6 and non-transgenic soybean meal Sabitha Papineni, Dale W. Fletcher, Gary L. Cromwell, and Ricardo D. Ekmay	1244
Effects of dietary fiber on growth performance, slaughter performance, serum biochemical parameters, and nutrient utilization in geese Y. P. Li, Z. Y. Wang, H. M. Yang, L. Xu, Y. J. Xie, S. L. Jin, and D. F. Sheng	1250
Effects of dietary organic zinc and α -tocopheryl acetate supplements on growth performance, meat quality, tissues minerals, and α -tocopherol deposition in broiler chickens R. Akbari Moghaddam Kakhki, R. Bakhshalinejad, A. Hassanabadi, and P. Ferke	1257
Effect of elevated dietary amino acid levels in high canola meal diets on productive traits and cecal microbiota population of broiler chickens in a pair-feeding study M. Toghyani, C. K. Girish, S. B. Wu, P. A. Iji, and R. A. Swick.....	1268
Effects of long-term <i>Bacillus subtilis</i> CGMCC 1.921 supplementation on performance, egg quality, and fecal and cecal microbiota of laying hens J. R. Guo, X. F. Dong, S. Liu, and J. M. Tong	1280

Effects of dietary threonine levels on growth performance, serum biochemical indexes, antioxidant capacities, and gut morphology in broiler chickens Y. N. Min, S. G. Liu, Z. X. Qu, G. H. Meng, and Y. P. Gao.....	1290
Use of Zn concentration in the gastrointestinal tract as a measure of phytate susceptibility to the effect of phytase supplementation in broilers N. K. Morgan, D.V. Scholey, and E. J. Burton.....	1298
Effect of varying dietary concentrations of lysine on growth performance of the Pearl Grey guinea fowl S. Bhogoj, S. N. Nahashon, J. Donkor, B. Kimathi, D. Johnson, C. Khwatenge, and T. Bowden-Taylor	1306
Effect of different protein ingredients on performance, egg quality, organ health, and jejunum morphology of laying hens X. C. Wang, H. J. Zhang, H. Wang, H. Y. Yue, J. Wang, S. G. Wu, and G. H. Qi.....	1316
Effect of seed source and pelleting temperature during steam pelleting on apparent metabolizable energy value of full-fat canola seed for broiler chickens M. Toghyani, R. A. Swick, and R. Barekatain.....	1325
Determination of pre-cecal phosphorus digestibility of inorganic phosphates and bone meal products in broilers J. van Harn, J. W. Spek, C. A. van Vuure, and M. M. van Krimpen.....	1334
Effect of diets with different energy and lysophospholipids levels on performance, nutrient metabolism, and body composition in broilers P. Y. Zhao and I. H. Kim	1341
Review	
Nutrients central to maintaining intestinal absorptive efficiency and barrier integrity with fowl Edwin T. Moran Jr.....	1348
Research Notes	
Effects of low-protein diets on growth performance and carcass yields of growing French meat quails (France <i>coturnix coturnix</i>) Z. G. Wen, Y. K. Du, M. Xie, X. M. Li, J. D. Wang, and P. L. Yang.....	1364
Effects of low-protein diets on growth performance and carcass yield of growing White Pekin ducks M. Xie, Y. Jiang, J. Tang, Z. G. Wen, Q. Zhang, W. Huang, and S. S. Hou	1370
MICROBIOLOGY AND FOOD SAFETY	
Effect of <i>Propionibacterium freudenreichii</i> on <i>Salmonella</i> multiplication, motility, and association with avian epithelial cells Divek V. T. Nair and A. Kollanoor-Johny	1376
Microbial community mapping in intestinal tract of broiler chicken Yingping Xiao, Yun Xiang, Weidong Zhou, Jinggang Chen, Kaifeng Li, and Hua Yang.....	1387
