DAFTAR PUSTAKA

Abdeltawab, A. M and M. S. A. Khattab. 2018. Utilization of palm kernel cake as a ruminant feed for animal: A Review. Asian J. Biol. Sci. 11: 157 - 164.

Abdollahi, M. R., F. Zaefarian, and V. Ravindran. 2018. Feed intake response of broilers: Impact of feed processing. Anim. Feed Sci. Technol. 237: 154 – 165.

Abdollahi, M.R., B. J. Hosking, D. Ning, and V. Ravindran. 2016. Influence of palm kernel meal inclusion and exogenous enzyme supplementation on growth performance, energy utilization, and nutrient digestibility in young broilers. Asian Australas. J. Anim. Sci. 29: 539 - 548.

Abdurrahman, F, Soeharsono, dan K. Soepranianondo. 2022. Studi indeks performa dan analisis usaha pada ayam pedaging yang diinfeksi *Escherichia coli* dengan pemberian probiotik bakteri asam laktat. Jurnal Medik Veteriner. 5: 74 – 80.

Adeola, O. and A. J. Cowieson. 2004. Opportunities and challenges in using exogenous enzyme to improve non ruminant animal production. J. Anim. Sci. 89: 3189 – 3218.

Adesehinwa, A. O. K. 2007. Utilization of Palm Kernel Cake as a Replacement for Maize in Diets of Growing Pigs: Effects on performance, serum metabolites, nutrient digestibility and cost of feed conversion. Bulg. J. Agric. Sci. 13: 593 – 600.

Aftab, U. 2012. Exogenous carbohydrase in cornsoy diets for broilers. World's Poult Sci J. 68:447463.

Akinyeye, O.A., E. I. Adeyeye, O. Fasakina, and A. Agboola. 2011. Physico-chemical properties and anti-nutritional factors of palm fruit products (*Elaeis Guineensis* Jacq) from ekiti state nigeria. E. J. Agric. Food Chem.10: 2190 – 2198.

Ali, M. S., G. H. Kang, and S. T. Joo. 2008. A Review: Influences of pre-slaughter stress on poultry meat quality. Asian-Aust. J. Anim. Sci. 21: 912 - 916.

Alshelmani, M. I., T. C. Loh, H. L. Foo, W. H. Lau, and A. Q.Sazili. 2014. Biodegradation of palm kernel cake by cellulolytic and hemicellulolytic bacterial cultures through solid state fermentation. Sci. World J. 14: 1 - 8.

Alimon, A. R. 2004. The nutritive value of palm kernel cake for animal feed. Palm Oil Developments. 40: 12 -14.

Alyileili, S. R., K. A. El-Tarabily, I. E. H. Belai, W. H. Ibrahim, M. Sulaiman, and A. S. Hussein. 2020. Effect of *Trichoderma reesei* degraded date pits on antioxidant enzyme activities and biochemical responses of broiler chickens. 7: 1 – 10.

Alqhtani, A. H., A. R. Al Sulaiman, A. S. Alharthi, and A. M. Abudabos. 2022. Effect of Exogenous Enzymes Cocktail on Performance, Carcass Traits, Biochemical Metabolites, Intestinal Morphology, and Nutrient Digestibility of Broilers Fed Normal and Low-Energy Corn–Soybean Diets. Animals. 12: 1094.

Angel, C. R., W. Saylor, S. L. Vieira, and N. Ward. 2011. Effects of a monocomponent protease on performance and protein utilization in 7- to 22-day-old broiler chickens. Poult. Sci. 90: 2281 – 2286.

AOAC, 2005. Official Methods of Analysis. 15th ed. Association of Official Analytical Chemists, Washington, DC.

Apajalahti, J.H. A., L. K. Sarkilahti, B. R. E. Maki, J.P. Heikkinen, P.H. Nurminen, and W. E. Holben. 1998. Effective recovery of bacterial DNA and percent-guanine-plus-cytosine-based analysis of community structure in the gastrointestinal tract broiler chickens. Appl. Environ. Microbiol. 64: 4084 – 4088.

Ardiyansyah., F., S. Tantalo, dan K. Nova. 2013. Perbandingan performa dan strain ayam Jantan tipe medium yang diberi ransum komersial broiler. J. Ilmiah Peternakan Terpadu. 1: 158 – 163.

Ariyadi, B. and S. Harimurti. 2010. The effects of single lactic bacteria probiotic supplementation on intestinal mucosa profile and immune response in broilers. The 5th International Seminar on Tropical Animal Production. October 19-22, 2010, Faculty of Animal Science, Universitas Gadjah Mada, Yogyakarta. 314 - 319.

Aristides, L. G. A., E. J. Venancio, A. A. Alfieri, R. A. A. Otonel, W. J. Frank, and A. Oba. 2018. Carcass characteristics and meat quality of broilers fed with different levels of Saccharomyces cerevisiae fermentation product. Poult. Sci. 97:3337–3342.

Arora, T and R. Sharma. 2011. Fermentation potential of the gut microbiome: implications for energy homeostasis and weight management. Nutrition. 69: 99 – 106.

Astuti, P and H. Suripta. 2020. Performance of Broiler Chicken Carcass Provided with Water Extract (*Phyllanthus niruri* L) and Moringa (*Moringa oleifera* Lam). BJAS. 2: 61 – 67.

Aviagen. 2019. Indian River / Indian River FF Broiler Performance Objectives. 0419. AVNIR-012.

Aya, V. E., B. A. Ayanwale, A. T. Ijaiya, and A. Aremu. 2013. Performance and nutrient digestibility in broiler chicks as influenced by multi enzyme addition to starter diets containing palm kernel meal. Biotechnol. Anim. Husb. 29: 92 – 104.

Ayanwale, B and A. Ijaiya. 2013. Performance and nutrient digestibility in broiler chicks as influenced by multienzyme addition to starter diets containing palm kernel meal. Biotechnol. Anim. Husb. 29: 93 – 104.

Azizi, M. N., T. C. Loh., H. L. Foo., and E. L. T. Chung. 2021. Review: Is palm kernel cake a suitable alternative feed ingredient for poultry? Animals. 11: 4-15.

Badan Pusat Statistik. 2021. Statistik Indonesia 2021. ISSN. 0126-2912.

Badan Pusat Statistik. 2023. Statistik Indonesia 2023. ISSN. 0126-2912.

Baron, S. 1996. *Streptococcus*. Medical Microbiology. 4th edition. University of Texas Medical Branch at Galveston.

Baurhoo, B., P. R. Ferket, and X. Zhao. 2009. Effects of diets containing different concentrations of mannanoligosaccharide or antibiotics on growth performance, intestinal development, cecal and litter microbial populations, and carcass parameters of broilers. Poult Sci. 88: 2262 - 2272.

Baurhoo, B., A. Letellier, X. Zhao, and C. A. Ruiz-Feria. 2007. Cecal populations of lactobacilli and bifidobacteria and *Escherichia coli* populations after *in vivo Escherichia coli* challenge in birds fed diets with purified lignin or mannanoligosaccharides. Poult Sci. 86: 2509 - 2516.

Becker W. A, J. V. Spencer, L. W. Minishand and J. A. Werstate. 1979. Abdominal and carcas fat in five broiler strain. Poult. Sci. 60: 692-697.

Bedford, M. R and H. L. Classen. 1993. An *in vitro* assay for prediction of broiler intestinal viscosity and growth when fed rye-based diets in the presence of exogenous enzyme. Poult. Sci. 72: 137 – 143.

Bennato, F., A. Lanni, C. Martino, L. Grotta, and G. Martino. 2021. Evaluation of chemical composition and meat quality of breast muscle in broilers reared under light-emitting diode. Animals. 11: 1 – 12.

