

DAFTAR PUSTAKA

- Abanikannda, O. T. F., O. Olutogun, A. O. Leigh, and L. A. Ajayi. 2007. Statistical modeling of egg weight and egg dimensions in commercial layers. *International Journal of Poultry Science* 6: 59-63.
- Abd El-Baky, H. H., F. K. El Baz, and G. S. El-Baroty. 2008. Evaluation of marine alga *Ulva lactuca* L. as a source of natural preservative ingredient. *Am-Eurasian J. Agric. Environ. Sci.* 3: 434-444.
- Abdollahi, M. R., V. Ravindran, T. J. Wester, G. Ravindran, and D. V. Thomas. 2012. Effect of improved pellet quality from the addition of a pellet binder and/or moisture to a wheat-based diet conditioner at two different temperatures on performance, apparent metabolisable energy and ileal digestibility of starch and nitrogen in broilers. *Anim. Feed Sci. Technol.* 175 (3-4): 150-157.
- Abudabos, A. M., A. B. Okab, R. S. Al-jumaah, E. M. Samara, K. A. Abdoun, and A. A. Al-Haidary. 2013. Nutritional value of green seaweed (*Ulva lactuca*) for broiler chickens. *Ital. J. Anim. Sci.* 12:177-181.
- Adams, J. M. M., A. B. Ross, K. Anastasakis, E. M. Hodgson, J. A. Gallagher, and J. M. Jones. 2011. Seasonal variation in the chemical composition of the bioenergy feedstock *Laminaria digitata* for thermochemical conversion. *Bioresour. Technol.* 102, 226-234.
- Agardh, J. G. 1984. *Species, genera et ordines algarum*. Gleerup. Lund 1: 36
- Agrahar-Murugkar, D. and G. Subbulakshmi. 2006. Preparation techniques and nutritive value of fermented foods from the Khasi tribes of Meghalaya. *Ecol Food Nutr.* 45: 27-38.
- Ahmadi, F. and F. Rahimi. 2011. Factors affecting quality and quantity of egg production in laying hens: a review. *World Applied Sciences Journal* 12 (3): 372-384.
- Aida, T. M., T. Yamagata, M. Watanabe, and R. L. Smith. 2010. Depolymerization of sodium alginate under hydrothermal conditions. *Carbohydrate Polymers* 80: 296-302.
- Al-Ankari, A., H. Najib, and A. Al-Hozab. 1998. Yolk and serum cholesterol and production traits, as affected by incorporating a supraoptimal amount of copper in the diet of the leghorn hen. *Br. Poult. Sci.* 39: 393-397.
- Ale, M. T., J. D. Mikkelsen, and A. S. Meyer. 2012. Designed optimization of a single-step extraction of fucose-containing sulfated polysaccharides from *Sargassum* sp. *Journal of Applied Phycology* 24: 715-723.

- Ale, M. T., J. D. Mikkelsen, and A. S Meyer. 2011. Important determinants for fucoidan bioactivity: a critical review of structure-function relations and extraction methods for fucose-containing sulfated polysaccharides from brown seaweeds. *Marine Drugs* 9: 2106–2130.
- Al-Harathi, M. A., A. A. El-Deek, and Y. A. Attia. 2010. Utilization of dried whole eggs processed by different methods with or without growth promoting mixture on performance and lymphoid organs of broiler chicks. *Int. Journal Poultry Science* 9: 511–520.
- Al-Harathi, M. A., A. A. El-Deek, and Y. A. Attia. 2011. Impacts of dried whole eggs on productive performance, quality of fresh and stored eggs, reproductive organs and lipid metabolism of laying hens. *Brit. Poultry Sci.* 52: 333–344.
- Al-Harathi, M. A and A. A. El-Deek. 2012a. Nutrient profiles of brown marine algae (*Sargassum dentifebium*) as affected by different processing methods for chickens. *Journal of Food, Agriculture, and Environment* 10 (1): 475–480.
- Al-Harathi, M. A. and A. A. El-Deek. 2011. The effects of preparing methods and enzyme supplementation on the utilization of brown marine algae (*Sargassum dentifebium*) meal in the diet of laying hens. *Italian Journal of Animal Science* 10(48): 195–203.
- Al-Harathi, M. A. and A. A. El-Deek. 2012b. Effect of different dietary concentrations of brown marine algae (*Sargassum dentifebium*) prepared by different methods on plasma and yolk lipid profiles, yolk total carotene and lutein plus zeaxanthin of laying hens. *Italian Journal of Animal Science* 11(64):347–353.
- Al-Shamkhani, A. R. and R. Duncan. 1995. Synthesis, controlled release properties and antitumour activity of alginate-cis-aconityl-daunomycin conjugates. *International Journal Pharm.* 122(1-2): 107–119.
- Altech. 2018. How do you measure performance in the poultry industry?. <https://www.alltech.com/blog/how-do-you-measure-performance-poultry-industry>. (4 Januari 2020).
- Alvarenga, R. R., M. G. Zangeronimo, L. J. Pereira, P. B. Rodrigues, and E. M. Gomide. 2011. Lipoprotein metabolism in poultry. *World's Poultry Science Journal* 67: 431–440.
- Amalia, L., L. Aboenawan, L. E. Budiarti, N. Ramli, M. Ridla, dan A. L. Darobin. 2000. Diktat Pengetahuan Bahan Makanan Ternak. Laboratorium Ilmu dan Teknologi Pakan Fakultas Peternakan Institut Pertanian Bogor. Bogor.

- Anderson, K. E., J. B. Tharrington, P. A. Curtis, and F. T. Jones. 2004. Shell characteristics of eggs from historic strains of single comb white leghorn chickens and relationship of egg shape to shell strength. *International Journal of Poultry Science* 3: 17-19.
- Anggadiredja, T. Jana, A. Zatinika, H. Purwato, dan S. Istani. 2010. Rumput Laut: Pembudidayaan, Pengolahan, Pemasaran Komoditas Perikanan Potensial. Penebar Swadaya. Jakarta.
- Anjalani, R., S. P. S. Budhi, dan H. Hartai. 2013. Pengaruh perbedaan kadar kalsium hidroksida dan penambahan air terhadap komposisi kimia dan pencernaan *in vitro* daun kelapa sawit. *Buletin Peternakan* 37(2): 107–113.
- Anton, M. 2013. Egg yolk: structures, functionalities, and processes. *Journal of the Science of Food and Agriculture* 93(12): 2871–2880.
- AOAC. 1990. *Official Methods of Analysis*, 15th edition. Association of Official Analytical Chemists, Arlington VA, U.S.A.
- Aquino, R. S., C. Grativol, and P. A. S. Mourão. 2011. Rising from the sea: correlations between sulphated polysaccharides and salinity in plants, *PLoS ONE* 6, 18862.
- Ardiansyah, Dahlia, Hartinah, Ibrahim, and Wahidah. 2018. Improvement of the nutritive quality of *Sargassum* powder through *Aspergillus niger*, *Saccharomyces cerevisiae*, and *Lactobacillus* spp. *Fermentations, Aquaculture, Aquarium, Conservation, and Legislation*. *Bioflux* 11(3): 753–764.
- Aregawi, T., G. Animut, K. Kebede, and H. Kassa. 2014. Effect of lime and/or urea treatment of sesame (*Sesamum indicum L.*) straw on feed intake, digestibility and body weight gain of sheep. *Livestock Research for Rural Development* 26(8).
- Ari, A. 2008. Bab X Air (Bab X Water). *Bahan Ajar Kimia Dasar Fakultas Teknik Universitas Negeri Yogyakarta*.
- Ariani, E. 2006. Penetapan kandungan kolesterol dalam kuning telur pada ayam petelur. *Pusat Penelitian dan Pengembangan Peternakan. Temu Teknis Nasional Tenaga Fungsional Pertanian*.
- Armin, F., S. Rahimi., A. M. Abkenar., Y. G. Ivani, and H. Ebrahimi. 2015. Effect of *Sargassum* sp. and vitamin E on stability of fish oil enriched meat in broiler chickens. *Iranian Journal of Applied Animal Science* 5(2): 385–392.
- Astawan, M., T. Wresdiyati, dan A. B. Hatanta. 2005. Pemanfaatan rumput laut sebagai sumber serat pangan untuk menurunkan kolesterol darah tikus. *Jurnal Hayati* 12(1): 23–27.

- Attia, Y. A., M. A. Al-Harhi, and M. M. Shiboob. 2014. Evaluation of quality and nutrient contents of table eggs from different sources in the retail market. *Italian Journal of Animal Science* 13(2): 369–376.
- Ayala, M. D., A. Garcia-Alcazar, M. Arizcun, I. Abdel, and O. Lopez-Albors. 2012. Effect of sodium alginate dietary in body parameters and muscle growth of Gilthead sea bream, *Sporus aurata* L. *Turkish Journal of Fisheries and Aquatic Sciences* 12: 627–633.
- Aydin R., M. Karaman, T. Cicek, and H. Yardibi. 2008. Black Cumin (*Nigella sativa* L.) supplementation into the diet of the laying hen positively influences egg yield parameters, shell quality, and decreases egg cholesterol. *Poultry Science* 87:2590–2595.
- Azhar, M. 2016. Biomolekul sel: karbohidrat, protein, dan enzim. Universitas Negeri Padang Press, Padang.
- Bacila, M. 2003. *Veterinary Biochemistry*. 2 ed. Robe Editorial, São Paulo, pp 583.
- Bajpai, S. K., M. Bajpai, and F. F. Shah. 2016. Alginate dialdehyde (AD)-crosslinked casein films: synthesis, characterization and water absorption behavior. *Designed Monomers and Polymers* 19(5): 406–419.
- Balnave, D. and D. Zhang. 1998. Adverse responses in egg shell quality in late-lay resulting from shortterm use of saline drinking water in early- or mid-lay. *Australian Journal of Agricultural Research* 49: 1161–1165.
- Baloš, M. Z., S. Jakšić, S. Knežević, and M. Kapetanov. 2016. Electrolytes – sodium, potassium and chlorides in poultry nutrition. *Arhiv veterinarske medicine* 9(1): 31–42.
- Barszcz, M., A. Tuśnio, M. Taciak, J. Paradziej-Lukowicz, M. Molenda, and A. Morawski. 2014. Effect of the composition and autoclave sterilization of diets for laboratory animals on pellet hardness and growth performance of mice. *Ann. Anim. Sci.* 14(2):315–328.
- Bayani, R. M. 2009. Kanker Rongga Mulut Disebabkan oleh Kebiasaan Menyirih (Laporan Kasus) [Skripsi]. Fakultas Kedokteran Gigi, Universitas Sumatera Utara, Medan.
- Bell, D. D. and W. D. Jr. Weaver. 2002. *Commercial Chicken Meat and Egg Production*. 5th Ed. Springer Science Business Media, Inc. Spring Street, New York.
- Beppu, F., M. Hosokawa, Y. Niwano, and K. Miyashita. 2012. Effects of dietary fucoxanthin on cholesterol metabolism in diabetic/obese KK-Ay mice. *Lipids in Health and Disease* 11: 2–8.
- Berger. 2006. *Salt and Trace Minerals for Livestock, Poultry, and Other Animals*. Salt Institute Alexandria, Virginia.

- Bielohuby, M., K. Bodendorf, H. Brandstetter, M. Bidlingmaier, and E. Kienzle. 2010. Predicting metabolisable energy in commercial rat diets: physiological fuel values may be misleading. *Brit. J. Nutr.* 103: 1525–1533.
- Bilan, M. I., A. A. Grachev, A. S. Shashkov, N. E. Nifantiev, and A. I. Usov. 2006. Structure of a fucoidan from the brown seaweed *Fucus serratus* L, *Carbohydr. Res.* 341 (2006) 238–245.
- Blair, R. 2008. *Nutrition and Feeding of Organic Poultry*. CAB International, Wallingford, Oxfordshire, UK, pp. 314.
- Borresen, E. C., A. J. Henderson, A. Kumar, T. L. Weir, and E. P. Ryan. 2012. Fermented foods: patented approaches and formulations for nutritional supplementation and health promotion. *Recent. Pat. Food Nutr. Agric.* 4: 134–140.
- Bouvarel, I. and Y. Nys. 2013. Optimizing egg mass and quality traits in modern laying hens through nutrition. In: 19th European Symposium on Poultry Nutrition (ESPN), Potsdam, Jerman, 26-29 Agustus. Available from: <https://prodinra.inra.fr/record/266291>, pp. 14.
- Bouvarel, I., Y. Nys, and P. Lescoat. 2011. Hen nutrition for sustained egg quality. In: Nys, Y., M. Bain, and F. Vanimmerseel. *Improving the safety and quality of eggs and egg products, vol 1: Egg chemistry, production and consumption*. Woodhead Publishing Ltd., Cambridge, pp. 261–290.
- Brownlee, I. A., A. Allen, J. P. Pearson, P. W. Dettmar, M. E. Havler, and M. R. Atherton. 2005. Alginate as a source of dietary fiber. *Critical Reviews in Food Science and Nutrition* 45: 497–510.
- Butcher, G. D. and R. Miles. 2018. *Concepts Of Eggshell Quality*. IFAS Extension. Institute Of Food And Agricultural Sciences. University Florida. Gainesville FL 32611. <https://edis.ifas.ufl.edu/pdf/VM/VM01300.pdf> (03 September 2019).
- Butler, D. M., K. Østgaard, C. Boyen, L. V. Evans, A. Jensen, and B. Kloareg. 1989. Isolation conditions for high yields of protoplasts from *Laminaria saccharina* and *L. digitata* (Phaeophyceae). *J. exp. Bot.* 40: 1237–1246.
- Caipang, C. M. A., C. C. Lazado, I. Berg, M. F. Brinchmann, and V. Kiron. 2011. Influence of alginic acid and fucoidan on the immune responses of head kidney leukocytes in cod. *Fish Physiol. Biochem.* 37(3): 603–612.
- Canibe, N. and B. B. Jensen. 2012. Fermented liquid feed-Microbial microbial and nutritional aspects and impact on enteric diseases in pigs. *Anim Feed Sci Technol.* 173: 17–40.
- Carrillo, S., A. Bahena, M. Casas, M. E. Carranco, C. C. Calvo, E. Ávila, and F. Pérez-Gi. 2012. The alga *Sargassum* spp. as alternative to reduce egg cholesterol content. *Cuban Journal of Agricultural Science* 46(2).

