

## DAFTAR PUSTAKA

- Abalaka, S. E., Sani, N. A., Idoko, I. S., Tenuche, O. Z., Oyelowo, F. O., Ejeh, S. A., & Enem, S. I. (2017). Pathological changes associated with an outbreak of colibacillosis in a commercial broiler flock. *Sokoto Journal of Veterinary Sciences*, 15(3), 95–102. <https://doi.org/10.4314/sokjvs.v15i3.14>
- Abu Daud, N. H. B., Htin, N. N., Abba, Y., Paan, F. H., Kyaw, T., Khaing, A. T., Jesse, F. F. A., Mohammed, K., Adamu, L., & Tijjani, A. (2014). An outbreak of colibacillosis in a broiler farm. *Journal of Animal and Veterinary Advances*, 4(7), 646–651. <https://doi.org/10.3923/javaa.2014.545.548>
- Afshar, A., Thomas, F. C., Dulac, G. C., & Randall, G. C. (1987). Comparison of competitive and indirect enzyme-linked immunosorbent assays for detection of bluetongue virus antibodies in serum and whole blood. *Journal of Clinical Microbiology*, 25(9), 1705–1710.
- Ahmad, I., Ahmad, S., & Yadava, J. N. S. (2004). Pathogenic strains of *E. coli* and transferability of col plasmid to *Salmonella typhimurium*. *Indian Veterinary Medical Journal*, 28, 340–344.
- Alber, A., Stevens, M., & Vervelde, L. (2021). The bird's immune response to avian pathogenic *Escherichia coli*. *Avian Pathology*, 50, 382 - 391. <https://doi.org/10.1080/03079457.2021.1873246>.
- Allocati, N., Masulli, M., Alexeyev, M. F., & Di Ilio, C. (2013). *Escherichia coli* in Europe: An overview. *International Journal of Environmental Research and Public Health*, 10(12), 6235–6254. <https://doi.org/10.3390/ijerph10126235>
- Altekruse, S. F., Elvinger, F., DebRoy, C., Pierson, F. W., Eifert, J. D., & Sriranganathan, N. (2002). Pathogenic and fecal *Escherichia coli* strains from turkeys in a commercial operation. *Avian Diseases*, 46(3), 562–569.
- Antao, E. M., Ewers, C., Gurlebeck, D., Preisinger, R., Homeier, T., Li, G., & Wieler, L. H. (2009). Signature-tagged mutagenesis in a chicken infection model leads to the identification of a novel avian pathogenic *Escherichia coli* fimbrial adhesin. *PLoS ONE*, 4(11), e7796. <https://doi.org/10.1371/journal.pone.0007796>
- Aravind, K. L., Patil, V. S., Devegowda, G., Umakantha, B., & Ganpule, S. P. (2003). Efficacy of esterified glucomannan to counteract mycotoxicosis in naturally contaminated feed on performance and serum biochemical and hematological parameters in broilers. *Poultry Science*, 82(4), 571–576. <https://doi.org/10.1093/ps/82.4.571>
- Ariyani, N., Palupi, M. F., Nugraha, E., & Widyarimbi, D. (2022). Deteksi *Escherichia coli* patogen dari usap kloaka ayam layer dari tujuh provinsi Indonesia dengan menggunakan metode Congo Red. *Buletin Pengujian*

*Mutu Obat Hewan*, 31, Unit Uji Farmasetik dan Premiks, Balai Besar Pengujian Mutu dan Sertifikasi Obat Hewan.

- Arne, P., Marc, D., Bree, A., Schouler, C., & Dho-Moulin, M. (2000). Increased tracheal colonization in chickens without impairing pathogenic properties of avian pathogenic *Escherichia coli* MT78 with a *fimH* deletion. *Avian Diseases*, 44(2), 343–355.
- Azizi, I. G., Azarmi, M., Danesh Pouya, N., & Rouhi, S. (2014). T-2 toxin analysis in poultry and cattle feedstuff. *Jundishapur Journal of Natural Pharmaceutical Products*, 9(2), e13734. <https://doi.org/10.17795/jjnpp-13734>
- Babai, R., Stern, B. E., Hacker, J., & Ron, E. Z. (2000). New fimbrial gene cluster of S-fimbrial adhesin family. *Infection and Immunity*, 68(10), 5901–5907.
- Barcella, L., Barbaro, A. P., & Rogolino, S. B. (2016). Colonial morphology of *Escherichia coli*: Impact of detection in clinical specimens. *Microbiologia Medica*, 31, 51–55. <https://doi.org/10.4081/mm.2016.5636>
- Barnhart, M. M., & Chapman, M. R. (2006). Curli biogenesis and function. *Annual Review of Microbiology*, 60, 131–147. <https://doi.org/10.1146/annurev.micro.60.080805.142106>
- Bartholomew, J. W., & Finkelstein, H. (1958). Relationship of cell wall staining to gram differentiation. *Journal of Bacteriology*, 75(1), 77–84.
- Battilani, P., Costa, L. G., Dossena, A., Gullino, M. L., Marchelli, R., Galaverna, G., Pietri, A., Dall'Asta, C., Giorni, P., Spadaro, D., & Gualla, A. (2009). *Scientific/technical report submitted to EFSA CFP/EFSA/CONTAM/2008/01: Scientific information on mycotoxins and natural plant toxicants* (pp. 1–467). European Food Safety Authority (EFSA).
- BD Diagnostic System. (2019). *BD™ Plate Count Agar (Standard Methods Agar)*. BD Diagnostic System.
- Beloin, C., Roux, A., & Ghigo, J.-M. (2008). *Escherichia coli* biofilms. In T. Romeo (Ed.), *Bacterial Biofilms* (Current Topics in Microbiology and Immunology, Vol. 322, pp. 249–289). Springer. [https://doi.org/10.1007/978-3-540-75418-3\\_12](https://doi.org/10.1007/978-3-540-75418-3_12)
- Benson, H. J. (1990). *Microbiological applications: A laboratory manual in general microbiology* (5th ed.). Wm. C. Brown Publishers.
- Berg, H. C. (2004). *E. coli in motion*. Springer. <https://doi.org/10.1007/b97370>
- Bhoite, S., Van Gerven, N., Chapman, M., & Remaut, H. (2019). Curli Biogenesis: Bacterial Amyloid Assembly by the Type VIII Secretion Pathway. *EcoSal Plus*, 8. <https://doi.org/10.1128/ecosalplus.esp-0037-2018>.

- Binder, E. M. (2007). Managing the risk of mycotoxins in modern feed production. *Animal Feed Science and Technology*, 133(1–2), 149–166. <https://doi.org/10.1016/j.anifeedsci.2006.08.008>
- Bócsai, A., Pelyhe, C., Zándoki, E., Ancsin, Z., Szabó-Fodor, J., Erdélyi, M., & Balogh, K. (2016). Short-term effects of T-2 toxin exposure on some lipid peroxide and glutathione redox parameters of broiler chickens. *Journal of Animal Physiology and Animal Nutrition*, 100(3), 520–525. <https://doi.org/10.1111/jpn.12382>
- Bonofiglio, L., Gardella, N. M., & Mollerach, M. E. (2012). Application of molecular typing methods to the study of medically relevant Gram-positive cocci. *Journal of Infection in Developing Countries*, 6(5), 349–356.
- Brennan, F. P., Grant, J., Botting, C. H., O’Flaherty, V., Richards, K. G., & Abram, F. (2013). Insights into the low-temperature adaptation and nutritional flexibility of a soil-persistent *Escherichia coli*. *FEMS Microbiology Ecology*, 84(1), 75–85. <https://doi.org/10.1111/1574-6941.12038>
- Brooks, G. F., Carroll, K. C., Butel, J. S., Morse, S. A., & Mietzner, T. A. (2013). *Jawetz, Melnick, & Adelberg’s Medical Microbiology* (26th ed.). McGraw Hill Medical.
- Brown, P. K., Dozois, C. M., Nickerson, C. A., Zuppardo, A., Terlonge, J., & Curtiss III, R. (2001). MlrA, a novel regulator of curli (AgF) and extracellular matrix synthesis by *Escherichia coli* and *Salmonella enterica* serovar Typhimurium. *Molecular Microbiology*, 41(2), 349–363. <https://doi.org/10.1046/j.1365-2958.2001.02521.x>
- Bueschkens, D. H., & Stiles, M. E. (1984). *Escherichia coli* variants for gas and indole production at elevated incubation temperatures. *Applied and Environmental Microbiology*, 48(3), 601–605.
- Burcham, Z., Hood, J., Pechal, J., Krausz, K., Bose, J., Schmidt, C., Benbow, M., & Jordan, H. (2016). Fluorescently labeled bacteria provide insight on post-mortem microbial transmigration. *Forensic science international*, 264, 63-9 . <https://doi.org/10.1016/j.forsciint.2016.03.019>.
- Calnek, B. W., Barnes, H. J., Beard, C. W., McDougald, L. R., & Saif, Y. M. (1997). *Diseases of poultry* (10th ed.). Iowa State University Press.
- Cantey, J. B., & Doern, C. D. (2015). “A defective and imperfect” method: H. Christian Gram and the history of the Gram stain. *The Pediatric Infectious Disease Journal*, 34(8), 848. <https://doi.org/10.1097/INF.0000000000000749>
- Cappuccino, J. G., & Sherman, N. (2014). *Microbiology: A laboratory manual* (10th ed.). Pearson Education.
- Caza, M., Lepine, F., & Dozois, C. M. (2011). Secretion, but not overall synthesis, of catecholate siderophores contributes to virulence of extraintestinal

