

## DAFTAR KEPUSTAKAAN

- Abdalla, A. L., Louvandini, H., Sallam, S. M. A. H., da Bueno, I. C. S., Tsai, S. M., & de Figueira, A. V. O. 2012. In vitro evaluation, in vivo quantification, and microbial diversity studies of nutritional strategies for reducing enteric methane production. *Tropical Animal Health and Production*. <https://doi.org/10.1007/s11250-011-9992-0>.
- Abuelfatah, K., Zuki, A. B., Goh, Y. M., and Sazili, A. Q. 2016. Effects Of Feeding Whole Linseed On Ruminal Fatty Acid Composition And Microbial Population In Goats. *Animal Nutrition* 2(4): 323–328. <https://doi.org/10.1016/j.aninu.2016.10.004>.
- Afid M, 2016. Efek Konsumsi Daging Kambing terhadap Tekanan Darah. Kes Mas: Jurnal Kesehatan Masyarakat, Vol. 10, No. 1, March 2016, pp. 28 – 32.
- Afzalani., R. A. M. dan E. M. 2008. Preferensi pakan, Tingkah Laku Makan Dan Kebutuhan Nutrien Rusa Sambar (*Cervus unicolor*) Dalam Usaha Penangkaran Di Provinsi Jambi. *Media Peternakan* 31(2):114–121.
- Afzalani, Zein, M., Jamarun, N., Musnandar, E., 2015. Effect of increasing doses of essential oil extracted from Brastagi orange (*Citrus sinensis* L.) peels on performance rumen fermentation and blood metabolites in fattening Bali cattle. *Pak. J. Nutr.* 14: 480– 486.
- Agung, A., Oka, G., Made, L., Pendidikan, M., Dokter, P., Hewan, F. K., dan Udayana, U. 2016. Identifikasi Senyawa Kimia Ekstrak Etanol Daun Kelor ( *Moringa oleifera* L ) di Bali. *Indonesia Medicus Veterinus* 5(5):464–473.
- Ahadi A, Firmasyah MA, Soekarno BPW, Wirtarto. 2015. Effect of tannin to control leaf blight disease on *toona sureni* caused by to isolate of *Rhizotonia* sp. *Journal Pathology*. 14(3): 148-152.
- Ali, C. S., I. U. Din, M. Sharif, M. Nisa, A. Javaid, N. Hashmi and M. Sarwar. 2009. Supplementation Of Ruminally Protected Proteins And Amino Acids: Feed Consumption, Digestion And Performance Of Cattle And Sheep. *International Journal Agriculture Biology* 11: 477-482.
- Ammaly P, dan Kaensombath L. 2006, Effect on Intake and Digestibility By Goats Given Jackfruit (*Artocarpus heterophyllus*) Leaves Alone, The Whole Branch Or Free Access To Both. *Livestock Reserach for Rural Development* 18(3).
- Animut, G., R. Puchala, A. L. Goetsch, A. K. Patra, T. Sahlu, V. H. Varel and J. Wells. 2008. Methane Emission By Goats Consuming Different Sources Of Condensed Tannins. *Animal Feed Science and Technology* 144: 228-241.
- Angelia, U. Silaban, R. 2019. Fitokimia, Total Phenolic Content dan Sitoksisitas Ekstrak, Senyawa Antimikrobal, dan Minyak Atsiri Buah Andaliman (*Zanthoxylum acanthopodium*). Jurnal Graha Tani. Universitas Graha Nusantara Padangsidimpuan. Vol (5):3; hal 22-27.
- Anggorodi, R. 1994. Ilmu Makanan Ternak Umum. PT. Gramedia. Jakarta.
- Anna Anggriana, Muhardi, Rostianti. 2017. Karakteristik Buah Nangka (*Artocarpus heterophyllus Lamk* ). *e-J. Agrotekbis* 5(3): 278-283.
- Arora, S.P. 1989. Pencernaan mikroba pada Ruminansia. Gajah Mada University Press. Yogyakarta. 114 hlm.
- Arora, S. P. 1995. Pencernaan Mikroba Pada Ruminansia. Cetakan kedua. Diterjemahkan oleh Retno Murwani. Gadjah Mada University Press, Yogyakarta.
- Aryanto, A., Suwignyo, B., dan Panjono, P. 2013. Efek Pengurangan Dan Pemenuhan Kembali Jumlah Pakan Terhadap Konsumsi Dan Kecernaan Bahan Pakan Pada Kambing Kacang

- Dan Peranakan Etawah. *Buletin Peternakan* 37(1):12. <https://doi.org/10.21059/buletinpeternak.v37i1.1954>.
- Astuti dan Wina. 2002. Pengaruh pakan limbah tempe terhadap eksresi derivat purin dan pasokan N-Mikroba pada kambing peranakan etawah laktasi. *Jurnal Ilmu Ternak dan Veteriner* Vol. 7. No.3. Th. 2002 P 126-165.
- Asrianti. 2015. Daya Cerna Protein Kasar Dan Serat Kasar Pelet Pakan Komplit Berbasis Tongkol Jagung Dengan Sumber Protein Berbeda Pada Kambing Kacang Jantan. SKRIPSI. Fakultas Peternakan Universitas Hasanuddin. Makasar.
- Auxiliadora, I., Almeida, M. De, St-pierre, N., Tomás, K., Resende, D., and Cannas, A. 2011. Prediction Of Intake And Average Daily Gain By Different Feeding Systems For Goats. *Small Ruminant Research* 98(1-3): 93–97. <https://doi.org/10.1016/j.smallrumres.2011.03.024>.
- Baah, J., Ivan, M., Hristov, A.N., Koenig, K.M., Rode, L.M., McAllister, T.A., 2007. Effects of potential dietary antiprotozoal supplements on rumen fermentation and digestibility in heifers. *J. Anim. And Feed Sci.* 137: 126–137.
- Babychan, N., & Jk, D. R. 2017. Analysis of antioxidant properties of *Moringa oleifera* Lam in urban and coastal area. *International Journal of Applied Research*, 3(6), 1098–1101.
- Badriyah, B., Achmadi, J., dan Nuswantara, L. K. 2017. Kelarutan Senyawa Fenolik dan Aktivitas Antioksidan Daun Kelor (*Moringa oleifera*) di Dalam Rumen Secara In Vitro. *Jurnal Peternakan Indonesia (Indonesian Journal of Animal Science)* 19(3): 120-125. <https://doi.org/10.25077/jpi.19.3.116-121.2017>.
- Bahar, S., Lestari, C. M. S., dan Purbowati, E. 2019. Kualitas Fisik Daging Kambing Jawarandu pada Bobot Potong dan Lokasi Otot yang Berbeda di RPH Bustaman Kota Semarang. In *Prosiding Seminar Nasional*.
- Beauchemin K.A., S.M. McGinn, T.F.Martinez, and T.A.McAlliste. 2007. Use of condensed tannin extract from quebracho trees to reduce methane emission from cattle. *J Anim Sci* 85:1990-1996.
- Beauchemin KA, Kreuzer M, O'ara F, McAllister TA. 2008. Nutritional Management For Enteric Methane Abatement: A Review, *Australian Journal of Experimental Agriculture* 48(2): 21-27. <http://doi.org/c6gfk9>.
- Bhatta, R., O. Enishi and M. Kurihara. 2007. Measurement Of Methane Production From Ruminants. *Asian-Australian journal Animal Science* 20: 1305-1318.
- Bhatta, R., M. M. Saravanan, L. Baruah and C. S. Prasad. 2015. Effect Of Graded Level Of Tannin-Containing Tropical Tree Leaves On In Vitro Rumen Fermentation, Total Protozoa And Methane Production. *Journal Application Microbiology* 118: 557- 564.
- Blakely, J. dan D.H. Bade. 1998. Ilmu Peternakan. Edisi keempat, Gadjah Mada University Press, Yogyakarta. (Diterjemahkan oleh B. Srigandono).
- Blümmel, M., and Ørskov, E.R., 1993. Comparison of in-vitro gas production and nylon bag degradability roughages in prediction of feed intake in cattle. *Animal feed science and technology* 40: 109-229.
- Blümmel, M., H. Steingass and K. Becker. 1997. The Relationship Between In Vitro Gas Production, In Vitro Microbial Biomass Yield and <sup>15</sup>N Incorporated And Its Implication For The Prediction Of Voluntary Feed Intake Of Roughages. *Br. Journal Nutrition* 77: 911-921.
- Boediono. 2002. Ekonomi Mikro. Yogyakarta: BPFE.
- Brock, T.D. and M.T. Madigan. 1991. Biology of Microorganisms, 6th edition, Prentice-Hall,

- Englewood Cliffs, NJ, 874 pp.
- Budiman, A., T. Dhalika, B. Ayuningsih. 2006. Uji kecernaan serat kasar dan bahan ekstrak tanpa nitrogen (BETN) dalam ransum lengkap berbasis hijauan daun pucuk tebu (*Saccharum officinarum*). *Jurnal Ilmu Ternak* 6(2): 132-135.
- Bunglavan S. J. and N. Dutta. 2013. Use Of Tannins As Organic Protectants Of Proteins In Digestion Of Ruminants. *Journal Livestock Science* 4: 67-77.
- Butler, L. G., dan J. C. Rogler. 1992. Biochemical mechanisms of tannin resistance and detoxification in the rumen. In *Microbial Biosystems : New Frontiers*. ACIAR Australia. pp. 117-122.
- Caetano, H., Oliveira, M. D. S., Freitas Júnior, J. E., Rêgo, A. C., Carvalho, M. V., & Rennó, F. P. (2011). Nutritional characteristics and in vitro digestibility of silages from different corn cultivars harvested at two cutting heights. *Revista Brasileira de Zootecnia*, 40(4), 708–714. <https://doi.org/10.1590/S1516-35982011000400002>.
- Cahyaningsih, E., dan Yuda, P. E. S. K. 2020. Uji Aktivitas Ekstrak Daun Mimba (*Azadirachta indica* A. Juss) Sebagai Bahan Pengawet Alami Buah Tomat. *Jurnal Ilmiah Medicamento*. <https://doi.org/10.36733/medicamento.v6i2.1108>.
- Cahyani., L.K. Nuswantara dan Subrata. 2012. Pengaruh Proteksi Protein Tepung Kedelai Dengan Tannin Daun Bakau Terhadap Konsentrasi Ammonia, Undegraded Protein Dan Protein Total Secara In Vitro. *J. Animal Agricultur* 1(1): 159- 166.
- Chanthakhoun, V. and M. Wanapat. 2012. The In Vitro Gas Production And Ruminal Fermentation Of Various Feeds Using Rumen Liquor From Swamp Buffalo And Cattle. *Asian Journal Animal Veterinary Advances* 7: 54- 60.
- Chen, X. B., Y. B. Chen, Franklm, E.R. Orskrov and W.J. Shand. 1992. The effect of intake and body weight on purin dericative excretan and microbial protein supply in sheep. *J. Anim. Sci.* 70:1534-1542.
- Chen, X. B. & M. J. Gomest. 1995. Estimation of microbial protein supply to sheep and cattle based on urinary excretion of purin derivatives – An overview of the technical detail. International Feed Resources Unit. Rowett Research Institute, Bucksburn, Aberdeen, United Kingdom.
- Chen, C.R., B. Yu and P.W.S. Chiou. 2004. Roughage energy and degradability estimatiion with *Aspergillus oryzae* inclusion using dairy *in vitro* fermentation. *Asian-Aust. J. Anim. Sci.* 17:5362.
- Chung, K.-T., Wong, T. Y., Wei, C.-I., Huang, Y.-W., & Lin, Y. 2016. Tannins and Human Health: A Review. *Food Science and Nutrition*, 38(6), 45. <https://doi.org/10.1080/10408699891274273>.
- Church, D.C. 1980. *The Ruminant Animal Digestive Physiology and Nutrition*. Prentice Hall, Englewood Cliffs. New Jersey. USA.
- Church, D.C. and W.G. Pond, 1988. *Basic Animal Nutrition and Feeding*. 3rd Edn., John Wiley and Sons, New York.
- Cieslak, A., Zmora, P., Pers-Kamczyc, E., Stochmal, A., Sadowinska, A., Salem, A.Z.M., Kowalczyk, D., Zbonik, P., Szumacher-Strabel, M., 2014. Effects of two sources of tannins (*Quercus* L. and *Vaccinium vitis idaea* L.) on rumen microbial fermentation: an in Vitro Study. *Ital. J. Anim. Sci.* 13: 3133.
- Cole, N. A., C. W. Purdy, and D. P. Hutcheson. 1991. Influences of yeast culture on feeder calves and lambs. *J. Anim. Sci.* 70: 1682-1690.
- Conway, E.J., dan E. O'Malley. 1942. Microdiffusion methods: ammonia and urea using