- Carrillo, S., E. López, M. M. Casas, E. Avila, R. M. Castillo, M. E. Carranco, C. Calvo, and F. Pérez-Gil. 2008. Potential use of seaweeds in the laying hen ration to improve the quality of n-3 fatty acid enriched eggs. *J. Appl. Phycol.* 20: 721–728.
- Casas, V. M. 2009. El alga marina *Sargassum* (Sargassaceae). En: Recursos marinos y servicios ambientales en el desarrollo regional. Eds. G.J. Urciaga, M.L.F. Beltrán & B.D. Lluch. La Paz, Baja California, México, pp. 139–156.
- Cesari, V., M. G. Mangiagalli, A. Giardini, P. Galimberti, and S. Carteri, D. Gallazzi, and I. Toschi. 2014. Egg quality and productive performance of laying hens fed different levels of skimmed milk powder added to a diet containing *Lactobacillus acidophilus*. 93: 1197–1201.
- Charoen Pokphand. 2007. Upaya Pigmentasi Melalui Pakan. CP-Bullentin Service, No. 97/Tahun IX.
- Chen J, Y. Hu, L. Zhang, Y. Wang, S. Wang, Y. Zhang, H. Guo, D. Ji, and Y. Wang. 2017. Alginate oligosaccharide DP5 exhibits antitumor effects in osteosarcoma patients following surgery. *Frontiers in Pharmacology* 8: 623.
- Chen, Y. Y., W. Ji, J. R. Du, D. K. Yu, Y. He, C. X. Yu, D. Li, C. Zhaob, and K. Qiao. 2010. Preventive effects of low molecular mass potassium alginate extrated from brown algae on DOCA salt-induced hypertension in rats. *Biomed. Pharmacother* 64(4): 291–295.
- Choi, Y., E. C. Lee, Y. Na, and S. R. Lee. 2018. Effects of dietary supplementation with fermented and non fermented brown algae by-products on laying performance, egg quality, and blood profile in laying hens. *Asian-Australas J. Anim. Sci.* 31(10):1654–1659.
- Çiçek-Rathert, T., F. Üçkardeş, D. Narinç, and T. Aksoy. 2011. Comparison of principal component regression with the least square method in prediction of internal egg quality characteristics in Japanese quails. *Kafkas Univ. Vet. Fak. Derg.* 17(5): 687-692.
- Ciptaan, G., Mirnawati, and A. Djulardi, 2019. Peningkatan Kualitas Ampas Susu Kedelai melalui Bioteknologi Fermentasi dan Aplikasinya sebagai Bahan Lokal Unggas. Laporan Penelitian Dana DRPM Kemenristek DIKTI No Kontrak: 051/SP2H/LT/DRPM/2019.
- Cisneros, F. 2018. DSM Egg Yolk Pigmentation Guidelines. <https://www.dsm.com/anh/en/feedtalks/eggyolk-pigmentation-guidelines.html>. (4 Oktober 2019).
- Cizer, O. 2016. Lime mortars in heritage: Fundamental insights into carbonation reaction and its biocatalization. Taylor & Francis Group, London, pp: 67–74.
- Collins, J. 2015. The Effect of hay type and soaking on glycemic response in horse [Thesis]. Middle Tennessee State University May.

- Correa, M. G. and G. K. Villena. 2010. Comprehensive food fermentation and biotechnology. Asiatech Publisher, Inc., New Delhi. 1(7): 183–227.
- Cote, G. L. and L. H. Krull. 1988. Characterization of the exocellular polysaccharides from *Azotobacter choococcum*. Carbohydr. Res. 181: 143–152.
- Cumashi, A., N. A. Ushakova, M. E. Preobrazhenskaya, A. D’Incecco, A. Piccoli, L. Totani, N. Tinari, G. E. Morozevich, A. E. Berman, M. I. Bilan, A. I. Usov, N. E. Ustyuzhanina, A. A. Grachev, C. J. Sanderson, M. Kelly, G. A. Rabinovich, S. Iacobelli, and N. E. Nifantiev. 2007. A comparative study of the anti-inflammatory, anticoagulant, antiangiogenic, and antiadhesive activities of nine different fucoidans from brown seaweeds. Glycobiology 17(5): 541–552.
- Dahal, G. K. 2011. Ascites (Water Belly) in Broiler Chickens During Winter Season. Ergomix. <https://en.engormix.com/poultry-industry/articles/ascites-in-broiler-chickens-t35214.htm> . (17 September 2019).
- Dänicke, S., I. Halle, H. Jeroch, W. Bottcher, P. Ahrens, R. Zachmann, and S. Gotze. 2000. Effect of soy oil supplementation and protein level in laying hen diets on precaecal nutrient digestibility, performance, reproductive performance, fatty acid composition of yolk fat, and on other egg quality parameters. European Journal of Lipid Science and Technology 102: 218–232.
- Dawes, C. J. 1981. Marine Botany. Jhon Wiley & Sons, Inc. pp: 229.
- de Rocha Souza, M. C., C. T. Marques, C. M. G. Dore, F. R. F. da Silva, H. A. O. Rocha, and E. L. Leite. 2007. Antioxidant activities of sulphated polysaccharides from brown and red seaweeds. J. Appl. Phycol. 19(2): 153–160.
- Delchier, N., M. Reich, and C. M. G. C. Renard. 2012. Impact of cooking methods on folates, ascorbic acid and lutein in green beans (*Phaseolus vulgaris*) and spinach (*Spinacea oleracea*). LWT-Food Science and Technology 49(2): 197–201.
- Dettmar, P. W., V. Strugula, and J. C. Richardson. 2011. The key role alginate play in health. Food Hydrocolloids 25(2): 263–266.
- Dewi, Y. L. 2015. Kecernaan In Vitro Fraksi Serat (NDF, ADF dan Selulosa) Lima Jenis Rumput Laut Coklat dari Pantai Sungai Nipah Kabupaten Pesisir Selatan [Skripsi]. Universitas Andalas.
- Dewi, Y. L., A. Yuniza, Nuraini, K. Sayuti, and M. E. Mahata, 2018. Immersion of *Sargassum binderi* Seaweed in River Water Flow to Lower Salt Content before Use as Feed for Laying Hens. International Journal of Poultry Science 17: 22-27.
- DiaSys Diagnostig System. 2014. Cholesterol FS. DiaSys Diagnostic Systems GmbH. Germany.

- DiaSys Diagnostig System. 2014. LDL-C Select FS. DiaSys Diagnostic Systems GmbH. Germany.
- DiaSys Diagnostig System. 2014. Triglycerides FS 10. DiaSys Diagnostic Systems GmbH. Germany.
- Dou, W., D. Wei, H. Li, H. Li, M. M. Rahman, J. Shi, Z. Xu, and Y. Ma. 2013. Purification and characterisation of a bifunctional alginate lyase from novel *Isotericola halotolerans* CGMCC 5336. *Carbohydr. Polym.* 98: 1476–1482.
- Draget, K. I. 2009. Alginates. In: Phillips, G.O. and P. A. Williams. *Handbook of Hydrocolloids* Second Edition. Woodhead Publishing, Washington, DC, pp. 807–828.
- Ekmay., R., K. Chou, A. Magnuson, and X. G. Lei. 2015. Continual feeding of two types of microalgal biomass affected protein digestion and metabolism in laying hens. *J. Anim. Sci.* 93: 287–297.
- El-Deek, A. A. and M. A. Brikaa. 2009a. Nutritional and biological evaluation of marine seaweed as a feedstuff and as a pellet binder in poultry diet. *International Journal of Poultry Science* 8(9): 875–881.
- El-Deek, A. A. and M. A. Brikaa. 2009b. Effect of different levels of seaweed in starter and finisher diets in pellet and mash form on performance and carcass quality of ducks. *International Journal of Poultry Science* 8(10): 1014–1021.
- El-deek, A. A. and M. A. Al-Harhi. 2009. Nutritive value of treated brown marine algae in pullet and laying diets. *World Poultry Science Association, Proceedings of the 19th European Symposium on Quality of Poultry Meat, 13th European Symposium on the Quality of Eggs and Egg Products*, Turku, Finland, pp. 1–12
- El-Deek, A. A., M. Asar, M. A. Safaa Hamdy, M. A. Kosba, and M. Osman. 1987. Nutritional value of marine seaweed in broiler diets. *J. Agric. Sci. Mansoura Univ.* 12: 707–717.
- El-Deek. A. A., M. A. Al-Harhi, A. A. Abdalla, and M. M. Elbanoby. 2011a. The use of brown algae meal in finisher broiler diets. *Egypt. Poult. Sci.* 31(4): 767–781.
- Elkin, R. G. and Z. Yan. 1999. Relation between inhibition of mevalonate biosynthesis and reduced fertility in laying hens. *Journal Reproduction, and Fertility* 116: 269–75.
- El-Said, G. F. dan A. El-Sikaily. 2013. Chemical composition of some seaweed from Mediterranean Sea Coast. *Egypt. Environ Monit Assess*, 185: 6089–6099
- Englmaierová, M. 2014. Carotenoids and egg quality. *Acta fytotechn. zootechn.* 17(2): 55–57.

- Erlania dan I. N. Radiarta. 2015. Distribusi rumput laut alam berdasarkan karakteristik dasar perairan di kawasan rata-rata terumbu labuhan-bua, Nusa Tenggara Barat: strategi pengelolaan untuk pengembangan budidaya. *Jurnal Riset Akuakultur* 10 (3): 449–457.
- Ertesvag, H. 2015. Alginate-modifying enzymes: Biological roles and biotechnological uses. *Front. Microbiol.* 6, 523.
- Estervåg H., F. Erlien, G. Skjåk-Braek, B. H. A. Rehm, and S. Valla. 1998. Biochemical properties and substrate specificities of a recombinantly produced *Azotobacter vinelandii* alginate lyase. *J. Bacteriol.* 180(15): 3778–3784.
- Fang, W., D. Bi, R. Zheng, N. Cai, H. Xu, R. Zhou, J. Lu, M. Wan and X. Xu. 2017. Identification and activation of TLR4-mediated signalling pathways by alginate-derived guluronate oligosaccharide in RAW264.7 macrophages. *Scientific Reports*, 7, 1663.
- FAO. 2018. The global status of seaweed production, trade, and utilization. *Globelish Research Programme Volume 124*. Rome. pp. 120
- Farghly, M. F. A. and D. E. Abou-Kassem. 2014. Impacts of feed color and form on growth performance of local turkey. *Egyptian J. Nutrition and Feeds* 17(3): 537–547.
- Farghly, M. F. and Kh. M. Mahrose. 2017. The response of growing native turkeys to different feed colours and forms. *Journal Animal Physiology Animal Nutrition* pp. 1–8.
- Farm Animal Welfare Compendium. 2012. The Life of: Laying hens. *Compendium in World Farming*. ciwf.org
- Feingold, K. R. and C. Grunfeld. 2018. Introduction to Lipids and Lipoproteins. <https://www.ncbi.nlm.nih.gov/books/NBK305896/>. (1 Januari 2020).
- Felix, N. and R. A. Brindo. 2014. Substituting fish meal with fermented seaweed *Kappaphycus alvarezii* in diets of juvenile freshwater prawn. *Macrobrachium rosenbergii* 1(5): 261–265.
- Fertah, M., A. Belfkira, E. Dahmane, M. Taourirte, and F. Brouillette. 2014. Extraction and characterization of sodium alginates from Moroccan *Laminaria digitata* brown seaweed: Sodium alginates from *Laminaria digitata*. *Arabian Journal Chemistry* 10: S3707–S3714.
- Fiett, P. P. 2014. Salinity Tolerance and Osmoregulatory Function of Mannitol in Danish Ecotype of *Saccharina latissima*. Department of Environmental, Social and Spatial Change (ENSPAC), Roskilde University, pp. 1– 20.
- Figueiredo, G. O., A. G. Bertechini, E. J. Fassani, P. B. Rodrigues, J. Á. G. Brito, and S. F. Castro. 2012. performance and egg quality of laying hens fed with dietary levels of digestible lysine and threonine. *Arq. Bras. Med. Vet. Zootec.* 64(3): 743–750.