Bianchi, M., M. Pertacci, F. Sirri, E. Folegathi, A. Franchini, and Meluzzi. 2007. The influence of the season and market class of broiler chickens on breast. Poult. Sci. 86: 959 – 963.

Boateng, M, D. B. Okai, J. Baah J, and A. Donkoh. 2013. Effect of processing method on the quality of palm kernel cake: Chemical composition and nutrient utilization in enzyme supplemented diets. Afr. J. Agric. Res. 8: 5226 – 5231.

Bogucka, J., A. Dankowiakowska, G. Elminowska-Wenda, A. Sobolewska, J. Jankowski, M. Szpinda, and M. Bednarczyk. 2017. Performance and small intestine morphology and ultrastructure of male broilers Injected in ovo with bioactive substances. Ann. Anim. Sci. 17: 179 - 195.

Budiarta, D. H., E. Sudjarwo, and N. Cholis. 2014. Pengaruh kepadatan kandang terhadap konsumsi pakan, pertambahan bobot badan dan konversi pakan pada ayam pedaging. J. Ternak Tropika. 15: 31 - 35.

Bulkani, Samsuhadi, Y, Sutaryono, D. Kiswoto, Sukarne, and T. Rozi. 2022. Carcass characteristics and pure meat production of broiler chickens in traditional markets on Lombok and Sumbawa Islands. 2022. Adv. Anim. Vet. Sci. 10: 1602 – 1610.

Butterwith, S. C. 1989. Contribution of lipoprotein lipase activity to the differential growth of three adipose tissue depots in young broiler chickens. Brit. Poultry Sci. 30: 927 - 933.

Cabuk, M and O. H. Bayrakar. 2000. Effect of heat stress on some blood parameters in broilers. Turk. J. Vet. Anim. Sci. 24: 145 – 148.

Caprita, R, A. Caprita, and C. Julean. 2011. Biochemical Aspects of Non-Starch Polysaccharides. J. Anim. Sci. Biotechnol. 43: 368 – 374.

Carrasco, J. M. D, N. A. Casanova, and M. E. F. Miyakawa. 2019. Microbiota, gut health and chicken productivity: What Is the Connection? Microorganisms. 7: 374.

Chacher, M. F. A., Z. Kamran, U. Ahsan, S. Ahmad, K. C. Koutoulis, H. G. Qutab Ud Din, and Ö.Cengiz. 2017. Use of mannan oligosaccharide in broiler diets: an overview of underlying mechanisms. Worlds Poult Sci J. 73: 831 - 844.

Chen, X., G. Zhang, W. Wang, G. Liu, H. Cai, A. Purba, and A. Zheng. 2023. Compound nonstarch-polysaccharide enzymes improve growth performance, slaughter performance, immune function, and apparent utilization rate of nutrients in broiler chickens fed a low-metabolizable energy diet. Front. Vet. Sci. 10:1162811.

Chen, W. L., J. B. Liang, M. F. Jahromi, N. Abdullah, Y. W. Ho, and V. Tufarelli. 2014. Enzyme treatment enhances release of prebiotic oligosaccharides from palm kernel expeller. Bioresource. 10: 196 - 209.

Choct, M. 2006. Enzymes for the feed industry: past, present and future. Worlds Poult Sci J. 62: 5 – 15

Chong, C. H., I. Zulkifli, and R. Blair. 2008. Effects of dietary inclusion of palm kernel cake and palm oil, and enzyme supplementation on performance of laying hens. Asian-Aust. J. Anim. Sci. 21: 1053 – 1058.

Christensen, K., J.P. McMurtry, Y.V. Thaxton, A. Corzo, C. McDaniel, and C. G. Scanes. 2013. Metabolic and hormonal responses of growing modern meat-type chickens to fasting. Br. Poult. 54: 199 – 205.

Chuang, W. Y., L. J. Lin, H. D. Shih, Y. M. Shy, S. C. Chang, and T. T. Lee. 2021. The potential utilization of high-fiber agricultural by-products as monogastric animal feed and feed additives: A Review. Animals (Basel). 11: 1 – 17.

Cozannet, P., R. Davin, M. Jlali, J. Jachacz, A. Preynat, and F. Molist. 2021. Dietary metabolizable energy, digestible lysine, available phosphorus levels and exogenous enzymes affect broiler chicken performance. Animal. 15: 100206.

Cummings, J. H., and A. M. Stephen. 2007. Carbohydrate terminology and classification. Eur J Clin Nutr. 61: S5 - S18.

Dairo, F. A. S and A. O. Fasuyi. 2007. Evaluation of fermented palm kernel meal and fermented copra meal proteins as substitute for soybean meal protein in laying hens diets. J. Cen. Eur. Agric. 9: 35 – 44.

Dawood, A and K. Ma. 2020. Application of microbial β-mannanases. Front. Bioeng. Biotechnol. 8: 1- 17. Article 598630.

Demirci, M and M. Basalan. 2021. Effects of medium-chain free fatty acids on performance, some biochemical parameters and meat fatty acids profile of broiler chickens. Thai J Vet Med. 51: 339 - 346.

Delezi, E., Q. Swennen, J. Buyse, and E. Decuypere. 2007. The effect of feed withdrawal and crating density in transit on metabolism and meat quality of broilers at slaughter weight. Poult. Sci. 86: 1414 – 1423.

Denke, M.A. 2006. Dietary fats, fatty acids, and their effects on lipoproteins. Curr Atheroscler Rep. 8:466-71.

Devers DO, P. M., and W. M. Brown ND. 2020. Fatty Acid Profilling. Texbook of Natural Medicine. Fifth edition. 127 – 133e2.

Dhawan, S. and J. Kaur. 2007. Microbial mannanases: an overview of production and applications. Crit. Rev. Biotechnol. 27: 197 – 216

Dillon, V. M. 2014. Natural anti-microbial systems. Preservative effects during storage. In: Batt, C. A., and M. L. Tortorello (Eds.). Encyclopedia of Food Microbiology. Academic Press, UK. pp. 941–947

Direktorat Jenderal Perkebunan. 2019. Kelapa Sawit dalam buku Statistik Perkebunan Indonesia 2018 – 2020. Kementerian Pertanian, Jakarta.

Do Nascimento, G.S., R. P. Constantin, E. H. Giglioni, C. V. D. C. Ghizoni, A. Bracht, K. S. Utsunomiya, N. S. Yamamoto, E. L. I. Iwamoto, J. Constantin, and R. P. Constantin. 2018. The acute of citrus flavanones on the metabolism of glycogen and monosaccharides in the isolated perfused rat liver. Toxicol Lett. 291: 158 - 172.

Dudek, S. O., M. Pietras, and J. Nowak. 2018. The effect of amaranth seeds, sea buckthorn pomace and black chokeberry pomace in feed mixtures for broiler chickens on productive performance, carcass characteristics and selected indicators of meat quality. Ann. Anim. Sci. 18: 501 – 523.

Dugget, N. A. 2015. High-throughput sequencing of the chicken gut microbiome. Thesis. The University of Birmingham, UK.

Erez, E., D. Fass, and E. Bibi. 2009. How intramembrane proteases bury hydrolyticreactions in the membrane. Nature. 459: 371–378.

Esuga, P. M., A. A. Sekoni, J. J. Omage and G. S. Bawa. 2008. Evaluation of enzyme (Maxigrain®) supplementation of graded levels of palm kernel meal (PKM) on the performance of broiler chickens. Pakistan J. Nutr. 7: 607 - 613.

Ezeilo, U. R., C. T. Lee, F. Huyop, I. I. Zakaria, and R. A. Wahab. 2019. Raw oil palm frond leaves as cost-effective substrate for cellulase and xylanase productions by Trichoderma asperellum UC1 under solid-state fermentation. J. Environ. Manage. 243: 206 - 217.