- buffered absorbents (revised methods for ranges greater than 10 µg N). Biochemistry Journal. 36: 655-661.
- Conway EJ, 1962, Microdiffusion Analysis And Volumetric Error, 5<sup>th</sup> edition, London (GB): Crosby Lookwood.
- Cottle DJ, Nolan JV, Wiedemann SG. 2011. Ruminant Enteric Methane Mitigation: A Review. *Animal Production Science* 51(6): 491-514. <http://doi.org/fqjt9p>.
- Crampton, E. W. dan L. E. Haris. 1969. Applied Animal Nutrition 1st E. d. The Engsminger Publishing Company, California, U. S. A.
- Czerkawski, J.W. 1986. "An Introduction to Rumen Studies" (Pergamon Press: Sydney).
- Daglia M. 2012. Polyphenols as antimicrobial agents. *Current Opinion in Biotechnology*. 23(2):174–181 doi:10.1016/j.copbio.2011.08.007.
- Danang, M., dan Yulianto, E. 2016. Kinerja Anak Kambing Bligon Setelah Introduksi Pejantan Unggul di Kelompok Ternak Purwo Manunggal, Gunungkidul. *Jurnal Sain Veteriner* 34(2): 251-258. <https://doi.org/10.22146/jsv.27568>.
- Davies, H.L., 1982. Nutrition and Growth Manual. Published by Australian Universities International Development Programme. Melbourne.
- Dehority, B. 1993. Laboratory manual for classification and morphology of rumen ciliate protozoa. CRC Press Taylor and Francis Group. Boca Raton.
- Dehority, B. A. 2004. In vitro determination of generalitional times for Entodinium exuum, Ophryoscolex purkynjei and Eudiplodinium magi. *J. Eukaryot. Microbiol.* 51:333-338.
- Desinta, T 2015, 'Penentuan jenis tanin secara kualitatif dan penetapan kadar tanin dari kulit buah rambutan (*Nephelium loppaceum* L.) secara permanganometri', Calyptra: Jurnal Ilmiah Mahasiswa Surabaya Vol. 4 No. 1, hal. 3.
- Dewi, A. C., Muspita, M., dan Utami, D. 2020. Efek Sinbiotik *Bacillus subtilis* dan Biji Asam ( *Tamarindus indica* L . ) terhadap Kualitas Fisik Daging dan Lemak Abdominal Ayam Broiler. *Jurnal Ilmu Dan Teknologi Peternakan Tropis* 8(3): 261–268. <https://doi.org/10.33772/jitro.v8i3.17248>.
- Dixon, R.A. 1985. Plant Cell Culture A Practical Approach. Washington DC: Department of Biochemistry, Royal Holloway College. IRL Press Oxford.
- Dong, S. zhao, Azarfar, A., Zou, Y., Li, S. li, Wang, Y. jing, and Cao, Z. jun. 2017. Effects Of Sequence Of Nylon Bags Rumen Incubation On Kinetics Of Degradation In Some Commonly Used Feedstuffs In Dairy Rations. *Journal of Integrative Agriculture* 16(1): 162–168. [https://doi.org/10.1016/S2095-3119\(16\)61438-7](https://doi.org/10.1016/S2095-3119(16)61438-7).
- Dosom, Y. N., Suarsana, I. N., dan Setiasih, N. L. E. 2018. Pengaruh Penambahan Tepung Daun Kelor Pada Pakan Terhadap Kadar Kreatinin Dan Urea Serum Tikus Wistar. *Buletin Veteriner Udayana* 10(2):190-195. <https://doi.org/10.24843/bulvet.2018.v10.i02.p13>.
- El-Waziry. A. M. and H. R. Ibrahim. 2007. Effect of *Saccharomyces cerevisiae* of Yeast on Fiber Digestion in Sheep Fed Berseem (*Trifolium alexandrinum*) Hay and Cellulase Activity. *Australian Journal of Basic and Applied Sciences*, 1(4): 379-385.
- Emanuele, S. M. and C. R. Staples. 1990. Ruminal Release of mineral from six forage.
- Ensminger, M.E, J.E Old Field and W.W. Hinennan. 1990. Feed and Nutrition. Second Ed. The Ensminger Publ. Comp. California.
- Ervinatun, W., Hasibuan, R., Hariri, A. M., & Wibowo, L. (2018). Uji Efikasi Ekstrak Daun Mimba, Daun Mengkudu, Dan Babadotan Terhadap Mortalitas Larva Crocidolomia binotalis Zell. DI LABORATORIUM. *Jurnal Agrotek Tropika*. <https://doi.org/10.23960/jat.v6i3.2924>.

- Erwanto., T. Sutardi, D. Sastradipradja, and MA. Nur. 1993. Effects of ammoniated zeolite on metabolic parameters of rumen microbes. *J Trop Agric* 5(1):5-6.
- Evitayani, L. Warly, A. Fariani, T. Ichinohe, M. Hayashida, S.A. Abdul Razak, and T. Fujihara.2006a. Macro mineral distribution of forages in South Sumatera during rainy and dry seasons. *Journal of Food, Agriculture & Environment-JFEA*, Vol. 4(2) : 155 – 160.
- Evitayani, L. Warly, A. Fariani, M. Hayashida and T. Fujihara, 2006b. Micro mineral solubility of forages in South Sumatera, Indonesia. *Journal of Food, Agriculture & Environment – JFEA*, Vol. 4 (2) : 213-215.
- Fahey, G.C. dan L.L. Berger. 1988. Carbohydrate nutrition of ruminants. In : D.C. Chruch (Ed.). *Digestive Physiology and Nutrition of Ruminants. The Ruminant Animal*. Prentice Hall Eglewood Cliifs. New Jersey.
- Fariani, A., Muslim, G., Pratama, A. N. T., & Warly, L. 2021. Evaluation of the digestibility of various types of swamp grass in south sumatra on pampangan local buffalo using the in sacco method. *American Journal of Animal and Veterinary Sciences*. <https://doi.org/10.3844/ajavsp.2021.152.160>.
- Febrina, D. 1998. Sintesis Protein mikroba dan karakteristik kondisi rumen ternak sapi lokal yang diberi ransum jerami padi amoniasi dan konsentrat dengan tingkat yang berbeda. Thesis. Program Pascasarjana Universitas Andalas, Padang.
- Finlay BJ, Esteban G, Clarke KJ, Williams AG, Embley TM, Hirt RP. 1994. Some Rumen Ciliates Have Endosymbiotic Methanogens, *FEMS Microbiology Letters* 117(2): 157-162. <http://doi.org/cngcgb>.
- Firdausi A, Siswoyo TA, Wiryadiputra S. 2013. Identifikasi tanaman potensial penghasil tanin-protein kompleks untuk penghambatan aktivitas  $\alpha$ -amylase kaitannya sebagai pestisida nabati. *Jurnal Pelita Perkebunan*. 29 (1):31–43.
- Fitriana, W. D., Fatmawati, S., & Ersam, T. 2015. Uji Aktivitas Antioksidan terhadap DPPH dan ABTS dari Fraksi-fraksi. Prosiding. 657–660.
- Foidl, N, Makkar H, Becker, K. 2001. “The Potential Of Moringa Oleifera For Agricultural And Industrial Uses.” What Development Potential For Moringa Products?: 1– 20.
- Fujiwara, N dan Yamamoto K. 1987. Production of Alkaline Protease in Low-cost Medium by Alkalophilic Bacillus sp. and Properties of The Enzyme. *Ferment Technol* .65: 345-348.
- Fuller, R. 1992. History and Development of Probiotics. In *Probiotics the Scientific basis*. Edited by Fuller. Chapman and hall. London, New York, Tokyo, Melbourne, Madras. Pp. 1 – 7.
- Fuller, R., 2002, Probiotic- What they are and what they do. <http://D:/Probiotic>. What they and what do, html.
- Franzolin, R., Dehority, B.A., 2010. The role of ph on the survival of rumen protozoa in steers. *Revista Brasileira de Zootecnia*. 39: 2262–2267.
- Gebregiorgis, F., Negesse, T., and Nurfeta, A. 2012. Feed Intake And Utilization In Sheep Fed Graded Levels Of Dried Moringa (*Moringa stenopetala*) leaf as a supplement to Rhodes grass hay. *Tropical Animal Health Production* 44(3): 511–517. <https://doi.org/10.1007/s11250-011-9927-9>.
- Georgievskii, V.I., B.N. Annenkov and V.T. Samokhin., 1982. Mineral Nutriri on of Animals. *Buffers Worths, Kolos*.
- Goel G, Makkar HPS, Becker K, 2008a. Changes In Microbial Community Structure, Methanogenesis And Rumen Fermentation In Response To Saponin- Rich Fractions From Different Plant Materials. *Journal of Applied Microbiology* 105(3): 770-777. <http://doi.org/dj2pn>.