- pathogenic *Escherichia coli*. *Molecular Microbiology*, 80(1), 266–282. <https://doi.org/10.1111/j.1365-2958.2011.07571.x>
- Chapman, M., Robinson, L., Pinkner, J., Roth, R., Heuser, J., Hammar, M., Normark, S., & Hultgren, S. (2002). Role of *Escherichia coli* Curli Operons in Directing Amyloid Fiber Formation. *Science*, 295, 851 - 855. <https://doi.org/10.1126/SCIENCE.1067484>.
- Chen, P., Xiang, B., Shi, H., Yu, P., Song, Y., & Li, S. (2020). Recent advances on type A trichothecenes in food and feed: Analysis, prevalence, toxicity, and decontamination techniques. *Food Control*, 118, 107371. <https://doi.org/10.1016/j.foodcont.2020.107371>
- Chen, Y., Kistler, H. C., & Ma, Z. (2019). *Fusarium graminearum* trichothecene mycotoxins: Biosynthesis, regulation, and management. *Annual Review of Phytopathology*, 57, 15–39. <https://doi.org/10.1146/annurev-phyto-082718-100204>
- Chodkowska, K., Iwiński, H., Wódz, K., Nowak, T., & Róžański, H. (2022). In Vitro Assessment of Antimicrobial Activity of Phytobiotics Composition towards of Avian Pathogenic *Escherichia coli* (APEC) and Other *E. coli* Strains Isolated from Broiler Chickens. *Antibiotics*, 11. <https://doi.org/10.3390/antibiotics11121818>.
- Coker, R. D. (2000). Aflatoxins and mycotoxins | Chromatography. In *Encyclopedia of Separation Science* (pp. 1873–1888). Elsevier. <https://doi.org/10.1016/B0-12-226770-2/01191-1>
- Cooper, K. G., Chong, A., Kari, L., Jeffrey, B., Starr, T., Martens, C., McClurg, M., Posada, V. R., Laughlin, R. C., Whitfield-Cargile, C., Adams, L. G., Bryan, L. K., Little, S. V., Krath, M., Lawhon, S. D., & Steele-Mortimer, O. (2021). Regulatory protein HilD stimulates *Salmonella Typhimurium* invasiveness by promoting smooth swimming via the methyl-accepting chemotaxis protein McpC. *Nature Communications*, 12(1), 348. <https://doi.org/10.1038/s41467-020-20558-6>
- Crookshank, E. M. (1886). *An introduction to practical bacteriology*. J. H. Vail and Co.
- Cuatrecasas, P., Wilchek, M., & Anfinsen, C. B. (1968). Selective enzyme purification by affinity chromatography. *Proceedings of the National Academy of Sciences of the United States of America*, 61(2), 636–643. <https://doi.org/10.1073/pnas.61.2.636>
- Curtis, L. (1885). The cultivation of bacteria and the cholera bacillus. *Proceedings of the American Society of Microscopists*, 7, 142–150.
- Davey, M. E., & O’Toole, G. A. (2000). Microbial biofilms: From ecology to molecular genetics. *Microbiology and Molecular Biology Reviews*, 64(4), 847–867. <https://doi.org/10.1128/MMBR.64.4.847-867.2000>

- Davis, C. R. (1938). Colibacillosis in young chicks. *Journal of the American Veterinary Medical Association*, 92, 518–522.
- De Boever, S., Croubels, S., Meyer, E., Sys, S., Beyaert, R., Ducatelle, R., & De Backer, P. (2009). Characterization of an intravenous lipopolysaccharide inflammation model in broiler chickens. *Avian Pathology*, 38(5), 403–411. <https://doi.org/10.1080/03079450903216508>
- De Brito, B. G., Gaziri, L. C., & Vidotto, M. C. (2003). Virulence factors and clonal relationships among *Escherichia coli*. *Veterinary Microbiology*, 97(3), 193–202. <https://doi.org/10.1016/j.vetmic.2003.08.010>
- Difco. (1998). *Difco manual* (11th ed.). Difco Laboratories.
- Donlan, R. M. (2002). Biofilms: Microbial life on surfaces. *Emerging Infectious Diseases*, 8(9), 881–890. <https://doi.org/10.3201/eid0809.020063>
- Donlan, R. M., & Costerton, J. W. (2002). Biofilms: Survival mechanisms of clinically relevant microorganisms. *Clinical Microbiology Reviews*, 15(2), 167–193. <https://doi.org/10.1128/CMR.15.2.167-193.2002>
- Dozois, C. M., Dho-Moulin, M., Bree, A., Fairbrother, J. M., Desautels, C., & Curtiss, R., III. (2000). Relationship between the Tsh autotransporter and pathogenicity of avian *Escherichia coli* and localization and analysis of the *tsh* genetic region. *Infection and Immunity*, 68(7), 4145–4154. <https://doi.org/10.1128/IAI.68.7.4145-4154.2000>
- Duncan, M. J., Mann, E. L., Cohen, M. S., Ofek, I., Sharon, N., & Abraham, S. N. (2005). The distinct binding specificities exhibited by enterobacterial type 1 fimbriae are determined by their fimbrial shafts. *Journal of Biological Chemistry*, 280(46), 37707–37716. <https://doi.org/10.1074/jbc.M506878200>
- Dunne, W. M. Jr. (2002). Bacterial adhesion: Seen any good biofilms lately? *Clinical Microbiology Reviews*, 15(2), 155–166. <https://doi.org/10.1128/CMR.15.2.155-166.2002>
- Dziva, F., & Stevens, M. P. (2008). Colibacillosis in poultry: Unravelling the molecular basis of virulence of avian pathogenic *Escherichia coli* in their natural hosts. *Avian Pathology*, 37(4), 355–366. <https://doi.org/10.1080/03079450802216652>
- EFSA Panel on Contaminants in the Food Chain (CONTAM). (2011). Scientific opinion on the risks for animal and public health related to the presence of T-2 and HT-2 toxin in food and feed. *EFSA Journal*, 9(12), 2481. <https://doi.org/10.2903/j.efsa.2011.2481>
- Engvall, E., & Perlmann, P. (1971). Enzyme-linked immunosorbent assay (ELISA): Quantitative assay of immunoglobulin G. *Immunochemistry*, 8(9), 871–874. [https://doi.org/10.1016/0019-2791\(71\)90454-X](https://doi.org/10.1016/0019-2791(71)90454-X)