Ezieshi, E. V., and J. M. Olomu. 2009. Nutritional evaluation of palm kernel meal types 1. Proximate composition and metabolizable energy value. Afr. J. Biotechnol. 6: 2484 – 2486.

Fagundes, N. S., M. C. Milfort, S. M. Williams, M. J. D. Costa, A. L. Fuller, J. F. Menten, R. Rekaya, and S. E. Anggrey. 2020. Dietary methionine level alters growth, digestibility, and gene expression of amino acid transporters in meat-type chickens. Genet. Mol. Biol. Poult. Sci. 99: 67 – 75,

Fan, S. P., L. Q. Jiang, C. H. Chia, Z. Fang, S. Zakaria, and K. L. Chee. 2014. High yield production of sugars from deproteinated palm kernel cake under microwave irradiation via dilute sulfuric acid hydrolysis. Bioresour. Technol. 153: 69 – 78.

Farida, T. E., N. D. Hanafi, and M. Tafsin. 2022. Comparative study of broiler chicken performance in closed bouse and conventional system in North Sumatera. The 5th International Conference on Agriculture, Environment, and Food Security. Canada. 977 (2022) 012138.

Ferket, P. R and A. G. Gernet. 2006. Factors that affect feed intake of meat birds: A Review. Int. J. Poult. Sci. 5: 905 – 911.

Fernandes, R. T. V., A. M. V. de Arruda, A. S. Melo, J. B. M. Marinho, R. T. V. Fernandes, and L. C. de Figueiredo. 2016. Chemical composition and pH of the meat of broilers submitted to pre-slughter heat stress. J. Anim. Behav. Biometeorol. 4: 93 – 95.

Fidianti, F. A., B. Hartoyo, dan Titin Widyastuti. 2023. Konversi pakan dan *income over feed cost* ayam broiler pada penggunaan biopeptide ekstrak ceker ayam yang dihidrolisis dengan enzim papain. Prosiding Seminar Nasional Teknologi dan Agribisnis Peternakan X. Universitas Jenderal Soedirman. 178 – 184. ISSN 2830-6686.

Fitro, R., D. Sudrajat, dan E. Dihansih. 2015. Performa ayam pedaging yang diberi ransum komersial yang mengandung tepung ampas kurma sebagai pengganti jagung. Jurnal Peternakan Nusantara. 1: 1 - 8.

Flint, H. J., S. H. Duncan, K. P. Scott, and P. Louis. 2015. Links between diet, gut microbiota composition and gut metabolism. 74: 13 – 22.

Folch, J., M. Lees, and G. H. Sloan-Stanley. 1957. A simple method for the isolation andpurification of total lipids from animal tissues. J. Bio.Chem. 226: 497 – 509.

Fouad, A. M., and H. K. El-Senousey. 2014. Nutritional factors affecting abdominal fat deposition in poultry: a review. Asian Australasian. J. Anim. Sci. 27: 1057 – 1068.

Freitas, T.B., T. L. Felix, M. S. Pedreiraa, R. R. Silva, H. G. O. Silvaa, and B. S. Moreira. 2017. Effects of increasing palm kernel cake inclusion in supplements fed to grazing lambs on growth performance, carcass characteristics, and fatty acid profile. Animal Feed Science and Technology. 226: 71 – 80.

Galeano, J. A. C., A. L. Herrera, and J. P. Suescun. 2015. The probiotic *Enterococcus faecium* modifies the intestinal morphometric parameters in weaning piglets. Rev. Fac. Nal. Agr. 69: 7803 – 7811.

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.

Gerritsen, J. 2015. The genus *Rombutsia*: genomic and functional characterization of novel bacteria dedicated to life in the intestinal tract. Ph.D Thesis. Wageningen University, Belanda.

Gopinger, E., E. G. Xavier, M. C. Elias, A. A. S. Catalan, M. L. S. Castro, A. P. Nunes, and V. F. B. Roll. 2014. The effect of different dietary levels of canola meal on growth performance, nutrient digestibility, and gut morphology of broiler chickens. Poult. Sci. 93: 1130 - 1136.

Gong, J., R.J. Forster, H. Yu, J. R. Chambers, R. Wheatcroft, P. M. Sabour, and S. Chen. 2002. Molecular analysis of bacterial populations in the ileum of broiler chickens and comparison with bacteria in the cecum. FEMS Microbiol. Ecol. 41: 171 - 179.

Greenacre, C. B., and T. Y. Moroshita. 2021. Backyard Poultry Medicine & Surgery: A Guide for Veterinary Practitioner. Second Edition. Iowa:Wiley Blackwell, Hoboken, USA.

Gutierrez, O., C. Zhang, D. J. Caldwell, J. B. Carey, A. L. Cartwright, and C. A. Bailey. 2008. Guar meal diets as an alternative approach to inducing molt and improving Salmonella enteritidis resistance in late-phase laying hens. Poult. Sci. 87: 536 - 540.

Habte-Tsion, H.-M., and V. Kumar. 2018. Nonstarch polysaccharide enzymes—general aspects. Enzymes in Human and Animal Nutrition. 183 – 209.

Hakim, A. H., I. Zulkifli, A. S. Farjam, E. A. Awad, and S. K. Ramiah. 2022. Impact of feeding fermented palm kernel cake and high dietary fat on nutrient digestibility, enzyme activity, intestinal morphology and intestinal nutrient transporters mRNA expression in broiler chickens under hot and humid conditions. Animal. 12: 1 – 14.

Halas, V and L. Babinszky. 2014. Role of dietary polysaccharides in monogastric farm animal nutrition. Polysaccharides: natural fibers in food and nutrition. CRC Press, Florida. 429 – 475.

Hanafi, N. D., M. Tafsin, S. H. Sitindoan, A. Sadeli, dan K. Simanungkalit. 2022. Pengaruh penggunaan bungkil inti sawit taraf 40% dalam ransum terhadap bobot potong,karkas, potongan komersil karkas dan kualitas daging ayam SenSi-1 Agrinak. Jurnal Agripet. 22: 62 -71.

Hasibuan, H. A., D. Siahaan, dan Sunarya. 2012. Kajian karakteristik minyak inti sawit dan produk fraksinasinya terkait dengan amandemen standar codex. Jurnal Standardisasi. 14: 98 – 104.

Hermier, D. 1997. Lipoprotein metabolism and fattening in poultry. J. Nutr. 127: 805 - 808

Hishamuddin, M. A. 2001. Malaysian palm kernel cake as animal feed. Malaysian Palm Oil Board. Palm Oil Developments. 34: 4-6.

Hilge, M., S. M. Gloor, W. Rypniewski, O. Sauer, T. D. Heightman, W. Zimmermann, K. Winterhalter, and K. Piontek. 1998. High-resolution native and complex structures of thermostable b-mannanase from *Thermomonospora fusca* — substrate specificity in glycosyl hydrolase family 5. Structure. 6: 1433 – 1444.

Hlalukana, N., M. Magengelele, S. Malgas, and B. I. Pletschke. 2021. Enzymatic conversion of mannan-rich plant waste biomass into prebiotic mannooligosaccharides. Foods. 10: 1 - 16.

Honikel, K. O. 1998. Reference methods for the Assesment of physical characteristics of meat. Meat Sci. 49: 447 – 457.

Huang, L., L. Luo, Y. Zhuang, Z. Wang, and Z. Xia. 2018. Effect of the dietary probiotic, Enterococcus faecium NCIMB11181, on the intestinal barrier and system immune status in Escherichia coli O78-challenged broiler chickens. Probiotics Antimicrob. Proteins. 11: 946 – 956.

Hui, Y. H. 2006. Handbook of Food Science, Technology, and Engineering. Vol. 3. CRC Press, Florida.

