

DAFTAR PUSTAKA

- Afandi, R., Hartono, B., and Djunaidi, I. 2020. The analysis of production cocts of laying hen farm using semi-mixing and total self-mixing feeds in Blitar Regency, East java. *Tropical animal science journal*, 43(1), 70-76.
- Allain, C. C., Poon, L. S., Chan, C. S. G., Richmond, W. Fu., and, Paul. C. 1974. Enzymatic Determination Of Total Serum cholesterol. *Clinical Chemistry*. 20(04): 470.
- Alves-Bezerra, M., and Cohen, D. E. 2017. Triglyceride metabolism in the liver. *Comprehensive Physiology*, 8(1), 1–8.
- Anita, S. 2017. Pengaruh lama fermentasi dengan *Lentinus edodes* terhadap kandungan hemiselulosa, lemak kasar dan energi metabolisme dari bungkil inti sawit. Thesis. Universitas Andalas.
- AOAC. 1990. Official Methods of Analysis Food Compotition; Additives; Natural Contaminants. Vol 2. 15th edition. Virginia USA.
- Aoudia, N., Rieu, A., Briandet, R., Deschamps, J., Chluba, J., Jego, G., and Guzzo, J. 2016. Biofilms of *Lactobacillus plantarum* and *Lactobacillus Fermentum*: effect on stress responses, antagonistic effect on pathogen growth and immunomodulatory properties. *Food Microbiology*, 53, 51-59.
- Astini, W. 2014. Potensi probiotik komersial terhadap penambahan berat badan, konsumsi pakan dan nilai konversi pakan ayam broiler. Skripsi, Universitas Airlangga, Surabaya.
- Bao, Y., Liang, X., Guan, M., Sun, Y., and Liu, Y. 2010. Screening of potential probiotic properties of *Lactobacillus fermentum* isolated from traditional dairy products. *Food Control*, 21(5), 695–701.
- Begley, M., Hill, C., and Gahan, C. G. M. 2006. *Bile salt hydrolase* activity in probiotics. *Applied and Environmental Microbiology*, 72(3), 1729–1738.
- Bourgin, M., Kriaa, A., Mkaouar, H., Mariaule, V., Jablaoui, A., Maguin, E., and Rhimi, M. 2021. *Bile Salt Hydrolases* : At the Crossroads of Microbiota and Human Health. *Microorganisms*, 9(5), 1122.
- Budiyanto, M. Yasin., dan Suhariningsih. 2018. pengembangan media pembelajaran optik menggunakan sensor serat optik bundle untuk menentukan konsentrasi kolesterol. *Jurnal Penelitian Pendidikan IPA*, 3(1)
- Cao, Y., Zhang, L., and Wang, Y. 2025. Genome analysis of *Bacillus subtilis* YZ01 reveals genes contributing to *bile salt hydrolase* activity and probiotic potential. *Microbial Genomics*, 11(1), 1–12.

- Castells, A., Leon, A., Sosa, D., Cadena, I., Ramirez, D., Serrano, L., Larrea, F., Almeida-streitwieser, D., and Alvarez, J. F. 2022. Evaluation of Lactic Acid Production by different *Bacillus Subtilis* Strains Isolated from Theobroma Cacao Crops in Ecuador. *Chemical Engineering Transactions*, 93, 55-60.
- Chandrasekaran, P., Weiskirchen, S., and Weiskirchen, R. 2024. Effects of probiotics on gut microbiota : An Overview. 1–20.
- Chiang, M. T. 2017. The effect of bile acid metabolism on cholesterol homeostasis and lipid metabolism. *Journal of Lipid Research*, 58(5), 1230–1238.
- Choi, S. B., Lew, L. C., Yeo, S. K., Parvathy, S. N., and Liong, M. T. 2015. Probiotics dan the BSH-related cholesterol lowering mechanism: a Jekyll and Hyde scenario. *Critical Reviews in Food Science and Nutrition*, 55(5), 634-653.
- Ciaula, A. D., briella, G., Raquel, L. B., Emilio, M. M., Leonilde, B., David, Q. H. W., and Piero P. 2017. Bile Acid Physiology. *Annals Of Hepatology*, 16(1).
- Cionita, T., Siregar, J. P., Shing, W. L., Hee, C. W., Fitriyana, D. F., Jaafar, J., Junid, R., Irawan, A. P., and Hadi, A. E. 2022. The influence of filler loading and alkaline treatment on the mechanical properties of palm kernel cake filler-reinforced epoxy composites. *Polymers*, 14(15), Article 3063.
- Citrawidi, T. A., Murningsih, W., dan Ismadi, V. D.Y.B. 2012. Pengaruh pemeraman ransum dengan sari daun pepaya terhadap kolesterol dan lemak total ayam broiler. *Animal Agriculture Journal*, 1(1): 529–540.
- City, S., Sugata, M. and Jan, T. T. 2021. Probiotic characterization of *Bacillus subtilis* SM10. *Journal of Physics: Conference Series*, 1918(5), 052025.
- Devi, P. C. 2023. Pengaruh kombinasi *Bacillus subtilis* dengan *Lactobacillus fermentum* sebagai inokulum dalam meningkatkan kualitas bungkil inti sawit fermentasi sebagai bahan pakan unggas. Tesis. Padang: Fakultas Peternakan, Universitas Andalas.
- Direktorat Jendral Perkebunan. 2024. Statistik perkebunan Indonesia 2022-2024: kelapa sawit. Jakarta: Kementerian Pertanian Republik Indonesia.
- Elkhaira, R., Kasuma, N., and Putra, A. E. 2019. Jumlah koloni bakteri asam laktat pada rongga mulut yang sehat. *Jurnal Kesehatan Andalas*, 8(4).
- Errington, J., and Aart, L. T. V. D. 2020. Microbe Profile: *Bacillus subtilis*: model organism for cellular development, and industrial workhorse. *Microbiology*, 166(5), 425-427.