- European Food Safety Authority (EFSA), Arcella, D., Gergelova, P., Innocenti, M. L., & Steinkellner, H. (2017). Human and animal dietary exposure to T-2 and HT-2 toxin. *EFSA Journal*, *15*(8), e04972. <https://doi.org/10.2903/j.efsa.2017.4972>
- Ewers, C., Janssen, T., Kiessling, S., Philipp, H. C., & Wieler, L. H. (2005). Rapid detection of virulence-associated genes in avian pathogenic *Escherichia coli* by multiplex polymerase chain reaction. *Avian Diseases*, *49*(2), 269–273. <https://doi.org/10.1637/7286-100504R>
- Fernye, C., Ancsin, Z., Bócsai, A., Balogh, K., Mézes, M., & Erdélyi, M. (2018). Role of glutathione redox system on the T-2 toxin tolerance of pheasant (*Phasianus colchicus*). *Toxicological Research*, *34*(3), 249–257. <https://doi.org/10.5487/TR.2018.34.3.249>
- Figueira, R., & Holden, D. W. (2012). Functions of the *Salmonella* pathogenicity island 2 (SPI-2) type III secretion system effectors. *Microbiology*, *158*(Pt 5), 1147–1161. <https://doi.org/10.1099/mic.0.058115-0>
- Filazi, A., Sireli, U. T., & Ekici, H. (2017). Mycotoxins in poultry. In E. Işıl (Ed.), *Mycotoxins in food and feed* (pp. 109–130). IntechOpen. <https://doi.org/10.5772/66892>
- Fitzgerald, D. M., Bonocora, R. P., & Wade, J. T. (2015). Correction: Comprehensive mapping of the *Escherichia coli* flagellar regulatory network. *PLOS Genetics*, *11*(9), e1005456. <https://doi.org/10.1371/journal.pgen.1005456>
- Fletcher, M. (1988). Attachment of *Pseudomonas fluorescens* to glass and influence of electrolytes on bacterium-substratum separation distance. *Journal of Bacteriology*, *170*(4), 2027–2030. <https://doi.org/10.1128/jb.170.4.2027-2030.1988>
- Foroud, N. A., Baines, D., Gagkaeva, T. Y., Thakor, N., Badea, A., Steiner, B., Bürstmayr, M., & Bürstmayr, H. (2019). Trichothecenes in cereal grains—An update. *Toxins*, *11*(11), 634. <https://doi.org/10.3390/toxins11110634>
- Frieg, B., Gremer, L., Heise, H., Willbold, D., & Gohlke, H. (2020). Binding modes of thioflavin T and Congo red to the fibril structure of amyloid- $\beta$ (1–42). *Chemical Communications*, *56*(45), 6070–6073. <https://doi.org/10.1039/d0cc01161d>
- Frost, L. S., Leplae, R., Summers, A. O., & Toussaint, A. (2005). Mobile genetic elements: The agents of open source evolution. *Nature Reviews Microbiology*, *3*(9), 722–732. <https://doi.org/10.1038/nrmicro1235>
- Gao, Q., Xia, L., Wang, X., Ye, Z., Liu, J., & Gao, S. (2019). SodA contributes to the virulence of avian pathogenic *Escherichia coli* O2 strain E058 in experimentally infected chickens. *Journal of Bacteriology*, *201*(3), e00625-18. <https://doi.org/10.1128/JB.00625-18>

- Gibbs, P. S., Maurer, J. J., Nolan, L. K., & Wooley, R. E. (2003). Prediction of chicken embryo lethality with the avian *Escherichia coli* traits complement resistance, colicin V production, and presence of the increased serum survival gene cluster (*iss*). *Avian Diseases*, 47(2), 370–379. [https://doi.org/10.1637/0005-2086\(2003\)047\[0370:POCELW\]2.0.CO;2](https://doi.org/10.1637/0005-2086(2003)047[0370:POCELW]2.0.CO;2)
- Gibbs, P. S., Petermann, S. R., & Wooley, R. E. (2004). Comparison of several challenge models for studies in avian colibacillosis. *Avian Diseases*, 48(4), 751–758. <https://doi.org/10.1637/7181>
- Glenn, A. E. (2007). Mycotoxigenic *Fusarium* species in animal feed. *Animal Feed Science and Technology*, 137(3–4), 213–240. <https://doi.org/10.1016/j.anifeedsci.2007.06.003>
- Göhler, D., Fischer, B., & Meissner, S. (2017). In-ovo sexing of 14-day-old chicken embryos by pattern analysis in hyperspectral images (VIS/NIR spectra): A non-destructive method for layer lines with gender-specific down feather color. *Poultry Science*, 96, 1–4. <https://doi.org/10.3382/PS/PEW282>.
- Gophna, U., Barlev, M., Seijffers, R., Oelschläger, T. A., Hacker, J., & Ron, E. Z. (2001). Curli fibers mediate internalization of *Escherichia coli* by eukaryotic cells. *Infection and Immunity*, 69(4), 2659–2665. <https://doi.org/10.1128/IAI.69.4.2659-2665.2001>
- Gordon, D. M., & Cowling, A. (2003). The distribution and genetic structure of *Escherichia coli* in Australian vertebrates: Host and geographic effects. *Microbiology*, 149(12), 3575–3586. <https://doi.org/10.1099/mic.0.26545-0>
- Gram, H. C. (1884/1999). *On the isolated staining of Schizomycetes in dried and section preparations* (T. D. Brock, Trans.). In T. D. Brock (Ed.), *Milestones in microbiology: 1546 to 1940* (pp. 206–210). ASM Press. (Original work published 1884)
- Grange, R. D., Thompson, J. P., & Lambert, D. G. (2014). Radioimmunoassay, enzyme and non-enzyme-based immunoassays. *BJA: British Journal of Anaesthesia*, 112(2), 213–216. <https://doi.org/10.1093/bja/aet293>
- Grizzle, J. M., Kersten, D. B., Houston, A. E., & Saxton, A. M. (2005). Effect of chronic vs. intermittent exposure to T-2 toxin on reproductive performance in bobwhite quail. *International Journal of Poultry Science*, 4(2), 71–75. <https://doi.org/10.3923/ijps.2005.71.75>
- Gunsalus, R. P., & Park, S. J. (1994). Aerobic-anaerobic gene regulation in *Escherichia coli*: Control by the ArcAB and Fnr regulons. *Research in Microbiology*, 145(5–6), 437–450. [https://doi.org/10.1016/0923-2508\(94\)90082-5](https://doi.org/10.1016/0923-2508(94)90082-5)
- Gyles, C., & Boerlin, P. (2013). Horizontally transferred genetic elements and their role in pathogenesis of bacterial disease. *Veterinary Pathology*, 51(2), 328–340. <https://doi.org/10.1177/0300985813511131>

- Hajna, A. A. (1945). Triple-sugar iron agar medium for the identification of the intestinal group of bacteria. *Journal of Bacteriology*, 49(1), 68–69. <https://journals.asm.org/journal/jb>
- Harden, A. (1905). Action on glucose of lactose-fermenting bacteria of feces. *The Journal of Hygiene*, 5, 488–495. <https://doi.org/10.1017/S0022172400001577>
- Harden, A., & Walpole, S. G. (1905–1906). Chemical action of *B. lactis aerogenes* (*Escherich*) on glucose: Production of 2:3 butylene-glycol and acetyl-methyl-carbinol. *Proceedings of the Royal Society B: Biological Sciences*, 77, 399–409. <https://doi.org/10.1098/rspl.1905.0093>
- Harley, J. P. (2005). *Laboratory exercises in microbiology* (6th ed.). McGraw-Hill.
- Harris, D. C. (2004). *Exploring chemical analysis* (3rd ed.). W. H. Freeman & Co.
- He, J., Jin, H., Guo, J., Li, K., Jia, L., Li, Y., & Zhang, L. (2023). T-2 toxin-induced testicular impairment by triggering oxidative stress and ferroptosis. *Ecotoxicology and environmental safety*, 270, 115844. <https://doi.org/10.1016/j.ecoenv.2023.115844>.
- Herwald, H., Morgelin, M., Olsèn, A., Rhen, M., Dahlbäck, B., Müller-Esterl, W., & Björck, L. (1998). Activation of the contact-phase system on bacterial surfaces—A clue to serious complications in infectious diseases. *Nature Medicine*, 4(3), 298–302. <https://doi.org/10.1038/nm0398-298>
- Hiss, P. H. (1897). On a method of isolating and identifying *Bacillus typhosus*, based on a study of *Bacillus typhosus* and members of the colon group in a semi-solid culture medium. *Journal of Experimental Medicine*, 2(6), 677–700. <https://doi.org/10.1084/jem.2.6.677>
- Hiss, P. H. (1902). New and simple media for the differentiation of the colonies for typhoid, colon, and allied bacilli. *Journal of Medical Research*, 8, 148–167.
- Hoerr, F. J., Carlton, W. W., Tuite, J., Vesonder, R. F., Rohwedder, W. K., & Szigeti, G. (1982). Experimental trichothecene mycotoxicosis produced in broiler chickens by *Fusarium sporotrichiella* var. *sporotrichioides*. *Avian Pathology*, 11(3), 385–405. <https://doi.org/10.1080/03079458208436173>
- Horn, F., Correa, A. M., Barbieri, N. L., Glodde, S., Weyrauch, K. D., Kaspers, B., Driemeier, D., Ewers, C., & Wieler, L. H. (2012). Infections with avian pathogenic and fecal *Escherichia coli* strains display similar lung histopathology and macrophage apoptosis. *PLOS ONE*, 7(8), e41031. <https://doi.org/10.1371/journal.pone.0041031>
- Huff, G. R., Huff, W. E., Rath, N. C., & Balog, J. M. (2000). Turkey osteomyelitis complex. *Poultry Science*, 79(7), 1050–1056. <https://doi.org/10.1093/ps/79.7.1050>