- Fishstat, J. 2018. Fishery and Aquaculture Statistics, version 3.04.9; Global Aquaculture Production 1950–2016; FAO Fisheries and Aquaculture Department, Rome, Italy.
- Fitton, J. H. 2011. Therapies from fucoidan; multifunctional marine polymers, *Marine Drugs* 13: 5920–5946.
- Flock, D. and G. Heil. 2002. Eine Langzeitanalyse der Leistungsentwicklung weißer und brauner Legehybriden anhand von Ergebnissen der amtlichen deutschen Legeleistungsprüfungen von 1974/75 bis 1997/99. *Archiv für Geflügelkunde* 66: 1–20.
- Franklin, M. J., D. E. Nivens, J. T. Weadge, and L. Howel. 2011. Biosynthesis of the *Pseudomonas aeruginosa* extracellular polysaccharides, alginate, Pel, and Psl. *Front. Microbiol.* 2(8): 1–16.
- Gacesa, P. 1987. Alginate-modifying enzyme: a proposed unified mechanism of action for the lysases and epimerases. *FEBS Lett.* 212: 199–202.
- Gacesa, P. 1992. Minireview: Enzymic degradation of alginates. *International Journal Biochemistry* 24: 545–552.
- Gammone, M. A. and N. D’Orazio. 2015. Anti-Obesity of the marine Carotenoid Fukoxanthin. *Mar. Drugs Rev* 13: 2196–2214.
- Garcia, C. and C. Albala. 1998. Lipid composition of eggs from hens fed with marine protein and fat products. *Arch. Latinoam. Nutr.* 48: 71–76
- Gazali, M, Nurjannah, dan N. P. Zamani. 2018. Eksplorasi senyawa bioaktif alga cokelat *Sargassum* sp. Agardh sebagai antioksidan dari pesisir barat aceh. *Jurnal Pengolahan Hasil Perikanan Indonesia* 21(1): 167–178.
- Geier, M. S., V. A. Torok, G. E. Allison, K. Ophel-Keller, and R. J. Hughes. 2009. Indigestible carbohydrates alter the intestinal microbiota but do not influence the performance of broiler chickens. *J. Appl. Microbiol.* 106: 1540–1548.
- Ghosh, S., D. L. Klass, and D. P. Chynoweth. 1981. Biconversion of *Macrocystis pyrifera* to methane. *J. Chem. Tech. Biotechnol*, 31: 791–807.
- Ginzberg, A., M. Cohen, U. A. Sod-Moriah, S. Shany, A. Rosenshtrauch, and S. Arad. 2000. Chickens fed with biomass of the red microalga *Porphyridium* sp. have reduced blood cholesterol level and modified fatty acid composition in egg yolk. *Journal of Applied Phycology* 12: 325–330.
- Goats, B. 2010. Natural Sources of Calcium Hydroxide/ *Livestrong.com*. 2010. www.livestrong.com/.../279343-natural-sources-of-calcium-hydroxid.
- Goelema, J. O., A. Smits, L. M. Vaessen, and A. Wemmers. 1999. Effects of pressure toasting, expander treatment and pelleting on in vitro and in situ parameters of protein and starch in a mixture of broken peas, lupins and faba beans. *Anim. Feed Sci. Technol.* 78 (1-2): 109–26.

- Goh, C. H., P. W. S. Heng, and L. W. Chan. 2012. Alginates as a useful natural polymer for microencapsulation and therapeutic applications. *Carbohydrate Polymers* 88(1): 1–12.
- Granzin, B. C. and G. McL. Dryden. 2003. Effects of alkalis, oxidants and urea on the nutritive value of rhodes grass (*Chloris gayana* cv. Callide). *Animal Feed Science and Technology* 103: 113–122.
- Griffin, H. D., G. Grant, and M. Perry. 1982. Hydrolysis of plasma triacylglycerol rich lipoproteins from immature and laying hens (*Gallus domesticus*) by lipoprotein lipase in vitro. *Biochemical Journal* 206: 647–654.
- Grobas, S., J. Mendez, C. De Blas, and G. G Mateos. 1999. Influence of dietary energy, supplemental fat and linoleic acid concentration on performance of laying hens at two ages. *British Poultry Science* 40: 681–687.
- Guarino, V., T. Caputo, R. Altobelli, and L. Ambrosio. 2015. Degradation properties and metabolic activity of alginate and chitosan polyelectrolytes for drug delivery and tissue engineering applications. Review. *AIMS Materials Science* 2(4): 497–502.
- Guedes, A. C., H. M. Amaro, and F. X. Malcata, 2011. Microalgae as sources of carotenoids. *Mar. Drugs* 9 (4): 625–644.
- Guiry, M. D. and G. M. Guiry. 2014. *Algae Base*. Galway: World-wide electronic publication, National University of Ireland. <http://www.algaebase.org>. (30 September 2014).
- Guiry. 2007. *Algaebase*. Irelandia, National University of Ireland Galway.
- Gurbuz, Y. 2017. Heat applications in feed and food processing. Proceedings of 72nd The IRES International Conference Mecca, Saudi Arabia, 23rd–24th June.
- Gutzeit, D., G. Baleanu, P. Winterhalter, and G. Jerz. 2008. Vitamin C content in Sea Buckthorn Berries (*Hippophaë rhamnoides* L. ssp. *rhamnoides*) and related products: a kinetic study on storage stability and the determination of processing effects. *Journal of Food Science* 73(9): 615–620.
- Halle. I., P. Janczyk, G. Freyer, and W. B. Souffrant. 2009. Effect of microalgae *Chlorella vulgaris* on laying hen performance. *Archiva Zootechnica* 12(2): 5–13.
- Handayani, T. 2017. Potensi makroalga di paparan terumbu karang perairan Teluk Lampung. *Oseanologi dan Limnologi di Indonesia* 2(1): 55–67.
- Hanzal, V., M. Divisova, D. Murawska, and P. Janiszewski. 2016. The effect of dietary bio-alginate supplementation of the growth rate and body weights of common Pheasant (*Phasianus colchicus*) chicks. *Pol. J. Natur. Sc.* 31(3): 363–371.

- Hao, J., C. Hao, L. Zhang, X. Liu, X. Zhou, Y. Dun, H. Li, G. Li, X. Zhao, Y. An, J. Liu, and G. Yu. 2015. OM2, a Novel Oligomannuronate Chromium (III) Complex, Promotes Mitochondrial Biogenesis and Lipid Metabolism in 3T3-L1 Adipocytes via the AMPK-PGC1 α Pathway. *PLoS ONE* 10(7): e0131930.
- Harbone, J. B. 1996. *Metode Fitokimia Penuntun Cara Modern Menganalisis Tumbuhan*. Penerbit ITB, Bandung.
- Hardini, D. 2010. The Nutrient Evaluation of Fermented Rice Bran as Poultry Feed. *International Journal of Poultry Science* 9(2): 152-154.
- Hargis, B. M. 2018. Ascites Syndrome in Poultry (Pulmonary hypertension syndrome, Waterbelly). *MSD Manual-Veterinary Manual*. <https://www.msdsvetmanual.com/poultry/miscellaneous-conditions-of-poultry/ascites-syndrome-in-poultry> . (17 September 2019).
- Harms, R. H., G. B. Russell, and D. R. Sloan. 2000. performance of four strains of commercial layers with major changes in dietary energy. *Journal of Applied Poultry Research* 9: 535–541.
- Hastuti, S., Y. D. Kurnianti, and M. Fakhry. 2013. Produksi manisan rambutan kering dengan variasi konsentrasi larutan kapur dan karakteristik pengeringan. *Agrointek* 7(1): 38–42.
- Haug A. 1964. *Composition and properties of alginates*. [Thesis], Norwegian Institute of Technology, Trondheim.
- Haugh, A., B. Larsen, and O. Smidsrød. 1967. Studies on the sequence of uronic acid residues in alginic acid. *Acta Chem. Scand.* 21: 691–704.
- Hegazi, M. M. I., A. P. Ruzafa, L. Almela, and M. E. Candela. 1998. Separation and identification of chlorophylls and carotenoids from *Caulerpa prolifera*, *Jania rubens*, and *Padina pavonica* by reversed-phase high-performance liquid chromatography. *J. Chromatography A*, 829: 153–159.
- Helmenstine, A. M. 2019. Why is Water The Universal Solvent. <https://www.thoughtco.com/why-is-water-the-universal-solvent-609417?print>. (17 September 2019).
- Hendro. 2015. Pengaruh Pemberian Jenis Rumput Laut Berbeda (*Padina australis*, *Turbinaria decurrens* dan *Sargassum crassifolium*) dalam Ransum terhadap Organ Fisiologis Broiler [Skripsi]. Universitas Andalas.
- Heriyanto and L. Limantara. 2010. Photo-stability and thermo-stability studies of fucoxanthin isomerization. Dalam: Leenawaty Limantara, Heriyanto & Eugenius Sadtono (Ed.). *Proceeding of Natural Pigments Conference for South East Asia*, Ma Chung University, Malang, pp: 73-78.
- Hermier, D. 1997. Lipoprotein metabolism and fattening in poultry. *J. Nutr.* 127: 805-808.

- Hiep, D. T. and R. A. Swick. 2017. Nutritional factors affecting egg production and eggshell quality in laying hens. *Journal of Animal Husbandry Sciences and Technics* 223: 15–20.
- Holdt, S. dan S. Kraan. 2011. Bioactive compounds in seaweed: Functional food applications and legislation. *J. Appl. Phycol.* 23 (3): 543–597.
- Horhoruw, W. M., Wihandoyo dan T. Yuwanta. 2009. Pengaruh pemanfaatan rumput laut *Gracilaria Edulis* dalam pakan terhadap kinerja ayam fase pullet. *Buletin Peternakan* 33(1): 8–16.
- Horn, S. J. 2000. *Biology from Brown Algae*. [Thesis], Department of Biotechnology Norwegian University of Science and Technology NTNU Trondheim, Norway.
- Hu, Y., Z. Feng, W. J. Feng, T. Hu, H. S. Guan, and Y. J. Mao. 2019. AOS ameliorates monocrotaline-induced pulmonary hypertension by restraining the activation of P-selectin/p38MAPK/NF-kappa B pathway in rats. *Biomedicine & Pharmacotherapy* 109: 1319–1326.
- Huang, L., J. Zhou, X. Li, Q. Peng, H. Lu, and Y. Du. 2013. Characterization of a new alginate lyase from newly isolated *Flavobacterium* sp. S20. *J Ind Microbiol Biotechnol* 40: 113–22.
- Hussain, M. M. 2014. Intestinal lipid absorption and lipoprotein formation. *Current opinion in lipidology* 25(3):200-206. Pubmed Central PMCID: 4265799, 25(3): 200–206.
- Hwang, I. G., Y. J. Shin, S. Lee, J. Lee, and S. M. Yoo. 2012 Effects of different cooking methods on the antioxidant properties of red pepper (*Capsicum annuum* L.). *Prev. Nutr. Food Sci.* 17: 286–292.
- Hy-Line International. 2013. *The Science of Egg Quality*. www.hyline.com. (15 November 2019).
- Hy-Line International. 2018. *Management Guide*. www.hyline.com.
- Idota, Y., Y. Kogure, T. Kato, M. Ogawa, S. Kobayashi, C. Kakinuma, K. Yano, H. Arakawa, C. Miyajima, F. Kasahara, and T. Ogihara. 2016. Cholesterol-lowering effect of calcium alginate in rats. *Biol. Pharm. Bull.* 39: 62–67.
- Isa Brown. 2015. *Management Guide*. A Hendrix Genetics Genetics Company.
- Ismadi, M. 1993. *Biokimia: Suatu Pendekatan Berorientasi Kasus*. Gadjah Mada University Press, Yogyakarta.
- Ismail, G. A. 2016. Biochemical composition of some Egyptian seaweeds with potent nutritive and antioxidant properties. *Food Sci. Technol (Campinas)* 37(2): 294–302.

