# EDITORIAL

## The 100 most cited *Poultry Science* papers

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*Poultry Science* continues the journal's centennial celebration. A total of 79,218 peer-reviewed papers were published from 1921 to 2020. These papers encompassed a breadth of topics as well as sphere of influence. The results reported in some papers produced immediate impact by changing practices or procedures, whereas other articles yielded a steady increase in influence once their value was perceived. Questions arose about the papers that epitomize significant contributions to our discipline. Cumulative citation data represent one measure of a paper's utility.

Citation data were only available for 1945 to 2020 and were drawn from Clarivate's Web of Science Platform (https://clarivate.libguides.com/webofscienceplatform). Therefore, the 100 most cited papers cover that period rather than the entire *Poultry Science* centennial, 1921 to 2020. Citations from all databases on the Web of Science Platform were included rather than limiting the numbers to a single platform. The top 100 papers have been cited 26,404 times for an average of 264.04 citations per article, a number which would rank 28th in the top 100 citation list.

Interesting facts are highlighted in the top citations list and the associated tables. A total of 319 authors appeared on the 100 most cited papers, meaning that the average authors per paper were 3.19. Two hundred seventy-six unique authors contributed to these publications. Thirty-one authors appeared multiple times, with seven authors who occurred 3 or more times (Table 1). The corresponding author listed for each publication was used to identify originating organization and country. These 100 papers came from 56 unique sources. Eight points of origin represented thirty-six percent of the total (Table 2). These sources were influenced by the most cited authors, but the 2 factors lacked universal association. Country of origin had 16 unique entities with 13 countries appearing multiple times (Table 2). Eighty-one percent of the papers came from 5 countries.

The publication decade, which covered every ten-year period decade between 1950 and 2010, is shown in Table 3. The oldest paper was published in 1952, whereas the most recent article appeared in 2014. Seventy-seven percent of the papers were published since 1990 and 52% were published after 2000. Four papers in the list were dated in the 1950s, including those ranked 2 and 3. Eight papers were published in 2000, the top single year.

**Table 1.** Authors appearing three or more times in the 100 most cited papers published in *Poultry Science* 1945 to 2020.

| Name | Total author (n) | First or last author (n) |
|---|---|---|
| Uni, Z. | 5 | 5 |
| Sklan, D. | 5 | 4 |
| Ferket, P. R. | 4 | 0 |
| Havenstein, G. B. | 3 | 3 |
| Silversides, F. G. | 3 | 2 |
| Noy, Y. | 3 | 1 |
| Smith, M. O. | 3 | 1 |

**Table 2.** Institution or agency and country of corresponding authors of the 100 most cited papers published in *Poultry Science* 1945 to 2020.

| Corresponding author institution | n |
|---|---|
| Hebrew University of Jerusalem, Israel | 6 |
| University of Georgia | 5 |
| USDA-ARS | 5 |
| Agriculture and Agri-Food Canada | 4 |
| Michigan State University | 4 |
| North Carolina State University | 4 |
| Purdue University | 4 |
| Roslin Institute, Scotland | 4 |
| Others | 64 |
| **Corresponding author country** | **n** |
| US | 52 |
| Canada | 12 |
| Israel | 8 |
| Spain | 5 |
| Scotland | 4 |
| Others | 19 |

Table 4 shows the topics covered based upon author-defined key words. Two caveats are noted for this information. First, the titles were not parsed for their word content and earlier publications did not have key words. Second, related variants of key words were combined to give the totals. The seven most frequent key words were broiler, antibiotic, intestinal microflora, egg, immunity, intestine, and layer.

The most cited paper, "Application of prebiotics and probiotics in poultry production" by J. A. Patterson and K. M. Burkholder from Purdue University (Poult. Sci. 82:627−631; https://doi.org/10.1093/ps/82.4.627), was published in 2003. This paper has 742 citations or 2.8% of the total for the 100 most cited works. Prebiotics, bursa of Fabricius, a blood diluent, antibiotics, and a metabolizable energy assay are topics covered in the top 5 most cited papers. Citations for these 5 works totaled 3,332, which represents 12.6% of the total.