- Jamali, H., Akrami, F., Bouakkaz, S., & Dozois, C. M. (2024). Prevalence of specific serogroups, antibiotic resistance and virulence factors of avian pathogenic *Escherichia coli* (APEC) isolated from clinical cases: A systematic review and meta-analysis. *Microbial Pathogenesis*, *186*, 106843. <https://doi.org/10.1016/j.micpath.2024.106843>
- Janik, E., Niemcewicz, M., Podogrocki, M., Ceremuga, M., Stela, M., & Bijak, M. (2021). T-2 toxin—The most toxic trichothecene mycotoxin: Metabolism, toxicity, and decontamination strategies. *Molecules*, *26*(22), 6868. <https://doi.org/10.3390/molecules26226868>
- Jaradat, Z. W. (2005). T-2 mycotoxin in the diet and its effects on tissues. In V. R. Preedy & G. Watson (Eds.), *Reviews in food and nutrition toxicity* (Vol. 4, pp. 173–212). CRC Press.
- Jarrell, K. F., & McBride, M. J. (2008). The surprisingly diverse ways that prokaryotes move. *Nature Reviews Microbiology*, *6*, 466–476. <https://doi.org/10.1038/nrmicro1900>
- Johnson, T. J., Wannemuehler, Y., Doetkott, C., Johnson, S. J., Rosenberger, S. C., & Nolan, L. K. (2008). Identification of minimal predictors of avian pathogenic *Escherichia coli* virulence for use as a rapid diagnostic tool. *Journal of Clinical Microbiology*, *46*(11), 3987–3996. <https://doi.org/10.1128/JCM.00816-08>
- Jordan, E. O., Caldwell, M. E., & Reiter, D. (1934). Bacterial motility. *Journal of Bacteriology*, *27*(2), 165–174. <https://doi.org/10.1128/jb.27.2.165-174.1934>
- Kaper, J. B., Nataro, J. P., & Mobley, H. L. T. (2004). Pathogenic *Escherichia coli*. *Nature Reviews Microbiology*, *2*(2), 123–140. <https://doi.org/10.1038/nrmicro818>
- Kementerian Pertanian. (2021). *Karpet Merah Investasi Usaha Peternakan*. Direktorat Pengolahan dan Pemasaran Hasil Peternakan, Direktorat Jenderal Peternakan dan Kesehatan Hewan.
- Kholik, K. (2022). Detection of antibiotic resistant in *Escherichia coli* from the reproductive tract of Bali cattle on smallholder farm. *Jurnal Biosains Pascasarjana*, *24SP*(1), 1–12. <https://doi.org/10.20473/jbp.v24i1sp.2022.1-12>
- Khoo, L. L., Hasnah, Y., Rosnah, Y., Saiful, N., Maswati, M. A., & Ramlan, M. (2010). The prevalence of avian pathogenic *Escherichia coli* (APEC) in Peninsular Malaysia. *Malaysian Journal of Veterinary Research*, *1*(1), 27–31.
- Kika, T. S., Cocoli, S., Pelić, D. L., Puvača, N., Lika, E., & Pelić, M. (2023). Colibacillosis in modern poultry production. *Journal of Agronomy, Technology and Engineering Management*, *6*(6), 975–987.

- Kimura, M., Tokai, T., Takahashi-Ando, N., Ohsato, S., & Fujimura, M. (2007). Molecular and genetic studies of *Fusarium* trichothecene biosynthesis: Pathways, genes, and evolution. *Bioscience, Biotechnology, and Biochemistry*, 71(9), 2105–2123. <https://doi.org/10.1271/bbb.70108>
- Kobayashi, R. K., Gaziri, L. C., Venancio, E. J., & Vidotto, M. C. (2007). Detection of Tsh protein mucinolytic activity by SDS-PAGE. *Journal of Microbiological Methods*, 68(3), 654–655. <https://doi.org/10.1016/j.mimet.2006.11.009>
- Koser, S. A. (1923). Utilization of the salts of organic acids by the colon-aerogenes group. *Journal of Bacteriology*, 8(5), 493–520.
- Kostakioti, M., & Stathopoulos, C. (2004). Functional analysis of the Tsh autotransporter from an avian pathogenic *Escherichia coli* strain. *Infection and Immunity*, 72(10), 5548–5554. <https://doi.org/10.1128/IAI.72.10.5548-5554.2004>
- Krieg, N. R., & Holt, J. G. (Eds.). (1984). *Bergey's manual of systematic bacteriology* (Vol. 1). Williams & Wilkins.
- Krska, R., Baumgartner, S., & Josephs, R. (2001). The state-of-the-art in the analysis of type-A and -B trichothecene mycotoxins in cereals. *Fresenius' Journal of Analytical Chemistry*, 371(3), 285–299. <https://doi.org/10.1007/s002160100893>
- Krska, R., Malachova, A., Berthiller, F., & van Egmond, H. P. (2014). Determination of T-2 and HT-2 toxins in food and feed: An update. *World Mycotoxin Journal*, 7(1), 131–142. <https://doi.org/10.3920/WMJ2013.1605>
- Kuca, K., Dohnal, V., Jezkova, A., & Jun, D. (2008). Metabolic pathways of T-2 toxin. *Current Drug Metabolism*, 9(1), 77–82. <https://doi.org/10.2174/138920008783331176>
- La Ragione, R. M., & Woodward, M. J. (2002). Virulence factors of *Escherichia coli* serotypes associated with avian colisepticaemia. *Research in Veterinary Science*, 73(1), 27–35. [https://doi.org/10.1016/S0034-5288\(02\)00019-9](https://doi.org/10.1016/S0034-5288(02)00019-9)
- La Ragione, R. M., Collighan, R. J., & Woodward, M. J. (1999). Non-curling of *Escherichia coli* O78:K80 isolates associated with IS1 insertion in *csgB* and reduced persistence in poultry infection. *FEMS Microbiology Letters*, 175(2), 247–253. <https://doi.org/10.1111/j.1574-6968.1999.tb13632.x>
- Leifson, E. (1951). Staining and arrangement of bacterial flagella. *Journal of Bacteriology*, 62(3), 377–389.
- Leifson, E. (1960). *Atlas of bacterial flagellation*. Academic Press.
- Levine, M. (1916). On the significance of the Voges-Proskauer reaction. *Journal of Bacteriology*, 1(2), 153–164.

- Li, S. J., Dhaenens, M., Garmyn, A., Verbrugghe, E., Van Rooij, P., De Saeger, S., ... & Martel, A. (2015). Exposure of *Aspergillus fumigatus* to T-2 toxin results in a stress response associated with exacerbation of aspergillosis in poultry. *World Mycotoxin Journal*, 8(3), 323–334. <https://doi.org/10.3920/WMJ2014.1862>
- Li, S. J., Ediage, E. N., De Saeger, S., Van Waeyenberghe, L., Garmyn, A., Verlinden, M., ... & Martel, A. (2013). Occurrence and pathology of mycotoxins in commercial parrot feeds. *World Mycotoxin Journal*, 6(4), 449–454. <https://doi.org/10.3920/WMJ2013.1620>
- Li, S. J., Pasmans, F., Croubels, S., Verbrugghe, E., Van Waeyenberghe, L., Yang, Z., Haesebrouck, F., & Martel, A. (2013). T-2 toxin impairs antifungal activities of chicken macrophages against *Aspergillus fumigatus* conidia but promotes the pro-inflammatory responses. *Avian Pathology*, 42(5), 457–463. <https://doi.org/10.1080/03079457.2013.822958>
- Li, S. J., Zhang, G., Xue, B., Ding, Q., Han, L., Huang, J. C., ... & Yang, C. (2022). Toxicity and detoxification of T-2 toxin in poultry. *Food and Chemical Toxicology*, 169, 113392. <https://doi.org/10.1016/j.fct.2022.113392>
- Li, X., Gu, Y., Dong, H., et al. (2015). Trapped lipopolysaccharide and LptD intermediates reveal lipopolysaccharide translocation steps across the *Escherichia coli* outer membrane. *Scientific Reports*, 5, 11883. <https://doi.org/10.1038/srep11883>
- Liang, W., Li, H., Zhou, H., Wang, M., Zhao, X., Sun, X., Li, C., & Zhang, X. (2021). Effects of Taraxacum and Astragalus extracts combined with probiotic *Bacillus subtilis* and *Lactobacillus* on *Escherichia coli*-infected broiler chickens. *Poultry Science*, 100. <https://doi.org/10.1016/j.psj.2021.01.030>.
- Liao, L. L., Grollman, A. P., & Horwitz, S. B. (1976). Mechanism of action of the 12,13-epoxytrichothecene, anguidine, an inhibitor of protein synthesis. *Biochimica et Biophysica Acta (BBA) - Nucleic Acids and Protein Synthesis*, 454(2), 273–284. [https://doi.org/10.1016/0005-2787\(76\)90018-9](https://doi.org/10.1016/0005-2787(76)90018-9)
- Lin, A. V. (2015). Indirect ELISA. In R. M. Hnasko (Ed.), *ELISA: Methods and Protocols* (pp. 51–59). Humana Press. [https://doi.org/10.1007/978-1-4939-2742-5\\_6](https://doi.org/10.1007/978-1-4939-2742-5_6)
- Linden, J. (2015). Colibacillosis in layers: An overview. *The Poultry Site*. <http://www.thepoultrysite.com/articles/3378/colibacillosis-in-layers-an-overview/>
- Liu, W., Wu, D., Li, S., Xu, J., Li, P., Jiang, A., Zhang, Y., Liu, Z., Jiang, L., Gao, X., Yang, Z., & Wei, Z. (2021). Glycolysis and reactive oxygen species production participate in T-2 toxin-stimulated chicken heterophil extracellular traps. *Journal of Agricultural and Food Chemistry*, 69(49), 12862–12869. <https://doi.org/10.1021/acs.jafc.1c05371>