Active packaging of chicken meats with modified atmosphere including oxygen scavengers B. Demirhan and K. Candoğan	1394
Colonization of internal organs by <i>Salmonella</i> serovars Heidelberg and Typhimurium in experimentally infected laying hens housed in enriched colony cages at different stocking densities Richard K. Gast, Rupa Guraya, Deana R. Jones, Jean Guard, Kenneth E. Anderson, and Darrin M. Karcher	1402
Evaluation of 3M Molecular Detection System and ANSR Pathogen Detection System for rapid detection of <i>Salmonella</i> from egg products L. Hu, L. M. Ma, S. Zheng, X. He, H. Wang, E. W. Brown, T. S. Hammack, and G. Zhang	1410
MOLECULAR AND CELLULAR BIOLOGY	
Derivation and characterization of primordial germ cells from Guangxi yellow-feather chickens L. Wang, M. J. Chen, D. Y. Chen, S. F. Peng, X. L. Zhou, Y. Y. Liao, X. G. Yang, H. Y. Xu, S. S. Lu, M. Zhang, K. H. Lu, and Y. Q. Lu.....	1419
Hsp70 expression induced by Co-Enzyme Q10 protected chicken myocardial cells from damage and apoptosis under in vitro heat stress J. Xu, S. Tang, E. Song, B. Yin, D. Wu, and E. Bao.....	1426

Dynamic expression of death receptor adapter proteins.tradd and fadd in <i>Eimeria tenella</i> -induced host cell apoptosis	1438
Zhi-yong Xu, Ming-xue Zheng, Li Zhang, Xin Gong, Rou Xi, Xiao-zhen Cui, and Rui Bai.....	
Research Note	
Targeted genome editing in a quail cell line using a customized CRISPR/Cas9 system	
Jinsoo Ahn, Joonbum Lee, Ju Yeon Park, Keon Bong Oh, Seongsoo Hwang, Chang-Won Lee, and Kichoon Lee.....	1445
PYHSIOLOGY AND REPRODUCTION	
Temperature during the last week of incubation. III. Effects on chicken embryo physiology	
C. M. Maatjens, I. A. M. van Roovert-Reijrink, B. Engel, C. W. van der Pol, B. Kemp, and H. van den Brand.....	1451
Effects of dynamic feeding low and high methionine diets on egg quality traits in laying hens	
Y. Liu, X. Lin, X. Zhou, D. Wan, Z. Wang, X. Wu, and Y. Yin.....	1459
Organic and inorganic selenium in Aseel chicken diets: Effect on hatching traits	
M. T. Khan, A. Mahmud, I. Zahoor, and K. Javed.....	1466
Effects of <i>In Ovo</i> feeding of dextrin-iodinated casein in broilers: I. Hatch weights and early growth performance	
S. Abousaad, K. Lassiter, A. Piekarski, P. Chary, K. Striplin, K. Christensen, L. R. Bielke, B. M. Hargis, S. Dridi, and W. G. Bottje.....	1473
Effect of <i>in ovo</i> feeding of dextrin-iodinated casein in broilers: II. Hatch window and growth performance	
S. Abousaad, K. Lassiter, A. Piekarski, P. Chary, K. Striplin, K. Christensen, L. R. Bielke, B. M. Hargis, S. Dridi, and W. G. Bottje.....	1478
PROCESSING AND PRODUCTS	
Quality of eggs from different laying hen production systems, from indigenous breeds and specialty eggs	
M. Lordelo, E. Fernandes, R. J. B. Bessa, and S. P. Alves.....	1485
<i>Pectoralis major</i> muscle of turkey displays divergent function as correlated with meat quality	
B. A. Patterson, S. K. Matarneh, K. M. Stufft, E. M. England, T. L. Scheffler, R. H. Preisser, H. Shi, E. C. Stewart, S. Eilert, and D. E. Gerrard	1492
Precipitation and ultimate pH effect on chemical and gelation properties of protein prepared by isoelectric solubilization/precipitation process from pale, soft, exudative (PSE)-like chicken breast meat	
X. Zhao, T. Xing, X. Chen, M.-y. Han, X. Li, X.-l. Xu, and G.-h. Zhou.....	1504
Corrigenda.....	1513
Errata.....	1514