**Table 3.** Decade issued of the 100 most cited papers published in *Poultry Science* 1945 to 2020.

| Decade published | n | Top year (n) |
|---|---|---|
| 1950 | 4 | 1956 (2) |
| 1960 | 5 | 1962 (2) |
| 1970 | 5 | 1970, 1975, 1976, 1978, 1979 (1) |
| 1980 | 9 | 1980, 1985, 1987, 1988 (2) |
| 1990 | 25 | 1999 (6) |
| 2000 | 44 | 2000 (8) |
| 2010 | 8 | 2010, 2011 (3) |

**Table 4.** Most frequent author-defined key words for the 100 most cited papers published in *Poultry Science* 1945 to 2020.

| Key word | n | Variants |
|---|---|---|
| Broiler | 13 | broilers, broiler chicken |
| Antibiotic | 10 | antimicrobial, antibiotic alternative, antibiotic growth promoter, antibiotics, antimicrobial growth promoter, antimicrobial peptide |
| Intestinal microflora | 10 | cecal microflora, intestinal microbial population, intestinal microbiome, intestinal microbiota, microflora |
| Egg | 7 | egg quality, egg component, egg components, egg composition, egg production and quality |
| Immunity | 7 | immune response, immune function, immunoglobulin, inflammation |
| Intestine | 7 | intestinal tract, ceca, cecum |
| Layer | 7 | laying hen, layer strain |

The Poultry Science Association invites you to celebrate the success of *Poultry Science* by examining the journal's 100 most cited papers shown in Table 5. A digital collection of these articles has also been assembled. The link also provides access to the list.

I thank Diana Jones, Executive Publisher, Nicole Scott, Journal Manager, David Busboom, Managing Editor, and John Carey, Editor-in-Chief, *Journal of Applied Poultry Research*, for providing initial data and valuable comments.

**Table 5.** The 100 most cited papers published in *Poultry Science* 1945 to 2020. Cited equals number of citations across all databases, ties noted (https://clarivate.libguides.com/webofscienceplatform).

| Rank T = ties | Cited (n) | Publication |
|---|---|---|
| 1 | 742 | Patterson, J. A., and K. M. Burkholder. 2003. Application of prebiotics and probiotics in poultry production. Poult. Sci. 82:627−631. https://doi.org/10.1093/ps/82.4.627 |
| 2 | 710 | Glick, B., T. S. Chang, and R. G. Jaap. 1956. The bursa of Fabricius and antibody production. Poult. Sci. 35:224−225. https://doi.org/10.3382/ps.0350224 |