- Jacob, J. 2015. Seaweed in Poultry Diets. <http://www.extension.org/pages/65717/seaweed-in-poultry-diets>. Extention.org. (9 Oktober 2015).
- Jacob, J. P., H. R. Wilson, R. D. Miles, G. D. Butcher, and F. B. Mather. 2014. Factors Affecting Egg Production in Backyard Chicken Flocks. UF/IFAS Extension.
- Jacob, J. P., R. D. Milles, and F. B. Mather. 2000. Egg quality. University of Florida extension, Institute of food and agricultural science.pp. 11.
- Jakobsen, J., and P. Knuthsen. 2014. Stability of vitamin D in foodstuffs during cooking. *Food Chemistry* 148: 170–175..
- Jalal, M. A., S. E. Scheideler, and D. Marx. 2006. Effect of bird cage space and dietary metabolizable energy level on production parameters in laying hens. *Poultry Science* 85: 306–311.
- Jalal, M. A., S. E. Scheideler, and E. M. Pierson. 2007. Strain response of laying hens to varying dietary energy levels with and without avizyme supplementation. *The Journal of Applied Poultry Research* 16: 289–295.
- Jankowski, J., J. Juśkiewicz, Z. Zduńczyk, K. Smiecinska, and P. Kwieciński. 2011. Effects of inclusion level and source of dietary sodium on performance and meat characteristics of broiler chickens. *Arch Anim Nutr.* 65(3): 186–202.
- January, G. G., R. K. Naidoo, B. Kirby-McCullough, dan R. Bauer. 2019. Assessing methodologies for fucoidan extraction from South African brown algae. *Algal Research* 40: 1–8.
- Jensen, A. 1963. The effect of seaweed carotenoids on egg yolk coloration. *Poult Sci* 42: 912-916.
- Jensen, M. G., C. Pedersen, M. Kristensen, G. Frost, and A. Astrup. 2013. Review: efficacy of alginate supplementation in relation to appetite regulation and metabolic risk factors: evidence from animal and human studies. *Obesity Reviews* 14(2): 129–144.
- Jesch, E. D., and T. P. Carr. 2017. Food ingredients that inhibit cholesterol absorption. *Prev. Nutrition Food Sciences.* 22(2): 67–80.
- Jim, E. L. 2013. Metabolisme lipoprotein. *Jurnal Biomedik (JBM)* 5(3): 149–15.
- Kadi, A. 2004. Potensi rumput laut di beberapa perairan pantai Indonesia (The potency of seaweed in Indonesia's Oceans. *Oseana* 24(4): 25–36.
- Kadi, A. 2005. Beberapa catatan kehadiran marga *Sargassum* diperairan Indonesia. *Oseana* 15(4): 19–29
- Kadi, A. 2017. Interaksi komunitas makroalga dengan lingkungan perairan Teluk Carita Pandeglang. *Biosfera* 34(1): 32–38.

- Kam, N., Y. J. Park, E. Y. Lee, and H. S. Kim. 2011. Molecular identification of a polyM-specific alginate lyase from *Pseudomonas* sp. strain KS-408 for degradation of glycosidic linkages between two mannuronates or mannuronate and guluronate in alginate. *Can. J. Microbiol.* 57: 1032–1041.
- Kartikaningsih, H., E. D. Mufti, and A. E. Nurhanief. 2017. Fucoxanthin from brown seaweed *Sargassum cristaefolium* tea in acid pH. The 7th International Conference on Global Resource Conservation AIP Conf. Proc. 1844, 030009-1–030009-9.
- Kartikaningsih, H., K. Zaelanie, dan S. Dayuti. 2014. Stabilitas fukosantin dari rumput laut coklat *Padina australis* terhadap perubahan suhu. Nasional Conference Green Tecknology 3.
- Kasahara, F., T. Kato, Y. Idota, H. Takahashi, C. Kakinuma, K. Yano, H. Arakawa, K. Hara, C. Miyajima, and T. Ogihara. 2018. Reduction effect of calcium alginate on blood triglyceride levels causing the inhibition of hepatic and total body accumulation of fat in rats. *Biol. Pharm. Bull.* 42(3): 365–372.
- Kementerian Kelautan dan Perikanan. 2017. Rencana strategis Kementerian Kelautan dan Perikanan tahun 2015 - 2019. Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 63/permen-kp/2017.
- Kementerian Kelautan dan Perikanan. 2018. KKP Pacu Pengembangan Daya Saing Rumput Laut Nasional. <https://kkp.go.id/djpb/artikel/3128-kkp-pacu-pengembangan-daya-saing-rumput-laut-nasional>. (11 September 2019).
- Ketta, M. and E. Tůmová. 2016. Eggshell structure, measurements, and quality-affecting factors in laying hens: a review. *Czech J. Anim. Sci.*, 61(7): 299–309.
- Khan, Z. H., M. A. K. Khan, M. Aftab, M. Idrees, and M. Naeem. 2011. Influence of alginate oligosaccharides on growth, yield and alkaloid production of opium poppy (*Papaver somniferum* L.). *Biotechnol Letters* 22 (11): 931–936.
- Khempaka, S., R. Thongkratok, S. Okrathok, and W. Molee. An evaluation of cassava pulp feedstuff fermented with *A. oryzae*, on growth performance, nutrient digestibility and carcass quality of broilers. *J Poult Sci.* 51:71–79.
- Khosravinia, H. 2007. Preference of broiler for color of lighting and feed. *The Journal of Poultry Science* 44: 213–219.
- Khotimchenko, Y. S. and M. Y. Khotimchenko. 2004. Healing and preventive effects of calsium alginate on carbon tetrachloride induced liver injury in rats. *Mar. Drugs* 2: 108–122.
- Kim, H. S., C. G. Lee, and E. Y. Lee. 2011. Alginate lyase: structure, property, and application. *Biotechnol Bioproc E.* 16: 843–851.

- Kim, I. H. and J. H. Lee. 2008. Antimicrobial activities against methicillin resistant *Staphylococcus aureus* from macroalgae. *Journal of Industrial Engineering Chemistry* 14: 568–572.
- Kim, S. M., Y. J. Jung, O. N. Kwon, K. H. Cha, B. H. Um, D. Chung, and C. P. Pan. 2012. A Potential Commercial Source of Fucoxanthin Extracted from the Microalga *Phaeodactylum tricornutum*. *Applied Biochemistry and Biotechnology* 166(7): 1843–1855.
- Kimura, Y., K. Watanabe, and H. Okuda. 1996. Effects of soluble sodium alginate on cholesterol excretion and glucose tolerance in rats. *J. Ethnopharmacol.* 54(1): 47–54.
- King, A. J. and J. K. Griffing. 2012. Unpublished data. University of California, Davis, California.
- Kiriyama, S., Y. Okasaki, and A. Yoshida. 1968. Hypocholesterolemic effect of polysaccharides and polysaccharide foodstuffs in cholesterol fed rats. *J. Nutr.* 97: 382.
- Klasing, K. C. 1998. Nutritional Strategies and Adaptations. In *Comparative Avian Nutrition*, New York, NY, USA: CAB International, pp. 71–124.
- Klauder, G. 1948. *Landwirtschaftliche Faustzahlen*. Paul Parey, Berlin, Germany.
- Kleiner, I. S. and L. B. Dotti. 1962. *Laboratory Instructions in Biochemistry*. 6th Edition. The C.V. Mosby Company, New York.
- Kloareg, B. and R. S. Quatrano. 1988. Structure of cell walls of marine algae and ecophysiology functions of the matrix polysaccharides. *Oecogr. Mar. Biol. Ann. Rev.* 26: 259–315.
- Kloareg, B., M. Demarty, and S. Mabeau. 1986. Polyanionic characteristics of purified sulphated homofucans from brown algae. *Int. J. Biol. Macromol.* 8: 380–386.
- Kompasiana. 2018. Sedimentasi Sungai Makin Parah, Hulu Hilir perlu Solusi. <https://www.kompasiana.com/penaulum/5a6c7ee9ab12ae28bf112d94/sedimentasi-sungai-makin-cepat-hulu-hilir-perlu-solusi?page=all>. (27 Februari 2020).
- Kraan, S. 2012. Algal polysaccharides, novel applications and outlook. In: *Carbohydrates-Comprehensive Studies on Glycobiology and Glycotechnology*, edited by Chang, C.F., InTech, Chapters published., pp. 489–532.
- Kulshreshtha, G., B. Rathgeber, G. Stratton, N. Thomas, F. Evans, A. Critchley, J. Hafting, and B. Prithiviraj. 2014. Feed supplementation with red seaweeds, *Chondrus crispus* and *Sarcodiotheca gaudichaudii*, affects performance, egg quality, and gut microbiota of layer hens. *Poultry Science* 93: 2991–3001.

- Kumar, C. S., P. Ganesan, P. V. Suresh, and N. Bhaskar. 2008. Seaweeds as a source of nutritionally beneficial compounds. Review. *J Food Sci Technol.* 45(1): 1–13.
- Kumar, V. V. and P. Kaladharan. 2007. Amino acids in the seaweeds as an alternate source of protein for animal feed. *Journal of the Marine Biological Association of India* 49 (1): 35–40.
- Kurlansky, M. 2002. *Salt: A World History*. <https://www.theguardian.com/books/2002/feb/16/historybooks.highereducation>. (12 Januari 2020).
- Laca, A., B. Paredes, and M. Díaz. 2010. A method of egg yolk fractionation. Characterization of fractions. *Food Hydrocolloids*, 24(4): 434–443.
- Lamela, M., J. Anca, R. Villar, J. Otero, and J.M. Calleja. 1989. Hypoglycemic activity of several seaweed extract. *Journal Ethnopharmacology*. 27(1-2): 35–43.
- Larsen, B., K. Hoøen, and K. Østgaard. 1993. Kinetics and specificity of alginate lyases. *Hydrobiologia* 260/261: 557–561.
- Lecuelle, S., I. Bouvarel, A. Chagneau, F. Laviron, P. Lescoat, and C. Leterrier. 2011. Early visual experience of food does not appear to reduce subsequent feed neophobia in turkeys. *Poultry Science* 90: 1–9.
- Lee, K. Y. and D. J. Mooney. 2012. Alginate: properties and biomedical applications. *Prog Polym Sci.* 37(1): 106–126.
- Lee, S. H., C. I. Ko, G. Ahn, S. You, J. S. Kim, M. S. Heu, J. Kim, Y. Jee, and Y. J. Jeon. 2012. Molecular characteristics and anti-inflammatory activity of the fucoidan extracted from *Ecklonia cava*. *Carbohydr. Polym.* 89: 599–606.
- Leeson, S. and J. D. Summers. 2001. *Nutrition of Chicken*. Univ. Books, Guelph, CA., pp. 363–377.
- Leeson, S., J. D. Summers, and L. J. Caston. 2001. Response of layers to low nutrient density diets. *Journal of Applied Poultry Research* 10: 46–52.
- Leng, X., K-N. Hsu, R. E. Austic and X' g. Lei. 2014. Effect of dietary defatted diatom biomass on egg production and quality of laying hens. *Journal of Animal Science and Biotechnology*, pp. 1–7.
- Leo, W. J., A. J. McLoughlin, and D. M. Malone. 1990. Effects of sterilization treatments on some properties of alginate solutions and gels. *Biotechnol. Prog.* 6: 51–53.

- Li, F., L. M. Zhang, X. H. Wu, C. Y. Li, J. Yang, Y. Dong, A. Lemme, J. C. Han, and J. H. Yao. 2013. Effect of metabolizable energy and balance protein on egg production, quality and components of Lohman Brown laying hens. *Journal of Applied Poultry Research* 22: 36–46.
- Li, S. Y., L. N. Wang, F. Han, Q. H. Gong, and W. G. Yu. 2016. Cloning and characterization of the first polysaccharide lyase family 6 oligoalginate lyase from marine *Shewanella* sp. Kz7. *Journal of Biochemistry* 159: 77–86.
- Liang, Z., X. Sun, F. Wang, W. Wang, and F. Liu. 2013. Impact of environmental factors on photosynthesis and respiration of young seedling of *Sargassum thunbergii* (Sargassaceae, Phaeophyta). *American Journal of Plant Sciences* 4: 27–33.
- Lichtenwalner, A. 2018. Nutrition for Chickens-Cooperative Extension: Livestock. University of Maine Cooperative Extension. <https://extension.umaine.edu/livestock/poultry/nutrition-for-chickens/>. (20 November 2019).
- Lieboldt, M., J. Frahm, L. Schrader, U. Baulain, M. Henning, and R. Preisinger, D.S.a.W.S. 2015b. Phylogenetic versus selection effects on growth development, egg laying and egg quality in purebred laying hens. *European Poultry Science* 79, 22.
- Liebretexts™. 2019. Rate of Dissolving. <https://chem.libretexts.org/link?53850>. (19 Desember 2019)
- Limantara, L. 2011. Optimasi Proses Ekstraksi Fukosantin Rumput Laut Coklat *Padina australis* Hauck Menggunakan Pelarut Organik Polar. *Ilmu Kelautan* 16(2): 86–94.
- Limantara, L. dan Heriyanto. 2010. Studi komposisi pigmen dan kandungan fukosantin rumput laut coklat dari perairan madura dengan kromatografi cair kinerja tinggi. *Ilmu Kelautan* 15(1): 23–32.
- Lin, B. Y. N. 2011. Phenology of *Sargassum* species at Teluk Kemang, Port Dickson, Malaysia. [Thesis], The Degree Master of Science at Universiti Tunku Abdul Rahman, Malaysia.
- Linker, A. and R. S. Jones. 1966. A new polysaccharide resembling alginic acid isolated from *Pseudomonas*. *J Biol Chem.* 241: 3845–3851.
- Lisley, R. K., M. A. Kohler, J. L. H. Paulhus, and Y. Hermawan, 1996. Hidrologi untuk Insinyur (Hydrology for insinyur). Erlangga, Jakarta.
- Liu, J. P. 2009. Molecular and cellular. *Endocrinology* 303(1–2): 1–6.
- Liu. X. H., S. P. Zhang, L. Han dan Y. Li. 2012. Influence of several fermentation on seaweed waste of feed. *Journal of Sustainable Bioenergy Systems* 2: 108–111.