- Falah, R. R., Fahlevi, R., Sugesti, M., dan Dewi, S. 2024. Kualitas karkas broiler dengan penggunaan berbagai level bungkil inti sawit terfermentasi dalam pakan sebagai pengganti jagung. *Journal of agriculture and animal science*, 4(2), 60-66.
- Farooqui, A. A. 2015. Importance and roles of fiber in the diet (pp. 193-218). Springer International Publishing.
- Fitrianingsih, E. V. 2023. Rasio efisiensi protein ransum ayam broiler yang diberi *Lactobacillus plantarum* dan mannan oligosakarida hasil hidrolisis bungkil inti sawit protein efficiency ratio of broiler rations given *Lactobacillus plantarum* and mannan oligosaccarida from hidrolisis of palm kernel meal. 6(2), 82–92.
- Funan, R., Lisnahan, C. V., dan Dethan, A. A. 2020. Profil pengaruh suplementasi L-Lysine HCl dalam pakan terhadap dimensi tubuh ayam broiler. *Journal of Animal Science*, 5(4), 61–63.
- Gadde, U., W. H. Kim, S. T. Oh, and H. S Lillehoj. 2017. Alternatives to antibiotics for maximizing growth performance and feed efficiency in poultry : a Review. *Animal Health Research Revies*, 18(1):26-45.
- Gesto, D. S., Pereira, C. M. S., Cerqueira, N. M. F. S., and Sousa, S. F. 2020. An atomic-level perspective of HMG-CoA reductase: The target enzyme to treat hypercholesterolemia. *Molecules*, 25(17), 3891
- Gil-Rodríguez, A. M., and Beresford, T. 2021. *Bile salt hydrolase* and lipase inhibitory activity in reconstituted skim milk fermented with lactic acid bacteria. *Journal of Functional Foods*, 77, 104342.
- Hafid, H., Midranisiah, Nendissa, S. J., Amruddin, Hidayati, Fita, R., Wijayanti, D., Ibrahim, A. M., Hetharia, C., Nendissa, D. M., Hambakodu, M., Zelpina, E., Widaningsih, N., dan Sugiarto, M. 2022. Membangun peternakan (menguntungkan dan berkelanjutan). Widina Bhakti Persada Bandung.
- Hartono, T. A., Puger, A. W., dan Nuriyasa, I. M. 2015. Suplementasi probiotik *Saccharomyces spp. G-7* dalam ransum basal terhadap jumlah lemak abdomen dan kadar kolesterol serum darah broiler umur 2-6 minggu. *E-Jurnal Fapet Unud*, 3(1), 609-620.
- Harumdewi, E., Suthama, N., dan Mangisah, I. 2018. Pengaruh pemberian pakan protein mikropartikel dan probiotik terhadap pencernaan lemak dan perlemakan daging pada ayam broiler. *jurnal sains peternakan indonesia*, 13(3), 258–264.