| 3 | 683 | Natt, M. P., and C. A. Herrick. 1952. A new blood diluent for counting the erythrocytes and leucocytes of the chicken. Poult. Sci. 31:735−738. https://doi.org/10.3382/ps.0310735 |
| 4 | 663 | Dibner, J. J., and J. D. Richards. 2005. Antibiotic growth promoters in agriculture: history and mode of action. Poult. Sci. 84:634−643. https://doi.org/10.1093/ps/84.4.634 |
| 5 | 534 | Sibbald, I. R. 1976. Bioassay for true metabolizable energy in feedingstuffs. Poult. Sci. 55:303−308. https://doi.org/10.3382/ps.0550303 |
| 6 | 493 | Spring, P., C. Wenk, K. A. Dawson, and K. E. Newman. 2000. The effects of dietary mannanoligosaccharides on cecal parameters and the concentrations of enteric bacteria in the ceca of salmonella-challenged broiler chicks. Poult. Sci. 79:205−211. https://doi.org/10.1093/ps/79.2.205 |
| 7 | 491 | Hernandez, F., J. Madrid, V. Garcia, J. Orengo, and M. D. Megias. 2004. Influence of two plant extracts on broilers performance, digestibility, and digestive organ size. Poult. Sci. 83:169−174. https://doi.org/10.1093/ps/83.2.169 |
| 8 | 484 | Ricke, S. C. 2003. Perspectives on the use of organic acids and short chain fatty acids as antimicrobials. Poult. Sci. 82:632−639. https://doi.org/10.1093/ps/82.4.632 |
| 9 | 478 | Simopoulos, A. P. 2000. Human requirement for n-3 polyunsaturated fatty acids. Poult. Sci. 79:961−970. https://doi.org/10.1093/ps/79.7.961 |
| 10 | 469 | Castanon, J. I. R. 2007. History of the use of antibiotic as growth promoters in European poultry feeds. Poult. Sci. 86:2466−2471. https://doi.org/10.3382/ps.2007-00249 |
| T11 | 438 | Havenstein, G. B., P. R. Ferket, and M. A. Qureshi. 2003. Growth, livability, and feed conversion of 1957 versus 2001 broilers when fed representative 1957 and 2001 broiler diets. Poult. Sci. 82:1500−1508. https://doi.org/10.1093/ps/82.10.1500 |
| T11 | 438 | Xu, Z. R., C. H. Hu, M. S. Xia, X. A. Zhan, and M. Q. Wang. 2003. Effects of dietary fructooligosaccharide on digestive enzyme activities, intestinal microflora and morphology of male broilers. Poult. Sci. 82:1030−1036. https://doi.org/10.1093/ps/82.6.1030 |
| 13 | 437 | Salih, A. M., D. M. Smith, J. F. Price, and L. E. Dawson. 1987. Modified extraction 2-thiobarbituric acid method for measuring lipid oxidation in poultry. Poult. Sci. 66:1483−1488. https://doi.org/10.3382/ps.0661483 |