- Goel G, Makkar HPS, Becker K. 2008b. Effects of *Sesbania sesban* and *Carduus pycnocephalus* Leaves And Fenugreek (*Trigonella foenum- graecum L.*) Seeds And Their Extracts On Partitioning Of Nutrients From Roughage And Concentrate-Based Feeds To Methane. *Animal Feed Science and Technology* 147(1-3): 72-89. <http://doi.org/dnsnt>.
- Gonzales, M. L. Pabon, dan J. Carulla. 2002. Effect of tannins on in vitro ammonia release and dry matter degradation of soybean meal. *J. Anim Prod.* Vol. 10:97-101.
- Gultom, E. P., T.H. Wahyuni dan M.R. Tafsin. 2016. Kecernaan Serat Kasar dan Protein Kasar Ransum yang Mengandung Pelepah Daun Kelapa Sawit Dengan Perlakuan Fisik, Biologis, Kimia dan Kombinasinya pada Domba. *Jurnal Peternakan Integratif*. 4: 193-202.
- Gustina, V. M. 2016. Sitotoksisitas Ekstrak Metanol Daun Sukun (*Artocarpus altilis*), Nangka (*Artocarpus heterophyllus*), Dan Kluwih (*Artocarpus camansi*) Terhadap Sel Kanker Payudara T47D. *Farmasi Skripsi.* <http://eprints.ums.ac.id/48573/22/Naskah%20Publikasi.pdf>.
- Guyader, J., Eugene, M., Noziere, P., Morgavi, D.P., Doreau, S. E., and McSweeney, C.S. 2008. Effect of tea saponin on methanogenesis, microbial community structure and expression of mcrA gene, in cultures of rumen microorganism. *Lett. Appl. Microbiol.* Vol. 47, pp. 421-426. Doi:10.1111/j.1472-765X.2008.02459.x.
- Hackmann, T. J., & Firkins, J. L. 2015. Maximizing efficiency of rumen microbial protein production. *Frontiers in Microbiology*, 6(MAY), 1-16. <https://doi.org/10.3389/fmicb.2015.00465>.
- Hambakodu, M., Kaka, A., dan Ina, Y. T. 2020. Kajian In Vitro Kecernaan Fraksi Serat Hijauan Tropis pada Media Cairan Rumen Kambing. *Jurnal Ilmu Dan Teknologi Peternakan Tropis.* <https://doi.org/10.33772/jitro.v7i1.8907>.
- Hanim, C., L.M. Yusiat, dan S. Alim. 2009. Effect of saponin as defaunating agent on in vitro ruminal fermentation of forage and concentrate. *J. Indo. Trop. Anim. Agric.* Vol. 34(4):231-235.
- Harahap, A. U., Warly, L., Hermon, Suyitman, dan Evitayani. 2021. Uji Kandungan Fitokimia Dari Daun Nangka (*Artocarpus heterophyllus*) dan Daun Kelor (*Moringa oleifera*) Sebagai Pakan Tambahan Bagi Ternak Kambing. *Pastura* 10(1): 1-4. <https://doi.org/10.24843/pastura.2021.v10.i02.p01>.
- Harahap, R. P., Setiawan, D., Nahrowi, N., Suharti, S., Obitsu, T., & Jayanegara, A. (2020). Enteric Methane Emissions and Rumen Fermentation Profile Treated by Dietary Chitosan: A Meta-Analysis of In Vitro Experiments. *Tropical Animal Science Journal*, 43(3), 233–239. <https://doi.org/10.5398/tasj.2020.43.3.233>.
- Harborne, J. B. 1987. Comparative Biochemistry Of Tanin. London : Academic Press.
- Hardjosworo, P.S., dan Rukmiasih, M.S. 2000. Meningkatkan Produksi daging. Penebar Swadaya. Yogyakarta.
- Hartutik, 1993. Nilai degradasi secara in sacco beberapa spesies hijauan sumber protein di daerah pegunungan kapur dan bukan kapur, kabupaten malang. Thesis. Program Pasca Sarjana UGM, Yogyakarta.
- Haryanto, B. & A. Thalib. 2009. Emisi metana dari fermentasi enterik: kontribusinya secara nasional dan faktor-faktor yang mempengaruhinya pada ternak. *Wartazoa*. Vol. 19 No. 4.
- Haryanto, B. 2012. Perkembangan Penelitian nutrisi Ruminansia. *Jurnal Wartazoa* 22(4): 169–177.
- Hastuty, W. 2017. Formulasi Sediaan Krim Ekstrak Etanol Daun Nangka (*Artocarpus heterophyllus Lam.*) Sebagai Anti-Aging. Skripsi Universitas Sumatera Utara.

- Hermon. 1993. Senyawa Nitrogen dalam Ransum Ternak Ruminansia. Fakultas Peternakan Universitas Andalas. Padang.
- Hermon, Suryahadi, Wiryawan, K. G., dan Hardjosoeignjo, S. 2008. Nisbah Sinkronisasi Suplai N-Protein dan Energi dalam Rumen Sebagai Basis Formulasi Ransum Ternak Ruminansia. *Media Peternakan* 31(3): 186–194.
- Hess HD, Kreuzer M, Diaz TE, Lascano CE, Carulla JE, Soliva CR, Machmüller A. 2003. Saponin Rich Tropical Fruits Affect Fermentation And Methanogenesis In Faunated And Defaunated Rumen Fluid. *Animal Feed Science and Technology*. 109(1-4): 79-94. <http://doi.org/cwkrfj>.
- Hidayah, N. 2016. Pemanfaatan senyawa metabolit sekunder tanaman (tanin dan saponin) dalam mengurangi emisi metan ternak ruminansia. *J. Sains Peternakan Nasional*. Vol. 11(2):89-98.
- Hindratiningrum, N., M. Bata dan S. A. Santosa. 2011. Produk fermentasi rumen dan produksi protein mikroba sapi lokal yang diberi pakan jerami amoniasi dan beberapa bahan pakan sumber energy. *Agripet*. 11 (2): 29 – 34.
- Hristov, A.N., T. A. McAllister, and K.J. Cheng. 1998. Effect of Dietary or Abomasal Supplementation of Exogenous Polysaccharide-Degrading Enzymes on Rumen Fermentation and Nutrient Digestibility. *J. Anim. Sci.* 76:3146-3156.
- Hristov, A.N., M. Ivan, and T.A. McAllister. 2004. In vitro effects on individual fatty acids on protozoal numbers and on fermentation products in ruminal fluid from cattle fed a high concentrate, barley-based diet. *J. Anim. Sci.* 82: 2693-2704.
- Hume, I. D. 1982. Digestion and Protein Metabolism in Ruminant. Australian Universities International Development Program, Melbourne
- Hvelplund T, and Madsen J. 1985. Amino acid passage to the small intestine in dairy cows compared with estimates of microbial protein and undegraded dietary protein from analysis on the feed. *Acta Aric* 2 Supl 25:21-36.
- Ibrahim, A., dan Kuncoro, H. 2012. Identifikasi metabolit sekunder dan aktivitas antibakteri ekstrak daun sungkai (Peronema canescens Jack.) terhadap beberapa bakteri patogen. *Journal of Tropical Pharmacy and Chemistry*. 2(1):8–18 doi:10.25026/jtpc.v2i1.43.
- Imam, K., Purbowati, E., dan Adiwinarti, R. 2013. Komposisi Kimia Daging Kambing Kacang Jantan Yang Diberi Pakan Dengan Kualitas Berbeda. *Animal Agriculture Journal* 2(4): 23-30. <http://ejournal-s1.undip.ac.id/index.php/aaaj>.
- IPCC. 2006. Emission from livestock and manure management. Guidelines for National Greenhouse Gas Inventories. Bab 10 hlm 72-82.
- IPCC. 2007. Climate Change 2007: Synthesis Report. [http://www.ipcc.ch/pdf/assessment-report/ayr4/syr/ar4\\_syr\\_sym.pdf](http://www.ipcc.ch/pdf/assessment-report/ayr4/syr/ar4_syr_sym.pdf).
- Irkham Widiyono, Sarmin, B. S. 2013. Respons Metabolik terhadap Pembatasan Asupan Pakan pada Kambing Peranakan Ettawa. *Jurnal Veteriner* 14(4): 424-429. <https://ojs.unud.ac.id/index.php/jvet/article/view/7676>.
- Irianty, RS, Yenti, SR 2014, ‘Pengaruh perbandingan pelarut etanol-air terhadap kadar tanin pada sokletasi daun gambir (Uncaria gambir Roxb)’, SAGU, Maret 2014 Vol.13 No.1:1- 7, ISSN 1412-4424, hal.3.
- Ismartoyo. 2011. Pengantar teknik penelitian degradasi pakan ternak ruminansia. Brilian Internasional, Surabaya.
- Isnan, W., dan Muin, N. 2017. Ragam Manfaat Tanaman Kelor (Moringa oleifera Lamk.) bagi masyarakat. *Buletin Ebomi*, 14(1), 63-75.

- Iqbal MF, Cheng YF, Zhu WY, Zeshan B. 2008. Mitigation Of Ruminant Methane Production: Currect Strategies, Constraints And Future Options. *World Journal of Microbiology and Biotechnology* 24(12): 2747-2755, <http://doi.org/dgfsxd>.
- Jardstedt, M., Hessle, A., Nørgaard, P., Richardt, W., and Nadeau, E. 2017. Feed Intake and Urinary Excretion Of Nitrogen And Purine Derivatives In Pregnant Suckler Cows Fed Alternative Roughage-Based Diets. *Livestock Science* 202(5): 82–88. <https://doi.org/10.1016/j.livsci.2017.05.026>.
- Jayanegara A, Makkar HPS, Becker K, 2009a. Emisi Metana dan Fermentasi Rumen *In Vitro* Ransum Hay Yang Mengandung Tannin Murni Pada Konsentrasi Rendah. *Media Peternakan* 32(3): 185-195.
- Jayanegara A, Sofyan A, Makkar HPS, Becker K, 2009b. Kinetika Produksi Gas, Kecernaan Bahan Organik, dan Produksi Gas Metana *In Vitro* Pada Hay Dan Jerami Disuplementasi Hijauan Mengandung Tannin. *Media Peternakan* 32(2): 120-129.
- Jayanegara, A., Leiber, F., dan Kreuzer, M. 2012. Meta-analysis Of The Relationship Between Dietary Tannin Level And Methane Formation In Ruminants From In Vivo And In Vitro Experiments. *Journal of Animal Physiology and Animal Nutrition* 96(3): 365–375. <https://doi.org/10.1111/j.1439-0396.2011.01172>.
- Jayanegara, Anuraga, Goel, G., Makkar, H. P. S., and Becker, K. 2015. Methane Emission, Rumen Fermentation And Microbial Population In Vitro. *Animal Feed Science and Technology*. <https://doi.org/10.1016/j.anifeedsci.2015.08.002>.
- Ji, S. K., Jiang, C. G., Li, R., Diao, Q. Y., Tu, Y., Zhang, N. F., & Si, B. W. 2016. Growth performance and rumen microorganism differ between segregated weaning lambs and grazing lambs. *Journal of Integrative Agriculture*, 15(4), 872–878. [https://doi.org/10.1016/S2095-3119\(15\)61267-9](https://doi.org/10.1016/S2095-3119(15)61267-9)
- Joko Santoso, dan Fibri, D. 2018. Uji Efektivitas Ekstrak Daun Nangka (*Artocarpus heterophyllus* Lam.) Sebagai Antidiare Pada Mencit (*Mus musculus*) Yang Diinduksi Dengan Minyak Jarak (*Oleum Ricini*). *Jurnal Permata Indonesia* 8(2):53-63.
- Jordan, E., D. Kenny, M. Hawkins, R. Malone, D. K. Lovett, and F. P. O'Mara. 2006. Effect oy refined soy oil or whole soybeans on intake, methane output, and performance of young bulls. *J.Anim.Sci.* 84: 2418-2425.
- Kakengi, A. M. V, Shem, M. N., Sarwatt, S. V, and Fujihara, T. 2002. *Can Moringa oleifera Be Used as a Protein Supplement for Ruminants ?* 42–47.
- Kasim. 2002. Performa domba lokal yang diberi ransum komplit berbahan baku jerami dan onggok yang mendapat perlakuan cairan rumen. Skripsi Sarjana, Fakultas Peternakan Institut Pertanian Bogor, Bogor.
- Karabulut, A., Canbolat, O., Kalkan, H., Gurbuzol, F., Sucu, E., & Filya, I. (2007). Comparison of in vitro gas production, metabolizable energy, organic matter digestibility and microbial protein production of some legume hays. *Asian-Australasian Journal of Animal Sciences*, 20(4), 517–522. <https://doi.org/10.5713/ajas.2007.517>.
- Kartika, D., Atikah, L., dan Pratiwi, A. 2021. Formulasi Ekstrak Daun Pandan Wangi (*Pandanus amaryllifolius* Roxb) Sebagai Masker Gel Peel Off. *Jurnal FarmasiMed (JFM)*. <https://doi.org/10.35451/jfm.v4i1.801>.
- Kay, B. J., Swart, V. R., and Van Der Watt, E. 2019. Evaluation and Comparison of Various Plant Extracts as Repellents Against *Lucilia* spp. *African Entomology*. <https://doi.org/10.4001/003.027.0167>.