- Hasanuddin, S., Yuniarto, V. D., dan Tristiarti. 2013. Lemak dan Kolesterol daging pada ayam broiler yang diberikan pakan step down protein dengan penambahan air perasan jeruk nipis sebagai acidifier buletin nutrisi dan makanan ternak, 91: 47-53.
- Hascik, P., Trembecka, L., Bobko, M., Kacaniova, M., Cubon, J., Kunova, S., and Bucko, O. 2016. Effect of diet supplemented with propolis extract and probiotic additives on performance , carcass characteristics and meat composition of broiler chickens Volume 10 Volume 10. 10(1), 223–231.
- Hasil Riset Laboratorium Nutrisi Non Ruminansia. 2025. Fakultas Peternakan Universitas Andalas, Padang.
- Herlina, B., Novita, R., dan T. Karyano. 2015. Pengaruh jenis dan waktu pemberian ransum terhadap performans pertumbuhan dan produksi ayam broiler. Jurnal Sain Peternakan Indonesia, 10 (2): 107-113.
- Hermier, D. 1997. Lipoprotein metabolism and fattening in poultry. Journal of Nutrition, 127(5), 805S–808S
- Hill, C., and Gahan, C. G. M. 2006. *Bile salt hydrolase* activity in probiotics. 72(3), 1729–1738.
- Hill, C., Guarner, F., Reid, G., Gibson, G. R., Merenstein, D. J., Pot, B., ... and Sanders, M. E. 2014. Expert consensus document: The International Scientific Association for Probiotics and Prebiotics consensus statement on the scope and appropriate use of the term probiotic. Nature Reviews Gastroenterology and Hepatology.
- Hooge, D. 2003. *Bacillus spora* May Enhance Broiler Perform. Feedstuffs, 75:1-5.
- Hutauruk, R. N. 2017. Pengaruh penggunaan bungkil inti sawit fermentasi dengan beberapa bakteri probiotik terhadap amonia ekskreta ayam broiler. Doctoral dissertation, Universitas Jambi.
- Iryos, A. R., Mirnawati, M., Harnentis, H., Srifani, A., and Yanti, G. 2025. Effectiveness of *Lactobacillus fermentum* CMUL-54 and *Lactobacillus fermentum* B978 as probiotic candidates producing mannanase, cellulase and protease activities for poultry. Online J. Anim. Feed Res, 15(2).
- Jeong, S. M., Choi, S., Kim, S., Park, S.M., and Son, J. S. 2018. Effect of change in total cholesterol levels on cardiovascular disease among young adults. Journal Of The American Heart Association.
- Jha, R., Das, R., Oak, S., and Mishra, P. 2020. Probiotics (direct-fed microbials) in poultry nutrition and their effects on nutrient utilization, growth and laying performance, and gut health: a systematic review. Animals, 10(10), 1863.

- Jha, R., Fouad, A. M., Hossain, M. M., Kim, Y. H., and Woyengo, T. A. 2021. Dietary fiber in poultry nutrition and their effects on nutrient utilisation and gut health. *Journal of animal science and Biotechnology*, 12(51), 1-14
- Jones, M. L., Martoni, C. J., Parent, M., and Prakash, S. 2012. Cholesterol lowering and *bile salt hydrolase* activity of probiotic. *Beneficial Microbes*, 3(2), 157-167.
- Joyce, S. A., Shanahan, F., Hill, C., Gahan, C. G. M., Joyce, S. A., Shanahan, F., Hill, C., and Gahan, C. G. M. 2015. Bacterial *bile salt hydrolase* in host metabolism: Potential for influencing gastrointestinal microbe- host crosstalk. 0976.
- Juniarti, N., R. ngitung dan F. Hiola. 2019. Pengaruh pemberian tepung rumput laut pada ransum ayam broiler terhadap kadar lemak dan kolestrol. Universitas Negeri Makassar. Makassar.
- Kalavathy, R., Abdullah, N., Jalaludin, S., and Ho, Y. W. 2003. Effects of *Lactobacillus* cultures on growth performance, abdominal fat deposition, serum lipids and weight of organs of broiler chickens. *Br. Poult. Sci.*, 44: 139-144.
- Khabirov, A., Khaziakhmetov, F., Kuznetsov, V., Tagirov, H., and Rebezov, M. 2020. Effect of normosil probiotic supplementation on the growth performance and blood parameters of broiler chickens. 54(4).
- Kim, H. W., Kim, N. K., Wolf, P. G., Brandvold, K., Rehberger, J. M., Rehberger, T. G., Dilger, R. N., Smith, A. H., and Mackie, R. I. 2025. Intestinal microbiota composition and *bile salt hydrolase* activity in fast and slow growing broiler chickens: implications for growth performance and production efficiency. *Journal of Animal Science and Biotechnology*, 16, 1-17.
- Kokoszynski, A., Kowalski, S., and Nowak, M. 2025. The effect of diet on intramuscular fat content in broiler breast meat. *Journal of Animal Science and Nutrition*, 18(2), 123-130.
- Kucukyilmaz, K. M. Bozkurt, A. U. Cath, EN Herken. M. Cunar., and E Bintas, 2012. Chemical composition, fatty acid profile and colour of broiler meat as affected by organic and conventional rearing systems. *S Afr. J. Anim Sci* 42(4):360-368.
- Kusada, H., Morinaga, K., dan Tamaki, H. 2021. Identification of *bile salt hydrolase* and bile salt resistance in a probiotic bacterium *Lactobacillus gasseri* JCM1131^T. *Microorganisms*, 9(5), 1011.