(*continued*)

**Table 5** (*Continued*)

| Rank T = ties | Cited (n) | Publication |
|---|---|---|
| 14 | 423 | Cook, M. E., C. C. Miller, Y. Park, and M. Pariza. 1993. Immune modulation by altered nutrient metabolism: nutritional control of immune-induced growth depression. Poult. Sci. 72:1301−1305. https://doi.org/10.3382/ps.0721301 |
| 15 | 409 | Mashaly, M. M., G. L. Hendricks, M. A. Kalama, A. E. Gehad, A. O. Abbas, and P. H. Patterson. 2004. Effect of heat stress on production parameters and immune responses of commercial laying hens. Poult. Sci. 83:889−894. https://doi.org/10.1093/ps/83.6.889 |
| 16 | 390 | Awad, W. A., K. Ghareeb, S. Abdel-Raheem, and J. Bohm. 2009. Effects of dietary inclusion of probiotic and synbiotic on growth performance, organ weights, and intestinal histomorphology of broiler chickens. Poult. Sci. 88:49−56. https://doi.org/10.3382/ps.2008-00244 |
| 17 | 357 | Mountzouris, K. C., P. Tsirtsikos, E. Kalamara, S. Nitsch, G. Schatzmayr, and K. Fegeros. 2007. Evaluation of the efficacy of a probiotic containing Lactobacillus, Bifidobacterium, Enterococcus, and Pediococcus strains in promoting broiler performance and modulating cecal microflora composition and metabolic activities. Poult. Sci. 86:309−317. https://doi.org/10.1093/ps/86.2.309 |
| 18 | 338 | Klasing, K. C. 1998. Nutritional modulation of resistance to infectious diseases. Poult. Sci. 77:1119−1125. https://doi.org/10.1093/ps/77.8.1119 |
| T19 | 316 | Quinteiro, W. M., A. Ribeiro, V. Ferraz-de-Paula, M. L. Pinheiro, M. Sakai, L. R. M. Sa, A. J. P. Ferreira, and J. Palermo-Neto. 2010. Heat stress impairs performance parameters, induces intestinal injury, and decreases macrophage activity in broiler chickens. Poult. Sci. 89:1905−1914. https://doi.org/10.3382/ps.2010-00812 |
| T19 | 316 | Siegel, P. B., and W. B. Gross. 1980. Production and persistence of antibodies in chickens to sheep erythrocytes .1. Directional selection. Poult. Sci. 59:1−5. https://doi.org/10.3382/ps.0590001 |
| 21 | 299 | Jin, L. Z., Y. W. Ho, N. Abdullah, and S. Jalaludin. 1998. Growth performance, intestinal microbial populations, and serum cholesterol of broilers fed diets containing Lactobacillus cultures. Poult. Sci. 77:1259−1265. https://doi.org/10.1093/ps/77.9.1259 |
| 22 | 290 | Havenstein, G. B., P. R. Ferket, and M. A. Qureshi. 2003. Carcass composition and yield of 1957 versus 2001 broilers when fed representative 1957 and 2001 broiler diets. Poult. Sci. 82:1509−1518. https://doi.org/10.1093/ps/82.10.1509 |
| 23 | 285 | Joerger, R. D. 2003. Alternatives to antibiotics: bacteriocins, antimicrobial peptides and bacteriophages. Poult. Sci. 82:640−647. https://doi.org/10.1093/ps/82.4.640 |
| 24 | 277 | Noy, Y., and D. Sklan. 1995. Digestion and absorption in the young chick. Poult. Sci. 74:366−373. https://doi.org/10.3382/ps.0740366 |
| 25 | 268 | Smith, J. W., and P. B. Hamilton. 1970. Aflatoxicosis in broiler chicken. Poult. Sci. 49:207−215. https://doi.org/10.3382/ps.0490207 |
| T26 | 265 | Mountzouris, K. C., P. Tsitrsikos, I. Palamidi, A. Arvaniti, M. Mohnl, G. Schatzmayr, and K. Fegeros. 2010. Effects of probiotic inclusion levels in broiler nutrition on growth performance, nutrient digestibility, plasma immunoglobulins, and cecal microflora composition. Poult. Sci. 89:58−67. https://doi.org/10.3382/ps.2009-00308 |
| T26 | 265 | Dransfield, E., and A. A. Sosnicki. 1999. Relationship between muscle growth and poultry meat quality. Poult. Sci. 78:743−746. https://doi.org/10.1093/ps/78.5.743 |
| 28 | 264 | Uni, Z., S. Ganot, and D. Sklan. 1998. Posthatch development of mucosal function in the broiler small intestine. Poult. Sci. 77:75−82. https://doi.org/10.1093/ps/77.1.75 |