- Lohmann Tierzucht. 2019. Manajement Guide Cage Housing. Lohmann Tierzucht GmgH, Germany.
- Longland, A. C., C. Barfoot, and P. A. Harris. 2014. Effect of period, water temperature and agitation on loss of water-soluble carbohydrates and protein from grass hay: implications for equine feeding management. *Veterinary Record*. 174: 68.
- Lv, C., Y. Tang, L. Wang, W. Ji, Y. Chen, S. Yang, and W. Wang. 2002. Bioconversion of yolk cholesterol by extracellular cholesterol oxidase from *Brevibacterium* sp. *Food Chemistry* 77(4): 457–463.
- Mack, S. J., A. H. Dugdale, C. McG. Argo, R. A. Morgan, and C. M. McGowan, 2014. Impact of water-soaking on the nutrient composition of UK Hays. *Veterinary Record*.
- Maehre, H. K., G. K. Edvinsen, K. E. Eilertsen, and E. O. Elvevoll. 2015. Heat treatment increases the protein bioaccessibility in the red seaweed dulse (*Palmaria palmata*), but not in the brown seaweed winged kelp (*Alaria esculenta*). *Journal of Applied Phycology* 28(1): 581–590.
- Maharani, M. A. dan Widyayanti. 2010. Pembuatan Alginat dari Rumput Laut untuk Menghasilkan Produk dengan Rendemen dan Viskositas yang Tinggi. Universitas Diponegoro. Semarang.
- Mahata, M. E., Y. L. Dewi, M. O. Sativa, S. Riski, Hendro, Zulhaqqi and A. Zahara, 2015. [The potency of brown seaweed from Sungai Nipah Beach as poultry feed]. Penelitian Mandiri Fakultas Peternakan, Universitas Andalas, Padang, (In Indonesian).
- Mahley, R. W. 2001. Biochemistry and Physiology of Lipid and Lipoprotein Metabolism. In: Becker, K. L., editor. *Principles and Practice of Endocrinology and Metabolism*. Lippincott William and Wilkins, Philadelphia, pp. 1503–50.
- Maier, R. M. 2009. Bacterial Growth. In *Environmental Microbiology*. Elsevier Inc, pp. 37–54.
- Mak, W., N. Hamid, T. Liu, J. Lu, and W. L. White. 2013. Fucoidan from New Zealand *Undaria pinnatifida*: monthly variations and determination of antioxidant activities. *Carbohydr. Polym.* 95: 606–614.
- Mann, K., V. Olsena, B. Maceka, F. Gnada, and M. Mann. 2008. Identification of new chicken egg proteins by mass spectrometry-based proteomic analysis. *World's Poultry Science Journal* 64: 209–218.
- Mao, W. J., B. F. Li, Q. Q. Gu, Y. F. Fang, and H. T. Xing. 2004. Preliminary studies on the chemical characterization and antihyperlipidemic activity of polysaccharide from the brown alga *Sargassum fusiforme*. *Hydrobiologia* 512 (1): 263–266.

- Marín, A., M. Casas-Valdez., S. Carrillo, H. Hernandez, A. Monroy, L. Sangines, and F. Perez-Gil, 2009. The marine algae *Sargassum* spp. (Sargassaceae) as feed for sheep in tropical and subtropical regions. *Rev. Biol. Trop.* 57 (4): 1271–1281
- Marine Forests. 2019. *Sargassum binderi* Sonder ex J. Agardh. <https://marineforests.com/reports/22775/>. (13 September 2019).
- Marples, N. M. and T. J. Roper. 1996. Effects of novel colour and smell on the response of naive chicks towards food and water. *Animal Behaviour* 51: 1417–1424.
- Martin, A., P. Bustamante, and A. F. C. Chun, 1993. *Physical Pharmacy: physical chemical principles in the pharmaceutical sciences*, 4th Ed. Williams & Wilkins, Baltimore, Maryland.
- Martinsen, A., G. Skjåk-Bræk, and O. Smidsrød. 1989. Alginate as immobilization material: I. Correlation between chemical and physical properties of alginate gel beads. *Biotechnol. Bioeng* 33:79–89.
- Martinson, K. L., M. Hathaway, H. Jung, and C. Sheaffer, 2012a. The effect of soaking on protein and mineral loss in orchardgrass and alfalfa hay. *J. Equine Vet. Sci.* 32: 776–782.
- Martinson, K., H. Jung, M. Hathaway, and C. Sheaffer, 2012. The effect of soaking on carbohydrate removal and dry matter loss in orchardgrass and alfalfa hays. *J. Equine Vet. Sci.* 32: 332–33.
- Matsuno, T. 2001. Aquatic animal carotenoids. *Fisheries Science* 67: 771-783.
- Mattio, L. and C. E. Payri. 2010. Assessment of five markers as potential barcodes for identifying *Sargassum* subgenus *Sargassum* species (Phaeophyceae, Fucales). *Cryptogamie Algal.* 31: 467–485.
- McCarty, B. 2018. *Management Turf Golf: Chapter 3. Soil Chemical Properties.* CRC Press Edisi 1. pp. 90.
- Mc Donald, P., R. A. Edwards, J. F. D. Greenhalgh, C. A. Morgan, L. A. Sinclair, and R. G. Wilkinson. 2011. *Animal Nutrition Seventh Editions.* Pearson, New York.
- Mc Haugh., D. J. 2003. *A guide to the seaweed industry.* Food and Agriculture Organization of The United Nations, Rome.
- McKay, J. 2008. "The genetics of modern commercial poultry", in: *Proceedings of the 23rd World's Poultry Congress, Brisbane, Australia.*

- Michalak, I., K. Chojnacka, Z. Dobrzanski, H. Gorecki, A. Zielinska, M. Korczynski, and S. Opalinski. 2010. Effect of macroalgae enriched with microelements on egg quality parameters and mineral content of eggs, eggshell, blood, feathers and droppings. *Journal of Animal Physiology and Animal Nutrition* 95: 374–387.
- Michel, C., M. Lahaye, C. Bonnet, S. Mabeau, and J. L. Barry. 1996. In vitro fermentation by human faecal bacteria of total and purified dietary fibres from brown seaweeds. *Br. J. Nutr.* 75: 263–280.
- Michel, G., T. Tonon, D. Scornet, J. M. Cock, and B. Kloareg. 2010. Central and storage carbon metabolism of the brown alga *Ectocarpus siliculosus*: In sights into the origin and evolution of storage carbohydrates in Eukaryotes. *New Phytologist*, Wiley 188 (1): .67-81.
- Mikami, K. and M. Hosokawa. 2013. Biosynthetic pathway and health benefits of fucoxanthin, an algae-specific xanthophyll in brown seaweeds. *Int. J. Mol. Sci. Rev.* 14: 13763–13781.
- Mirza, M. 2012. Pengaruh Perendaman Larutan KOH dan NaOH Terhadap Kualitas Alginat Rumput Laut *Sargassum polycystum* C.A. Agard [Skripsi]. Fakultas Perikanan dan Ilmu Kelautan, Universitas Diponegoro, Semarang, hal.73.
- Mishra, M. 2019. *Encyclopedia of Polimer Application*. Boca Raton: CRC Press, pp, 118.
- Mishra, V. K., F. Temelli, P. F. Ooraikul Shacklock and J. S. Craigie. 1993. Lipids of the red alga *Palmaria palmata*. *Botanica Marina* 36(2): 169–174.
- Misurcová, L. 2012. Chemical Composition of Seaweeds. In: Kim, S.-K. (Ed.), *Handbook of Marine Macroalgae: Biotechnology and Applied Phycology*. John Wiley & Sons, pp. 567.
- Moen, E. 1997. Biological degradation of brown seaweeds. [Thesis], Norwegian Biopolymer Laboratory (NOBIPOL) Departement of Biotechnology, Norwegian University of Science and Technology..
- Moen, E., B. Larsen, K. Østgaard, and A. Jensen. 1999. Alginate stability during high salt preservation of *Aschophyllum nodosum*. *J. appl. Phycol.* 11:21–25.
- Mohd, H., C. C. Yen, and C. Y. Ching. 2000. Nutritional composition of edible seaweed *Gracilaria changgi*. *Food Chem.* 68: 69–76.
- Moon, Y. S. 2018. Lipid metabolism and fatty liver in poultry. *Korean J. Poult. Sci.* 45(2): 109–118.

- Mora Castro, N., M. Casas Valdez, A. Marin Alvarez, R. N. Aguila Ramirez, I. Sanchez Rodriguez, H. Hernandez Contreras, and L. Sangines Garcia. 2009. The kelp *Macrocystis pyrifera* as nutritional supplement for goats. *Rev. Cient., Fac. Ciencias Vet., Univ. del Zulia*, 19 (1): 63–70.
- Moradali, M. F., S. Ghods, and B. H. A. Rehm. 2018. Alginate Biosynthesis and Biotechnological Production. *Alginates and Their Biomedical Applications*, 1–25.
- Mosisa, M. T. 2017. Effect of processing on proximate and mineral composition of black climbing (*P. coccineus* L.) bean flour. *African Journal of Food Science* 11(3): 74–8.
- Muchtadi, T. R. dan F. Ayustaningwarno. 2010. *Teknologi Proses Pengolahan Pangan*. Alfabeta, Bandung, hal. 132.
- Muradian, Kh., A. K.-J. Vaiserman, and V. E. Min . 2015. Fucoxanthin and lipid metabolism: a minireview. *Nutrition, Metabolism and Cardiovascular Diseases* 25(10): 891–897.
- Murakami, A. E., M. I. Sakamoto, J. R. G. Franco, E. N. Martins, and E. O. O. Rondon. 2003. Requirements of sodium and chloride by leghorn laying hens. *J. Appl. Poult. Res.* 12: 217–221.
- Murata, M. and J. Nakazoe. 2001. Production and use of marine algae in Japan. *Japan Agricultural Research Quarterly* 35: 281–290.
- Murni, R., B. L. Suparjo, Akmal, and Ginting. 2008. Metode pengolahan limbah untuk pakan ternak. *Buku ajar teknologi pemanfaatan limbah untuk pakan*. Laboratorium Makanan Ternak Fakultas Peternakan Universitas Jambi.
- Murray, R. K., D. A. Bender, K. M. Bothman, P. J. Kennelly, V. W. Rodwell, and D. A. Weil. 2012. *Harper's Illustrated Biochemistry* 29th edition. McGrawHill Education, New York.
- Mushoilaeni, W., N. Supartini, and E. Rusdiana. 2015. Decreasing blood cholesterol levels in rats induced by alginate of *Sargassum duplicatum* and *Turbinaria* sp. derived from Yogyakarta. *Asian Journal Agriculture and Food Sciences* 3(4): 321–326.
- Mushtaq, M. M. H., T. N. Pasha, Saima, M. Akram, T. Mushtaq, R. Parvin, U. Farooq, S. Mehmood, K. J. Iqbal, and J. Hwangbo. 2013. Growth performance, carcass traits, and serum mineral chemistry as affected by dietary sodium and sodium salts fed to broiler chickens reared under phase feeding system. *Asian Australas. J. Anim. Sci.* 26(12): 1742–1752.
- National Research Council. 1994. *Nutrient Requirements of Domestic Animals. Nutrient Requirements of Poultry*. 9th rev. ed. Natl. Acad. Sci., Washington, DC.

- Nejrup, L. B. and M. F. Pedersen. 2012. The effect of temporal variability in salinity on the invasive red alga *Gracilaria vermiculophylla*. *European Journal of Phycology* 47: 254–263.
- Nelson, D. L. and M. M. Cox. 2013. *Lehninger's Principles of Biochemistry*. 10th Edition. W. H. Freeman and Company, New York.
- Niba, A. T., J. D. Beal, A. C. Kudi, and P. H. Brooks. 2009. Potential of bacterial fermentation as a biosafe method of improving feeds for pigs and poultry. *Afr J Biotechnol* 8: 58–67.
- Niekraszewicz, B. and A. Niekraszewicz. 2009. The Structure of Alginate, Chitin and Chitosan Fibres. *Handbook of Textile Fibre Structure*, pp. 266–304.
- Noble, R. C. and M. Cocchi. 1991. Lipid metabolism and the neonatal chicken. *Progress in Lipid Research* 29: 107–140.
- Noblet, R. C., B. K. Speake, R. McCartney, C. M. Foggin, and D. C. Deemig. 1996. Yolk lipids and their fatty acids in the wild and captive ostrich. *Comparative Biochemistry and Physiology* 113: 753–756.
- Nofriya. 2015. Pendayagunaan sumber daya genetik rumput laut sebagai sumber energi alternatif di masa depan. *Jurnal Teknik Lingkungan UNAND* 12 (1) : 38–47.
- Noiraksa, T., T. Ajisak, and C. Kaewsuralikhit. 2006. Species of *Sargassum* in the East Coast of the Gulf of Thailand. *Science Asia* 32(1): 99–106.
- Nuraini. 2018. Produksi Ransum Komplit Berbasis Limbah Sawit Fermentasi untuk menghasilkan Telur dan Daging Unggas Rendah Kolesterol. Hibah Penelitian Kompetensi.
- Nurmeiliasari. 2010. Ascites incidence in broilers. *Jurnal Science Peternakan Indonesia* 5(1): 59–64.
- Nursid, M., T. Wikanta, dan R. Susilowati. 2013. Aktivitas antioksidan, sitotoksisitas dan kandungan fukosantin ekstrak rumput laut coklat dari Pantai Binuangeun, Banten. *JPB Kelautan dan Perikanan* 8(1):73-83.
- Nys, Y. 2000. Dietary carotenoids and egg yolk coloration –a review. In *Archiv Fur Geflugelkunde* 64(2): 45–54.
- O'Doherty, J. V., S. Dillon, S. Figat, J. J. Callan, and T. Sweeney. 2010. The effects of lactose inclusion and seaweed extract derived from *Laminaria* spp. on performance, digestibility of diet components and microbial populations in newly weaned pigs. *Animal Feed Science and Technology*. *Animal Feed Science and Technology* 157:173–180.
- Oates, C. G. and D. A. Ledward. 1990. Studies on the effect of heat on alginates. *Food Hydrocolloids* 4(3): 215–220.