Label Kemasan Top Mix. PT. Medion

- Li, Z., and Zhang, H. 2016. Reprogramming of glucose , fatty acid and amino acid metabolism for cancer progression. *Cellular and Molecular Life Sciences*, 73(2), 377–392.
- Li, Y., Zhang, H., Chen, Y. P., Yang, M. X., Zhang, L. L., Lu, Z. X., and Wang, T. 2021. Effects of dietary probiotic supplementation on growth performance, meat quality, and lipid metabolism of broiler chickens. *Poultry Science*, 100(4), 1012–1021.
- Liu, Y., Kuang, W., Li, M., Wang, Z., Zhao, M., Huan, H., and Yang, Y. 2025. Cholesterol-Lowering mechanism of *Lactobacillus bile salt hydrolase* through regulation of *Bifidobacterium pseudolongum* in the gut microbiota. *Nutrient*, 17(18), 3019.
- Lokapirnasari, W.P., Anggun, R., dan Hana, E. 2016. Potensi penambahan bakteri asam laktat *Lactobacillus casei* dan *Lactobacillus rhamnosus* terhadap konsumsi pakan dan konversi pakan ayam pedaging. *Agro Veteriner* 5(1): 43-49 .
- Latorre, J. D., Hernandez-velasco, X., Wolfenden, R. E., Vicente, J. L., Yeoman, C. J., Bischoff, K. M., and Tellez, G. 2016. Evaluation and selection of *Bacillus* species based on enzyme production, antimicrobial activity, and biofilm synthesis as direct-fed microbial candidates for poultry. 3(October), 1–9.
- Lozinska, N., and Jungnickel, C. 2021. Importance of conjugation of the bile salt on the mechanism of lipolysis. *Molecules*, 26(19), 5764.
- Maryuni, S. S., dan C. H. Wibowo. 2005. Pengaruh kandungan lisin dan energi metabolis dalam ransum yang mengandung ubi kayu fermentasi terhadap konsumsi ransum dan lemak ayam broiler. *Journal of Indonesian Tropical Animal Agriculture*. 30 (1): 26-33.
- Mc Donald, P., R. A. Edwards., J. F. D., Greenhalgh, and C. A. Morgan. 2002. *Animal Nutrition*. 6 th Ed. An Imprint of Pearson Education Prontice Hall. Jhon Wiley and Sons Inc, New York.
- Mekkaoui, A., Liu, Y., Zhang, P., Ullah, S., Wang, C., and Xu, B. 2021. Effect of bile salts on the interfacial dilational rheology of lecithin in the lipid digestion process. 1080(8), 1069–1080.
- Mikelsaar, M., and M. Zilmer. 2009. *Lactobacillus fermentum* ME-3-an antimicrobial and antioxidative probiotic. *Microbial Ecology in Health and Disease*, 21(1):1-27.
- Milicevic, D., Trbovic, D., and Masic, Z. 2014. Cholesterol content and fatty acid composition of chicken meat. *Meat Science*, 96(2), 135–142.