- Keliher FM., and Clarck H. 2010. Ruminants. Di dalam: Reay D, Smith P, Armstel A. *Methane and Climate Change*. London, UK: Earthscan Ltd.
- Klinhom P, Markvichitr K, Vijchulata P, Tumwasorn S, Bunchasak C, Choothesa A. 2006a. Effect of refeeding on Lipid Metabolism in Kamphaengsaen Beef Heifers. *Kasetsart J. (Nat. Sci.)* 40: 420- 429.
- Klinhom P, Markvichitr K, Vijchulata P, Tumwasorn S, Bunchasak C, Choothesa A. 2006b. Effect of restricted feeding on metabolic adaptations of Kamphaengsaen and crossbred Brahman heifers. *Animal Science Journal* 77: 399-406.
- Kongmanila, D., and Ledin, I. 2009. Chemical Composition Of Some Tropical Foliage Species And Their Intake And Digestibility By Goats. *Asian-Australasian Journal of Animal Sciences*, 22(6), 803–811. <https://doi.org/10.5713/ajas.2009.80589>.
- Kraft W, Duerr MW. 1999. Klinische Labordiagnostik in der Tiermedizin, Auflage. Stuttgart: Schattauer.
- Kusumawati, E., Apriliana, A., dan Yulia, R. 2017. Kemampuan Antibakteri Ekstrak Etanol Daun Nangka (*Atrocarpus heterophyllus* Lam.) Terhadap *Escherichia coli*. *Jurnal Sains Dan Kesehatan*. <https://doi.org/10.25026/jsk.v1i7.51>.
- Laka, M.R., Kleden, M.M. 2019. Pengaruh Pemberian Pakan Komplit Fermentasi Serasah Gamal dan Batang Pisang dengan Imbangan yang berbeda Terhadap Biokimia Darah Kambing Kacang. *Jurnal Peternakan Lahan Kering* 1(4): 570–578. <https://doi.org/10.57089/jplk.v1i4.462>.
- Lawrie, R.A. 1995. Ilmu Daging. Penerjemah Aminudin Parakkasi. Penerbit Universitas Indonesia.
- Lee, S., Ha, J., & Cheng, K.-J. 2000. Influence of an anaerobic fungal culture administration on in vivo ruminal fermentation and nutrient digestion. *Animal Feed Science and Technology*, 88(3–4), 201–217. [https://doi.org/10.1016/S0377-8401\(00\)00216-9](https://doi.org/10.1016/S0377-8401(00)00216-9).
- Leng RA, 1991, Application of Biotechnology to Nutrition of Animal in Developing countries, *FAO Animal Production and Health Paper*.
- Lestari, 2017. Penurunan Gas Metan Melalui Penambahan Daun Kelor (*Moringa oleifera*) Pada Pakan Sapi Potong. Prosiding Seminar Teknologi dan Agribisnis Peternakan VI: Pengembangan Sumber Daya Genetik Ternak Lokal Menuju Swasembada Pangan Hewani ASUH, Fakultas Peternakan Universitas Jenderal Soedirman.
- Liama, Care A, 2014, *The important of forages in Animal*, Equine Applied and Clinical Nutrition.
- Liang, J.B., M. Matsumato and B.A. Young, 1994. Purine Derivative Excretion and Ruminal Microbial Yield in Malaysian Cattle and Swamp Buffalo. *Animal Feed. Science and Technololgy*. 47 : 189-199.
- Liu, X., Guangxi, Ren., Yan, Shi. 2011. The Effect of Organic Manure And Chemical Fertilizer On Growth And Development of Stevia Rebaudiana Bertoni. *Journal Energy Procedia*, 5, 1200-1204.
- Lykholt, O. A., Grigoryuk, I. P., and Lykholt, T. Y. 2016. Metabolic Effects Of Alimentary Estrogen In Different Age Animals. *Annals of Agrarian Science* 14(4): 335–339. <https://doi.org/10.1016/j.aasci.2016.09.012>.
- Machmuller, A., Soliva, C.R., and Kreuzer, M. 2003. Effect of Coconut Oil and Defaunation Treatment on Methanogenesis in sheep. *J. Reprod. Nutr. Dev.* 43 (2003) 41-55.
- Mahmudah, R. A., Yulianti, E., & Hanapi, A. 2019. Pemberdayaan Tanaman Moringa Oleifera

- Lamk. (kelor) Pada Masyarakat Dusun Talangsari Desa Ringinkembar Kecamatan Sumbermanjing Wetan Kabupaten Malang. *Journal of Research on Community Engagement*, 1(1), 10-13.
- Makkar, H. P., Blummel, M., & Becker, K. 1995. Formal complexes between polyvinyl pyrrolidones or polyethylene glycols and tannins, and their implication in gas production and true digestibility in in vitro techniques. *British Journal of Nutrition*, 897–913.
- Makkar, H. P. S., and Becker, K. 1996. Nutritional value and antinutritional components of whole and ethanol extracted *Moringa oleifera* leaves. *8401*(96).
- Malik, P. K., Kolte, A. P., Bakshi, B., Baruah, L., Dhali, A., & Bhatta, R. 2017. Effect of tamarind seed husk supplementation on ruminal methanogenesis, methanogen diversity and fermentation characteristics. *Carbon Management*, 8(4), 319–329. <https://doi.org/10.1080/17583004.2017.1357403>.
- Mao J, Zak LJ, Cosgrove JR, Shostak S, Foxcroft GR. 1999. Reproductive, metabolic and endocrine responses to feed restriction and GnRH treatment in Primiparous Lactating Sows. *Journal of Animal Science* 77: 724-735
- Marhaeniyanto, E., dan Susanti S. 2016. Penggunaan Konsentrat Hijau Untuk Meningkatkan Penampilan Domba Jantan Muda. *Seminar Nasional Hasil Penelitian*.
- Martin C., J Rovel, J.P Jouny,M. Doreau, and Y. Chilliard. 2008. Methane Output and Die Digestibility in Response to Feeding Dairy Cows Crude Linseed, Extruded Linseed, of Linseed Oil. *J. Anim.Sci.* 86:2642-2650.
- Martin, C., Morgavi, D. P., and Doreau, M. 2010. Methane Mitigation In Ruminants: From Microbe To The Farm Scale. *Animal* 4(3): 351–365. <https://doi.org/10.1017/S1751731109990620>.
- Mastopan, Tafsin, M., Hanafi, N.D., 2015. Kecernaan lemak kasar dan TDN (*Total digestible nutrient*) ransum yang mengandung pelepas daun kelapa sawit dengan perlakuan fisik, kimia, biologis dan kombinasinya pada domba. *J. Peternakan Integratif*. 3(1): 37 – 45.
- Mayulu, H., B. Suryanto, Sunarso, M. Christiyanto, F. I. Ballo and Refa'i. 2009. Feasibility of Complete feed Based on Ammoniated Fermented Rice Straw Utilization on the Beef Cattle Farming. *J. I. Tropic. Anim. Agri.* 34: 74-78.
- Mazur A, Ozgo M, Rayssiguier Y. 2009. Altered plasma triglyceride-rich lipoproteins and triglyceride secretion in feed-restricted pregnant ewes. *Veterinarni Medicina* 54 (9):412-418.
- Mc.Donald, P., Edward, R.A., and Greenhalgh, JFD. 1988. *Animal Nutrion*. New York. Longman Scientific & Technical
- McDonald, M. N And D. J. Minson. 1998. Large Particle reak down by cattle cating regras and alfafa. *Journal Animal Science.*\
- Mc.Donald, P., R. A. Edwards, J. F. D. Greenhalgh, and C. A. Morgan. 2002. *Animal Nutrition*. 6th ed. Ashford Colour Press Ltd, Gosport. pp. 515-535.
- McDonald P, Edwards R, Greenhalgh J, Morgan C, Sinclair L, Wilkinson R. 2010. *Animal Nutrition*. Seventh Ed. England: Preason Education Limited.
- Mehrez, A.Z., E.R. Orskov and I. McDonald. 1977. Rate of rumen fermentation in relation to ammonia concentration. *Br J. Nutr.* 38: 437.
- Metri, Y., Warly, L., & Suyitman. 2018. Biodegradation of lignin by white rot fungi (*Pleurotus ostreatus*) to decrease the fibre components in the palm midrib. *Pakistan Journal of Nutrition*. <https://doi.org/10.3923/pjn.2018.71.75>.

