

CONTENTS

ENVIRONMENT, WELL-BEING, AND BEHAVIOR

- Effect of heating system using a geothermal heat pump on the production performance and housing environment of broiler chickens
H. C. Choi, H. M. Salim, N. Akter, J. C. Na, H. K. Kang, M. J. Kim, D. W. Kim, H. T. Bang, H. S. Chae, and O. S. Suh 275
- Persistent *Salmonella* Enteritidis environmental contamination on layer farms in the context of an implemented national control program with obligatory vaccination
I. Dewaele, H. Van Meirhaeghe, G. Rasschaert, M. Vanrobaeys, E. De Graef, L. Herman, R. Ducatelle, M. Heyndrickx, and K. De Reu 282
- Effects of a premolt calcium and low-energy molt program on laying hen performance, egg quality, and economics
E. R. Dickey, A. K. Johnson, K. J. Stalder, and K. Bregendahl 292
- Aerial perches and free-range laying hens: The effect of access to aerial perches and of individual bird parameters on keel bone injuries in commercial free-range laying hens
C. J. Donaldson, M. E. E. Ball, and N. E. O'Connell 304

Research Notes

- Effect of sequential feeding on nitrogen excretion, productivity, and meat quality of broiler chickens
F. Sirri and A. Meluzzi 316
- Liver enzymes in White Leghorns selected for the sheep red blood cell immune response
S. Blevins, P. B. Siegel, D. J. Blodgett, M. Ehrich, and R. M. Lewis..... 322

GENETICS

- Analysis of genetic divergence between closely related lines of chickens
R. Tadano, A. Nakamura, and K. Kino 327

IMMUNOLOGY, HEALTH, AND DISEASE

- Acute hypersensitive-like injury in specific-pathogen-free chickens after infection with very virulent infectious bursal disease virus
D. Wang, X. Jia, R. She, and Y. Liu 334
- The role of heat shock protein 70 in resistance to *Salmonella enteritidis* in broiler chickens subjected to neonatal feed restriction and thermal stress
A. F. Soleimani, I. Zulkifli, M. Hair-Bejo, A. R. Omar, and A. R. Raha..... 340
- Differences in the early response of hatchlings of different chicken breeding lines to *Salmonella enterica* serovar Enteritidis infection
D. Schokker, T. H. F. Peters, A. J. W. Hoekman, J. M. J. Rebel, and M. A. Smits 346
- Combined effects of aflatoxin B₁ and corticosterone treatment on selected performance indices and liver histopathology in Japanese quail
A. P. Magnoli, M. P. Monge, F. N. Nazar, C. E. Magnoli, L. R. Cavaglieri, G. Bagnis, A. M. Dalcero, and R. H. Marin 354
- Evaluation of in vitro and in vivo adhesion and immunomodulatory effect of *Lactobacillus* species strains isolated from chickens
T. S. Rocha, A. A. S. Baptista, T. C. Donato, E. L. Milbradt, A. S. Okamoto, J. C. Z. Rodrigues, M. P. Coppola, and R. L. Andreatti Filho 362
- The embryo lethality of *Escherichia coli* isolates and its relationship to the presence of virulence-associated genes
J. Y. Oh, M. S. Kang, H. Yoon, H. W. Choi, B. K. An, E. G. Shin, Y. J. Kim, M. J. Kim, J. H. Kwon, and Y. K. Kwon 370

Meta-analysis of the relationship of mycotoxins with biochemical and hematological parameters in broilers I. Andretta, M. Kipper, C. R. Lehnen, and P. A. Lovatto.....	376
Comprehensive analysis of commercially available mouse antichickens monoclonal antibodies for cross-reactivity with peripheral blood leukocytes from commercial turkeys R. R. Meyerhoff, R. A. Ali, K. Liu, G.-Q. Huang, and M. D. Koci.....	383