- Mirawati, Djulardi, A., and Ciptaan, G. 2018. Utilization of fermented palm kernel cake with *Sclerotium rolfsii* in broiler ration. *International Journal of Poultry Science*, 17(7), 342-347.
- Mirawati, Ciptaan, G., and Ferawati. 2019. Improving the quality and nutrient content of palm kernel cake through fermentation with *Bacillus subtilis*. *Livestock Research for Rural Development*, 31(7).
- Mirawati, Ciptaan, G., Seftiadi, Y., and Makmur, M. 2020. Effects of humic acid dosage and fermentation time with *Bacillus subtilis* on nutrient content and quality of palm kernel cake. *American Journal of Animal and Veterinary Sciences*, 17(1), 35-41.
- Mirawati, Ciptaan, G., Martaguri, I., Ferawati, and Srifani, A. 2023. Improving quality and nutrient content of palm kernel meal with *Lactobacillus fermentum*. *International 12(4), Science, Journal Veterinary of 615-622*.
- Mirawati, S., Akhadiarto, Harnentis, Ciptaan, G., Zurmiati. 2024. Peran bakteri kandidat probiotik dalam meningkatkan daya guna bungkil inti sawit sebagai pakan unggas. *Laporan Akhir Riset dan Inovasi untuk Indonesia Maju*. Contract: 188/IV/KS/11/2023 dan 508/UN16.19/PT.01.03/KS/2023.
- Mirawati, Akhadiarto, S., Harnentis, Ciptaan, G., Zurmiati, Yanti, G., and Srifani, A. 2025. Synergistic probiotic consortium of *Bacillus subtilis* and *Lactobacillus fermentum* enhances palm kernel meal utilization and functional feed potential in poultry. 18, 3447–3463.
- Monte, M. J., Marin, J. J. G., Antelo, A., and Vazquez-tato, J. 2009. Bile acids : Chemistry , physiology , and pathophysiology. 15, 804–816.
- Mountzouris, K. C., Tsirtsikos, P., Kalamara, E., and Palamidi, I. 2007. Effect of dietary supplementation of probiotics and prebiotics on the gut microbiota of broilers and its implications for performance and health. *World's Poultry Science Journal*, 63(4), 459–473.
- Muchtadi, D., N. S. Palupi, dan M. Astawan. 1993. *Metabolisme Zat Gizi: Sumber, Fungsi dan Kebutuhan Bagi Manusia*. Pustaka Sinar Harapan, Jakarta.
- Murray, R. K., D. K. Granner, P.A., Mayers, dan Rodwell, V. W. 2003. *Biokimia Harper*. Edisi ke-25. Buku Kedokteran EGC, Jakarta.
- Nailatul, F. 2022. Pengaruh sistem pemeliharaan dengan dan tanpa umbaran serta pemberian tepung biji pepaya (*carica papaya*) dan kecambah padi (*oryza sativa*) terhadap performa karkas ayam kub. *Doctoral dissertation*. Universitas Andalas.

- Ndhlala, A. R., Yüksel, A. K., Çelebi, N., and Doğan, H. Ö. 2023. A general review of methodologies used in the determination of cholesterol levels in foods. *Foods*, 12(24), 4424.
- National Research Council. 1994. *Nutrient Requirements of Poultry* (9th ed.). In National Academy Press.
- Oketch, E. O., Wickramasuriya, S. S., Oh, S., Choi, J. S., and Heo, J. M. 2023. Physiology of lipid digestion and absorption in poultry. *Journal of Animal Physiology and Animal Nutrition*, 107(5), 13859.
- Ong WL. KL. Chan, A. Suwanto, Z. Li, KH. Ng, and K. Zhou. 2024. Hydrolysis of palm kernel mean fibre using a newly isolated *Bacillus subtilis* F6 with high mannanase activity. *Bioresources and Bioprocessing*, 11(1): 113.
- Pahan, L. 2021. *Panduan budidaya kelapa sawit untuk perkebunan*. Jakarta: Penebar Swadaya.
- Pasaribu, T. 2018. Upaya meningkatkan kualitas bungkil inti sawit melalui teknologi fermentasi dan penambahan enzim untuk unggas. *Wartazoa* 28(3): 119-128.
- Pereira, D. I. A., Mc Cartney, A. L., and Gibson, G. R. 2003. An in vitro study of the probiotic potential of a *bile salt hydrolyzing Lactobacillus fermentum* strain, and determination of its cholesterol-lowering properties. *Applied and Environmental Microbiology*, 69(8), 4743–4752.
- Pimenov, N. V. Smirnova, E., and Ivannikova, R. F. 2023. Foreign research experience of the effect of probiotic agent on the intestinal microbiome of poultry *Leg. Regul. Vet. Med.* 104-108.
- Piliang, W. G. dan S. Djojosoebagio. 2006. *Fisiologi Nutrisi*. Volume ke-2. IPB Press, Bogor.
- Prameswari, D. C. 2021. Konsumsi pisang dalam menurunkan kadar kolesterol darah. *Jurnal Penelitian Perawat Profesional*, 3(3) : 511-518.
- Pratikno, H. 2011. Lemak abdominal ayam broiler (*Gallus sp*) karena pengaruh ekstrak kunyit (*Curcuma domestica Vahl*). *Bioma*, 13 (1): 17-24.
- Pratiwisari, A. T., Kurniasih, E., dan Hadi, M. 2012. Pengaruh tingkat serat kasar dalam ransum terhadap pencernaan pakan dan performa ayam broiler. *Jurnal Ilmu Ternak*, 4(2), 105–113.
- Purwati, E., Lisdiyanti, P., dan Lestari, Y. 2005. Peranan bakteri asam laktat dalam keseimbangan mikroflora usus. *Biodiversitas*, 6(1), 68–72.