- Ljutov, V. (1959). Technique of indole test. *Acta Pathologica Microbiologica Scandinavica*, 46(4), 349–360. <https://doi.org/10.1111/j.1699-0463.1959.tb01106.x>
- Lovelock, J., & Bishop, M. (1959). Prevention of freezing damage to living cells by dimethyl sulphoxide. *Nature*, 183(4672), 1394–1395. <https://doi.org/10.1038/1831394a0>
- Lymberopoulos, M. H., Houle, S., Daigle, F., Leveille, S., Bree, A., Moulin-Schouleur, M., Johnson, J. R., & Dozois, C. M. (2006). Characterization of Stg fimbriae from an avian pathogenic *Escherichia coli* O78:K80 strain and assessment of their contribution to colonization of the chicken respiratory tract. *Journal of Bacteriology*, 188(17), 6449–6459. <https://doi.org/10.1128/JB.00531-06>
- MacFaddin, J. F. (2000). *Biochemical tests for identification of medical bacteria* (3rd ed.). Lippincott Williams & Wilkins.
- Maciel, J. F., Matter, L. B., Trindade, M. M., Camillo, G., Lovato, M., de Avila Botton, S., & de Vargas, A. C. (2017). Virulence factors and antimicrobial susceptibility profile of extraintestinal *Escherichia coli* isolated from an avian colisepticemia outbreak. *Microbial Pathogenesis*, 103, 119–122. <https://doi.org/10.1016/j.micpath.2016.12.020>
- Mackei, M., Orbán, K., Molnár, A., Pál, L., Dublec, K., Husvéth, F., Neogrady, Z., & Mátis, G. (2020). Cellular effects of T-2 toxin on primary hepatic cell culture models of chickens. *Toxins*, 12(1), 46. <https://doi.org/10.3390/toxins12010046>
- MacWilliams, M. P. (2009). *Citrate test protocol*. American Society for Microbiology. <https://asm.org/ASM/media/Protocol-Images/Citrate-Test-Protocol.pdf>
- Madheswaran, R., Balachandran, C., & Manohar, M. M. (2004). Influence of dietary culture material containing aflatoxin and T-2 toxin on certain serum biochemical constituents in Japanese quail. *Mycopathologia*, 158(3), 337–341. <https://doi.org/10.1007/s11046-005-8399-8>
- Madhu, S., Katiyar, A. K., Vegad, J. L., & Swamy, M. (2001). Bacteria-induced increased vascular permeability in the chicken skin. *Indian Journal of Animal Sciences*, 71(7), 621–622.
- Madigan, M. T., Martinko, J. M., Stahl, D. A., & Clark, D. P. (2012). *Brock biology of microorganisms* (13th ed.). Benjamin Cummings.
- Manafi, M., Pirany, N., Noor Ali, M., Hedayati, M., Khalaji, S., & Yari, M. (2015). Experimental pathology of T-2 toxicosis and mycoplasma infection on performance and hepatic functions of broiler chickens. *Poultry Science*, 94(7), 1483–1492. <https://doi.org/10.3382/ps/pev115>

- Marcobal, A., Southwick, A. M., Earle, K. A., & Sonnenburg, J. L. (2013). A refined palate: Bacterial consumption of host glycans in the gut. *Glycobiology*, 23(9), 1038–1046. <https://doi.org/10.1093/glycob/cwt040>
- Markey, B. K., Leonard, F. C., Archambault, M., Cullinane, A., & Maguire, D. (2013). *Clinical veterinary microbiology* (2nd ed.). Mosby Elsevier.
- Marklund, B. I., Tennent, J. M., Garcia, E., Hamers, A., Baga, M., Lindberg, F., Gaastra, W., & Normark, S. (1992). Horizontal gene transfer of the *Escherichia coli* pap and prs pili operons as a mechanism for the development of tissue-specific adhesive properties. *Molecular Microbiology*, 6(15), 2225–2242. <https://doi.org/10.1111/j.1365-2958.1992.tb01405.x>
- McCormick, S. P., Stanley, A. M., Stover, N. A., & Alexander, N. J. (2011). Trichothecenes: From simple to complex mycotoxins. *Toxins*, 3(7), 802–814. <https://doi.org/10.3390/toxins3070802>
- Mellata, M., Dho-Moulin, M., Dozois, C. M., Curtiss, R., Lehoux, B., & Fairbrother, J. M. (2003). Role of avian pathogenic *Escherichia coli* virulence factors in bacterial interaction with chicken heterophils and macrophages. *Infection and Immunity*, 71(1), 494–503. <https://doi.org/10.1128/IAI.71.1.494-503.2003>
- Meneely, J. P., Elliott, C. T., & Al-Jowder, O. (2023). T-2 and HT-2 toxins: Toxicity, occurrence and analysis. *Toxins*, 15(8), 481. <https://doi.org/10.3390/toxins15080481>
- Merchant, I. A., & Packer, R. A. (1967). *Veterinary bacteriology and virology* (7th ed., pp. 286–306). The Iowa University Press.
- Meyer, T. (2010). Competitive ELISA. In R. Kontermann & S. Dübel (Eds.), *Antibody engineering* (pp. 739–745). Springer. [https://doi.org/10.1007/978-3-642-01144-3\\_47](https://doi.org/10.1007/978-3-642-01144-3_47)
- Milićević, D. R., Škrinjar, M., & Baltić, T. (2010). Real and perceived risks for mycotoxin contamination in foods and feeds: Challenges for food safety control. *Toxins*, 2(4), 572–592. <https://doi.org/10.3390/toxins2040572>
- Mireles, A. J., Kim, S. M., & Klasing, K. C. (2005). An acute inflammatory response alters bone homeostasis, body composition, and the humoral immune response of broiler chickens. *Poultry Science*, 84(4), 553–556. <https://doi.org/10.1093/ps/84.4.553>
- Moawad, A. A., Hotzel, H., Hafez, H. M., Ramadan, H., Tomaso, H., Braun, S. D., ... & Monecke, S. (2022). Occurrence, phenotypic and molecular characteristics of extended-spectrum beta-lactamase-producing *Escherichia coli* in healthy turkeys in Northern Egypt. *Antibiotics*, 11(8), 1075. <https://doi.org/10.3390/antibiotics11081075>