- Olawumi, S. O. and J. T. Ogunlade. 2008. Phenotypic correlation between some external and internal egg quality traits in the exotic ISA brown layer breeders, *Asian Journal of Poultry Science* 2(1): 30-35.
- Oryza. 2011. Fucoxanthin. ORYZA OIL & FAT CHEMICAL CO., LTD.
- Østgaard, K. 1993. Determination of alginate composition by a simple enzymatic assay. *Hydrobiologia* 260/261: 513–520.
- Owen, E., T. Klopfenstein and N. A. Urio. 1984. Treatment with other chemicals. In : Sundstol, F and Owen, E. (eds). *Straw and other Fibrous By-Products as Feed*. Elsevier, New York.
- Ozaki, H., M. Kawahara, R. Nogami, Y. Yamada, and H. Takahash. 2013. Supplemental red alga, *Gracilaria vermiculophylla*, from a Brackish Japanese Lake, strengthens egg shells and improves the haugh unit of eggs in laying hens. *J. Fisheries Livest Prod.* 2: 2–5.
- Pal, A., M. C. Kamthania, and A. Kumar. 2014. Bioactive compounds and properties of seaweeds- A Review. *Open Access Library Journal* 1(4): 1–7.
- Panlasigui, L. N., O. Q. Baello, J. M. Dimatangal, and B. D. Dumelod. 2003. Blood cholesterol and lipid-lowering effects of carrageenan on human volunteers. *Asia-Pacific J. Clin. Nutr.* 12: 209.
- Park, J. H., S. D. Upadhaya, and I. H. Kim. 2015. Effect of dietary marine microalgae (*Schizochytrium*) powder on egg production, blood lipid profiles, egg quality, and fatty acid composition of egg yolk in layers. *Asian Australas. J. Anim. Sci.* 28(3): 391–397.
- Pawar, S. N. and K. J. Edgar. 2012. Alginate derivatization: a review of chemistry, properties and applications. *Biomaterials* 33(11): 3279–3305
- Paxman, J. R., J. C. Richardson, P. W. Dettmar, and B. M. Corfe. 2008. Alginate reduces the increased uptake of cholesterol and glucose in over weight male subjects: A pilot study. *Nurt. Res.* 28(8): 501–505.
- Pena, C., L. Miranda, D. Segura, C. Nunez, G. Espin, and E. Galindo. 2002. Alginate production by *Azotobacter vinelandii* mutant altered in poly-beta-hydroxybutyrate and alginate biosynthesis. *J. Ind. Microbiol. Biotech.* 29(5): 209–2013.
- Peng, J., J. P. Yuan, C. F. Wu, and J. H. Wang. 2011. Fucoxanthin, a marine carotenoid present in brown seaweeds and diatoms: Metabolism and bioactivities relevant to human health. *Mar. Drugs* 9: 1806–1828.
- Pereira, L. 2011. Chapter 2-A Review Of The Nutrient Composition Of Selected Edible Seaweeds, pp. 15–47. In: Pomin, V. H. (ed.). *Seaweed: Ecology, Nutrient Composition and Medicinal Uses*. Nova Science Publishers Inc., New York.

- Pereira, L. 2016. Chapter 1-Introduction. Pp. 6-7. In: Critchley, A. T. Edible Seaweed of the World. CRC Press, Taylor & Francis Group, Boca Raton.
- Pesti, G. M. and R. I. Bakalli. 1998. Studies on the effect of feeding cupric sulfate pentahydrate to laying hens on egg cholesterol content. *Poult. Sci.* **77**: 1540–1545.
- Picard, M., J. P. Melcion, D. Bertrand, and J. M. Faure. 2002. Visual and Tactile Cues Perceived by Chickens. In McNab, J. and N. Boorman (Eds.), *Poultry Feedstuffs: Supply, Composition and Nutritive Value*, pp. 279–300. CABI Publishing, Wallingford, UK.
- Pomin, V. H. and P. A. S. Muraao. 2008. Structure, biology, evaluation, and medical importance of sulfated fucans and galactans. *Glycobiology* **18**(12): 1016–1027.
- Pond, W. G., D. C. Church, and K. R. P. A. Pond. 1995. *Basic Animal Nutrition and Feeding*. 5th Edition. John Wiley and Sons, New York.
- Pourreza, J. and M. A. Edriss. 1992. The effects of high vs. normal temperatures on the physical characteristics of the broilers carcass. *J. Agric. Sci. Technol.* **1**: 35–41.
- Pritchard, M. F., A. A. Jack, L. C. Powell, H. Sadh, P. D. Rye, K. E. Hill, and D. W. Thomas. 2017. Alginate oligosaccharides modify hyphal infiltration of *Candida albicans* in an *in vitro* model of invasive human candidosis. *Journal of Applied Microbiology* **123**: 625–636.
- Priya, T., S. Maurya, and K. H. Khan. 2013. Cholesterol: genetic, clinical and natural implications. *Research Journal of Pharmaceutical, Biological and Chemical Sciences* **4**(3): 1344–1364.
- Pubchem. 2019. Sodium Chlorida/ NaCl. <https://pubchem.ncbi.nlm.nih.gov/compound/Sodium-chloride>. (19 Desember 2019).
- Puertas, G. and M. Vázquez. 2018. Advances in techniques for reducing cholesterol in egg yolk: a review. *Critical Reviews in Food Science and Nutrition*.
- Pusat Pendidikan dan Pelatihan Sumber Daya Air dan Konstruksi. 2016. *Diklat Teknis Operasi dan Pemeliharaan Irigasi Tingkat Dasar. Modul Teknik Irigasi Praktis*, Kementerian Pekerjaan Umum dan Perumahan Rakyat Badan Pengembangan Sumber Daya Manusia.
- Rachmaniar, R. 2005. Penelitian Kandungan Kimia Makroalgae untuk Neuroceuticals dan Agrochemicals. Laporan Akhir P2O LIPI, Jakarta, pp. 22.
- Radwan, M. M., S. F. Darwish, I. M. El-Sabagh, A. A. El-Sanousi, M. A. Shalaby. 2011. Purification and characterization of a bifunctional alginate lyase from *Pseudoalteromonas* sp. SM0524, *Mar. Drugs* **21**:1374–1380.

- Rahman, A. 1992. Teknologi Fermentasi. Penerbit Arcan, Jakarta.
- Rajauria, G. 2015. Seaweeds: a sustainable feed source for livestock and aquaculture. *Seaweed Sustainability*, pp. 389–420.
- Rao, D. A., G. Subbarangaiah, and S. E. Padal. 2014. Habitat influences the seasonal growth, fruiting behaviour in *Sargassum polycystum* C. Agardh. (Fucales, Phaeophyceae) at Visakhapatnam Coast, India. *International Journal of Pharmacy and Bioscience* 1 (1): 1–10.
- Rasyaf, M. 1994. Beternak Ayam Betelur. Edisi revisi. Penebar Swadaya Jakarta.
- Rasyid, A. 2004. Pemanfaatan alga. *Oseana* 29 (3): 9–15.
- Reddy, P. M., V. R. Reddy, C. V. Reddy, and S. P. Rap. 1979. Egg weight, shape index and hatchability in khaki Campbell duck egg. *Ind. J. Poult. Sci.* 14: 26–31.
- Rehm, B. H. A. 2002. Alginate from bacteria. *Biopolimers* 89: 179–212
- Remminghorst, U. and B. H. A. Rehm. 2006. Bacterial from biosynthesis to applications. *Biotechnol. Lett.* 28(1701–1712).
- Ren, D., H. Noda, H. Amano, T. Nishino, and Nishizana. 1994. Study on and hypertensive and antihyperlipidemic effect of marine algae. *Fish Sci*, 60: 83–88.
- Renge, V. C., S. V. Khedkar, and N. R. Nandurkar. 2012. Enzyme synthesis by fermentation method: a review. *Sci Rev Chem Comm.* 2: 585–590.
- Rice, G. E. and E. Skadhauge. 1982. Colonic and coprodecal transepithelial parameters in sodium chloride loaded domestic fowl. *J. Comp. Biochem.* 147:65–69.
- Rimber, I. I. 2007. Why seaweeds [P.Hd]. Sam Ratulangi University, Manado, Indonesia.
- Rinaudo, M. 2014. Biomaterials bas edona natural polysaccharide: alginate. *TIP Revista Especializada en Ciencias Químico-Biológicas* 17(1): 92–96.
- Riski, S. 2015. Pengaruh penggunaan tiga jenis rumput laut dalam ransum terhadap bobot hidup, persentase lemak abdomen dan persentase karkas ayam broiler [Skripsi]. Universitas Andalas.
- Rizal, Y. 2015. Ilmu Nutrisi Unggas. Andalas University Press, Padang.
- Rizki, S. 2019. Pengaruh penggunaan *Indigofera zollingeriana* dalam ransum basal jerami padi amoniasi terhadap pencernaan bahan kering, bahan organik dan protein kasar secara in-vitro. [Thesis], Universitas Andalas.

- Rodriguez-Navarro, C. 2012. Binders in historical buildings: traditional lime in conservation. In Int seminar on archaeome try and cultural heritage, J.M. Herrero, M.Vendrell (Eds.). Bilbao: Sociedad Española de Mineralogía (pp. 91–112).
- Saadullah, M., M. Haque, and F. Dolberg. 1981. Effectiveness of ammonication through urea in improving the feeding value of rice straw in ruminants. *Trop Anim Prod* 6: 30–36.
- Sachan, K. N., S. Pushkar, A. Jha, and A. Bhattacharya. 2009. Sodium alginate: the wonder polymer for controlled drug delivery. *Journal of Pharmacy Research* 2(8):1191–1199.
- Sako, T., K. Matsumoto, and R. Tanaka. 1999. Recent progress on research and applications of non-digestible galacto-oligosaccharides. *Int. Dairy J.* 9: 69-80.
- Saltmarsh, M. 2013. *Essential Guide to Food Additives* 4th Edition. RSC Publising, Chapter 6. pp. 160.
- Santosa, G. W. 2003. *Budidaya Rumput Laut*. Program Community College Industri Kelautan dan Perikanan. Universitas Diponegoro, Semarang.
- Saraswathi, S. J., B. Babu, and R. Rengasamy. 2003. Seasonal studies on the alginate its biochemical composition: *Sargassum polycystum* (Fucales), Phaeophyta. *Phycological Research* 51: 240–243.
- Sarica, M. and C. Erensayin. 2009. Poultry Products. In: Turkoglu M. and M. Sarica. *Poultry Science*. Bey-Ofset, Ankara, Turkey. pp. 89-138.
- Sartal, C. G., M. C. B. Alonso, and P. B. Barrera. 2012. Application of seaweed in the food ondustry. Ch. 34. In: Kim. S. K. *Handbook of Marine Macroalgae: Biotechnology and Applied Phycology*. First Edition (Ed). Jhon Wiley and Son Ltd, West Sussex, pp. 10.
- Sativa, M. O. 2015. Evaluasi Nilai Gizi Lima Jenis Rumput Laut Coklat (*Padina australis*, *Turbinaria murayana*, *Turbinaria decurrens*, *Sargassum binderi*, dan *Sargassum crassifolium*) dari Pantai Sungai Nipah Kabupaten Pesisir Selatan [Skripsi]. Universitas Andalas.
- Sato, K., K. Fukao, Y. Seki, and Y. Akiba. 2004. Expression of the chicken Peroxisome Proliferator-Activated Receptor- γ gene is influenced by aging, nutrition, and agonist administration. *Poultry Science* 83:1342-1347.
- Sato, K., K. Suzuki, and Y. Akiba. 2009. Characterisation of chicken portomicron remnant and very low density lipoprotein remnant. *Journal Poultry Science* 46: 35-39.
- Scanes, C. G., G. Brant, and M. E. Ensminger. 2004. *Poultry Science*. 4th Eds. Pearson Education, Inc. Upper Saddle River, New Jersey 07458.