- Putra, C. G. N., Maulana, R., dan Fitriyah, H. 2018. Implementasi otomasi kandang dalam rangka meminimalisir heat stress pada ayam broiler dengan metode fuzzy sugeno. *Jurnal Pengembangan Teknologi Informasi Ilmu Komputer*, 2(1),387–394.
- Ratni, E., Alfajri, A., Afriko, D., Trizamadani, D., dan Sandika, S. P. 2011. Upaya penurunan lemak tubuh ayam broiler melalui penambahan metionin dan lisin sebagai precursor karnitin dalam ransum. Jurusan nutrisi dan makanan ternak. Universitas Andalas. Padang.
- Ravindran, V., Tancharoenrat, P., Zaefarian, F., and Ravindran, G. 2016. Fats in poultry nutrition: Digestive physiology and factors influencing their utilisation. *Animal Feed Science and Technology*, 213, 1–21.
- Reis, S. A., Conceição, L. L., Rosa, D. D., Siqueira, N. P., and Peluzio, M. C. G. 2017. Mechanisms responsible for the hypocholesterolaemic effect of regular consumption of probiotics. *Nutrition research reviews*, 30(1), 36-49.
- Ridlon, J. M., Kang, D. J., and Hylemon, P. B. 2006. Bile salt biotransformations by human intestinal bacteria. *J. Lipid Res.*, 47, 241–259
- Risna, Y. K., Harimurti, S., Wihandoyo, W., Widodo, W., dan Sukarno, A. S. 2022. Aktivitas antibakteri bakteri asam laktat (*BAL*) yang diisolasi dari saluran pencernaan itik lokal asal Aceh terhadap *Salmonella pullorum* dan *Escherichia coli*. *Jurnal Agripet*, 22(2), 169–174.
- Rizal, Y. 2006. Ilmu Nutrisi Unggas. Andalas University Press, Padang
- Rizal, Y. Mahata, M.E., dan Yuniza, A., dan Reski, S., 2024. Pemanfaatan *alginate oligosakarida* (aos) dari rumput laut *Turbinaria murayania* sebagai alternative pengganti antibiotic pada broiler. Laporan penelitian riset disertasi doktor, Universitas Andalas.
- Rusmana, D., Natawiharja, D., dan Happali. 2008. Pengaruh pemberian ransum mengandung minyak ikan lemuru dan vitamin E terhadap kadar lemak dan kolesterol daging ayam broiler. *JIT.*, 8(1), 19-24.
- Safitri R., Fajriana A., Hasibuan, Yasmi P., Kuntana, Yuliana T., and Abun. 2021. Nutritional value of fermented sago dregs (*Metroxylon sago rottb.*) by various consortiums of probiotics for feedstuff. *Scientific Papers-Animal Science Series: Lucrări Științifice- Seria Zootehnie*, 76: 113-121.
- Saleh, A. A., Alharthi, A. S., Alhotan, R. A., Atta, M. S., and Abdel-Moneim, A. M. E. 2021. Soybean oil replacement by poultry fat in broiler diets. *Animals (Basel)*, 11(9), 2609.