- Mihra, M., Jura, M. R., dan Ningsih, P. 2018. Analisis Kadar Tanin dalam Ekstrak Daun Mimba (*Azadirachta indica* a. Juss) dengan Pelarut Air dan Etanol. *Jurnal Akademika Kimia* 7(4): 179. <https://doi.org/10.22487/j24775185.2018.v7.i4.11941>.
- Miller, T.L., M.J. Wolin, Z. Hongxue, and M.P. Bryant. 2002. Characteristics of Methanogens Isolated from Bovine Rumen. *Applied and Environmental Microbiology*. American Sociey for Microbiology. 51: 201-202.
- Miller-Webster, T., W.H. Hoover and M. Holt. 2002. Influence of yeast culture on ruminal microbial metabolism in continous culture. *J. Dairy. Sci.* American Dairy Science Association. 85: 2009-2014.
- Mitsumori, M. and W. Sun. 2008. Control of rumen microbial fermentation for mitigating methane emissions from the rumen. *Asian-Aust. J. Anim. Sci.* 21:144-154.
- Mody, L., dan Suhartati, 2013, Potensi Pengembangan Cempedak (*Artocarpus Integer* Merr.) Pada Hutan Tanaman Rakyat Ditinjau Dari Sifat Kayu Dan Kegunaannya, Info Teknis EBONI, Vol. 10 (2) : 69-83.
- Mohammed, S., dan Manan, F. A. (2015). Analysis of total phenolics, tannins and flavonoids from *Moringa oleifera* seed extract. *Journal of Chemical and Pharmaceutical Research*, 7(1), 132–135.
- Mohandas, G. G., dan Kumaraswamy, M. 2018. Antioxidant Activities of Terpenoids from *Thuidium tamariscellum* (C. Muell.) Bosch. And Sande-Lac. A Moss. *Pharmacogn J.*, 10(4).
- Morgavi, D. P., Forano, E., Martin, C., & Newbold, C. J. 2010. Microbial ecosystem and methanogenesis in ruminants. *Animal*, 4(7), 1024–1036. <https://doi.org/10.1017/S1751731110000546>.
- Mosoni, P., Martin, C., Forano, E., & Morgavi, D. P. 2011. Long-term defaunation increases the abundance of cellulolytic ruminococci and methanogens but does not affect the bacterial and methanogen diversity in the rumen of sheep1. *Journal of Animal Science*, 89(3), 783–791. <https://doi.org/10.2527/jas.2010-2947>.
- Moss, A.R., J.P.Jouany, and J. Newbold. 2000. Methane production by ruminants: its contribution to global warming. *Ann. Zootech.* 49: 231-253.
- Mukherjee, P. K. (n.d.). Qualitative Analysis for Evaluation of Herbal Drugs. 16.
- Muktiari, B. N. 2019. Penggunaan Daun Lamtoro (*Lleucaena leucocephala*) Sebagai Sumber Tanin Untuk Menurunkan Produksi Metan Pada Fermentasi Rumen Domba Secara In Vitro. Skripsi Sarjana Fakultas Peternakan. Universitas Gadjah Mada. Yogyakarta.
- Munir, M.I. dan E. Kardiyanto. 2015. Peningkatan Bobot Badan Domba Lokal di Provinsi Banten melalui Pertambahan Dedak dan Rumput. Balai Pengkajian Teknologi Pertanian Banten. Prosiding Seminar Nasional Teknologi Peternakan dan Veteriner 2015.
- Musa, A. M.2012. Regression Analysis of Linier Body Measurements on Live Weight in Sudanese Shugor Sheep. Online J. anim. Feed Res. 2(1): 27-29.
- Muslim, G., Sihombing, J.E., Fauziah, S., Abrar, A., Fariani A., 2014. Aktivitas proporsi berbagai cairan rumen dalam mengatasi tannin dengan teknik in vitro. *J. Peternakan Sriwijaya*. 3: 25–36.
- Muqier, Qi, S., Wang, T., Chen, R., Wang, C., and Ao, C. 2017. Effects of Flavonoids From *Allium mongolicum* Regel on Growth Performance And Growth-Related Hormones in Meat Sheep. *Animal Nutrition* 3(1): 33–38. <https://doi.org/10.1016/j.aninu.2017.01.003>.
- Nhan, N.T.H., N. Van Hon, N.T. Ngu, N.T. Von, T.R. Preston and R.A. Leng. 2001. Practical application of defaunation of cattle on farm in Vietnam: Response of young cattle fed rice

- straw and grass to a single drench of groundnut oil. Asia-Aust. J. Anim. Sci. 14(4): 485 – 490.
- Natsir, A. 2007. Ekskresi derivate purin dan estimasi suplai protein. JITV 12(3):183-188.
- Nasiu, F., Yusiat, L. M., dan Supadmo, S. 2013. Pengaruh Suplementasi Vitamin E Dalam Ransum yang Mengandung Capsulated Crude Palm Oil Terhadap Kandungan Polyunsaturated Fatty Acid Daging dan Performan Kambing Bligon. *Buletin Peternakan*. <https://doi.org/10.21059/buletinpeternak.v37i3.3090>.
- Newbold, C.J., dan Ramos-Morales E. 2020. Review: Ruminal microbiome and microbial metabolome: Effects of diet and ruminant host. Animal. 14(S1):S78–S86 doi:10.1017/S1751731119003252.
- Ningrat, R.W.S., M. Zain, Erpomen and H. Suryani. 2017. Effect of doses and different sources of tannins on in vitro ruminal methane, volatile fatty acid production and on bacteria and protozoa population. *Asian J. of Anim. and Vet. Adv.* Vol. 11. No 5, pp. 314-318
- Ningrat, R. W. S., Zain, M., & Warly, L. 2018. Optimization of Rumen Microbial Protein Synthesis by Addition of Gambier Leaf Residue to Cattle Feed Supplement. *Pakistan Journal of Nutrition*. <https://doi.org/10.3923/pjn.2019.12.19>.
- Nisa, D., Achmadi, J., Wahyono, F., dan Diponegoro, U. 2017. Degradabilitas Bahan Organik dan Produksi Total Vollatile Fatty Acids (VFA) Daun Kelor (*Moringa oleifera*) Dalam Rumen Secara In Vitro. *Jurnal Ilmu-ilmu Peternakan* 27(1): 12–17.
- Nooriyan Soroor, M. E., & Rouzbehani, Y. 2017. Effect of Essential Oils Of Eucalyptus (*Eucalyptus globulus labill*) and Angelica (*Heracleum persicum desf. ex fischer*) on In Vitro Ruminal Fermentation, Protozoal Population and Methane Emission Using Afshari Sheep Inoculum. *Journal of Agricultural Science and Technology* 19(3):553-567.
- Nora, D., Astuti, T., dan Wahid, D. 2017. Efektivitas Daun Nangka Dalam Ransum Ruminansia Terhadap Kecernaan Bahan Kering, Bahan Organik, dan Kandungan Tanin. *Jurnal BiBiET*. <https://doi.org/10.22216/jbbt.v2i1.1917>.
- Nugroho, A,R,P., dan Andy, 2012. Estimasi suplai protein mikrobia pada ternak kambing dengan tingkat konsumsi berbeda berdasarkan ekskresi turunan purin pada urin. *J. Agrisistem*. 8(1):36-43.
- Nugroho, T., Nurhidayati, A., Ayuningtyas, A. I., Kustiyani, C., Prastowo, S., and Widyas, N. 2018. Birth and Weaning Weight of Kids From Different Boer Goat Crosses. *IOP Conference Series: Earth and Environmental Science*. <https://doi.org/10.1088/1755-1315/142/1/012010>.
- Nuraini,. I. G. S. Budisatria, dan A. Agus. 2014. Pengaruh Tingkat Penggunaan Pakan Penguin terhadap Performa Induk Kambing Bligon di Peternak Rakyat. *Buletin Peternakan*. Vol 38 (1): 34-41.
- Nuraliah, S., Purnomoadi A., Nuswantara LK. 2015. Konsentrasi Asam Lemak Terbang dan Glukosa Darah Domba Ekor Tipis yang Diberi Bungkil Kedelai Terproteksi Tanin. *Jurnal Veteriner*. 16 (3): 448-456.
- Nuraliah, S., Purnomoadi A., Nuswantara LK. 2016. Pengaruh Bungkil Kedelai Terproteksi Tanin Terhadap Gas Metan Dan Glukosa Darah Pada Domba Ekor Tipis. *Jurnal Pengembangan Penyuluhan Pertanian*. 11 (21): 15.
- Nurdin, A. S., dan Fariani, A. 2014. Pengembangan Populasi Ternak Ruminansia Berdasarkan Ketersediaan Lahan Hijauan dan Tenaga Kerja di Kota Palembang Sumatera Selatan. *Jurnal Peternakan Sriwijaya* 3(2): 1–11. <https://doi.org/10.33230/JPS.3.2.2014.1765>.
- Ogimoto K, Imai S, 1987. *Atlas of Rumen Microbiology*. Tokyo (JP): Japan Scientific Societies

- Press.
- Ørskov, E. R. 1992. Protein Nutrition in Ruminant. 2nd Ed. Academic Press, London.
- Orskov ER, 1998. Protein Nutrition in Ruminants. Second Edition. Academic Press Inc., San Diego.
- Owens,F.N. dan A.L. Goeetsch. 1979. Ruminal Fermentation. Dalam : Church, D.C. Ed. Digestive Phisiology and Nutritional of Ruminannt. Prentice Hall. New jersey 07632. 145-158.
- Owen, F. N., A. L. Goetsch. 1998. Ruminal fermentation in: D. C. Chruch (ed), the ruminant animal digestive physiology and nutrition. Prentice Hall. Engwood Cliffs. New Jersey.
- Oyetayo VO, and FL. Oyetayo. 2005. Potential of Probiotics as Biotherapeutic Agents Targeting the Innate Immune System. Afr. J. Biotech., 4: 123-127.
- Parakkasi A. 1999. Ilmu Nutrisi dan Makanan Ternak Ruminansia. Universitas Indonesia, Jakarta.
- Pathak, A. K. 2008. Various factors affecting microbial protein synthesis in the rumen. Vet. World. 1 (6) : 186 – 189.
- Patra, A.K., Saxena, J., 2011. Exploitation of dietary tannins to improve rumen metabolism and ruminant nutrition. J. Sci. Food Agric. 91: 24–37.
- Patra, A.K., and Yu, Z. 2013. Effect Of Coconut and Fish Oils on Ruminal Methanogenesis, Fermentation, and Abundance and Diversity of Microbial Population In Vitro. J. Dairy Sci. 96:1782-1792.
- Popalayah dan Afa, M. 2017. Efek Pemberian Daun Kelor (*Moringa oleifera* Lam) Terhadap Pertambahan Bobot Badan Kambing Bligon. *Jitp* 5(3): 117–121.
- Pazla, R., Jamarun, N., Warly, L., Yanti, G., & Nasution, N. A. 2021. Lignin content, ligninase enzyme activity and in vitro digestability of sugarcane shoots using *pleurotus ostreatus* and *aspergillus oryzae* at different fermentation times. *American Journal of Animal and Veterinary Sciences.* <https://doi.org/10.3844/ajavsp.2021.192.201>
- P. Devanandan, dan, V. A. Muthukumar, 2016. Antioxidant And Analgesic Activity Of Leaf Extracts Of *Artocarpus heterophyllus*. Asian J. Res. Chem., Vol. 9No. 3, Pp. 0–4. Doi: 10.5958/0974.
- Pamungkas, D., Mariyono, R. Antari, dan T.A. Sulistya. 2013. Imbangan pakan serat dengan penguat yang berbeda dalam ransum terhadap tampilan sapi Peranakan Ongole jantan. Prosiding. Seminar Nasional Teknologi Peternakan dan Venteriner. Hal: 107-115.
- Phengvilaysouk, A., & Kaensombath, L. (n.d.). *Effect on intake and digestibility by goats given jackfruit ( Artocarpus heterophyllus ) leaves alone , the whole branch or free access to both.*
- Philippe, F. X. & B. Nicks. 2014. Review on greenhouse gas emissions from pig houses: Production of carbon dioxide, methane and nitrous oxide by animals and manure. Agri, Eco and Env 199 e10-e25.
- Philippe, F. X., V. Remience, J. Y. Dourmard, J. F. Cabarux, M. Vandenneede, & B. Nicks. 2008. Food fibers in gestating sows: effects on nutrition behavior, performances and waste in the environment. INRA Prod. Anim. 21 : 277-290.
- Pilajun, R., M. Wanapat, C. Wachirapakorn, and C. Navanukroaw. 2010. Effect of Coconut oil and sunflower oil ratio on ruminal fermentation, rumen microorganisms, N-balance and digestibility in cattle. J. Anim. And Vet. Adv. 9 (13) : 1868-1874.