Hussain, M., M. A. Mirza, H. Nawaz, M. Asghar, and G. Ahmed. 2019. Effect of exogenous protease, mannanase, and xylanase supplementation in corn and high protein corn DDGS based diets on growth performance, intestinal morphology and nutrient digestibility in broiler chickens. Braz. J. Poultry Sci. eRBCA-2019-1088.

Husna, A., N. Y. Runa, A. T. M. Badruzzaman, N. Y. Runa, S. Yesmin, N. S. Runa, M. A. Rahman, and M. M. Mia. 2017. Evaluation of productive performance of selected broiler strains under field condition at Sylhet district of Bangladesh. Annals of Veterinary and Animal Science. 4: 105 – 110.

Iqbal, F., U. Atmomarsono, and R. Muryani. 2012. Pengaruh berbagai frekuensi pemberian pengaruh berbagai frekuensi pemberian pakan dan pembatasan pakan terhadap efisiensi penggunaan protein ayam broiler. Animal Agricultural Journal. 1: 53 – 64.

Istiqomah, L., S. N. Hayati, E. Damayanti, H. Julendra, A. A. Sakti, and Untari. 2013. Performance and meat quality of broilers Infected with *Escherichia coli* and administered with bio additive, probiotic, and antibiotic. Media Peternakan. 36: 14 – 20.

Jose, C. E. E., R. B. G. Jose, L. D. C. Alejandro, and M. C. G. Maria. 2022. Nutrient content and *in vitro* degradability of the palm kernel meal produced in the state of Chiapas, Mexico, as feed for ruminants. Agro Prod. 15: 125–131.

Jaelani, A., S. Dharmawati, dan Wanda. 2014. Berbagai lama penyimpanan daging ayam broiler segar dalam kemasan plastik pada lemari es (Suhu 4^{o}C) dan pengaruhnya terhadap sifat fisik dan organoleptik. ZIRAA'AH Majalah Ilmiah Pertanian. 39: 119-128. ISSN Elektronik 2355 - 3545

Jensen, J., P. I. Rustad, A. J. Kolnes, and Y. C. Lai. 2011. A Review: The role of skeletal muscle glycogen breakdown for regulation of insulin sensitivity by exercise. Front. Physiol. 2: 1 – 11.

Jimoh, A. 2018. Effects of enzyme cocktails on *in vitro* digestibility of palm kernel cake. J. Cent. Eur. Agric. 19: 114-125.

Johnston, L. J., S. Noll, and A. Renteria. 2003. Feeding by-products high in concentration of fiber to nonruminants. In Proceedings of the 3rd National Alternative Feeds Symposium Western Regional Coordinating Committee, Kansas City.

Jong A. J. D., M. Kloppenburg, R. E. M. Toes, and A. L. Facsinay. 2014. Fatty acid, lipid mediators, and T-cell function. Front. Immunol. 5: 1 - 7.

Joo, S. T. 2018. Determination of Water-hoding capacity of porcine musculature base on released water method using optimal load. Korean J Food Sci Anim Resour. 38: 823 - 828.

Jun-Hui, X., C. Hui-Juan, Z. Bin, and Y. Hui. 2020. The mechanic effect of bromelain and papain on terderization in jumbo squid (dosidicus gigas) muscle. Food. Res. 131: 108991

Kaca, I. N., Y. Tonga, L. Suariani, I. G. A. M. P. Sanjaya, N. M. Yudiastari, and N. K. E. Suwitasari. 2021. Dry matter digestibility, organic matter and digestibility *in vitro* of setaria grass at types and different dosage of fertilizers. Int. J. Life Sci. 5: 125 – 132.

Kalidas, N. R., M. Saminathan, I. S. Ismail, F. Abas, P. Maity, S. S. Islam, N. Manshoor, and K. Shaari. 2017. Structural characterization and evaluation of prebiotic activity of oil palm kernel cake mannanoligosaccharides. Food Chem. 234: 348 – 355.

Kanost, M. R and T. E. Clarke. 2005. Comprehensive Moleculer Insect Science. Editor Lwrence. I. Gilbert. 4: 247 – 265. Elsevier B.V.

Kenny, A. P. 1952. The determination of cholesterol by the Liebermann – Burchard Reaction. Biochem J. 52: 611 – 619.

Keong, N. W. 2004. Researching the use of palm kernel cake in aquaculture feeds. Malaysian Palm Oil Board. 41: 19 – 21.

Kerth, C. R. 2013. The Science of Meat Quality. First published. John Wiley and Sons, Inc. UK.

Khatibjoo, A., M. Mahmoodi, F. Fattahnia, M. A. Gharaei, A. N. Shokri, and S. Soltani. 2017. Effects of dietary short- and medium-chain fatty acids on performance, carcass traits, jejunum morphology, and serum parameters of broiler chickens. J. Appl. Anim. Res. 46: 1 – 7.

Khwatenge, C. N., B. M. Kimathi, T. T. Bowden, and S. N. Nahashon. 2020. Expression of lysine-mediated neuropeptide hormones controlling satiety and appetite in broiler chickens. Poult. Sci. 99:1409 – 1420.

Kiarie, E., L. F. Romero, and C. M. Nyachoti. 2013. The role of added feed enzymes in promoting gut health in swine and poultry. Nutr Res Rev. 26: 71-88.

Kidd, M., P. Tillman, P. Waldroup, and W. Holder. 2013. Feed-grade amino acid use in the United States: the synergetic inclusion history with linear programming. J. Appl. Poult. Res. 22: 583 – 590

Klein, J., M. Williams, B. Brown, S. Rao, and J. T. Lee. 2015. Effects of dietary inclusion of a cocktail NSPase and β-mannanase separately and in combination in low energy diets on broiler performance and processing parameters. J. Appl. Poult. Res. 24: 489 – 501.

Ko, H., H. K. Kang, J. Moturi, S. L. Inglae, and J. Kim. 2021. Supplementation of enzyme cocktail in chickens diet is an effective approach to increase the utilization of nutrient in wheat-based diets. J. Anim. Sci.Technol. 63: 69-76.

Koranteng, A. A. A., K. A. Gbogbo, B. Adjei-Mensah, T. Bouassi, R. K. Agbehadzi, and K. Tona. 2023. Influence of palm kernel cake on the growth performance, gut health and hematochemical indices of slow-growing broilers. J. Appl. Anim. Res. 51: 554 – 563.

Koranteng, A. A. A., K. A. Gbogbo, B. Adjei-Mensah, T. Bouassi, C. T. F. Aina, J. Glago, and T. Kokou. 2022. Impact of palm kernel cake with or without multi-blend enzyme on the growth performance and carcass traits of Sasso broilers. Int. J. Vet. Sci. Med. 10: 80 – 89.

Krismianto, L., V. D. Yunianto, N. Suthama, and Agritio. 2023. Effect of adding palm kernel meal extract to rations using microparticle protein sources on fatty meat and carcass weight of broiler chicken. BJAS. 5: 37 – 47.

Laili, A. R., R. Damayanti, B. Setiawan, and S. Hidanah. 2022. Comparison of broiler performance in closed house and ope hous systems in Trenggalek. JAVest. 03: 6 – 11.

Larasati, N., S. Chasanah, S. Machmudah, dan S. Winardi. 2016. Studi analisa ekonomi pabrik CPO (*Crude Palm Oil*) dan PKO (*Palm Kernel Oil*) Dari Buah Kelapa Sawit. Jurnal teknis ITS. 5: 2337 – 3539.

Lawrie, R. A. 2003 Ilmu Daging. Diterjemahkan oleh Parakkasi., A, dan Y. Amwila. Edisi Ke-5. Universitas Indonesia Press, Jakarta.

