

## CONTENTS

### ANIMAL WELL-BEING AND BEHAVIOR

- Cloacal and surface temperatures of tom turkeys exposed to different rearing temperature regimes during the first 12 weeks of growth  
S. L. Mayes, M. L. Strawford, S. D. Noble, H. L. Classen, and T. G. Crowe..... 1105
- Effects of outdoor access days on growth performance, carcass yield, meat quality, and lymphoid organ index of a local chicken breed  
H. B. Tong, J. Cai, J. Lu, Q. Wang, D. Shao, and J. M. Zou..... 1115

### IMMUNOLOGY, HEALTH, AND DISEASE

- Oral administration of the *Salmonella* Typhimurium vaccine strain Nal2/Rif9/Rtt to laying hens at day of hatch reduces shedding and caecal colonization of *Salmonella* 4,12:i:-, the monophasic variant of *Salmonella* Typhimurium  
Sofie Kilroy, Ruth Raspoet, Rosalie Devloo, Freddy Haesebrouck,  
Richard Ducatelle, and Filip Van Immerseel ..... 1122
- Oral peptide specific egg antibody to intestinal sodium-dependent phosphate co-transporter-2b is effective at altering phosphate transport in vitro and in vivo  
Elizabeth A. Bobeck, Erica M. Hellestad, Jordan M. Sand, Michelle L. Piccione,  
Jeff W. Bishop, Christian Helvig, Martin Petkovich, and Mark E. Cook..... 1128
- Effects of feed supplemented with fermented pine needles (*Pinus ponderosa*) on growth performance and antioxidant status in broilers  
Q. J. Wu, Z. B. Wang, G. Y. Wang, Y. X. Li, and Y. X. Qi..... 1138
- Combined physical and chemical methods to control lesser mealworm beetles under laboratory conditions  
Jônatas Wolf, Michele Potrich, Everton R. Lozano,  
Alfredo Gouvea, and Carla S. Pegorini..... 1145
- Absolute quantification of a very virulent Marek's disease virus dynamic quantity and distributions in different tissues  
Zhenjie Zhang, Shaoqiong Liu, Chengtai Ma, Peng Zhao, and Zhizhong Cui..... 1150
- Characterization of *Clostridium perfringens* isolates obtained from 2010 to 2012 from chickens with necrotic enteritis in Korea  
Ji-Young Park, Sara Kim, Jae Young Oh, Hye Ryoung Kim, Il Jang,  
Hee Soo Lee, and Yong Kuk Kwon ..... 1158
- Temporal expression and DNA hypomethylation profile of CD30 in Marek's disease virus-infected chicken spleens  
Kaiyang Li, Ling Lian, Ning Yang, and Lujiang Qu..... 1165
- Molecular cloning and immune responsive expression of LGP2 gene, a pivotal member of the RLR gene family from Muscovy duck *Cairina moschata*  
P. R. Jiao, L. M. Wei, Y. F. Song, J. Cui, S. Zhang, F. Han, R. Y. Yuan, and M. Liao ..... 1170
- Bacterial enteritis in ostrich (*Struthio Camelus*) chicks in the Western Cape Province, South Africa  
L. Keokilwe, A. Olivier, W. P. Burger, H. Joubert, E. H. Venter, and D. Morar-Leather..... 1177
- Nutritional effects of egg shell membrane supplements on chicken performance and immunity  
S. Makkar, N. C. Rath, B. Packialakshmi, W. E. Huff, and G. R. Huff..... 1184
- Molecular responses to the influenza A virus in chicken trachea-derived cells  
Hyun-Jun Jang, Hyun-Jeong Lee, Kyung Soo Kang, Ki-Duk Song,  
Tae-Hun Kim, Chang-Seon Song, and Mi Na Park ..... 1190