- Salma, U. Miah. A. G., Maki. T., Nishimura. M. and Tsujii, H. 2007. Effect of dietary *Rhodobacter capsulatus* on cholesterol concentration and fatty acid composition in broiler meat. *Poultry Science*. 86 : 1920-1926.
- Samadi, B. 2010. Sukses Beternak Ayam Ras Petelur dan Pedaging. Pustaka Mina, Jakarta
- Samartsev, V. N., Khoroshavina, E. I., Pavlova, E. K., Dubinin, M. V., and Semenova, A. A. 2023. Bile acids as inducers of protonophore and ionophore permeability of biological and artificial membranes. *Membranes*, 13(5), 472
- Samlawi, A. Rastosari, dan C. A. Patria. 2018. Pengaruh frekuensi pemberian pakan terhadap konsumsi pakan, penambahan berat badan harian dan feed conversion ratio pada ayam ras pedaging. *Jurnal Wahana Peternakan*, 2 (2): 16-23.
- Saputri, F. 2012. Pengaruh pemberian probiotik bakteri asam laktat (BAL) *Pediococcus pentosaceus* terhadap keseimbangan mikroflora usus dan trigliserida daging itik Pitalah. Laporan penelitian, Program Pascasarjana Universitas Andalas, Padang, Indonesia
- Sardar, D., S. Afsana, A. Habib, and Hossain, T. 2024. Dietary effects of multistrain probiotics as an alternative to antibiotics on growth performance, carcass characteristics, blood profiling and meat quality of broilers. *Veterinary Integrative Sciences*. 22(2):e2025059.
- Schrezenmeir, J., and de Vrese, M. 2001. Probiotics, prebiotics, and synbiotics—approaching a definition. *The American Journal of Clinical Nutrition*, 73(2 Suppl), 361S–364S.
- Schunack, W., Mayer, Klaus and Haake. 1990. Senyawa Obat, Buku Pelajaran Kimia Farmasi. Edisi Kedua. GMU-Press, Yogyakarta.
- Scott, M. L., Nesheim, M. C., and Young, R. J. 1982. Nutrition of the chicken. (3rd Ed). Dep. Poultry science, Coenell Univ. Ithaca.
- Seftiadi Y, Mirnawati, and Mirzah. 2020. The effect of the addition of palm kernel cake in making *Lactobacillus sp.* Inoculum on enzyme activity. *Quest Journal of Research in Agriculture and Animal Science*. 7(5):1-5
- Sengupta, R. 2014. Acomparative study of two *Lactobacillus fermentum* strains that show opposing effects on intestinal barrier integrity : a thesis presented in partial fulfilment of there quirements for the degree of Doctor of Philosophy, Massey University, Manawatu, New Zealand (Doctoral dissertation, Massey University).

- Sholihati, A. M., Baharuddin, M., dan Santi, S. 2015. Produksi dan uji aktivitas enzim selulase dari bakteri *Bacillus subtilis*. *Al-Kimia*, 3(2), 78-90.
- Sigres, D., P. dan Sutrisno, A. 2015. Enzim mananase dan aplikasi di bidang industri: Kajian Pustaka mananase and the application in industry: A Review. 3(3), 899-908.
- Silva, M., de Lima, M. Dos, S. F., and Converti, A. 2020. Effect of short-chain fatty acids produced by probiotics: functional role toward the improvement of human health (pp. 124-141). CRC Pres.
- Soeharsono. 1976. Respon ayam broiler terhadap berbagai kondisi lingkungan. Disertasi program pasca sarjana. Universitas Padjadjaran. Bandung.
- Soeparno. 2011. Ilmu Nutrisi dan Gizi Daging. Gajah Mada University Press, Yogyakarta.
- Song, Y., Li, X., and Kim, J. H. 2023. *Lactobacillus fermentum* as an efficient lactic acid-producing probiotic: metabolic traits and functional properties. *Journal of Applied Microbiology*, 134(2), 1-12.
- Srifani, A. 2025. Kajian isolat asal ampas susu kedelai sebagai probiotik potensial penghasil selulase dan fitase serta aplikasinya pada broiler. disertasi. Program Studi Doktor Ilmu Peternakan, Universitas Andalas, Padang.
- Steel, R. G. D. and Torrie, J. H. 1991. Prinsip dan prosedur statistika. (diterjemahkan dari: Principles and Procedures of Statistic, penerjemah: B. Sumantri). PT. Gramedia. Jakarta, 748.
- Subowo, E dan Saputra, M. 2019. Sistem informasi peternakan ayam broiler di Kabupaten Pekalongan berbasis web dan android. *Jurnal Surya Informatika*, 6(1), 53-65.
- Sudeepa, E, E., and Bhavini, K. 2020. Review on *Lactobacillus fermentum*. *Internasional Journal of Advance Research and Innovative ideas in Education (IJARIIE)*, 6(30), 719-724. ISSN (Online): 2395-4396.
- Sugiarto, H., Jayanegara, A., and Widyastuti, Y. 2013. The effect of probiotics on the nutrient digestibility and performance of broilers. *Jurnal Peternakan Tropika*, 10(1), 25-34.
- Sulardi, L. 2022. Budidaya Tanaman Kelapa Sawit. Jawa Barat: PT Dewangga Energi Internasional.
- Sundu, B., Kumar, A., and Dingle, J. 2006. Palm kernel meal in broiler diets: effect on chicken performance and health. *World's poultry science journal*, 62(2), 316-325.