- Prasetyo, A. B. 2013. Partisipasi pelaksanaan program sarjana membangun desa dalam pengembangan sapi potong di Kabupaten Bantul Daerah Istimewa Yogyakarta. Tesis Fakultas Peternakan, Universitas Gadjah Mada, Yogyakarta.
- Pratama, Y., Sarjono, P. R., dan Mulyani, N. S. 2015. Skrining Metabolit Sekunder Bakteri Endofit yang Berfungsi sebagai Antidiabetes dari Daun Mimba (*Azadirachta Indica*). *Jurnal Kimia Sains Dan Aplikasi*. <https://doi.org/10.14710/jksa.18.2.73-78>.
- Preston, T.R. and R.A. Leng. 1987. Matching Ruminant Production System with Available Resources in The Tropics. Penambul Books. Armidale.
- Prihantoro, I., T. Toharmat, D. Evvyernie, Suryani, dan L. Abdullah. 2012. Kemampuan isolat bakteri pencerna serat asal rumen kerbau pada berbagai sumber hijauan pakan. JITV. 17(3):189-200.
- Puastuti, W. 2010. Manipulasi Bioproses dalam Rumen untuk Meningkatkan Penggunaan Pakan Serat. Wartazoa. Vol 19, No 4.
- Puchala, R., B.R. Min, A.L. Goetsch, dan T. Sahlu. 2005. The effect of condensed tannin-containing forage on methane emission by goats. J. Anim. Sci. Vol. 83:182-186.
- Purbowati, E., E. Baliarti dan S.P.S. Budhi. 1996. Kinerja domba yang digemukkan secara feedlot dengan aras konsentrat dan pakan dasar berbeda. BPPS-UGM. 9(3B). hlm. 359 – 371.
- Putra, S., 2006. Improved feed supplemented with zinc acetate increased bacterial population and microbial protein in the rumen, digestibility of dry matter and nutrients of diet of pregnant Bali heifers. Majalah Ilmiah Peternakan. 9: 153–167.
- Putra, 2011. Pengaruh suplementasi daun waru (*Hibiscus tiliaceus L.*) terhadap karakteristik fermentasi dan populasi protozoa rumen secara in vitro. Skripsi. Universitas Sebelas Maret. Surakarta.
- Putri, E. M., Zain, M., Warly, L., & Hermon, H. 2021. Effects of rumen-degradable-to-undegradable protein ratio in ruminant diet on in vitro digestibility, rumen fermentation, and microbial protein synthesis. *Veterinary World*. <https://doi.org/10.14202/VETWORLD.2021.640-648>.
- Qin WZ, Li CY, Kim JK, Ju JG & Song MK. 2012. Effects of defaunation on fermentation characteristics and methane production by rumen microbes in vitro when incubated with starchy feed sources. Asian-Australasian Journal of Animal Science. 25(10):1381–1388 doi:10.5713/ajas.2012.12240
- Raffrenato, E., Fievisohn, R., Cotanch, K. W., Grant, R. J., Chase, L. E., & Van Amburgh, M. E. (2017). Effect of lignin linkages with other plant cell wall components on in vitro and in vivo neutral detergent fiber digestibility and rate of digestion of grass forages. *Journal of Dairy Science*, 100(10), 8119–8131. <https://doi.org/10.3168/jds.2016-12364>
- Ragni, M., Vicenti, A., Melodia, L., and Marsico, G. 2014. Use of Grape Seed Flour in Feed for Lambs and Effects on Performance and Meat Quality. *Procedia - Social and Behavioral Sciences* 8:59–64. <https://doi.org/10.1016/j.apcbee.2014.03.001>.
- Rahmawati, P.D., Pangestu, E., Nuswatra, L. K., dan Christiyanto, M. 2021. Kecernaan Bahan Kering, Bahan Organik, Lemak Kasar dan Nilai Total Digestible Nutrient Hijauan Pakan Kambing. *Jurnal Agripet* 21(1):71-77. <https://doi.org/10.17969/agripet.v21i1.17933>.
- Rahmi, B. Y. Yanti, S. Mizumachi, J. Achmadi, Y. Kawamoto dan A. Purnomoadi. 2008. Pengaruh pengeringan menggunakan oven dan freeze dryer terhadap kandungan sianida umbi dan batang ketela pohon. Seminar Nasional Teknologi Peternakan dan Veteriner. Fakultas Peternakan. Universitas Diponegoro.

- Ramdan R., 2007. Fenotipe domba lokal di Unit Pendidikan Penelitian dan Peternakan Jonggol. (skripsi). Fakultas Peternakan. IPB.
- Ranjhan,S.K. And N.N. Pathak. 1979 Management and Feeding of Buffaloes Vikas Publishing House PVT. Ltd. New Delhi.
- Ravindran, V. 2016. Feed-Induced Specific Ileal Endogenous Amino Acid Losses: Measurement and Significance In The Protein Nutrition of Monogastric Animals. *Animal Feed Science and Technology* 221:304–313. <https://doi.org/10.1016/j.anifeedsci.2016.05.013>.
- Richards, N., and Kempton, T. J. 2016. The Post Feeding Glycaemic and Insulin Response To Copra Meal in Horses. *Animal Feed Science and Technology* 211:100–108. <https://doi.org/10.1016/j.anifeedsci.2015.09.003>.
- Riestanti L.U, Retnani Y., dan, Despal D. 2020. Fermentability and digestibility responses of prill fat supplementation in dairy ration. IOP Conference:Earth and Environmental Science (EES). 411(1) doi:10.1088/1755- 1315/411/1/012037.
- Rizki, M. I., Nurley, Fadlilaturrahmah, Ma'shumah, 2021. Skrining fitokimia dan penetapan kadar fenol total pada ekstrak daun nangka (*Artocarpus heterophyllus*), cempedak (*Artocarpus integer*), dan tarap (*Artocarpus odoratissimus*) asal desa pengaron kabupaten banjar. *Jurnal Insan Farmasi Indonesia*. 4(1):95-102. doi: 10.36387/jifi.v3i2.667.
- Rosmalia A, Permana IG, Despal & Zahera R. 2021. Estimation rumen degradable protein of local feeds in dairy cattle using in sacco method. IOP Conference Series: Earth and Environmental Science (EES). Vol. 883. IOP Publishing Ltd.
- Rostini, T., & Jaelani, A. 2015. Pemanfaatan Hijauan Rawa Sebagai Pakan Ternak Pada Kelompok Ternak Banua Raya. *Al-Ikhlas Jurnal Pengabdian* 1: 30–35. <http://ojs.uniska-bjm.ac.id/index.php/AIJP/article/view/340>.
- Russell, J.B., Muck, R.E., and Weimer, P.J. 2009. Quantitative analysis of cellulose degradation and growth of cellulolytic bacteria in the rumen. *FEMS Microbiol Ecol* 67:183-197.
- Sagala, W. 2011. Analisis biaya pakan dan performa sapi potong local pada ransum hijauan tinggi yang disuplementasi ekstrak lerak (sapindusrarak). Skripsi Fakultas Peternakan, Institut Pertanian Bogor, Bogor.
- Sajati, G., Prasteyo, B.W.H.E. Surono, 2012. Pengaruh ekstrusi dan proteksi dengan tannin pada tepung kedelai terhadap produksi gas total dan metan secara in vitro. *Anim. Agric. J.* 1: 241–256.
- Sakinah, D. 2005. Kajian Suplementasi probiotik bermineral terhadap produksi VFA, NH3 dan kecernaan zat makanan pada domba. Skripsi. Fakultas Peternakan IPB. Bogor.
- Salem, A. Z. M., Salem, M. Z. M., El-Adawy, M. M., & Robinson, P. H. (2006). Nutritive evaluations of some browse tree foliages during the dry season: Secondary compounds, feed intake and in vivo digestibility in sheep and goats. *Animal Feed Science and Technology*. <https://doi.org/10.1016/j.anifeedsci.2005.09.005>.
- Sarıçiçek, B., Zehra, & Kılıç, Ü. (2009). The effects of different additives on silage gas production, fermentation kinetics and silage quality. *Ozean Journal of Applied Sciences.*, 2(1), 11–18.
- Sari, Y. 2010. Pengaruh pemanfaatan batang dan kulit pisang batu (*musa brachyarpa*) sebagai pengganti rumput lapangan dalam ransum terhadap karakteristik cairan rumen (NH3, VFA dan PH) secara invitro.
- Sari Yusriana, C., Setya Budi, C., dan Dewi, T. 2014. Uji Daya Hambat Infusa Daun Nangka (*Artocarpus heterophyllus*) Terhadap Pertumbuhan Bakteri *Staphylococcus aureus*. *Jurnal Permata Indonesia* 5(2):1-7.