| 29 | 259 | Baker, D. H., and Y. M. Han. 1994. Ideal amino acid profile for chicks during the first 3 weeks posthatching. Poult. Sci. 73:1441−1447. https://doi.org/10.3382/ps.0731441 |
| 30 | 257 | Julian, R. J. 1998. Rapid growth problems: ascites and skeletal deformities in broilers. Poult. Sci. 77:1773−1780. https://doi.org/10.1093/ps/77.12.1773 |
| 31 | 256 | Leveille, G. A., D. R. Romsos, Y. Y. Yeh, and E. K. O'hea. 1975. Lipid biosynthesis in chick. A consideration of site of synthesis, influence of diet and possible regulatory mechanisms. Poult. Sci. 54:1075−1093. https://doi.org/10.3382/ps.0541075 |
| 32 | 245 | Silversides, F. G., and T. A. Scott. 2001. Effect of storage and layer age on quality of eggs from two lines of hens. Poult. Sci. 80:1240−1245. https://doi.org/10.1093/ps/80.8.1240 |
| 33 | 244 | Rath, N. C., G. R. Huff, W. E. Huff, and J. M. Balog. 2000. Factors regulating bone maturity and strength in poultry. Poult. Sci. 79:1024−1032. https://doi.org/10.1093/ps/79.7.1024 |
| T34 | 243 | Engberg, R. M., M. S. Hedemann, S. Steenfeldt, and B. B. Jensen. 2004. Influence of whole wheat and xylanase on broiler performance and microbial composition and activity in the digestive tract. Poult. Sci. 83:925−938. https://doi.org/10.1093/ps/83.6.925 |
| T34 | 243 | Qiao, M., D. L. Fletcher, D. P. Smith, and J. K. Northcutt. 2001. The effect of broiler breast meat color on pH, moisture, water-holding capacity, and emulsification capacity. Poult. Sci. 80:676−680. https://doi.org/10.1093/ps/80.5.676 |
| 36 | 239 | Goto, N., H. Kodama, K. Okada, and Y. Fujimoto. 1978. Suppression of phytohemagglutinin skin response in thymectomized chickens. Poult. Sci. 57:246−250. https://doi.org/10.3382/ps.0570246 |
| 37 | 237 | Phillips, T. D., L. F. Kubena, R. B. Harvey, D. R. Taylor, and N. D. Heidelbaugh. 1988. Hydrated sodium calcium aluminosilicate: a high-affinity sorbent for aflatoxin. Poult. Sci. 67:243−247. https://doi.org/10.3382/ps.0670243 |
| 38 | 235 | Ravindran, V., S. Cabahug, G. Ravindran, and W. L. Bryden. 1999. Influence of microbial phytase on apparent ileal amino acid digestibility of feedstuffs for broilers. Poult. Sci. 78:699−706. https://doi.org/10.1093/ps/78.5.699 |
| 39 | 233 | Havenstein, G. B., P. R. Ferket, S. E. Scheidler, and B. T. Larson. 1994. Growth, livability, and feed conversion of 1957 vs 1991 broilers when fed "typical" 1957 and 1991 broiler diets. Poult. Sci. 73:1785−1794. https://doi.org/10.3382/ps.0731785 |
| 40 | 228 | Lay, D. C., R. M. Fulton, P. Y. Hester, D. M. Karcher, J. B. Kjaer, J. A. Mench, B. A. Mullens, R. C. Newberry, C. J. Nicol, N. P. O'Sullivan, and R. E. Porter. 2011. Hen welfare in different housing systems. Poult. Sci. 90:278−294. https://doi.org/10.3382/ps.2010-00962 |
| 41 | 226 | Bartlett, J. R., and M. O. Smith. 2003. Effects of different levels of zinc on the performance and immunocompetence of broilers under heat stress. Poult. Sci. 82:1580−1588. https://doi.org/10.1093/ps/82.10.1580 |
| 42 | 225 | Hill, F. W., and L. M. Dansky. 1954. Studies of the energy requirements of chickens: 1. The effect of dietary energy level on growth and feed consumption. Poult. Sci. 33:112−119. https://doi.org/10.3382/ps.0330112 |
| 43 | 224 | Crespo, N., and E. Esteve-Garcia. 2001. Dietary fatty acid profile modifies abdominal fat deposition in broiler chickens. Poult. Sci. 80:71−78. https://doi.org/10.1093/ps/80.1.71 |
| T44 | 222 | Yegani, M. M., and D. R. Korver. 2008. Factors affecting intestinal health in poultry. Poult. Sci. 87:2052−2063. https://doi.org/10.3382/ps.2008-00091 |