- Tafsin, M., N. D. Hanafi., E. Kejora, E. and Yusraini. 2018. Nutrition quality of extraction mannan residu from palm kernel cake on broiler chicken. IOP Conf. Series: Earth and Environmental Science. 122 (2018) 012114.
- Talluri, V. P., and Lanka, S. S. 2017. Optimization of cultural parameters for the production of antimicrobial compound from *Lactobacillus fermentum* (MTCC No. 1745). J Bacteriol Mycol Open Access, 4(5), 154-157.
- Tillman, A. D., Hartadi, H., Reksohadiprodjo, S., Prawirokusumo, S., dan Lebdosukojo, S. 2005. Ilmu Makanan Ternak Dasar. Yogyakarta: Gadjah Mada University Press.
- Trisna, dan Wahud, N. 2012. Identifikasi molekuler dan pengaruh pemberian probiotik bakteri asam laktat (BAL) asal dadih dari Kabupaten Sijunjung terhadap kadar kolestrol daging pada itik pitalah sumber daya genetic Sumatera Barat. Artikel. Program Pascasarjana Universitas Andalas, Padang. Hal. 32.
- Tulumoglu, S., H.I. Kaya, and O. Simsek. 2014. Probiotic characteristic of *Lactobacillus fermentum* strain isolated from tulum cheese. Anaerob, 30:120-125.
- Umiarti, A. T. 2020. Manajemen pemeliharaan broiler. Pustaka larasam. Denpasar, Bali.
- Wahyu, J. 2004. Ilmu Nutrisi Unggas. Yogyakarta: Gadjah Mada University Press
- Wahyuningsih, R. 2018. Pemberian probiotik *Lactobacillus helveticus* Rosell-52 dan *Lactobacillus rhamnosus* Rosell-11 untuk mengatasi konstipasi pada usia lanjut. Jurnal Gizi Prima, 3(2), 130-133.
- Wang, X., Zhang, H., Wu, Q., and Zhang, Z. 2019. Probiotic mechanisms in reducing cholesterol absorption in the gastrointestinal tract. Frontiers in Nutrition, 6, 127.
- Wibowo, B. 2017. Dynamics performance of native chicken agribusiness in Indonesia. Indonesian Bulletin of Animal and Veterinary Sciences, 26(4), 191
- Widiyaningsih, E. N. 2011. Peran probiotik untuk kesehatan. 4(1), 14-20. Universitas muhammadiyah surakarta.
- Wu, T., Wang, G., Xiong, Z., Xia, Y., Song, X., Zhang, H., ... and Ai, L. 2022. Probiotics interact with lipids metabolism and affect gut health. Frontiers in Nutrition, 9, 917043.

- Wulan, S. 2024. Pengaruh pemberian bungkil inti sawit fermentasi dengan *Lactobacillus fermentum* dalam ransum terhadap performa dan *income over feed cost* broiler. Skripsi. Padang: Fakultas Peternakan Universitas Andalas.
- Yadav, S., and Jha, R. 2019. Strategies to modulate the intestinal microbiota and their effects on nutrient utilization, performance, and health of poultry. *Journal of Animal Science and Biotechnology*, 10(2), 1-11.
- Yopi, A. Purnawan, A. Thontowi, H. Hermansyah, dan A. Wijanarko. 2006. Preparasi mannan dan mannanase kasar dari bungkil inti sawit. *Jurnal Teknologi*. 4: 312-319.
- Yuliana, N. 2012. Kinetika pertumbuhan bakteri asam laktat isolat T5 yang berasal dari tempoyak. *Jurnal Teknologi dan Industri Hasil Pertanian*, 13(2):108-116
- Yusrizal, F. Manin, Yatno, and Noverdiman. 2012. The use of probiotic and prebiotic (*sybiotik*) derived from palm kernel cake in reducing ammonia emission in the broiler house. Proceeding the 1st poultry Internasional Seminar 2012. The role of poultry in improving human welfare. Faculty of animal science, University Of Andalas, Padang. Indonesia.
- Zein, Y., Sugito, Amiruddin, Roslizawaty, Gholib and M. Isa. 2023. The effect of jaloh (*Salix tetrasperma roxb*) extract on fat level and water content in muscle of broiler chicken which heat stres condition. *Jurnal Medika Veterinaria*, 17 (1): 1-7.
- Zhang, C., Hao, E., Chen, X., Huang, C., Liu, G., Chen, H., and Chen, Y. 2023. Dietary fiber level improve growth performance, nutrient digestibility, immune and intestinal morphology of broilers from day 22 to 42. *Animals*, 13(7), 1227.
- Zhao, X., Liu, H., and Chen, Y. 2024. Characterization of *Bacillus subtilis* som8 with *bile salt hydrolase* activity and probiotic properties. *Journal of Functional Foods*, 105, 105555.