Lebreton, F., R. J. L. Willems, and M. S. Gilmore. 2014. *Enterococcus* Diversity, Origins in Nature, and Gut Colonization. In: *Enterococci*: From Commensals to Leading Causes of Drug Resistant Infection [Internet]. Boston: Massachusetts Eye and Ear Infirmary. Bookshelf URL: https://www.ncbi.nlm.nih.gov/books/

Lee, F. H., S. Y. Wan, H. L. Foo, T. C. Loh, R. Mohamad, R. A. Rahim, and Z. Idrus. 2019. Comparative study of extracellular proteolytic, cellulotyc, and hemicellulolytic enzyme activities and biotransformation of palm kernel cake biomass by *Lactic Acid* bacteria isolated from Malaysian foods. Mol. Sci. 20: 1 – 26.

Lee, S. A., M. R. Bedford, and C. L. Walk. 2018. Meta-analysis: explicit value of mono-componen proteases in monogastric diets. Poult. Sci. 97: 2078 – 2085.

Leeson, S and J. D. Summers. 2008. Commercial Poultry Nutrition. 3rd ed. Nottingham University Press, Nottingham.

Lyon, B. G., D. P. Smith, C. E. Lyon, and E. M. Savage. 2004. Effects of diet and feed withdrawal on the sensory descriptive and instrumental profiles of broiler breast fillets. Poult. Sci. 83: 275 - 281.

Mairizal and Filawati. 2021. Optimization of mannanase enzyme production from *Bacillus cereus* V9 using local mannan subastrate. Proceedings of the 3rd Green Development International Conference (GDIC 2020). Atlantis Press. Adv. eng. res. 205: 71 – 76.

Malathi, V., and G. Devegowda. 2001. *In vitro* evaluation of nonstarch polysaccharide digestibility of feed ingredients by enzymes. Poult. Sci. 80: 302 – 305.

Matsue, M., Y.Mori, S. Nagase, Y. Sugiyama, R. Hirano, K. Ogai, K. Ogura, S. Kurihara, and S. Okamoto. 2019. Measuring the antimicrobial activity of lauric acid against various bacteria in human gut microbiota using a new method. Cell Transplantation. 28: 1528 - 1541.

Maulana, M. F. 2018. Pengaruh bentuk kandang closed house dan semi closed house terhadap konsumsi pakan, pertambahan bobot dan dan *Feed Conversion Ratio* (FCR) pada ayam pedaging. Skripsi. Fakultas Peternakan, Universitas Brawijaya Malang.

Mihaylova, B., J. Emberson, L. Blackwell, A. Keech, J. Simes, E. H. Barnes, M. Voysey, A. Gray, R. Collins, and C. Baigent. 2012. The effects of lowering LDL cholesterol with statin therapy in people at low risk of vascular disease: meta-analysis of individual data from 27 randomised trials. Lancet. 380: 581 – 590.

Mirnawati, G. Ciptaan, and Ferawati. 2019. Improving the quality and nutrient content of palm kernel cake through fermentation with *Bacillus subtilis*. Livest. Res. Rural. Dev. 31 (7).

Moati, A. Y. A., N. M. Eissa, K. F. M. Aboulezz, and M. Younis. 2022. Effect of dietary supplementation of probiotics, enzymes and their combination on growth performance, meat yield, intestinal microbiota and plasma analysis of broiler chicks. AASJ. 5: 136–152.

Mohamed, Z. W and A. R. Alimon. 2003**.** Use of Palm Kerne**l** Cake and Oil Palm By-Products in Compound Feed. Palm Oil Developments 40.

Mohammed, A. 2023. Effect of multi-enzyme supplementation on growth performance of rabbits. AJSAFE. 11: 11 – 15.

Morkowiak-Kopec, P and K. Slizewska. 2020. Review: The effect of probiotics on the production of short-chain fatty acids by human intestinal microbiome. Nutrients.12: 1107

Morales-Barrera, J., M. Gonzales-Alcorta, R. Castillo-Dominguez, O. Prado-Rebolledo, X. Hernandez-Velasco, A. Menconi, G. Tellez, B. Hargis, and S. Carillio-Dominguez. 2013. Fatty acid deposition on broiler meat in chickens supplemented with Tuna oil. Food Nutrition Sci. 4: 16 – 20.

Muhlisin, C. S. Song, Y. J. Rhee, Y. H. Song, and S. K. Lee. 2016. Effects of direct-fed microbial and pine cone extract on carcass traits and meat quality of Hanwoo (Korean Native Cattle). Asian Australas. J. Anim. Sci. 29: 722 – 730.

Mustafa, M. F., A. R. Alimon, M. W. Zahari, I. Idris, and M. H. Bejo. 2004. Nutrient digestibility of palm kernel cake for muscovy ducks. Asian-Aust. J. Anim Sci. 17: 514-517.

Mushawwir, A dan D. Latipudin. 2011. Beberapa parameter biokimia darah ayam ras petelur fase grower dan layer dalam Lingkungan “Upper Zonathermoneutral”. Jurnal Peternakan Indonesia. 13: 191 – 198.

Mumma, J. O., J. P. Thaxton, Y. V. Thaxton, and W. L. Dodson. 2006. Physiological stress in laying hens. Poult. Sci. 85: 761 – 769.

Nahashon, S. N., N. Adelope, A. Amenyenu, and D. Wright. 2005. Effect of dietary metabolizable energy and crude protein concentrations on growth performance and carcass characteristics of French Guinea Broilers. Poult. Sci. 84: 337 – 344.

National Research Council (NRC). Nutrient Requirement for Poultry. 1994. Ninth Revised Edition. National Academy Press, Washington D. C.

Natsir, M. H., I. Djunaidi, O. Sjofjan, A. Suwanto, E. Puspitasari, and L. J. Virginia. 2018. The effect of corn substitution with palm kernel meal treated by enzyme on production performance and carcass quality of broiler. Buletin Peternakan. 42: 103 -108.

Ninduangdee, P., V. I. Kuprianov, E. Y. Cha, R. Kaewrath, P. Youngyuen, and W. Atthawethworawuth. 2015. Thermogravimetric studies of oil palm empty fruit bunch and palm kernel shell: TG/DTG analysis and modeling. Energy Proc. 79: 453–458

Nitbani, F., F. Nitti, P. J. P. Tjitda, and J. Junima. 2022. Antimicrobial properties of lauric acid and monolaurin in virgin coconut oil: review. Chem. Bio. Eng. 9: 1 – 21.

Nizamuddin, A. O. Achila, V. K. Vidyarthi, and V. B. Sharma. 2013. Performance of broiler chicken fed on diets supplemented with mixed enzyme. Indian J. Poult. Sci. 48: 250 – 253.

Nogoy, K. M. C., H. J. Kim, Y. Lee, Y. Zhang, J. Yu, D. H. Lee, X. Z. Li, S. B. Smith, H. A. Seong, and S. H. Choi. 2020. High dietary oleic acid in olive oil-supplemented diet enhanced omega-3 fatty acid in blood plasma of rats. Food Sci Nutr. 00: 1–9.

Nunes, J. O., R. D. Abreu, J. A. G. Brito, R. F. Silva, L.S. dal Oliveira, and N. A. Jesus. 2015. Enzyme supplementation of Broiler Feeds with reduced mineral and energy levels. Rev. Bras. Cienc. Avic. 17: 15 -21.

Okeudo, N. J., I. L. Onyike, C. V. Okoli, and I. L. Chielo. 2006. Production performance, meat quality, and feed cost implications of utilizing high levels of palm kernel cake in broiler finisher diets. Int. J. Poult. Sci. 5: 1160 – 1163.

Okeudo, N. J., K. V. Eboh, N. V. Izugboekwe, and E. C. Akanno. 2005. Growth rate, carcass characteristics, and organoleptic quality of broiler fed graded levels of palm kernel cake. Int. J. Poult. Sci. 4: 330 – 333.

Okoroigwe, E. C., and C. M. Safron. 2012. Determination of bioenergy potential of palm kernel shell by physicochemical characterization. NIJOTECH. 31: 329 – 335.