METABOLISM AND NUTRITION

Effects of prebiotic, protein level, and stocking density on performance, immunity, and stress indicators of broilers M. Houshmand, K. Azhar, I. Zulkifli, M. H. Bejo, and A. Kamyab	393
Supplementation of guanidinoacetic acid to broiler diets: Effects on performance, carcass characteristics, meat quality, and energy metabolism J. Michiels, L. Maertens, J. Buyse, A. Lemme, M. Rademacher, N. A. Dierick, and S. De Smet	402
Effects of wheat inclusion and xylanase supplementation of the diet on productive performance, nutrient retention, and endogenous intestinal enzyme activity of laying hens S. Mirzaie, M. Zaghari, S. Aminzadeh, M. Shivazad, and G. G. Mateos	413
Dietary influence of digestible lysine concentration on Cobb 500 hen broiler breeder reproductive performance L. Mejia, C. D. McDaniel, and A. Corzo.....	426
β -Cryptoxanthin biofortified maize (<i>Zea mays</i>) increases β -cryptoxanthin concentration and enhances the color of chicken egg yolk Y.-Q. Liu, C. R. Davis, S. T. Schmaelzle, T. Rocheford, M. E. Cook, and S. A. Tanumihardjo.....	432

Research Note

Ileal digestibility of amino acids for zero-tannin faba bean (<i>Vicia faba</i> L.) fed to broiler chicks T. A. Woyengo and C. M. Nyachoti	439
--	-----

MOLECULAR, CELLULAR, AND DEVELOPMENTAL BIOLOGY

Yolk sac carbohydrate levels and gene expression of key gluconeogenic and glycogenic enzymes during chick embryonic development L. Yadgary and Z. Uni.....	444
Elucidation of colonization time and prevalence of thermophilic <i>Campylobacter</i> species during turkey rearing using multiplex polymerase chain reaction H. El-Adawy, H. Hotzel, H. Tomaso, H. Neubauer, and H. M. Hafez	454

PHYSIOLOGY, ENDOCRINOLOGY, AND REPRODUCTION

Comparison of gizzard activity between chickens from genetic D ⁺ and D ⁻ lines selected for divergent digestion efficiency N. Rougière, C.-H. Malbert, N. Rideau, J. Cognié, and B. Carré	460
--	-----

PROCESSING, PRODUCTS, AND FOOD SAFETY

Effect of holding temperature, shackling, sex, and age on broiler breast meat quality B. L. Schneider, R. A. Renema, M. Betti, V. L. Carney, and M. J. Zuidhof.....	468
Poultry offal meal in chicken: Traceability using the technique of carbon (¹³ C/ ¹² C)- and nitrogen (¹⁵ N/ ¹⁴ N)-stable isotopes V. C. Cruz, P. C. Araújo, J. R. Sartori, A. C. Pezzato, J. C. Denadai, G. V. Polycarpo, L. H. Zanetti, and C. Ducatti.....	478
Breed effect between Mos rooster (Galician indigenous breed) and Sasso T-44 line and finishing feed effect of commercial fodder or corn D. Franco, D. Rois, J. A. Vázquez, L. Purriños, R. González, and J. M. Lorenzo.....	487
Small bird programs: Effect of phase-feeding, strain, sex, and debone time on meat quality of broilers V. B. Brewer, J. L. Emmert, J.-F. C. Meullenet, and C. M. Owens	499

Effects of dietary oregano essential oil and vitamin E on the lipid oxidation stability of cooked chicken breast meat F. Avila-Ramos, A. Pro-Martínez, E. Sosa-Montes, J. M. Cuca-García, C. M. Becerril-Pérez, J. L. Figueroa-Velasco, and C. Narciso-Gaytán	505
Pathogenic and multidrug-resistant <i>Escherichia fergusonii</i> from broiler chicken V. Forgetta, H. Rempel, F. Malouin, R. Jr. Vaillancourt, E. Topp, K. Dewar, and M. S. Diarra	512
The use of sodium bicarbonate for marination of broiler breast meat M. Petracci, L. Laghi, P. Rocculi, S. Rimini, V. Panarese, M. A. Cremonini, and C. Cavani	526

ASSOCIATION NOTES

Positions Available	535
---------------------------	-----