- Sarwono, B. 2008. Beternak Kambing Unggul. Penebar Swadaya, Jakarta.
- Sasongko, W. T., Yusiaty, L. M., Bachruddin, Z., & Mugiono. 2010. Optimalisasi Pengikatan Tanin Daun Nangka dengan Protein Bovine Serum Albumin. *Buletin Peternakan* 34 (3): 154-158. <https://doi.org/10.21059/buletinpeternak.v34i3.84>.
- Satter, L,D and L.L. Slyter, 1974. Effect of amoniac concentration on rument microbial protein production in-vitro Brit. J.Nurt. 32:194-208.
- Saweng, C. F. I. J., Sudimartini, L. M., dan Suartha, I. N. 2020. Uji Cemaran Mikroba pada Daun Mimba (Azadiractha Indica A. Juss) Sebagai Standarisasi Bahan Obat Herbal. *Indonesia Medicus Veterinus* 9(2): 270-280. <https://doi.org/10.19087/imv.2020.9.2.270>.
- Setiawansyah, A., Hakim, A., and Wirasisya, D. G. 2018. Evaluation and Identification of Antibacterial Compound of Neem Leaves and Barks (Azadirachta indica A.Juss) Against Escherichia coli. *Jurnal Tumbuhan Obat Indonesia* 11(2):40-48. <https://doi.org/10.22435/jtoi.v11i2.1003>.
- Simbolan, J.M., M. Simbolan., N. Katharina. 2007. Cegah Malnutrisi dengan Kelor. Yogyakarta: Kanisius.
- Siregar, S.B. 1995. Pengawetan Pakan Ternak. Penebar Swadaya, Jakarta.
- Siswanto, D., B. Tulung., K. Maaruf., M. R. Waani dan M. M. Tindangen. 2016. Pengaruh Pemberian Rumput Raja (*Pennisetum purpupoides*) dan Tebon Jagung Terhadap Kecernaan NDF dan ADF Pada Sapi PO Pedet Jantan. *Jurnal Zootek* 36(2): 379- 386.
- Smith, S. B., B. L. Prior, L. J. Koong, & H. J. Mersmann. 1992. Nitrogen and lipid metabolism in heifers fed at increasing levels of intake. *J. Anim. Sci.* 70: 152- 160.
- Soeharsono, Supriadi, dan E. Winarti, 2005. Pengaruh pemberian tepung gapplek-urea yang dikukus terhadap konsumsi dan kecernaan protein serta necara nitrogen pada domba. Seminar Nasional Teknologi Peternakan dan Veteriner.
- Soejono, M., Utomo, R., Budi, S.P.S., dan Agus, A., 2002. Mutu pakan sapi potong ditinjau dari kebutuhan nutrisi. Makalah disampaikan pada pertemuan Pengawas Mutu Pakan Ternak Dinas Peternakan Propinsi Jawa Timur, Surabaya.
- Soetanto, H., & Marhaeniyanto, E. 2011. Penerapan Teknologi Suplementasi Berbasis Daun Kelor dan Molases pada Peternakan Kambing Rakyat. *Buana Sain Jurnal* 11(1): 25–34.
- Soeparno, 2009. Ilmu dan Teknologi Daging. Cetakan ke V.Gadjah Mada University Press. Yogyakarta.
- Soetanto, H., dan Marhaeniyanto, E. 2011. *Penerapan teknologi suplementasi berbasis daun kelor dan molases pada peternakan kambing rakyat.* 11(1), 25–34.
- Sofyani, W.O.W. 2019. Sistem Klasifikasi Kelor dalam Etnobotani Masyarakat Wolio. *JSW: Jurnal Sosiologi Walisongo* 3(1): 49. <https://doi.org/10.21580/jsw.2019.3.1.3488>
- Solehudin, S., Antonius, A., dan Ginting, S. P. 2020. Suplementasi Probiotik dan Senyawa Fitokimia terhadap Performan, Persentase Komponen Asam Lemak Terbang, Total Bakteri dan Protozoa Cairan Rumen Kambing. *Jurnal Agripet* 20(1): 63-69. <https://doi.org/10.17969/agripet.v20i1.15598>.
- Soeparno, 2009. Ilmu dan Teknologi Daging. Cetakan ke V.Gadjah Mada University Press. Yogyakarta.
- Soppela P, Saarela S, Heiskari U, Nieminen M. 2008. The effects of wintertime undernutrition on plasma leptin and insulin levels in an arctic ruminant, the reindeer. *Comparative Biochemistry and Physiology, Part B* 149: 613-621.
- Sriyani, NLP, I N. T. Ariana. 2014. Pengaruh pemberian pakan daun pepaya (*Carica Papaya* L)

- terhadap kualitas daging kambing bligon. Majalah Ilmiah Peternakan Vol. 17 no 3 tahun 2014.
- Steel dan Torrie. 1992. Prinsip dan Prosedur Statistik. Jakarta. Gramedia Jakarta Utara. Yogyakarta.
- Stern, M. D and Hoover. 1979. Methods for determination and factor affecting rumen microbial synthesis. A. Riview, J. Animal Sci, 49 : 1590 – 1603.
- Sticker LS, Thompson Jr DL, Bunting LD, Fernandez JM. 1996. Dietary protein and energy restriction in mares: rapid changes in plasma metabolite and hormone concentrations during dietary alteration. *J Anim Sci* 74: 1326-1335.
- Sucak MG, Serbester U & Görgülü M. 2017. Effects of dietary starch and crude protein tarafs on milk production and composition of dairy cows fed high concentrate diet. Turkish Journal of Agriculture and Food Science Technology. 5(6):563– 567.doi:10.24925/turjaf.v5i6.563-567.718.6
- Suharlina, S., Abdullah, L., Astuti, D., Nahrowi, N., dan Jayanegara, A. 2017. Karakteristik Fermentasi Rumen Terhadap Beberapa Jenis Tanaman Leguminosa. *Pastura* 5(2): 71-74. <https://doi.org/10.24843/pastura.2016.v05.i02.p02>.
- Sulistyorini, R., Johan, A., Djamiyatun, K. 2013. Pengaruh Ekstrak Etanol Daun Kelor ( Moringa oleifera ) pada Ekspresi Insulin dan Insulitis Tikus Diabetes Melitus. Bandung Medical Jurnal 7(22): 69–76.
- Suparjo, S., Wiryawan, K. G., Laconi, E. B., dan Mangunwidjaja, D. 2011. Performa Kambing yang Diberi Kulit Buah Kakao Terfermentasi. *Media Peternakan* 34(1): 35–41. <https://doi.org/10.5398/medpet.2011.34.1.35>.
- Supriyanto, R 2011, ‘Studi Analisis Spesiasi Ion Logam Cr(III) dan Cr(VI) dengan Asam Tanat dari Ekstrak Gambirmenggunakan Spektrofotometri UV-VIS’, J.Sains MIPA, April 2011, Vol. 17, No1, ISSN 1978-1873.
- Suryahadi, Nugraha A.R ., Bey A, dan Boer R. 2002. Laju Konversi Metan dan Factor Emisi Metan pada Kerbau yang Diberi Ragi Tape Lokal yang Berbeda Kadarnya yang Mengandung *Saccharomyces cereviseae*. *Ringkasan Seminar Program Pascasarjana IPB. Bogor*.
- Suryani, H., Zain, M., Jamarun, N., dan Ningrat, R. W. S. 2015. Peran Direct Fed Microbials (DFM) *Saccharomyces cerevisiae* dan *Aspergillus oryzae* terhadap Produktivitas Ternak Ruminansia : Review. *Jurnal Peternakan Indonesia (Indonesian Journal of Animal Science)* 17(1): 27. <https://doi.org/10.25077/jpi.17.1.27-37.2015>.
- Susanti, S dan Hidayat E. 2016. Profil protein susu dan produk olahannya. *Jurnal MIPA* 39 (2) : 98-106.
- Sutardi T. 1980. *Landasan Ilmu Nutrisi* Bogor: Dept. Ilmu Makanan Ternak, Fakultas Peternakan IPB.
- Sutardi, T. 2006. *Landasan Ilmu Nutrisi*. Departemen Ilmu Makanan Ternak, Fakultas Peternakan Institut Pertanian Bogor, Bogor.
- Suwignyo, B., Wijaya, U. A., Indriani, R., dan Kurniawati, A. 2016. Konsumsi, Kecernaan Nutrien, Perubahan Berat Badan dan Status Fisiologis Kambing Bligon Jantan dengan Pembatasan Pakan. *Jurnal Sain Veteriner* 34(2): 210-219. <https://doi.org/10.22146/jsv.27560>.
- Suyadi, F. P., dan Wahyuningsih, S. 2017. Performan Reproduksi Pada Persilangan Kambing Boer dan Peranakan Etawah (PE). *Jurnal Ilmu-Ilmu Peternakan* 23(1): 11–17.
- Suyitman, Warly, L., dan Evitayani. 2014. S and p mineral supplementation of ammoniated palm

leaves as ruminant feed. *Pakistan Journal of Nutrition.* <https://doi.org/10.3923/pjn.2013.903.906>

- Suyitman, Warly, L., Hellyward, J., dan Pazla, R. 2021. Optimization of rumen bioprocess through the addition of phosphorus and sulfur minerals on ammoniated palm leaves and fronds (*Elaeis guineensis* jacq.). *American Journal of Animal and Veterinary Sciences.* <https://doi.org/10.3844/ajavsp.2021.225.232>
- S. Verma, & N. Shukla, 2015. Impact Of Various Factors Responsible For Fluctuations In Plant Secondary Metabolite. *J. Appl. Res. Med. Aromat. Plants*, Vol. 2, No. 4, Pp. 105– 113.
- Uddin, M. J., Khandaker, Z. H., Khan, M. J., & Khan, M. M. H. 2015. Dynamics of microbial protein synthesis in the rumen - A Review. *Annals of Veterinary and Animal Science*, 2(5), 116–131.
- Tan, H.Y., C.C. Sieo, N. Abdullah, J.B. Liang, X.D. Huang, dan Y.W. Ho. 2011. Effects of condensed tannins from Leucaena on methane production, rumen fermentation, and populations of methanogens and protozoa in vitro. *J. Anim. Feed. Sci. Tech.* Vol. 169:185-193.
- Tanaka T, Yamaguchi T, Kamomae H, Kaneda Y. 2003. Nutritionally induced body weight loss and ovarian quiescence in Shiba goats. *Journal of Reproduction and Development* 49:113-119.
- Tandi, J., Ikbal, M., dan Andi A.M. 2018. Uji Ekstrak Eтанol Daun Nangka Terhadap Gambaran Histopatologi pankreas Tikus Putih Jantan Diinduksi Streptozotocin. *Farmakologika Jurnal Farmasi* 15(2):106-113.
- Tarigan, A dan S. P. Ginting. 2011. Pengaruh taraf pemberian indigofera sp. terhadap konsumsi dan kecernaan pakan serta pertambahan bobot hidup kambing yang diberi rumput brachiaria ruziziensis. *JITV* 16(1): 25-32.
- Taufiq, M. N., Dewi, C., dan Mahmudy, W. F. 2017. Optimasi Komposisi Pakan Untuk Penggemukan Sapi Potong Menggunakan Algoritma Genetika. *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer* 1(1): 571–582. <https://doi.org/10.1007/s13398-014-0173-7.2>.
- Tavendale, M.H. L.P. Meahger, D. Pacheco, N. Walker, G.G. Attwood & S. Sivakumaran. 2005. Methane production from in vitro rumen incubation with Lotus pondoculatus and Medicago sativa and effects of extracable condensed tannin fraction on methanogenesis. *Anim. Feed Sci. and Technol.* Vol, 123-124, pp. 403- 419.
- Thalib, A., Haryanto, B., Hanid, H., Suherman, D., dan Mulyani. 2001. Pengaruh Kombinasi Defaunator dan Probiotik terhadap Ekosistem Rumen dan Performa Ternak Domba. *Jitv*, 6(2): 83–88.
- Thiruvenkadan, A. K., and Rajendran, R. 2015. Strategies to Improve Goat Production in India. *November*, 63–72.
- Trina, Fitmawati, N. S. 2014. Identifikasi Tumbuhan Antidiabetes Berdasarkan Analisis Kuantitatif Asam Tanat. *JOM FMIPA* 1(2):409-416.
- Theodorou MK, Brook AE. 1990. Evaluation of a New Laboratory Procedure for Estimating the Fermentation Kinetic of Tropical Feeds, Chatham (UK): Contractor Report (EMC X0162) for the Natural Resources Institute.
- Thorpe A, 2009, Enteric Fermentation and Ruminant Eructation: The Role of Methane in The Climate Change Debate, *Climate Change*, 93(3/4): 407-431, <http://doi.org/fckbws>.
- Tilley, J. M. A. and R. A. Terry. 1963. A two stage technique for the in vitro digestion of forage crops. *Journal Of British Grassland Society*, 18 : 104 – 111.