- Montgomery, R. D., Jones, L. S., Boyle, C. R., Luo, Y., & Boyle, J. A. (2005). The embryo lethality of *Escherichia coli* isolates and its relationship to various in vitro attributes. *Avian Diseases*, 49(1), 63–69. <https://doi.org/10.1637/7244-070804R>
- Morales, C., Lee, M. D., Hofacre, C., & Maurer, J. J. (2004). Detection of a novel virulence gene and a *Salmonella* virulence homologue among *Escherichia coli* isolated from broiler chickens. *Foodborne Pathogens and Disease*, 1(3), 160–165. <https://doi.org/10.1089/fpd.2004.1.160>
- Munkvold, G. P., & Desjardins, A. E. (1997). Fumonisin in maize: Can we reduce the occurrence? *Plant Disease*, 81(6), 556–565. <https://doi.org/10.1094/PDIS.1997.81.6.556>
- Nešić, K., Jajić, I., & Ignjatović, S. (2013). Mycotoxins – Climate impact and steps to prevention based on prediction. *Acta Veterinaria*, 63(1), 1–16. <https://doi.org/10.2298/AVB1301001N>
- Nolan, L. K., Giddings, C. W., Horne, S. M., Doetkott, C., Gibbs, P. S., Wooley, R. E., & Foley, S. L. (2002). Complement resistance, as determined by viable count and flow cytometric methods, and its association with the presence of *iss* and the virulence of avian *Escherichia coli*. *Avian Diseases*, 46(2), 386–392. [https://doi.org/10.1637/0005-2086\(2002\)046\[0386:CRADBV\]2.0.CO;2](https://doi.org/10.1637/0005-2086(2002)046[0386:CRADBV]2.0.CO;2)
- Nolan, L. K., Vaillancourt, J.-P., Barbieri, N. L., & Logue, C. M. (2013). Colibacillosis. In D. E. Swayne (Ed.), *Diseases of poultry* (13th ed., pp. 751–805). Wiley-Blackwell.
- Oakley, B. B., Gonzalez-Escalona, N., & Molina, M. (2015). Molecular typing and differentiation. In *Compendium of methods for the microbiological examination of foods* (pp. 72–153). Springer.
- Oh, J. Y., Kang, M. S., Yoon, H., Choi, H. W., An, B. K., Shin, E. G., ... & Kwon, Y. K. (2012). The embryo lethality of *Escherichia coli* isolates and its relationship to the presence of virulence-associated genes. *Poultry Science*, 91(2), 370–375. <https://doi.org/10.3382/ps.2011-01757>
- Olsen, A., Jonsson, A., & Normark, S. (1989). Fibronectin binding mediated by a novel class of surface organelles on *Escherichia coli*. *Nature*, 338, 652–655.
- Olsén, A., Wick, M. J., Morgelin, M., & Björck, L. (1998). Curli, fibrous surface proteins of *Escherichia coli*, interact with major histocompatibility complex class I molecules. *Infection and Immunity*, 66(3), 944–949.
- Orndorff, P. E. (1994). *Escherichia coli* type 1 pili. In V. L. Miller, J. B. Kaper, D. A. Portnoy, & R. R. Isberg (Eds.), *Molecular genetics of bacterial pathogenesis* (pp. 91–111). ASM Press.
- Osselaere, A., Li, S.-J., De Bock, L., Devreese, M., Goossens, J., Vandenbroucke, V., Van Bocxlaer, J., Boussery, K., Pasmans, F., Martel, A., De Backer, P.,

- & Croubels, S. (2013). Toxic effects of dietary exposure to T-2 toxin on intestinal and hepatic biotransformation enzymes and drug transporter systems in broiler chickens. *Food and Chemical Toxicology*, *55*, 150–155. <https://doi.org/10.1016/j.fct.2012.12.055>
- Palmer, C. C., & Baker, H. R. (1923). Studies on infectious enteritis of poultry caused by *Bacterium coli communis*. *Journal of the American Veterinary Medical Association*, *63*, 85–96.
- Panth, Y. (2019). Colibacillosis in poultry: A review. *Journal of Agriculture and Natural Resources*, *2*(1), 301–311. <https://doi.org/10.3126/janr.v2i1.26094>
- Parreira, V. R., & Gyles, C. L. (2003). A novel pathogenicity island integrated adjacent to the *thrW* tRNA gene of avian pathogenic *Escherichia coli* encodes a vacuolating autotransporter toxin. *Infection and Immunity*, *71*, 5087–5096.
- Picault, J. P., Giraud, P., Drouin, P., Guittet, M., Bennejean, G., Lamande, J., Toquin, D., & Oueouen, C. (1987). Isolation of a TRTV-like virus from chickens with swollen-head syndrome. *The Veterinary Record*, *121*, 135.
- Porath, J. (1997). From gel filtration to adsorptive size exclusion. *Journal of Protein Chemistry*, *16*, 463–468.
- Pourbakhsh, S. A., Boulianne, M., Martineau-Doize, B., Dozois, C. M., Desautels, C., & Fairbrother, J. M. (1997). Dynamics of *Escherichia coli* infection in experimentally inoculated chickens. *Avian Diseases*, *41*(2), 221–233.
- Pourbakhsh, S. A., Dho-Moulin, M., Bree, A., Desautels, C., Martineau-Doize, B., & Fairbrother, J. M. (1997). Localization of the in vivo expression of P and F1 fimbriae in chickens experimentally inoculated with pathogenic *Escherichia coli*. *Microbial Pathogenesis*, *22*(6), 331–341.
- Procop, G. W., Church, D. L., Hall, G. S., Janda, W. M., Koneman, E. W., Schreckenberger, P. C., & Woods, G. L. (2017). *Koneman's color atlas and textbook of diagnostic microbiology* (7th ed.). Wolters Kluwer.
- Qadri, F., Hossain, S. A., Ciznár, I., Haider, K., Ljungh, A., Wadström, T., & Sack, D. A. (1988). Congo red binding and salt aggregation as indicators of virulence in *Shigella* species. *Journal of Clinical Microbiology*, *26*(7), 1343–1348.
- Quintieri, L., Fanelli, F., Zühlke, D., Caputo, L., Logrieco, A., Albrecht, D., & Riedel, K. (2020). Biofilm and Pathogenesis-Related Proteins in the Foodborne *P. fluorescens* ITEM 17298 With Distinctive Phenotypes During Cold Storage. *Frontiers in Microbiology*, *11*. <https://doi.org/10.3389/fmicb.2020.00991>.
- Raju, M. V., & Devegowda, G. (2000). Influence of esterified-glucomannan on performance and organ morphology, serum biochemistry and haematology in broilers exposed to individual and combined mycotoxicosis (aflatoxin,

- ochratoxin and T-2 toxin). *British Poultry Science*, *41*, 640–650.  
<https://doi.org/10.1080/713654986>
- Ramos-Diaz, J. M., Sulyok, M., Jacobsen, S. E., Jouppila, K., & Nathanail, A. V. (2021). Comparative study of mycotoxin occurrence in Andean and cereal grains cultivated in South America and North Europe. *Food Control*, *130*, 108260.
- Reddy, C. A. (2007). *Methods for general and molecular microbiology* (3rd ed.). ASM Press.
- Redfield, R. J. (2002). Is quorum sensing a side effect of diffusion sensing? *Trends in Microbiology*, *10*(9), 365–370.
- Reichhardt, C., McCrate, O., Zhou, X., Lee, J., Thongsomboon, W., & Cegelski, L. (2016). Influence of the amyloid dye Congo red on curli, cellulose, and the extracellular matrix in *E. coli* during growth and matrix purification. *Analytical and Bioanalytical Chemistry*, *408*, 7709–7717.  
<https://doi.org/10.1007/s00216-016-9868-2>.
- Reisner, A., Haagensen, J. A., Schembri, M. A., Zechner, E. L., & Molin, S. (2003). Development and maturation of *Escherichia coli* K-12 biofilms. *Molecular Microbiology*, *48*(4), 933–946.
- Remel. (2010). *EMB (Levine) agar*. Santa Fe Drive: Remel.
- Richard, J. L. (2007). Some major mycotoxins and their mycotoxicoses—An overview. *International Journal of Food Microbiology*, *119*(1–2), 3–10.
- Rocha, O., Ansari, K., & Doohan, F. M. (2005). Effects of trichothecene mycotoxins on eukaryotic cells: A review. *Food Additives and Contaminants*, *22*(4), 369–378.  
<https://doi.org/10.1080/02652030500058403>
- Rodriguez-Siek, K. E., Giddings, C. W., Doetkott, C., Johnson, T. J., Fakhr, M. K., & Nolan, L. K. (2005). Comparison of *Escherichia coli* isolates implicated in human urinary tract infection and avian colibacillosis. *Microbiology*, *151*, 2097–2110.
- Rycroft, A. N., & Garside, L. (2024). *Fundamentals of veterinary microbiology* (1st ed.). Academic Press.
- Sandu, D. (2023). Mycotoxicoses in poultry. In *MSD Veterinary Manual*.  
<https://www.msdrvetermanual.com/poultry/mycotoxicoses-in-poultry/mycotoxicoses-in-poultry>
- Schouler, C., Schaeffer, B., Bree, A., Mora, A., Dahbi, G., Biet, F., Oswald, E., Mainil, J., Blanco, J., & Moulin-Schouleur, M. (2012). Diagnostic strategy for identifying avian pathogenic *Escherichia coli* based on four patterns of virulence genes. *Journal of Clinical Microbiology*, *50*(5), 1673–1678.