Okoroigwe, E. C., C. M. Safron, and P. D. Kamdem. 2014. Characterization of palm kernel shell for materials reinforcement and water treatment. J. Chem. Eng. Mater. Sci. 5: 1 – 6.

Okukpe, M. K., T. A. Aderibigde, and J. O. Atleh. 2019. Effect of supplementation of palm kernel cake (PKC) with enzyme xylanase on performances and gut microbiota of broiler chickens. VJS. 22: 12 – 28.

Oliveira, R. L., L. Bezerra, M. M. D. S. Faria, J. Simionato. 2015. Fatty acid profile of milk and cheese from dairy cows supplemented a diet with palm kernel cake. Molecules. 20: 15434 - 15448.

Oloruntola, O. D., J. O. Agbede, S. O. Ayodele, E. S. Ayedun, O. T. Daramola, and D. A. Oloruntalo. 2018. Gliricidia leaf meal and multi-enzyme in rabbit diet: effect on performance, blood indices, serum metabolites and antioxidant status. J. Anim. Sci. Technol. 60: 1 - 8.

O'Mara, F.P., F. J. Muligan, E. J. Cronin, M. Rath, and P. J. Caffrey. 1999. The nutritive value of palm kernel meal measured *in vivo* and using rumen fluid and enzymatic techniques. Livestock Production Science. 60: 305 – 316.

Onwudike, O.C. 1986. Palm kernel meals as a feed for poultry. 3 Replecement of groundnut cake by palm kernel meal in broiler diets. Animal Feed Science and Technology. 16: 195 – 202.

Osorio, L. M. G., J. U. Nielsen, H. J. Martens, and R. Wimmer. 2022. Upgrading the nutritional value of PKC using a *Bacillus subtilis* derived monocomponent β-mannanase. Molecules. 27: 1 - 14.

Pahan, I. 2012. Panduan Lengkap Kelapa Sawit: Manajemen Agribisinis dari Hulu hingga Hilir. Penebar Swadaya, Jakarta.

Pang, B., B. Bowker, H. Zhuang, Y. Yang, and J. Zhang. 2022. Research note: Comparison of 3 methods used for estimating cook loss in broiler breast meat. Poult. Sci. 99:6287–6290.

Pasaribu, T. 2018. Efforts to improve the quality pf palm kernel cake through fermentation technology and enzyme addition for poultry. Indonesian bulletin of Animal and Veterinary Sciences. WARTAZOA. 28: 119 - 128.

Pasaribu, T., E. B. Laconim and I. P. Kompiang. 2019. Evaluation of the nutrient contents of palm kernel cake fermented by microbial cocktails as a potential feedstuff for poultry. J. Indonesian Trop. Anim. Agric. 44: 295-302

Perić, L., N. Milošević, M. Đukić-Stojčić, S. Bjedov, and V. Rodić. 2008. Effect of enzymes performances of broiler chickens. Biotechnol. Anim. Husb. 24: 45 – 51.

Prasetya, R. D. D., A. Karwati, A. Wiyono, and A. Jayanegara. 2021. The quality of hydrolized palm kernel meal and Its efficacy on laying hens aged 21 – 27 weeks. Proceeding of the 6th International Seminar of Animal Nutrition and Feed Science. Adv. Biol. Res. Atlantis Press. 21: 296 – 300.

Prasetyo, B., L. D. Mahfudz, dan M. H. Nasoetion. 2021. Kualitas fisik daging ayam broiler yang dipelihara di kandang closed House pada ketinggian daerah berbeda. Jurnal Sain Peternakan Indonesia. 16: 61 – 67.

Proszkowiec-Weglarz, M., J. Dupont, N. Rideau, C. Gespach, J. Simon, and T. E. Porter. 2017. Insulin immuno-neutralization decreases food intake in chickens without altering hypothalamic mRNA levels for genes involved in regulation of food intake and metabolism. Poult. Sci. 96: 4409 – 4418.

Rahadian, A., A. Mushawwir, dan K. A. Kamil. 2015. Profil albumin dan globulin darah ayam petelur fase layer pada temperatur *humidity index* yang berbeda. 4: 1 – 10.

Rahim, F., Sabrina, Rusmawati, and M. Syibli. 2007.Broiler small intestine villi response to feed containing palm kernel cake which fermented with *Rhizopus* sp. J. Indon. Trop. Anim. Agric. 32: 251 – 256.

Ramesh, J and D. C. Chandrasekaran. 2011. Effect of exogenous enzyme supplementation on performance of cockerels. Tamil Nadu J. Vet. Anim. Sci. 7: 29 - 34.

Rao, M. B., A. M. Tanksale, M. S. Ghatge, and V. V. Deshpande. 1998. Molecular and biotechnological aspects of microbial proteases. Microbiol. Mol. Biol. Rev. 62: 597 – 635.

Ravindran, V. 2013. Feed Enzymes: The Science, Practice, and Metabolic Realities. J Appl Poult Res. 22: 628 – 636.

Ravindran, V., and R. Abdollahi. 2021. Review: Nutrition and digestive physiology of broiler chick: state the art and outlook. Animals. 11: 1 – 23.

Rios, P. R., J. Fothergill, M. Bernaedeau, and P. Wigley. 2020. Development of the ileal microbiota in three broiler breeds. Front. Vet. Sci. 7: 17.

Risnadati, R. 2010. Pengaruh lama penyimpanan dalam lemari es terhadap pH, daya ikat air, dan susut masak karkas broiler yang dikemas plastik polyethylene. Jurnal Ilmiah Ilmu-Ilmu Peternakan. XIII: 309 – 315.

Robinson, P. K. 2015. Enzymes: principles and biotechnological applications. Essays Biochem. 59: 1 – 41.

Rohde, M. 2019. The Gram-positive bacterial cell wall. Microbiol. Spectrum. 7: GPP3 – 0044 – 2018.

Rukmini, N. K. S., N.K. Mardewi, and I. G. A. D. S. Rejeki. 2019. Kualitas kimia daging ayam broiler Umur 5 minggu yang dipelihara pada kepadatan kandang yang berbeda. WICAKSANA, Jurnal Lingkungan dan Pembangunan. 3: 31 – 37.

Saenphoom, P., J. B. Liang, Y. W. Ho, T. C. Loh, and M. Rosfarizan. 2013. Effects of enzyme treated palm kernel expeller on metabolizable energy, growth performance, villus height and digesta viscosity in broiler chickens. Asian-Aust. J. Anim. Sci. 26: 537-544.

Saeed, M., T. Ayaşan, M. Alagawany, M. E. A. El-Hack, M. A. Abdel-Latif, A. K. V. Patra. 2019. The role of ß-mannanase (Hemicell) in improving poultry productivity, health and environment. Braz J Poultry Sci. 21: 1 - 8.

Saelin, S., S. Wattanachant, and W. Youravong. 2017. Evaluation of water holding capacity in broiler breast meat by electrical conductivity. Int Food Res J. 24: 2593 – 2598.

Saleh, A. A., M.Mustafa, Dawood, N. A. Badawi, T. A. Ebeid, K. A. Amber, and M. M. Azzam. 2020. Effect of supplemental serine-protease from *Bacillus licheniformis* on growth performance and physiological change of broiler chickens. J. Appl. Anim. Res. 48: 86 - 92.

Santos, N. J. A. D., L. R. Bezerra, D. P. V. Castro, P. D. R. Marcelino, G. E. V. Junior, J. M. D. S. Junior, E. S. Pereira, E. A. D. Andrade, T. M. Silva, A. M. Barbosa, R. L. Oliveira. 2022. Effect of dietary palm kernel oil on the quality, fatty acid profile, and sensorial attributes of young bull meat. Foods. 11: 1-12

Sanvictores, T., J. J. Casale, and M. R. Huecker. 2023. Physiology, Fasting. StatPealrs Publishing. National Library of Medicine. Physiology, Fasting - StatPearls - NCBI Bookshelf (nih.gov).