(*continued*)

**Table 5** (*Continued*)

| Rank T = ties | Cited (n) | Publication |
|---|---|---|
| T44 | 222 | Sandercock, D. A., R. R. Hunter, G. R. Nute, M. A. Mitchell, and P. M. Hocking. 2001. Acute heat stress-induced alterations in blood acid-base status and skeletal muscle membrane integrity in broiler chickens at two ages: implications for meat quality. Poult. Sci. 80:418−425. https://doi.org/10.1093/ps/80.4.418 |
| 46 | 220 | Araba, M. and N. M. Dale. 1990. Evaluation of protein solubility as an indicator of overprocessing soybean meal. Poult. Sci. 69:76−83. https://doi.org/10.3382/ps.0690076 |
| 47 | 219 | Baurhoo, B., L. Phillip, and C. A. Ruiz-Feria. 2007. Effects of purified lignin and mannan oligosaccharides on intestinal integrity and microbial populations in the ceca and litter of broiler chickens. Poult. Sci. 86:1070−1078. https://doi.org/10.1093/ps/86.6.1070 |
| 48 | 215 | Zhang, A. W., B. D. Lee, S. K. Lee, K. W. Lee, G. H. An, K. B. Song, and C. H. Lee. 2005. Effects of yeast (Saccharomyces cerevisiae) cell components on growth performance, meat quality, and ileal mucosa development of broiler chicks. Poult. Sci. 84:1015−1021. https://doi.org/10.1093/ps/84.7.1015 |
| 49 | 214 | Harmon, B. G. 1998. Avian heterophils in inflammation and disease resistance. Poult. Sci. 77:972−977. https://doi.org/10.1093/ps/77.7.972 |
| T50 | 212 | Zuidhof, M. J., B. L. Schneider, V. L. Carney, D. R. Korver, and F. E. Robinson. 2014. Growth, efficiency, and yield of commercial broilers from 1957, 1978, and 2005. Poult. Sci. 93:2970−2982. https://doi.org/10.3382/ps.2014-04291 |
| T50 | 212 | Niewold, T. A. 2007. The nonantibiotic anti-inflammatory effect of antimicrobial growth promoters, the real mode of action? A hypothesis. Poult. Sci. 86:605−609. https://doi.org/10.1093/ps/86.4.605 |
| T50 | 212 | Zanella, I., N. K. Sakomura, F. G. Silversides, A. Fiqueirdo, and M. Pack. 1999. Effect of enzyme supplementation of broiler diets based on corn and soybeans. Poult. Sci. 78:561−568. https://doi.org/10.1093/ps/78.4.561 |
| 53 | 210 | Qian, H., E. T. Kornegay, and D. M. Denbow. 1997. Utilization of phytate phosphorus and calcium as influenced by microbial phytase, cholecalciferol, and the calcium:total phosphorus ratio in broiler diets. Poult. Sci. 76:37−46. https://doi.org/10.1093/ps/76.1.37 |
| 54 | 207 | Puvadolpirod, S., and J. P. Thaxton. 2000. Model of physiological stress in chickens 1. Response parameters. Poult. Sci. 79:363−369. https://doi.org/10.1093/ps/79.3.363 |
| 55 | 205 | Amit-Romach, E., D. Sklan, and Z. Uni. 2004. Microflora ecology of the chicken intestine using 16S ribosomal DNA primers. Poult. Sci. 83:1093−1098. https://doi.org/10.1093/ps/83.7.1093 |
| 56 | 204 | Whitehead, C. C., and R. H. Fleming. 2000. Osteoporosis in cage layers. Poult. Sci. 79:1033−1041. https://doi.org/10.1093/ps/79.7.1033 |
| T57 | 203 | Gao, J., H. J. Zhang, S. H. Yu, S. G. Wu, I. Yoon, J. Quigley, Y. P. Gao, and G. H. Qi. 2008. Effects of yeast culture in broiler diets on performance and immunomodulatory functions. Poult. Sci. 87:1377−1384. https://doi.org/10.3382/ps.2007-00418 |
| T57 | 203 | Van Laack, R. L., C. H. Liu, M. O. Smith, H. D. Loveday, and R. M. Van Laack. 2000. Characteristics of pale, soft, exudative broiler breast meat. Poult. Sci. 79:1057−1061. https://doi.org/10.1093/ps/79.7.1057 |
| 59 | 202 | Viveros, A., S. Chamorro, M. Pizarro, I. Arija, C. Centeno, and A. Brenes. 2011. Effects of dietary polyphenol-rich grape products on intestinal microflora and gut morphology in broiler chicks. Poult. Sci. 90:566−578. https://doi.org/10.3382/ps.2010-00889 |
| 60 | 201 | Hamilton, R. M. G. 1982. Methods and factors that affect the measurement of eggshell quality. Poult. Sci. 61:2022−2039. https://doi.org/10.3382/ps.0612022 |