- Schmidt, R. J., L. Y. Chung, A. M. Andrew, O. Spyratou, and T. D. Turner. 1993. Biocompatibility of wound management products: A study of the effects of various polysaccharides on murine L929 fibroblast proliferation and macrophage respiratory burst. *J. Pharm. Pharmacol.* 45(6): 508–513.
- Schneider, W. J. 2016. Lipid transport to avian oocytes and to the developing embryo. *The Journal of Biomedical Research* 30(3): 174–180.
- Schneider, W. J., A. Osanger, M. Waclawek, and J. Nimpf. 1998. Oocyte growth in the chicken: receptors and more. *Biol Chem.* 379(8-9): 965–971.
- Scott, M. L., M. C. Nesheim, and R. S. Young. 1982. *Nutrition of the Chicken*. 3rd Ed. Published by M.L. Scott & Associates, Itacha, New York.
- Sekeroğlu, A., G. T. Kayaalp, and M. Sarica. 2000. The Regression and correlation analysis on egg parameters in Denizli poultry. *Journal of Agricultural Faculty, Cukurova University* 15: 69-74.
- Semenkovich, C. F. 2007. Disorders of Lipid Metabolism. In: Goldman, L, D. Ausiello, editors. *Cecil Medicine (Twentythird Edition)*. Saunders Elsevier, Philadelphia.
- Semenkovich, C. F., A. C. Goldberg, I. J. Goldber. 2011. Disorders of Lipid Metabolism. In: Melmed, S., K.S.Polonsky, P.R.Larsen, H.M.Kronenberg, editors. *Williams Textbook of Endocrinology*. Philadelphia: Elsevier Saunders, p.1633–74.
- Serviere-Zaragoza, E., D. Gómez-lopez, and G. PonceDíaz, 2002. Gross chemical composition of three common macroalgae and a sea grass on the Pacific coast of Baja California, Mexico. *Hidrobiologica* 12: 113–118.
- Shahowna, E. M., A. G. Mahala, A. M. Mokhtar, E. O. Amasaib, and B. Attaelmnan. 2013. Evaluation of nutritive value of sugar cane bagasse fermented with poultry litter as animal feed. *Afr J Food Sci Technol.* 4: 106–109.
- Sharma, D. K., S. B. Andersen, C-O. Ottosen, and E. Rosenqvist. 2012. Phenotyping of wheat cultivars for heat tolerance using chlorophyll a fluorescence. *Functional Plant Biology* 39(10-11): 936–947.
- Sibbald, I. R. 1986. *The TME System of Feed Evaluation: Methodology, feed composition data and bibliography*. Animal Research Centre, Ottawa, Ontario.
- Skrede, G., O. Herstad, S. Sahlstrøm, A. Holck, E. Slinde, and A. Skrede. 2003. Effects of lactic acid fermentation on wheat and barley carbohydrate composition and production performance in the chicken. *Anim. Feed Sci. Technol.* 105: 135–148.
- Smith, A., S. P. Rose, and A. Speers. 2000. On-farm variation in food composition and the effect on egg quality. *Br. Poult. Sci.* 41: 598–607.

- Sonder, O. G. 1871. Die Algen des tropischen Australiens. Abhandlungen aus dem Gebiete der Naturwissenschaften herausgegeben von dem Naturwissenschaftlichen Verein in Hamburg 5(2): 33–74, pls I–VI.
- Song, M. Y., S. K. Ku, and J. S. Han. 2012. Genotoxicity testing of low molecular weight fucoidan from brown seaweeds. *Food Chem. Toxicol.* 50 (3-4): 790–796.
- Stanislav, D. A., N. M. Shevchenko, S. P. Ermakova, O. S. Vishchuk, E. L. Nazarenko, P. S. Dmitrenok, and T. N. Zvyagintseva. 2012. Anticancer activity in vitro of a fucoidan from the brown alga *Fucus evanescens* and its slow-molecular fragments, structurally characterized by tandem mass spectrometry. *Carbohydrate Polymers* 87: 186–194.
- Steel, R. G. D. and J. H. Torrie. 1991. *Principles and Procedures of Statistics*. McGraw-Hill Book Co. Inc. Pub. Ltd, London.
- Steinmetz, A., M. Hermann, J. Nimpf, R. Aebbersold, and W. J. Schneider. 1998. Expression and conservation of apolipoprotein AIV in an avian species. *The Journal of Biological Chemistry* 273: 10543–10549.
- Strand, A., O. Herstad, and S. Liaaen-Jensen. 1998. Fucoxanthin metabolites in egg yolks of laying hens. *Comparative Biochemistry and Physiology Part A* 119 : 963–974.
- Subaryono. 2013. *Produksi Alginat Oligosaccharides (AOS) dari Rumput Laut Coklat Lokal Sargassum sp. dan Aktivitas Biologisnya sebagai Senyawa Imunomodulator [Disertasi]*. Bogor: Fakultas Ilmu dan Teknologi Pangan, IPB.
- Subaryono. 2016. Alginate lyase from Indonesia *B. megaterium* S245 shows activities toward polymannuronate and polyguluronate. *Squalen Bulletin of Marine and Fisheries Postharvest and Biotechnology* 11(2): 45–52.
- Subramaniam, R. and R. Vimala. 2012. Solid state and submerged fermentation for the production of bioactive substances: a comparative study. *Int. J. Sci. Nat.* 3: 480–486.
- Sudariastuti, E. 2011. *Materi Penyuluhan Perikanan: Pengolahan Rumput Laut*. PPKP, Jakarta.
- Sudarmadji, S., B. Haryono, and Suhardi, 1996. *Analisis Bahan Makanan dan Pertanian (Analysis of food and agriculture substance)*. Liberty Yogyakarta, Yogyakarta.
- Sugiharto and S. Ranjitkar. 2019. Recent advances in fermented feeds towards improved broiler chicken performance, gastrointestinal tract microecology and immune responses: A review. *Animal Nutrition* 5: 1–10.

- Sugiharto, S., T. Yudiarti, and I. Isroli. 2015. Functional properties of filamentous fungi isolated from the Indonesian fermented dried cassava, with particular application on poultry. *Mycobiology* 43: 415–422.
- Sujaya. I. N., N. K. Sutiari, N. W. Arya Utami, dan K. A. Nocianitri. 2011. Fermentasi Rumput Laut secara In Vivo oleh Bakteri Saluran Pencernaan Mencit. *The Excellence Research Universitas Udayana*.
- Sulaiman. 1988. A Study on The Production Process of Microbe Protein Using Amylolytic Yeast and Simba Yeast on Cassava (*Manihot utilissima*, Pohl) based solid media. [Thesis], Agriculture Technology Faculty, Institute Pertanian Bogor.
- Sundstol, F. 1988. Feedstuffs. 5 Straw and other fibrous by-products. *Livest. Prod. Sci.* 19: 137–158.
- Suparmi dan A. Sahri. 2009. Mengenal potensi rumput laut: kajian pemanfaatan sumber daya rumput laut dari aspek industri dan kesehatan. *Sultan Agung* 44(118): 95–116.
- Surono, A. 2004. Profil Rumput Laut Indonesia. Direktorat Jenderal Perikanan Budidaya. Departemen Kelautan dan Perikanan, Jakarta.
- Suzuki, T., K. Nakal, Y. Yosie, T. Shiral, and T. Hirano. 1993. Effect of Sodium Alginates Rich in Guluronic and Mannuronic Acids on Cholesterol Levels and Digestive Organs on Hight-Cholesterol-Fed Rats. *Nippon Suisan Gakkaishi* 59: 545–551.
- Synytsya, A., W. J. Kim, and S. M. Kim. 2010. Structure and antitumor activity of fucoidan isolated from sporophyll of Korean brown seaweed *Undaria pinnatifida*. *Carbohydr. Polym.* 81: 41–48.
- IPTEKnet. 2005. Rumput laut/alga. http://www.iptek.net.id/ind/pd_alga/index.php?alga=coklat&id=19. (8 September 2014).
- Tabbu, R. C. 2002. Penyakit Ayam dan Penanggulangannya. Volume 2. Penerbit Kanisius, Yogyakarta. hlm. 305–320.
- Taciak, M., A. Tusnio, E. Swiech, M. Barszcz, L. Staskiewicz, J. Skomial, J. Paradziej-Lukowicz, and B. Pastuszewska. 2015. Effects of autoclaving soy-free and soy-containing diets for laboratory rats on protein and energy values determined in vitro and in vivo. *Journal of the American Association for Laboratory Animal Science* 54(5): 507–515.
- Talukder, S., T. Islam, S. Sarker, and M. Islam. 2010. Effects of environment on layer performance. *Journal of the Bangladesh Agricultural University* 8(2): 253–258.
- Taylor, R. J. 1980. Food Additives. John Willey and Sons Ltd., Chichester, pp. 126.

- Terao, J. 1994. Role of carotenoids in the antioxidant defense on human blood plasma. In: Asada, K., and Yoshikawa, T. (Eds.). *Frontiers of reactive oxygen species in biology and medicine*. Elsevier Science, Amsterdam, pp. 329–332.
- Thanh, T. T. T., V. T. T. Tran, Y. Yuguchi, L. M. Bui, and T. T. Nguyen. 2013. Structure of fucoidan from brown seaweed *Turbinaria ornata* as studied by Electrospray Ionization Mass Spectrometry (ESIMS) and Small Angle X-ray Scattering (SAXS) Techniques. *Mar. Drugs* 11: 2431–2443.
- Tilman, A. D., H. Hartadi., S. Reksohadiprodjo, S. Prawirokusumo, dan S. Lebdoekadjo. 1986. *Ilmu Makanan Ternak Dasar*. Gadjah Mada University Press, Yogyakarta.
- Tjitrosoepomo, G. 2005. *Morfologi Tumbuhan*. Gadjah Mada University Press, Yogyakarta.
- Todar, K. 2015. *Todar's Online Textbook of Bacteriology*. http://www.textbookofbacteriology.net/Bacillus_3.html. (10 Juni 2015).
- Torres, M. R., A. P. A. Sousa, A. T. S. Filho, D. F. Melo, J. P. A. Feitosa, R. C. de Paula, and M. G. S. Lima. 2007. Extraction and physicochemical characterization of *Sargassum vulgare* alginate from Brazil. *Carbohydr. Res.* 342: 2067–2074
- Toye, A. A., F. E. Sola-Ojo, and K. L. Ayorinde. 2012. Egg production, egg weight and egg mass repeatability, and genetic gain from use of multiple time-spaced records in Black Harco and Lohman Brown layers. *Centrepont Journal (Science Edition)* 18(2): 147–156.
- Trach, N. X., M. Mo, and C. X. Dan. 2001. Effects of treatment of rice straw with lime and/or urea on its chemical composition, in-vitro gas production and in-sacco degradation characteristics. <http://www.lrrd.org/lrrd/lrrd13/4/trac134a.htm>. (28 September 2009).
- Tri, A. B. 1993. *Manual Kesehatan Unggas*. Penerbit Kanisius, Yogyakarta. hlm. 179–180.
- Trouw Care. 2016. *Egg Duction*. PT Trouw Nutrition Indonesia, Bekasi.
- Truus, K., M. Vaher, and I. Taure. 2001. Algal Biomass from *Fucus vesiculosus* (Phaeophyta): Investigation of the mineral and alginate components. *Proc. Estonian Acad. Sci. Chem.* 50(2): 95–103.
- Turner, M. F. 1919. *The Condensed Chemical Dictionary*. First Edition. The Chemical Catalog Company Inc, New York.
- Uchida, M. and T. Miyoshi. 2013. Fermentation of seaweeds-alchemy of algae and aquatic plant biomass. *J. Food Process.* 4:10.