Class 1 and class 2 integrons in avian pathogenic <i>Escherichia coli</i> from poultry in Italy Lara Cavicchio, Giorgia Dotto, Martina Giacomelli, Davide Giovanardi, Guido Grilli, Maria Pia Franciosini, Angela Trocino, and Alessandra Piccirillo.....	1202
Effect of <i>in ovo</i> -delivered prebiotics and synbiotics on lymphoid-organs' morphology in chickens J. P. Madej, T. Stefaniak, and M. Bednarczyk.....	1209
Poultry enteric inflammation model with dextran sodium sulfate mediated chemical induction and feed restriction in broilers V. A. Kuttappan, L. R. Berghman, E. A. Vicuña, J. D. Latorre, A. Menconi, J. D. Wolchok, A. D. Wolfenden, O. B. Faulkner, G. I. Tellez, B. M. Hargis, and L. R. Bielke.....	1220
<b>METABOLISM AND NUTRITION</b>	
Growth performance and endogenous losses of broilers fed wheat-based diets with and without essential oils and xylanase supplementation V. Pirgozliev, D. Bravo, M. W. Mirza, and S. P. Rose.....	1227
Effect of hen age and maternal vitamin D source on performance, hatchability, bone mineral density, and progeny <i>in vitro</i> early innate immune function J. L. Saunders-Blades and D. R. Korver.....	1233
<i>Camelina sativa</i> cake for broilers: Effects of increasing dietary inclusion from 0 to 24% on tissue fatty acid proportions at 14, 28, and 42 d of age S. Nain, M. A. Oryschak, M. Betti, and E. Beltranena.....	1247
Effect of micellized natural (D- $\alpha$ -tocopherol) vs. synthetic (DL- $\alpha$ -tocopheryl acetate) vitamin E supplementation given to turkeys on oxidative status and breast meat quality characteristics A. I. Rey, J. Segura, A. Olivares, A. Cerisuelo, C. Piñeiro, and C. J. López-Bote .....	1259
Metabolizable energy content of wheat distillers' dried grains with solubles supplemented with or without a mixture of carbohydrases and protease for broilers and turkeys A. O. Adebiyi and O. A. Olukosi.....	1270
The response of meat ducks from 15 to 35 d of age to gossypol from cottonseed meal Q. F. Zeng, P. Bai, J. P. Wang, X. M. Ding, Y. H. Luo, S. P. Bai, Y. Xuan, Z. W. Su, S. Q. Lin, L. J. Zhao, and K. Y. Zhang.....	1277
Partition of metabolizable energy, and prediction of growth performance and lipid deposition in broiler chickens B. Carré and H. Juin.....	1287
Prevalence and effects of mycotoxins on poultry health and performance, and recent development in mycotoxin counteracting strategies G. R. Murugesan, D. R. Ledoux, K. Naehrer, F. Berthiller, T. J. Applegate, B. Grenier, T. D. Phillips, and G. Schatzmayr.....	1298
Inclusion levels of sweet potato root meal in the diet of broilers I. Effect on performance, organ weights, and carcass quality R. C. Beckford and J. R. Bartlett.....	1316
<b>MOLECULAR AND CELLULAR BIOLOGY</b>	
mRNA expression of amino acid transporters, aminopeptidase, and the di-and tri-peptide transporter PepT1 in the intestine and liver of posthatch broiler chicks Katarzyna B. Miska, Raymond H. Fetterer, and Eric A. Wong.....	1323
Induction of tissue- and stressor-specific kinomic responses in chickens exposed to hot and cold stresses Scott Napper, Samira Dadgar, Ryan J. Arsenault, Brett Trost, Erin Scruton, Anthony Kusalik, and Phyllis Shand.....	1333
<b>PHYSIOLOGY AND REPRODUCTION</b>	
Higher rates of internal ovulations occur in broiler breeder hens treated with testosterone Kristen J. Navara, Sara E. Pinson, Parag Chary, and Patrick C. Taube.....	1346
Dose titration of FITC-D for optimal measurement of enteric inflammation in broiler chicks E. A. Vicuña, V. A. Kuttappan, G. Tellez, X. Hernandez-Velasco, R. Seeber-Galarza, J. D. Latorre, O. B. Faulkner, A. D. Wolfenden, B. M. Hargis, and L. R. Bielke .....	1353

## **PROCESSING AND PRODUCTS**

Effect of yellow lupine ( <i>L. luteus</i> ) on the egg yolk fatty acid profile, the physicochemical and sensory properties of eggs, and laying hen performance	1360
Magdalena Krawczyk, Marcin Przywitowski, and Dariusz Mikulski .....	1360
Oxidative damage to poultry: from farm to fork	
M. Estévez.....	1368
Sensory quality of broiler breast meat influenced by low atmospheric pressure stunning, deboning time and cooking methods	
M. W. Schilling, V. Radhakrishnan, Y. Vizzier-Thaxton, K. Christensen, J. B. Williams, and P. Joseph.....	1379

## **MANAGEMENT AND PRODUCTION**

Effects of broiler breeder management on pullet body weight and carcass uniformity	
M. J. Zuidhof, D. E. Holm, R. A. Renema, M. A. Jalal, and F. E. Robinson .....	1389

## **SYMPOSIUM**

### **Organic Poultry Production with Natural Feed Supplements as Antimicrobials**

Zoonotic bacterial pathogens and mixed crop-livestock farming	
S. Salaheen, N. Chowdhury, I. Hanning, and D. Biswas .....	1398
Potential of fructooligosaccharide prebiotics in alternative and nonconventional poultry production systems	
S. C. Ricke.....	1411
Botanical alternatives to antibiotics for use in organic poultry production	
Sandra Diaz-Sanchez, Doris D'Souza, Debrabrata Biswas, and Irene Hanning.....	1419

## **ASSOCIATION NOTES**

Positions Available.....	1431
--------------------------	------