Saragih, V. D., K. Mea, Melaca, R. Darmawan, and N. Hendrianie. 2018. Pra desain pabrik CPO (*Crude Palm Oil*) dan PKO (*Palm Kernel Oil*) dari buah kelapa sawit V. Jurnal Teknis ITS. 7: 2337 – 3520.

Sari, T. V., U.Hasanah, R. I. H. Harahap, P. Zalukhu, and A. Trisna. 2022. Chemical and physical quality of broiler meat with drinking water containing boiled and fermented water of various cooking spices as phytobiotics. The 5th International Conference on Agriculture, Environment, and Food Security. 977 (2022) 012137.

Sathitkowitchai, W., S. Nitisinprasert, and S. Keawsompong. 2018. Improving palm kernel cake nutrition using enzymatic hydrolysis optimized by Taguchi method. 3 Biotech. 8: 407.

Saw, H. Y., J. Janaun, S. Kumaresan, C. M. Chu. 2012. Charaterization of the physical properties of palm kernel cake. Int. J. Prop. 15: 536–548.

Setyaningrum, F., M. Handayani, dan A. Setiadi. 2014. *Income over feed cost* pemeliharaan ayam broiler betina dengan ransum mengandung tepung S. molesta. Animal Agriculture Journal. 3: 172 – 178.

Shah, N. D, and B. N. Limketkai. 2017. The Use of Medium-Chain Triglycerides in Gastrointestinal Disorders. Practical Gastroenterology. 160: 20 – 28.

Sharma, K., A. Dhillon, and A. Goyal. 2018. Insights into structure and reaction mechanism of β-mannanases. Curr. Protein Pept. Sci. 19: 34 - 47.

Sharmila, A., A. R. Alimon, K. Azhar, H. M. Noor, and A. A. Samsudin. 2014. Improving nutritional values of palm kernel cake (PKC) as poultry feed: A review. Mal. J. Anim. Sci. 17: 1–18.

Shastak, Y., P. Ader, D. Feuerstein, R. Ruehle, and M. Matuschek. 2019. B – mannan and mannanase in poultry nutrition. Worlds Poult Sci J. 71: 161 – 174.

Shastak, Y., P. Ader, D. Feuerstein, R. Ruehle, and M. Matuschek. 2015. Review: β-mannan and mannanase in poultry nutrition. Worlds Poult Sci J. 71: 161 – 174.

Shang, Y., S. Kumar, B. Oakley, and W. K. Kim. 2018. Chicken gut microbiota: importance and detection technology. Front Vet Sci. 5. 254.

Shehata, A. A., S. Yalcin, J. D. Latorre, S. Basiouni, Y. A. Attia, A. A. El-Wahab, C. Visscher, H. R. El-Seedi, C. Huber, H. M. Hafez, W. Eisenreich, and G. Tellez-Isaias. 2022. Probiotics, Prebiotics, and Phytogenic Substances for Optimizing Gut Health in Poultry. Microorganism. 10: 1 -34.

Shukor, H., P. Abdeshahian, N. K. N. Al-Shorgani, A. A. Hamid, N. A. Rahman, and M. S. Kalil. 2016. Saccharification of polysaccharide content of palm kernel cake using enzymatic catalysis for production of biobutanol in acetone-butanolethanol fermentation. Bioresources. 202: 206 – 213.

Singh, P. K., Chandramoni, A. Kumar, and S. Kumar. 2015. Animal Feed Additives. New India Publishing Agency, New Delhi.

Slawinska, A., A. Dunislawska, A. Plowiec, M. Radomska, J. Lachmanska, M. Siwek, S. Tavaniello, and G. Maiorano. 2019. Modulation of microbial communities and mucosal gene expression in chicken intestines after galactooligosaccharides delivery In Ovo. Plos One. 1 – 23.

Soeparno, 2011. Ilmu dan Teknologi Daging. Cetakan 5. Gadjah Mada University Press. Yogyakarta.

Soeparno. 2015. Ilmu dan Teknologi Daging. Cetakan ke 6. Gadjah Mada University Press. Yogyakarta.

Smirnov, A., E. Tako, P. R. Ferket, and Z. Uni. 2006. Mucin gene expression and mucin content in the chicken intestinal goblet cells are affected by in ovo feeding of carbohydrates. *Poult Sci, 85*(4), 669-673. doi:10.1093/ps/85.4.669

SNI. 2017. Bungkil Inti Sawit – Bahan pakan ternak. Badan Standardisasi Nasional, Jakarta.

Simon, O. 1999. Microbial enzymes as feed additives in poultry nutrition. In Use of Growth Promoters in Animal Nutrition. Proceedings of the 8th International Symposium on Animal Nutrition, ed. L. Babinszky, 61–81. Kaposvár: University Press.

Simon, O. 2001. The infuence of feed composition on protein metabolism in the gut. In Gut Environment of Pigs. ed. A. Piva, K. E. Bach Knudsen, and J. E. Linberg. 32–62 Nottingham: Nottingham University Press.

Sinurat, A.P. 2012. Teknologi pemanfaatan hasil samping industri sawit untuk meningkatkan ketersediaan bahan pakan unggas nasional. Pengembangan Inovasi pertanian 5: 65 – 78.

Sinurat, A. P., T. Purwadaria, dan T. Pasaribu. 2013. Peningkatan nilai gizi bungkil inti sawit dengan pengurangan cangkang dan penambahan enzim. JITV Vol. 18: 34 - 41.

Sritrakul, N., S. Nitisinprasert, and S. Keawsompong. 2020. Copra meal hydrolysis by the recombinant β-mannanase KMAN3 and MAN 6.7 expressed in *Escherichia coli*. J. Biotech. 10: 44.

Statistik Peternakan dan Kesehatan Hewan. 2022. Direktorat Jenderal Peternakan dan Kesehatan Hewan Kementerian Pertanian RI. 1644549920.Buku_Statistik_2021.pdf (pertanian.go.id). Diakses tanggal 27 Desember 2022.

Steel, R. G dan Torrie, J. H. 1989. Prinsip dan Prosedur Statistika. Suatu pendekatan biometrik. Edisi ke 2. PT. Gramedia, Jakarta.

Stein, H. H., G. A. Casas, J. J. Abelilla, Y. Liu and R. C. Sulabo. 2015. Nutritional value of high fiber co-products from the copra, palm kernel, and rice industries in diets fed to pigs. J. Anim. Sci. Biotechnol. 6: 1 – 9.

Sun, R.C., X. F. Sun, and J. Tomkinson. 2004. Hemicelluloses and Their Derivates. American Chemical Society Downloaded via 36.80.249.122 on November 29, 2022 at 20:43:48 (UTC). See https://pubs.acs.org/sharingguidelines for options on how to legitimately share published articles. Gatenholm and Tenkanen; Hemicelluloses: Science and Technology ACS Symposium Series; American Chemical Society: Washington, DC, 200

Sundu, B., A. Kumar, and J. Dingle. 2006. Palm kernel meal in broiler diets: effect on chicken performance and health. Worlds Poult Sci J. 62: 316 – 325.

Sundu, B., A. Kumar, and J. Dingle. 2008. The Effect of Proportion of Crumbled Copra Meal and Enzyme Supplementation on Broiler Growth and Gastrointestinal Development. Int. J. Poult. Sci. 7: 511-515.

Sundu, B., A. Adjis, S. Sarjuni, S. Mozin, and U. Hatta. 2021. Fermented palm kernel meal by different fungi in broiler diets. The 3rd International Conference of Animal Science and Technology. IOP Conf. Series: Earth and Environmental Science 788 (2021) 012041.