- Schütz, A., Soragni, A., Hornemann, S., Aguzzi, A., Ernst, M., Böckmann, A., & Meier, B. H. (2011). The amyloid–Congo red interface at atomic resolution. *Angewandte Chemie International Edition*, 50(26), 5956–5960. <https://doi.org/10.1002/anie.201008276>
- Schwartz, L. D., & Bickford, A. A. (1986). Necropsy of chickens, turkeys, and other poultry. *Veterinary Clinics of North America: Food Animal Practice*, 2(1), 43–60. [https://doi.org/10.1016/S0749-0720\(15\)31282-2](https://doi.org/10.1016/S0749-0720(15)31282-2)
- Sigma-Aldrich. (n.d.). *Product information: Formalin solution*. Sigma-Aldrich.
- Singh, R., Park, S., Koo, J. S., Kim, I. H., & Balasubramanian, B. (2020). Significance of varying concentrations of T-2 toxin on growth performance, serum biochemical and hematological parameters in broiler chickens. *Journal of Animal Science and Technology*, 62(4), 468. <https://doi.org/10.5187/jast.2020.62.4.468>
- Sipayung, A. L., Wattiheluw, M. J., & Patty, C. W. (2024). Performa produksi ayam ras petelur Isa Brown yang diberi pakan jadi dan campur. *Syntax Admiration*, 5(5), 1568–1578.
- Skyberg, J. A., Horne, S. M., Giddings, C. W., Wooley, R. E., Gibbs, P. S., & Nolan, L. K. (2003). Characterizing avian *Escherichia coli* isolates with multiplex polymerase chain reaction. *Avian Diseases*, 47, 1441–1447.
- Skyberg, J. A., Siek, K. E., Dotkott, C., & Nolan, L. K. (2006). Biofilm formation by avian *Escherichia coli* in relation to media, source and phylogeny. *Journal of Applied Microbiology*, 102, 548–554.
- Slaoui, M., & Fiette, L. (2011). Histopathology procedures: From tissue sampling to histopathological evaluation. In J.-C. Gautier (Ed.), *Drug safety evaluation: Methods and protocols* (Vol. 691, pp. 69–82). Springer. [https://doi.org/10.1007/978-1-60761-849-2\\_4](https://doi.org/10.1007/978-1-60761-849-2_4)
- Sojka, W. J. (1965). *Escherichia coli in domestic animals and poultry*. Commonwealth Agricultural Bureau.
- Sokolovic, M., Garaj-Vrhovac, V., & Simpraga, B. (2008). T-2 toxin: Incidence and toxicity in poultry. *Arhiv za Higijenu Rada i Toksikologiju*, 59, 43–52. <https://doi.org/10.2478/10004-1254-59-2008-1843>
- Stanier, R. Y., & van Neil, C. B. (1941). The main outlines of bacterial classification. *Journal of Bacteriology*, 42, 437–466.
- Stehling, E. G., Yano, T., Brocchi, M., & da Silveira, W. D. (2003). Characterization of a plasmid-encoded adhesin of an avian pathogenic *Escherichia coli* (APEC) strain isolated from a case of swollen head syndrome (SHS). *Veterinary Microbiology*, 95, 111–120.

- Suerbaum, S., Friedrich, S., Leying, H., & Opferkuch, W. (1994). Expression of capsular polysaccharide determines serum resistance in *Escherichia coli* K92. *Zentralblatt für Bakteriologie*, 281(2), 146–157.
- Sumantri, I., Hidayat, A. A. A., & Kusumawardhani, E. (2024). Co-existence of mycotoxins in the diet of layer farms in Java Provinces of Indonesia. In *IOP Conference Series: Earth and Environmental Science* 1360(1): 012016. <https://doi.org/10.1088/1755-1315/1360/1/012016>
- Sun, Y., Huang, K., Long, M., Yang, S., & Zhang, Y. (2022). An update on immunotoxicity and mechanisms of action of six environmental mycotoxins. *Food and Chemical Toxicology*, 163, 112895. <https://doi.org/10.1016/j.fct.2022.112895>
- Surgalla, M. J., & Beesley, E. D. (1969). Congo red-agar plating medium for detecting pigmentation in *Pasteurella pestis*. *Applied Microbiology*, 18, 834–837.
- Sutton, J. C. (1982). Epidemiology of wheat head blight and maize ear rot caused by *Fusarium graminearum*. *Canadian Journal of Plant Pathology*, 4, 195–209.
- Suzuki, T., & Iwahashi, Y. (2012). Comprehensive gene expression analysis of type B trichothecenes. *Journal of Agricultural and Food Chemistry*, 60, 9519–9527. <https://doi.org/10.1021/jf302404z>
- Swaminathan, T. R., Chandran, N. D. J., & Dorairajan, N. (2004). Virulence attributes of *E. coli* associated with colisepticaemic chickens. *Indian Journal of Animal Sciences*, 74(3), 248–252.
- Swanson, S. P., Nicoletti, J., Rood, H. D., Buck, W. B., Cote, L. M., & Yoshizawa, T. (1987). Metabolism of three trichothecene mycotoxins, diacetoxyscirpenol, T-2 toxin, and deoxynivalenol, by bovine rumen microorganisms. *Journal of Chromatography A*, 414, 335–342.
- Taunde, P. A., Bianchi, M. V., Mathai, V. M., Lorenzo, C. D., Gaspar, B. D., Correia, I. M. S., ... & Driemeier, D. (2021). Pathological, microbiological and immunohistochemical characterization of avian colibacillosis in broiler chickens of Mozambique. *Pesquisa Veterinária Brasileira*, 41, e06831. <https://doi.org/10.1590/1678-5150-pvb-6831>
- Tenaillon, O., Skurnik, D., Picard, B., & Denamur, E. (2010). The population genetics of commensal *Escherichia coli*. *Nature Reviews Microbiology*, 8(3), 207–217. <https://doi.org/10.1038/nrmicro2298>
- Thongsomboon, W., Werby, S., & Cegelski, L. (2020). Evaluation of Phosphoethanolamine Cellulose Production among Bacterial Communities Using Congo Red Fluorescence. *Journal of Bacteriology*, 202. <https://doi.org/10.1128/JB.00030-20>.
- Tille, P. M. (2017). *Bailey & Scott's diagnostic microbiology* (14th ed.). Elsevier.

- Tittsler, R. P., & Sandholzer, L. A. (1935). Studies on the *Escherichia-Aerobacter* intermediates. *Journal of Bacteriology*, *29*, 349–362.
- Tittsler, R. P., & Sandholzer, L. A. (1936). The use of semi-solid agar for the detection of bacterial motility. *Journal of Bacteriology*, *31*, 575–580.
- Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., Reece, J. B., & Campbell, N. A. (2017). *Campbell biology* (11th ed.). Pearson Education, Inc.
- Van Hofwegen, D. J., Hovde, C. J., & Minnich, S. A. (2016). Rapid evolution of citrate utilization by *Escherichia coli* by direct selection requires *citT* and *dctA*. *Journal of Bacteriology*, *198*. <https://doi.org/10.1128/JB.00831-15>
- Vaughn, R. H., Osborne, J. T., Wedding, G. T., Tabachnick, J., Beisel, C. G., & Braxton, T. (1950). The utilization of citrate by *Escherichia coli*. *Journal of Bacteriology*, *60*(2), 119–127.
- Venkatesh, P. K., Vairamuthu, S., Balachandran, C., Manohar, B. M., & Raj, G. D. (2005). Induction of apoptosis by fungal culture materials containing cyclopiazonic acid and T-2 toxin in primary lymphoid organs of broiler chickens. *Mycopathologia*, *159*, 393–400.
- Wang, S., Niu, C., Shi, Z., Xia, Y., Yaqoob, M., Dai, J., & Lu, C. (2011). Effects of *ibeA* deletion on virulence and biofilm formation of avian pathogenic *Escherichia coli*. *Infection and Immunity*, *79*(1), 279–287. <https://doi.org/10.1128/IAI.00821-10>
- Wang, S., Shi, Z., Xia, Y., Li, H., Kou, Y., Bao, Y., Dai, J., & Lu, C. (2012). *IbeB* is involved in the invasion and pathogenicity of avian pathogenic *Escherichia coli*. *Veterinary Microbiology*, *159*(3–4), 411–419. <https://doi.org/10.1016/j.vetmic.2012.04.015>
- Wang, Y., Liu, P., Fan, J., Li, S., Zhang, X., Li, Y., Wang, X., Zhang, C., & Yang, X. (2025). T-2 Toxin Nephrotoxicity: Toxic Effects, Mechanisms, Mitigations, and Future Perspectives.. *Journal of agricultural and food chemistry*. <https://doi.org/10.1021/acs.jafc.4c10015>.
- Wannemacher, R. W., Jr., & Wiener, S. L. (1997). Trichothecene mycotoxins. In R. Zajtchuk & R. Bellamy (Eds.), *Medical aspects of chemical and biological warfare* (pp. 587–603). Office of the Surgeon General, Borden Institute.
- Watts, A., & Wigley, P. (2024). Avian Pathogenic *Escherichia coli*: An Overview of Infection Biology, Antimicrobial Resistance and Vaccination. *Antibiotics*, *13*. <https://doi.org/10.3390/antibiotics13090809>.
- Weerts, E., Matthijs, M., Bonhof, J., Van Haarlem, D., Dwars, R., Gröne, A., Verheije, M., & Jansen, C. (2021). The contribution of the immune response to enhanced colibacillosis upon preceding viral respiratory infection in broiler chicken in a dual infection model.. *Veterinary*

*immunology and immunopathology*, 238, 110276 .  
<https://doi.org/10.1016/j.vetimm.2021.110276>.