- Tillman, A.D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo, S. Lebdosoekojo, 1991. *Ilmu Makanan Ternak Dasar*. Gadjah Mada University Press. Yogyakarta.
- Tillman, A. D., H. Hartadi, S. Prawirokusumo, S. Reksohadiprodjo dan S. Lebdosoekojo. 1998. Ilmu Makanan Ternak Dasar. Cetakan ke-6. Gadjah Mada University Press. Yogyakarta.
- Tshabalala, T., Ncube, B., Madala, N. E., Nyakudya, T. T., Moyo, H. P., Sibanda, M., & Ndhlala, A. R. 2019. Scribbling the Cat: A Case of the “Miracle” Plant, *Moringa oleifera*. 23.
- Toerien CA, Cannot JP 2007. Duration of a severe feed restriction required to reversibly Decrease milk production in the highproducing dairy cow. *Can J Anim Sci* 87: 455-458.
- Uddin, M. J., Khandaker, Z. H., Khan, M. J., & Khan, M. M. H. (2015). Dynamics of microbial protein synthesis in the rumen - A Review. *Annals of Veterinary and Animal Science*, 2(5), 116–131.
- Umar, M., M. Arifin and A. Purnomoadi. 2011. Ruminal condition between Madura cattle and Ongole Crossbred cattle raised under intensive feeding. *J. Indon. Trop. Anim. Agric.* 36: 213-218.
- Umbu, C. J. T., Hilakore, M. A., & Amalo, D. 2020. Pengaruh Lama Fermentasi Dengan Cairan Rumen Kambing Terhadap Perubahan Kualitas putak. *Jurnal Peternakan Lahan Kering* 2(3):1022-1028. <https://doi.org/10.57089/jplk.v2i3.268>.
- Utami R, Yuliawati K, Syafnir L, 2015, Pengaruh Metode Ekstraksi terhadap Aktivitas Antioksidan Daun Sukun (*Artocarpus altilis*(Parkinson) Fosberg), Prosiding Penelitian SPeSIA Unisba 2015: 280 – 286.
- Van Soest, P.J. 1982. Nutrional Ecology of the Ruminant : Ruminant Metabolism, Nutrional Strategies the Cellulolytic Fermentation and the Chemistry of Forages and Plant Fibers. Cornell University O and B Books Inc. USA.
- Vergara-Jimenez, M., Almatrafi, M., & Fernandez, M. (2017). Bioactive Components in *Moringa Oleifera* Leaves Protect against Chronic Disease. *Antioxidants*, 6(4), 91. <https://doi.org/10.3390/antiox6040091>
- Vlaming J.B. 2008. Quantifying variation in estimated methane emission from ruminants using the SF6 tracer technique. A Thesis of Doctor of Phylosophy in Animal Science. Massey University, Palmerston North, New Zealand.
- Wahyono, T., Sasongko, W. T., Sholihah, M., dan Pikoli, M. R. 2017a. Pengaruh Penambahan Tanin Daun Nangka (*Artocarpus heterophyllus*) Terhadap Nilai Biologis Daun Kelor (*Moringa oleifera*) dan Jerami Kacang Hijau (*Vigna radiata*) Secara In vitro. *Buletin Peternakan* 41(1): 15-25. <https://doi.org/10.21059/buletinpeternak.v41i1.22450>.
- Wahyuni, I.M.D., Muktiani, A., Christianto, M., 2014. Penentuan dosis tanin dan saponin untuk defaunasi dan peningkatan fermentabilitas pakan. *J. Ilmu Dan Teknologi Peternakan*. 3: 133–140
- Wahyuni, I. M. D., A. Muktiani., dan M. Christiyanto. 2014. Kecernaan Bahan Kering dan Bahan Organik dan Degrabilitas Serat pada Pakan yang Disuplementasi Tanin dan Saponin. *Agripet*. 14(2): 115-124
- Wahyuni, F. Sjofjan, Osfar. 2018. Pengaruh pengukusan terhadap kandungan nutrisi biji asam jawa (*Tamarindus indica* L) sebagai bahan pakan unggas. *Journal of Tropical Animal Production* Vol 19, No. 2 pp. 139-148. DOI: 10.21776/ub.jtapro.2018.019.02.8
- Wang, B., Jia, M., Fang, L., Jiang, L., and Li, Y. 2018. Effects of Eucalyptus Oil and Anise Oil Supplementation on Rumen Fermentation Characteristics, Methane Emission, and

- Digestibility in Sheep. *Journal of Animal Science* 96(8): 3460–3470. <https://doi.org/10.1093/jas/sky216>.
- Warly, L., 1994. Study on improving nutritive value of rice straw and physico-chemical aspects of its digestion in sheep. Ph.D. Thesis. The United Graduated School of Agriculture Sciences, Tottori University, Japan.
- Warly, L., Suyitman, Evitayani, & Fariani, A. 2015. Supplementation of solid Ex-decanter on performance of cattle fed palm fruit by-products. *Pakistan Journal of Nutrition*. <https://doi.org/10.3923/pjn.2015.818.821>.
- Warly, L., Suyitman, Evitayani, and Fariani, A. 2017. Nutrient digestibility and apparent bioavailability of minerals in beef cattle fed with different levels of concentrate and oil-palm fronds. *Pakistan Journal of Nutrition*. <https://doi.org/10.3923/pjn.2017.131.135>.
- Weller, J. I. 1994. Evaluation of genetic differences from profit equations. In: Economic Aspects of Animal Breeding. Chapman & Hall, London, pp: 78-90.
- Widiarti, E. 2013. Identifikasi Sifat Fisik Buah Nangka. J. Keteknikan Pertanian Tropis dan Biosistem, 1: 224-230.
- Widiawati, Y. 2013. Current and Future Mitigation Activities Emission From Ruminant in Indonesia. IAARD Press. Jakarta.
- Wihardjaka. 2015. Mitigasi Emisi Gas Metana Melalui Pengelolaan Lahan Sawah. *J.Litbang Pert.* 34(3) :95-104.
- Wood, R. A., Vellinga, M., Thorpe, R., Trans, P., and Lond, R. S. 2018. Global warming and Thermohaline circulation stability Global warming and thermohaline circulation stability. *August*. <https://doi.org/10.1098/rsta.2003.1245>.
- Wicaksono. B. 2022. Pengaruh Penambahan Tanin Terkondensasi Dan Myristic Acid Pada Bahan Lengkap Berbasis Jerami Jagung Terhadap Degradasi Bahan Kering Dan Bahan Organic Secara In Vitro. Thesis. Universitas Brawijaya.
- Widyobroto, B.P. 1995. Degradasi protein dalam rumen dan pencernaan protein dalam intestinum. Dalam Kursus Singkat Teknik Evaluasi Pakan Ruminansia, Fak. Peternakan UGM, Yogyakarta.
- Widyobroto, B.P., Soejono, M. dan Utomo, R., 1998. Pengukuran Degradasi In Sacco: Review Metodologi. Lokakarya Standarisasi Pengukuran Degradasi In Sacco di Indonesia. Fak. Peternakan Universitas Gadjah Mada, Yogyakarta.
- Wilkie, A. C., 2000. Anaerob Digestion : Holistic vioprocessing of animal manures. in proceeding of the animal residuals management coference. p.1-12. Virginia.
- Wina E, Muetzel S, Hoffman E, Makkar HPS, Becker, K. 2005. Saponins Containing Methanol Extract of *Sapindus rarak* Affect Microbial Fermentation, Microbial Activity and Microbial Community Structure *in vitro*, *Animal Feed Science and Technology*, 121(1-2):159-174. <http://doi.org/bv7bjq>.
- Wischer, G., J. Boguhn, H. Steing, M. Schollenberger, dan M. Rodehutscord. 2012. Effects of nutrient tannin extracts and rapessed tannin monomers on methane formation and microbial protein synthesis *in vitro*. Dissertation. Institut für Tierernährung, Universität Hohenheim, Germany.
- Wiseman, J., 1990. Variability in the Nutritive Value of Facts for Ruminant. Butterworths. London.
- Yanuartono, A. Nururrozi, S. Indarjulianto, dan H. Purnamaningsih. 2019. Peran protozoa pada pencernaan ruminansia dan dampak terhadap lingkungan. *J. Tropic Anim Prod.* Vol. 22:16-28.

- Yenni, S. 2018. Pengaruh Pemberian Rebusan Daun Kelor Terhadap Kadar Gula Darah Pada Penderita DM Tipe 2 di Kelurahan Bangkinang Kota Wilayah Kerj Puskesmas Tahun 2017. *Jurnal Ners* 2(2): 43–50. <https://doi.org/10.31004/jn.v2i2.191>.
- Yokoyama, M. T. and K. A. Johnson. 1993. Microbiology of the Rumen and Intestine. In Church (ed). *The Ruminant Animal. Digestive, Physiology, and Nutrition.* Waveland Press, Inc., Englewood Cliffs.
- Yuliana, P., E.B. Laconi, E. Wina, dan A. Jayanegara. 2014. Extraction of tanins and saponins from plant sources and their effects on in vitro methanogenesis and rumen fermentation. *J. Indonesian Tropic Anim Agri.* Vol. 39:91-97.
- Yulistiani, D. Lw. Mathius, I.K. Sutama, umi A, Ria S.G, Sianturi, Hastono dan LG.m. Budiarso. 1999. Respon Produksi Kambing PE Induk sebagai Akibat Perbaikan Pemberian Pakan pada Fase Bunting dan Laktasi. *Jurnal Ilmu Ternak dan veteriner.* Vol 4 hal: 88 – 93.
- Yunilas. 2009. Bioteknologi Jerami Padi Melalui Fermentasi Sebagai Bahan Pakan Ternak Ruminansia, Medan, (ID): Universitas Sumatera Utara.
- Zain,M., N. Jamarun dan Elihasridas. 2002. Suplementasi rumput dengan jerami olahan dalam ransum ternak sapi. *J.Andalas.* No.31/Mei/Tahun XI.
- Zain, M., T. Sutardi, Suryahadi and N. Ramli. 2008. Effect of defaunation and supplementation methionine hydroxy analogue and branched chain amino acid in growing sheep diet based on palm press fiber ammoniated. *Pakistan J. Nut.*7(6): 813 – 816.
- Zain,M., N. Jamarun,A.Arnim, W.S.N. Ningrat and R.Herawati 2011. Effect of Yeast (*Saccharomyces cerevisiae*) on fermentability, microbial population and digestibility low quality roughage (in vitro). *Archiva Zootecnica* 14(4), 51-58.
- Zain, M., Jurnida Rahman, Khasrad and Erpomen. 2015. In vitro Fermentation Characteristics of Palm Oil By products Which is Supplemented with Growth Factor Rumen Microbes. *Pakistan Journal of Nutrition* 14 (9): 625-628.
- Zahera, R., Anggraeni D, Rahman, Z.A., dan Evvyernie, D. 2020. Pengaruh kandungan protein ransum yang berbeda terhadap kecernaan dan fermentabilitas rumen sapi perah secara in vitro. *Journal Ilmu Nutrisi dan Teknology Pakan.* 18(1):1–6 doi:10.29244/jintp.v18i1.31547.
- Zahera, R., Purwanti, J., Evvyernie D., 2022. Populasi Mikroba Rumen, Fermentabilitas, Dan Kecernaan Suplementasi Daun Kelor Dalam Ransum Sapi Perah Secara In vitro. *JINTP.* Volume 20(3): 117-122. DOI: <http://dx.doi.org/10.29244/jintp.20.3.117-122>.
- Zhang, B. 2011. Relating Protein Adduction to Gene Expression Changes: a Systems Approach. *Mol Biosyst;*7(7) : 2118-2127.