Suresh, G., D. U. Santos, T. Rouissi, S. K. Brara, Y. Mehdi, S. Godbout, Y. Chorfi, and A. A. Ramirez. 2019. Production and in-vitro evaluation of an enzyme formulation as a potential alternative to feed antibiotics in poultry. Process Biochem. 80: 9 – 16.

Suryati, T., I.I. Arief, dan B. N. Polli. 2008. Korelasi dan kategori keempukan daging berdasarkan hasil pengujian menggunakan alat dan panelis. Anim. Product. 10 (3): 188 – 193.

Svihus, B. 2014. Function of the digestive system. J Appl Poult Res. 23: 306 – 314.

Szabo, R. T., M. Kpvacs-Weber, A. Zimboran, L. Kovacs, and M.Erdely. 2023. Effects of Short- and Medium-Chain Fatty Acids on Production, Meat Quality, and Microbial Attributes—A Review. Molecules. 28: 1 – 17.

Tabook, N. M., I. T. kadim, O. Mahgoub, and W. Al-Marzooqi. 2006. The effect of date fiber supplemented with exogenous enzyme on the performance and meat quality of broiler chickens. Brit. Poultry Sci. 47: 73 – 82.

Tavano, O. L. 2013. Protein hydrolysis using proteases: An important tool for food biotechnology. Journal of Molecular Catalysis B: Enzymatic. 90: 1 - 11.

Umam, M. K., H. S. Prayogi, and V. M. A. Nurgiartiningsih. 2014. The performance of broiler rearing in system stage floor and double floor. Jurnal Ilmu-Ilmu Peternakan. 24: 79 – 87.

Ugwuanyi, J. O. 2016. Chapter 10 – Enzymes for Nutritional Enrichment of Agro-Residues as Livestock Feed. Agro-Industrial Wastes as Feedstock for Enzyme Production. Academic Press. Pages 233-260

Vaezi, G, M. Teshfam, S. Bahadoran, H. Farazyan, and S. Hosseini. 2011. Effects of different levels of lysine on small intestinal villous morphology in starter diet of broiler chickens. Glob. Vet. 7: 523 – 526.

Van der Klis, J. D. and A. Van Voorst. 1993. The efect of a soluble polysaccharide (carboxy methyl cellulose) on the physico-chemical conditions in the gastro intestinal tract of broilers. Br Poult Sci. 34: 971 – 83.

Van Leeuwen, P., A. H. van Gelder, J. A. de Leeuw, and J. D. Van der Klis. 2006. An animal model to study digesta passage in different compartments of the gastro-intestinal tract (GIT) as afected by dietary composition. Curr Nutr Food Sci. 2: 97 – 105.

Van Soest, P. J., J. B. Robertson, and B. A. Lewis. 1991. Methods for Dietary Fiber, Neutral Detergent Fiber, and Nonstarch Polysaccharides in Relation to Animal Nutrition. J. Dairy Sci. 74: 3583 – 3597.

Wallace, P. A., E. K. Adu, and S. W. A. Rhule. 2010. Optimizing storage conditions for cocoa with shell, palm kernel cake and copra cake as poultry and livestock feed in Ghana. Livest. Res. Rural Dev. 22(2).

Walters, H. G., B. Brown, N. Augspurger, R. Brister, S. Rao, and J. T. Lee. 2018. Evaluation of NSPase inclusion in diets manufactured with high- and low-quality corn on male broilers. J. Appl. Poult. Res. 27: 228 – 239.

Wang, C., T. Yuan, W. Zheng, Q. Wu, K. Zhu, X, Mou, L. Wang, K. Nie, X. Li, and Y. Zhu. 2022. Responses of combined non-starch polysaccharide enzymes and protease on growth performance, meat quality, and nutrient digestibility of yellow-feathered broilers fed with diets with different crude protein levels. Front. Vet. Sci. 9:946204.

Wang, J. H., T. Inoue, M. Higashiyama, P. H. Guth, E. Engel, J. D. Kaunits, and Y. Akiba. 2011. Umami receptor activation increases duodenal bicarbonate secretion via glucagon-like peptide-2 release in rats. JPET. 339: 464 - 473.

Wati, C., F. Maulana, dan S. C. Labatar. 2016. Pengaruh penambahan pasir laut untuk meningkatkan kualitas daya cerna pakan terhadap ayam broiler. Jurnal triton. 7: 27 – 36.

Wilkinson, J. M and R. H. Young. 2020. Strategies to reduce reliance on soya bean meal and palm kernel meal in livestock nutrition. 8: 75 – 82.

Winarno, F. G. 1986. Enzim Pangan. Penerbit PT. Gramedia, Jakarta.

Wu, X., Y. Zhou, Z. Lu, Y. Zhang, and T. Zhang. 2024. Effect of pre-slaughter fasting time on carcass yield, blood parameters and meat quality in broilers. Anim Biosci. 37: 315 - 322.

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.

Yaophakdee, N., Y. Ruangpanit, and S. Attamangkune. 2018. Effects of palm kernel meal level on live performance and gut morphology of broilers. Agric. Nat. Resour. 52: 72 – 78.

Yason, C. V., B. A. Summers, and K. A. Schat. 1987. Pathogenesis of rotavirus infection in various age groups of chickens and turkeys: Pathology. Am. J. Vet. Res. 6: 927 – 938.

Yeoman, C. J., N. Chia, P. Jeraldo, M. Sipos, N. D. Goldenfeld, and B. A. White. 2012. The microbiome of the chicken gastrointestinal tract. Anim Health Res Rev. 13 (1): 89-99. doi:10.1017/S1466252312000138

Yuwanta, T. 2004. Dasar Ternak Unggas. Penerbit Kanisius, Yogyakarta.

Zaki, E. F., A. I. El Faham, and G. M. Nematallah. 2018. Fatty acids profile and quality characteristics of broiler chicken meat fed different dietary oil sources with some additives. Int. J. Health Animal Sci. Food Saf. 5: 40 – 50.

Zamani, H. U., T. C. Loh, H.L. Foo, A. A. Samsudin, and M. I. Alshelmani. 2017. Effect of feeding palm kernel cake with crude enzyme supplementation on growth performance and meat quality of broiler chicken. IJMB. 2: 22 – 28.

Zeiger, K., J. Popp, A. Becker, J. Hankel, C. Visscher, G. Klein, and D. Meemken 2017. Lauric acid as feed additive. An approach to reducing *Campylobacte*r spp. In broiler meat. PLoS One. 12: 1-10.

Zeitz, J. O., J. Fenhoff, H. Kluge, G. I. Stangl, and K. Eder. 2015. Effect of dietary in lauric and myristic acid on performance, intestinal morphology, gut microbe, and meat quality in broilers. Poultry Sci. 92: 2404 – 2413.

Zhu, C., W. Song, Z. Tao, H. Liu, S. Zhang, W. Xu, and H. Li. 2020. Analysis of microbial diversity and composition in small intestine during different development times in ducks. Poult. Sci. 99: 1096 – 1106.

Zhao, X., Y. Guo, S. Guo, and J. Tan. 2013. Effects of *Clostridium butyricum* and *Enterococcus faecium* on growth performance, lipid metabolism, and cecal microbiota of broiler chickens. Appl Microbiol Biotechnol. 97: 6477 – 6488.

Zulkifl, I., H. I. S. Rahayu, A. R. Alimon, M. K. Vidyadaran, and S. A. Babjee. 2009. Gut micoflra and intestinal morphology of commercial broiler chickens and Red Jungle Fowl fed diets containing palm kernel meal. Arch. Geflgelk. 73: 49 – 55.

Zuprizal, E. Indarto, N. D. Dono, A. P. Baskara, M. Kamal, dan L. M. Yusiati. 2023. Nutrisi dan Metabolisme Ternak Unggas. Cetakan pertama. Depublish Publisher.