| 61 | 198 | Moran, E. T. 2007. Nutrition of the developing embryo and hatchling. Poult. Sci. 86:1043−1049. https://doi.org/10.1093/ps/86.5.1043 |
| 62 | 197 | Viveros, A., A. Brenes, I. Arija, and C. Centeno. 2002. Effects of microbial phytase supplementation on mineral utilization and serum enzyme activities in broiler chicks fed different levels of phosphorus. Poult. Sci. 81:1172−1183. https://doi.org/10.1093/ps/81.8.1172 |
| T63 | 196 | Siegel, P. B. 1962. Selection for body weight at 8 weeks of age: 1. Short term response and heritabilities. Poult. Sci. 41:954−962. https://doi.org/10.3382/ps.0410954 |
| T63 | 196 | Donaldson, W. E., G. F. Combs, and G. L. Romoser. 1956. Studies on energy levels in poultry rations .1. The effect of calorie-protein ratio of the ration on growth, nutrient utilization and body composition of chicks. Poult. Sci. 35:1100−1105. https://doi.org/10.3382/ps.0351100 |
| T65 | 195 | Meng, X., B. A. Slominski, C. M. Nyachoti; L. D. Campbell, and W. Guenter. 2005. Degradation of cell wall polysaccharides by combinations of carbohydrase enzymes and their effect on nutrient utilization and broiler chicken performance. Poult. Sci. 84:37−47. https://doi.org/10.1093/ps/84.1.37 |
| T65 | 195 | Whitehead, C. C. 2004. Overview of bone biology in the egg-laying hen. Poult. Sci. 83:193−199. https://doi.org/10.1093/ps/83.2.193 |
| T65 | 195 | Nelson, T. S. 1967. Utilization of phytate phosphorus by poultry—a review. Poult. Sci. 46:862−871. https://doi.org/10.3382/ps.0460862 |
| T68 | 194 | Fanatico, A. C., P. B. Pillai, J. L. Emmert, and C. M. Owens. 2007. Meat quality of slow- and fast-growing chicken genotypes fed low nutrient or standard diets and raised indoors or with outdoor access. Poult. Sci. 86:2245−2255. https://doi.org/10.1093/ps/86.10.2245 |
| T68 | 194 | Mitsch, P., K. Zitterl-Eglseer, B. Kohler, C. Gabler, R. Losa, and I. Zimpernik. 2004. The effect of two different blends of essential oil components on the proliferation of Clostridium perfringens in the intestines of broiler chickens. Poult. Sci. 83:669−675. https://doi.org/10.1093/ps/83.4.669 |
| 70 | 192 | Muir, W. M. 1996. Group selection for adaptation to multiple-hen cages: selection program and direct responses. Poult. Sci. 75:447−458. https://doi.org/10.3382/ps.0750447 |
| 71 | 191 | Sibbald, I. R. 1979. Bioassay for available amino acids and true metabolizable energy in feedingstuffs. Poult. Sci. 58:668−673. https://doi.org/10.3382/ps.0580668 |
| 72 | 190 | Corrier, D. E., and J. R. DeLoach. 1990. Evaluation of cell-mediated, cutaneous basophil hypersensitivity in young chickens by an interdigital skin test. Poult. Sci. 69:403−408. https://doi.org/10.3382/ps.0690403 |
| 73 | 189 | Mujahid, A., Y. Yoshiki, Y. Akiba, and M. Toyomizu. 2005. Superoxide radical production in chicken skeletal muscle induced by acute heat stress. Poult. Sci. 84:307−314. https://doi.org/10.1093/ps/84.2.307 |
| T74 | 188 | Uni, Z., P. R. Ferket, E. Tako, and O. Kedar. 2005. In ovo feeding improves energy status of late-term chicken embryos. Poult. Sci. 84:764−770. https://doi.org/10.1093/ps/84.5.764 |
| T74 | 188 | Scott, T. A., and F. G. Silversides. 2000. The effect of storage and strain of hen on egg quality. Poult. Sci. 79:1725−1729. https://doi.org/10.1093/ps/79.12.1725 |

(*continued*)

**Table 5** (*Continued*)

| Rank T = ties | Cited (n) | Publication |
|---|---|---|
| T76 | 187 | Burkholder, K. M., K. L. Thompson, M. E. Einstein, T. J. Applegate, and J. A. Patterson. 2008. Influence of stressors on normal intestinal microbiota, intestinal morphology, and susceptibility to Salmonella Enteritidis colonization in broilers. Poult. Sci. 87:1734−1741. https://doi.org/10.3382/ps.2008-00107 |
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