- Uchimura, K., M. Miyazaki, Y. Nogi, T. Kobayashi, and K. Horikoshi. 2010. Cloning and sequencing of alginate lyase genes from deep-sea strains of *Vibrio* and *Agarivorans* and characterization of a new *Vibrio* enzyme. *Mar. Biotechnol.* 12: 526–533.
- Udani, J. and R. Hesslink. 2012. The potential use of fucoidans from brown seaweed as a dietary supplement. *Nutrition and Food Sciences* 2(10): 1–6.
- Udensi, E. A., N. U. Arisa, and E. Ikpa. 2010. Effects of soaking and boiling and autoclaving on the nutritional quality of *Mucuna flagellipes* (“ukpo”). *African Journal of Biochemistry Research* 4(2): 47–50.
- Ueda, H., K. Suehiro, S. Kainou, and T. Bungo. 2005. Feeder color and feeder position act as a cue to discriminate between two diets in choice feeding of chicks. *Poultry Science* 42: 321–328.
- US Department of Agriculture, Agricultural Research Service. 2016. Nutrient Data Laboratory. USDA National Nutrient Database for Standard Reference, Release 28 (Slightly revised). Version Current: May 2016. <http://www.ars.usda.gov/nea/bhnrc/mafcl>
- USDA. 2000. Egg grading manual USDA AA grade. The US Department of Agriculture (USDA), Washington.
- USGS. 2019. Water-The universal Solvent. https://www.usgs.gov/special-topic/water-science-school/science/water-universal-solvent?qt-science_center_objects=0#qt-science_center_objects. (17 September 2019).
- Valderrama, D., J. Cai, N. Hishamunda, and N. Ridler. 2013. Social and economic dimensions of carrageenan seaweed farming. *Fisheries and Aquaculture Technical Paper*. No. 580. FAO, Rome.
- Van Krimpen, M. M., R. P. Kwakkel, C. M. Van Der Peet-Schwering, L. A. Den Hartog, and M. W. Verstegen. 2008. Low dietary energy concentration, high nonstarch polysaccharide concentration, and coarse particle sizes of nonstarch polysaccharides affect the behavior of feather-pecking-prone laying hens. *Poultry Science* 87: 485–496.
- Van Niekerk, T. 2014. Egg quality. Low Input Breeds technical note. Download at www.lowinputbreeds.org. (15 November 2019).
- Vary, P. S., R. Biedendieck, T. Fuerch, F. Meinhardt, M. Rohde, D. W. Deckwer, and D. Jahn. 2007. *B. megaterium* from simple soil bacterium to industrial protein production host. *Appl. Microbiol and Biotechnol.* 76(5): 957–967.
- Ventura, M. R., J. I. R. Castafion and J. M. McNab. 1994. Nutritional value of seaweed (*Ulva rigida*) for Poultry. *Animal Feed Science and Technology* 49: 87–92.
- Voet, D. and J. G. Voetová. 1995. *Biochemie*. Victoria Publishing, a.s. Praha, pp. 1325

- Vool, W. P., B. B. Lee, A. Idris, A. Islam, B. T. Tey, and E. S. Chan. 2015. Reduction of ultra-high concentration calcium alginate beads with prolonged dissolution profile. *RSC Adv.* 5(46): 36687–36695.
- Vorlová, L., E. Siegllová, R. Karpísková, V. Kopoiva. 2001. Cholesterol content in eggs during the laying period. *ACTA VET. BRNO* 70: 387–390.
- Walzem, R. L. 1996. Lipoproteins and the laying hen: form follows function. *Poult. Avian Biol. Rev.* 7: 31–64.
- Wan, J., F. Jiang, Q. S. Xu, D. W. Chen, and J. He. 2016. Alginic acid oligosaccharide accelerates weaned pig growth through regulating antioxidant capacity, immunity and intestinal development. *RSC Adv.* 6, 87026-87035.
- Wan, J., J. Zhang, D. W. Chen, B. Yu, and J. He. 2017. Effects of alginate oligosaccharide on the growth performance, antioxidant capacity and intestinal digestion-absorption function in weaned pigs. *Animal Feed Science and Technology* 234: 118–127.
- Wang, S. B., Y. H. Jia, L. H. Wang, F. H. Zhu, and Y. T. Lin. 2013. *Enteromorpha prolifera* supplemental level: Effects on laying performance, egg quality, immune function and microflora in feces of laying hens. *Chin. J. Anim. Nutr.* 25: 1346–1352.
- Wang, T. Y., Y. H. Wu, C. Y. Jiang, and Y. Liu. 2010. Solid state fermented potato pulp can be used as poultry feed. *Br. Poult. Sci.* 51: 229–234.
- Washington, I. M. and G. Van Hoosier. 2012. *Clinical Biochemistry and Hematology in The Laboratory Rabbit, Guinea Pig, Hamster, and Other Rodents American College of Laboratory Animal Medicine*, pp. 57–116.
- Watkins, S. E., C. A. Fritts, F. Yan, M. L. Wilson, and P. W. Waldroup. 2005. The Interaction of Sodium Chloride Levels in Poultry Drinking Water and the Diet of Broiler Chickens. *The Journal of Applied Poultry Research*, pp. 55–59.
- Welch, V. A. and J. T. Borlak. 2008. Absorption and Transport of Dietary Lipid. In: *Fatty Acids in Foods and Their Health Implications*. Ed. C.K. Chow. CRC Press. Boca Raton, Florida, USA. pp. 562–589.
- West, J., H. P. Calumpong, and G. Martin. 2017. Chapter 14-Seaweeds. In *The First Global Integrated Marine: Assessment World Ocean Assessment I*; United Nations: Cambridge, United Kingdom, pp. 1–10.
- Whyte, J. N. C., J. R. Englar, and M. Kung. 1976. Alginate Degradation in situ Accompanying Thermal Drying of the Marine Algae *Nereocystis luetkena* and *Macrocystis integrifolia*. Technical Report No. 643. Dept. of Environment Fisheries and Marine Service.
- Widiastuti, B. L. 2001. Efek Pemberian Komponen Serat Pangan dari Rumput Laut Terhadap Profil Kolesterol Darah, Mikroflora Usu dan Histologi Usus Tikus Percobaan [Tesis]. Program Pascasarjana IPB. Bogor.

- Widyartini, D. S., P. Widodo, and A. B. Susanto. 2017. Thallus variation of *Sargassum polycystum* from Central Java, Indonesia. *BIODIVERSITAS* (18)3: 1004–1011.
- Widyastuti, S. 2009. Kadar alginat rumput laut yang tumbuh di perairan laut Lombok yang diekstrak dengan dua metode ekstraksi. *Jurnal Teknologi Pertanian* 10(3): 144–152.
- Wijesinghe, W. A. J. P. and Y.-J. Jeon. 2012. Biological activities and potential industrial applications of fucose rich sulfated polysaccharides and fucoidans isolated from brown seaweeds: A review. *Carbohydrate Polymers* 88: 13–20.
- Wikanta, T. 2003. Pengaruh pemberian natrium alginat terhadap penurunan kadar kolesterol total darah dan bobot badan tikus. *Jurnal Penelitian Perikanan Indonesia* 9(5).
- Wikanta, T. Khaeroni, dan L. Rahayu. 2002. Pengaruh pemberian natrium alginat terhadap penurunan kadar glukosa darah tikus. *Jurnal Penelitian Perikanan Indonesia* 8(6).
- Wisnu, R. dan D. Rachmawati. 2005. Analisa Komposisi Nutrisi Rumput Laut (*Euchema cotoni*) di Pulau Karimunjawa dengan Proses Pengeringan Berbeda. Laporan Kegiatan, Fakultas Perikanan dan Ilmu Kelautan Universitas Diponegoro.
- Wolever, T. M. S., R. A. Hegele, P. W. Connelly, T. P. P. Ransom, J. A. Story, E. J. Furumoto, and D. J. A. Jenkins. 1997. Long-term effect of soluble-fiber foods on postprandial fat metabolism in dyslipidemic with E3 and apo E4 genotypes. *American Society for Clinical Nutrition* 66: 584–590.
- Wong, K. H., S. W. Sam, P. C. K. Cheung, dan Ang PO Jr. 1999. Changes in lipid profiles of rats fed with seaweed-based diet. *Nutrition Research* 19(10): 1519–1527.
- Wong, T. W. 2011. Alginate graft copolymers and alginate-co-excipient physical mixture in oral drug delivery. *Journal of Pharmacy and Pharmacology* 63: 1497-1512.
- Wong, T. Y., L. A. Preston, and N. L. Schiller. 2000. Alginate lyase: Review of mayor sources and enzyme characteristics, structure-function analysis, biological roles, and applications. *Annu. Rev. Microbiol.* 54: 289–340.
- Xu, F., P. Wang, Y-Z. Zhang, and X-L Chena. 2018. Diversity of three-dimensional structures and catalytic mechanisms of alginate lyases. *Applied and Environmental Microbiology* 84(1): 1–12.
- Yamasaki, M., S. Moriwaki, O. Miyake, W. Hashimoto, K. Murata, and B. Mikami. 2004. Structure and function of a hypothetical *Pseudomonas aeruginosa* protein PA1167 classified into family PL-7. *The Journal of Biological Chemistry* 279(30): 31863–31872.

- Yan, G. L., Y. M. Guo, J. M. Yuan, D. Liu, and B. K. Zhang. 2011. Sodium alginate oligosaccharides from brown algae inhibit *Salmonella enteritidis* colonization in broiler chickens. *Poultry Science* 90: 1441–1448.
- Yang, C., D. Chung, I. S. Shin, H. Lee, J. Kim, Y. Lee, and S. You. 2008. Effects of molecular weight and hydrolysis conditions on anticancer activity of fucoidans from sporophyll of *Undaria pinnatifida*. *Journal of Biological Macromolecules* 43: 433–437.
- Yang, M., Y. Yu, S. Yang, X. Shi, H. Mou, and L. Li. 2018. Expression and characterization of a new PolyG-specific alginate lyase from marine bacterium *Microbulbifer* sp. Q7. *Front. Microbiol.* 9: 2894.
- Yeh, S. P., C. A. Chang, C. Y. Chang, C. H. Liu, and W. Cheng. 2008. Dietary sodium alginate administration affects fengerling growth and resistance to *Streptococcus* sp. and iridovirus, and juvenile non-specific immune responses of the orange spotted grouper, *Epinephelus coioides*. *Fish and Shellfish Immunology* 25:19–27.
- Yoshie, Y., T. Suzuki, T. Shirai, and T. Hirano. 1994. Changes in the contents of dietary fibers, minerals, free amino acids, and fatty acids during processing of dry Nori. *Nippon Suisan Gakk* 60: 117–123.
- Yoshiko, S. and N. Hoyoko. 2007. Fucoxanthin, a natural carotenoid, induces G1 arrest and GADD45 gene expression in human cancer cells. *In Vivo* 21(2): 305–309.
- Yuan, Y. 2008. Marine algal constituents. In: Barrow, C. and F. Shahidi Eds. *Marine nutraceuticals and functional foods*. CRC Press, Boca Raton, Florida, USA. pp. 259.
- Yulianto, K. 2007. Penelitian isolasi alginate rumput laut coklat dan prospeknya menuju industry. *Prosiding Seminar Riptek Kelautan Nasional, Jakarta* (2): 104–108.
- Zaelanie, K., T. Susanto, dan B. W. Simon. 2001. Ekstraksi dan pemurnian alginat dari *Sargassum fillipendula*: kajian dari bagian tanaman, lama ekstraksi dan konsentrasi isopropanol. *Jurnal Teknologi Pertanian* 2 (1): 13–15.
- Zahara, F. 2015. Pengaruh Penggunaan Rumput Laut Berbeda (*Padina australis*, *Turbinaria decurrens*, *Sargassum crassifolium*, dan *Sargassum binderi*) dalam Ransum Terhadap Kandungan Kolesterol dan Lemak Daging Paha serta Lemak Hati Broiler [Skripsi]. Universitas Andalas.
- Zahid, P. B., K. Aisha, and A. Ali. 1995. Green seaweed as component of poultry feed. *Bangladesh. J. Bot* 24(21): 15315.
- Zaid, P. B., A. Ali, and M. e-Jabeen Zahid, 2001. Brown seaweed as supplement for broiler feed. *Hamdard Medicus* 44(2): 98–101.

- Zhang, H. R. Kong, Y. Tang, C. Han, Y. Zhang, S. Zhang, Z. Liu, J. Qu, and X. Wang. 2015. Fucoxanthin: A Promising Medicinal and Nutritional Ingredient. Hindawi Publishing Corporation Evidence-Based Complementary and Alternative Medicine, Rev. pp. 1–10.
- Zhang, J. L., Q. M. Xie, J. Ji, W. H. Yang, Y. B. Wu, C. Li, J. Y. Ma, and Y. Z. Bi. 2012b. Different combinations of probiotics improve the production performance, egg quality, and immune response of layer hens. *Poult. Sci.* 91: 2755–2760.
- Zhang, S., X. Hu, X. J. Ma, Z. Ma, X. Liu, and Cu Li. 2012a. Study on feed fermented from seaweed waste. *African Journal of Microbiology Research* 6(50): 7610–7615.
- Zhu, B. and H. Yin. 2015. Alginate lyase: Review of major sources and classification, properties, structure-function analysis and applications. *Bioengineered* 6(3): 125–131.
- Zhu, B. W., L. S. Huang, H. D. Tan, Y. Q. Qin, Y. G. Du, and H. Yin. 2014. Characterization of a new endo-type polyM-specific alginate lyase from *Pseudomonas* sp. *Biotechnol; Lett*, PMID: 25257600.
- Zhu, W. H., D. F. Li, Wu, Wu, J. T. Li., Y. Q. Chen, H. S. Guan, and L. Y. Zhang. 2015a. Effects of purified polymannuronate on the performance, immune status, antioxidant capacity, intestinal microbial populations and volatile fatty acid concentrations of weaned piglets. *Animal Feed Science and Technology* 216: 161–168.
- Zhu, W., D. Li, J. Wang, H. Wu, X. Xian, W. Bi, H. Guan, and L. Zhang. 2015b. Effects of polymannuronate on performance, antioxidant, immune status, cecal microflora, and volatile fatty acids in broiler chickens. *Poultry Sciences* 94: 345–352.
- Zhu, Y. B., L. Y. Wu, Y. H. Chen, H. Ni, A. F. Xiao, and H. N. Cai. 2016. Characterization of an extracellular biofunctional alginate lyase from marine *Microbulbifer* sp. ALW1 and antioxidant activity of enzymatic hydrolysates. *Microbiological Research* 182: 49–58.
- Zita, L., E. Tumova, and L. Stolc. 2009. Effects of genotype, age and their interaction on egg quality in brown egg laying hens. *Acta Veterinaria Brno* 78: 85–91.
- Zulhaqqi. 2015. Pengaruh penggunaan jenis rumput laut berbeda dalam ransum terhadap performa produksi broiler [Skripsi]. UPT, Perpustakaan Unand.