- Wei, J. T., Wu, K. T., Sun, H., Khalil, M. M., Dai, J. F., Liu, Y., ... & Sun, L. H. (2019). A novel modified hydrated sodium calcium aluminosilicate (HSCAS) adsorbent can effectively reduce T-2 toxin-induced toxicity in growth performance, nutrient digestibility, serum biochemistry, and small intestinal morphology in chicks. *Toxins*, 11(4), 199. <https://doi.org/10.3390/toxins11040199>
- White, A. P., Gibson, D. L., Collinson, S. K., Banser, P. A., & Kay, W. W. (2003). Extracellular polysaccharides associated with thin aggregative fimbriae of *Salmonella enterica* serovar Enteritidis. *Journal of Bacteriology*, 185(18), 5398–5407.
- Whitfield, C., & Trent, M. S. (2014). Biosynthesis and export of bacterial lipopolysaccharides. *Annual Review of Biochemistry*, 83, 99–128. <https://doi.org/10.1146/annurev-biochem-060713-035600>
- Wooley, R. E., Gibbs, P. S., Brown, T. P., & Maurer, J. J. (2000). Chicken embryo lethality assay for determining the virulence of avian *Escherichia coli* isolates. *Avian Diseases*, 44(2), 318–324.
- Wyatt, R. D., Weeks, B. A., Hamilton, P. B., & Burmeister, H. R. (1972). Severe oral lesions in chickens caused by ingestion of dietary fusariotoxin T-2. *Applied Microbiology*, 24(2), 251–257. <https://doi.org/10.1128/am.24.2.251-257.1972>
- Xavier, D. B., Broom, D. M., McManus, C. M. P., Torres, C., & Bernal, F. E. M. (2010). Number of flocks on the same litter and carcass condemnations due to cellulitis, arthritis and contact foot-pad dermatitis in broilers. *British Poultry Science*, 51(5), 586–591.
- Xue, C. Y., Wang, G. H., Chen, F., Zhang, X. B., Bi, Y. Z., & Cao, Y. C. (2010). Immunopathological effects of ochratoxin A and T-2 toxin combination on broilers. *Poultry Science*, 89(6), 1162–1166.
- Yadav, V., Joshi, R. K., Joshi, N., & Diwakar, R. P. (2014). Congo red binding and plasmid profile of *E. coli* isolates of poultry origin. *Journal of Animal Health and Production*, 2(3), 31–32.
- Yang, L., Tu, D., Zhao, Z., & Cui, J. (2017). Cytotoxicity and apoptosis induced by mixed mycotoxins (T-2 and HT-2 toxin) on primary hepatocytes of broilers *in vitro*. *Toxicon*, 129, 1–10. <https://doi.org/10.1016/j.toxicon.2017.01.001>
- Yang, L., Zhao, Z., Wu, A., Deng, Y., Zhou, Z., Zhang, J., & Hou, J. (2013). Determination of trichothecenes A (T-2 toxin, HT-2 toxin, and diacetoxyscirpenol) in the tissues of broilers using liquid chromatography coupled to tandem mass spectrometry. *Journal of Chromatography B*, 942–943, 88–97. <https://doi.org/10.1016/j.jchromb.2013.10.034>

- Yang, S., De Boevre, M., Zhang, H., De Ruyck, K., Sun, F., Zhang, J., Jin, Y., Li, Y., Wang, Z., Zhang, S., ... & De Saeger, S. (2017). Metabolism of T-2 toxin in farm animals and human *in vitro* and in chickens *in vivo* using ultra high-performance liquid chromatography-quadrupole/time-of-flight hybrid mass spectrometry along with online hydrogen/deuterium exchange technique. *Journal of Agricultural and Food Chemistry*, 65(33), 7217–7227. <https://doi.org/10.1021/acs.jafc.7b02575>
- Yang, S., Li, Y., Cao, X., Hu, D., Wang, Z., Wang, Y., Shen, J., & Zhang, S. (2013). Metabolic pathways of T-2 toxin in *in vivo* and *in vitro* systems of Wistar rats. *Journal of Agricultural and Food Chemistry*, 61(41), 9734–9743. <https://doi.org/10.1021/jf4012054>
- Yang, X., Liu, P., Cui, Y., Xiao, B., Liu, M., Song, M., Huang, W., & Li, Y. (2020). A review of the reproductive toxicity of T-2 toxin.. *Journal of agricultural and food chemistry*. <https://doi.org/10.1021/acs.jafc.9b07880>.
- Yin, H., Han, S., Chen, Y., Wang, Y., Li, D., & Zhu, Q. (2020). T-2 toxin induces oxidative stress, apoptosis and cytoprotective autophagy in chicken hepatocytes. *Toxins*, 12(2), 90. <https://doi.org/10.3390/toxins12020090>
- You, L., Zhao, Y., Kuča, K., Wang, X., Olekšák, P., Chrienova, Z., Nepovimova, E., Jačević, V., Wu, Q., & Wu, W. (2021). Hypoxia, oxidative stress, and immune evasion: a trinity of the trichothecenes T-2 toxin and deoxynivalenol (DON). *Archives of Toxicology*, 95, 1899 - 1915. <https://doi.org/10.1007/s00204-021-03030-2>.
- Yu, D., Banting, G., & Neumann, N. F. (2021). A review of the taxonomy, genetics, and biology of the genus *Escherichia* and the type species *Escherichia coli*. *Canadian Journal of Microbiology*, 67(8), 553–571. <https://doi.org/10.1139/cjm-2020-0508>
- Yunus, A. W., Kröger, S., Tichy, A., Zentek, J., & Böhm, J. (2013). Electrophysiological response of chicken's jejunal epithelium to increasing levels of T-2 toxin. *Mycotoxin Research*, 29, 23–27. <https://doi.org/10.1007/s12550-012-0142-y>
- Zain, M. E. (2011). Impact of mycotoxins on humans and animals. *Journal of Saudi Chemical Society*, 15(2), 129–144. <https://doi.org/10.1016/j.jscs.2010.06.006>
- Zhang, G., Meredith, T. C., & Kahne, D. (2013). On the essentiality of lipopolysaccharide to Gram-negative bacteria. *Current Opinion in Microbiology*, 16(6), 779–785. <https://doi.org/10.1016/j.mib.2013.09.009>
- Zhang, X., Wang, Y., Velkov, T., Tang, S., & Dai, C. (2018). T-2 toxin-induced toxicity in neuroblastoma-2a cells involves the generation of reactive oxygen, mitochondrial dysfunction and inhibition of Nrf2/HO-1 pathway.. *Food and chemical toxicology: an international journal*

*published for the British Industrial Biological Research Association*, 114, 88-97 . <https://doi.org/10.1016/j.fct.2018.02.010>.

- Zimbro, M. J., Power, D. A., Miller, S. M., Wilson, G. E., & Johnson, J. A. (2009). *Difco & BBL manual: Manual of microbiological culture media* (2nd ed.). Becton Dickinson and Company.
- Zinedine, A., & Mañes, J. (2009). Occurrence and legislation of mycotoxins in food and feed from Morocco. *Food Control*, 20(4), 334–344. <https://doi.org/10.1016/j.foodcont.2008.07.002>
- Ziprin, R. L., & Elissalde, M. H. (1990). Effect of T-2 toxin on resistance to systemic *Salmonella typhimurium* infection of newly hatched chickens. *American Journal of Veterinary Research*, 51(11), 1869–1872.
- Zuo, J., Tu, C., Wang, Y., Qi, K., Hu, J., Wang, Z., Mi, R., Yan, H., Chen, Z., & Han, X. (2019). The role of the *wzy* gene in lipopolysaccharide biosynthesis and pathogenesis of avian pathogenic *Escherichia coli*. *Microbial Pathogenesis*, 127, 296–303. <https://doi.org/10.1016/j.micpath.2018.12.021>