

DAFTAR PUSTAKA

- Akter, M.N., Sutriana, A., Talpur, A.D., & Hashim, R. (2016). Dietary supplementation with mannan oligosaccharide influences growth, digestive enzymes, gut morphology, and microbiota in juvenile striped catfish, *Pangasianodon hypophthalmus*. *Aquaculture International*, 24(1), 127-144.
- Aslamyiah, S. (2006). Penggunaan mikroflora saluran pencernaan sebagai probiotik untuk meningkatkan pertumbuhan dan kelangsungan hidup ikan bandeng (*Chanos chanos* Forsskal) [disertasi]. Bogor: Program Pascasarjana, Institut Pertanian Bogor.
- Aslamyiah, S., & Karim, M. Y. (2012). Uji organoleptik, fisik, dan kimiawi pakan buatan untuk ikan bandeng yang disubstitusi dengan tepung cacing tanah (*Lumbricus* sp.). *Jurnal Akuakultur Indonesia*, 11(2), 124-131.
- Aslamyiah, S., Karim, M. Y., & Badraeni, B. (2018). Pengaruh Dosis Mikroorganisme Mix. Dalam Memfermentasi Bahan Baku Pakan Yang Mengandung *Sargassum* sp. Terhadap Kinerja Pertumbuhan, Komposisi Kimia Tubuh Dan Indeks Hepatosomatik Ikan Bandeng, (*Chanos chanos* Forsskal). *TORANI: Journal Of Fisheries And Marine Science*, 1(2), 59-70.
- Aslamyiah, S., Zainuddin, & Badraeni. (2019). Pengaruh Suplementasi Ekstrak *Lumbricus* sp. dalam Pakan Fermentasi terhadap Kinerja Pertumbuhan, Komposisi Kimiawi Tubuh, dan Indeks Hepatosomatik Ikan Bandeng, *Chanos chanos* Forsskal, 1775. *Jurnal Iktiologi Indonesia*, 19(2), 271-282.
- Aslamyiah, S., Zainuddin, & Badraeni. (2022). The Effect Of Microorganisms Combination As Prociotics In Feed For Growth Performance, Gastric Evacuation Rates, And Blood Glucose Levels Of Milkfish, *Chanos chanos* Forsskal, 1775. *Indonesian Journal Of Ichthyology*, 22(1), 77-91.
- Azaza, M. S., Mensi, F., Ksouri, J., Dhraief, M. N., Brini, B., Abdelmouleh, A., & Kraïem, M. M. (2010). Growth Of Nile Tilapia (*Oreochromis niloticus* L.) Fed With Bread Waste Or Date By-Products Based Diets. *Aquaculture*, 302(1-2), 76-85.
- Bai, S. C., Hamidoghli, A., & Bae, J. (2022). Feed And Feeding Practices In Aquaculture (Second Edition). Woodhead Publishing Series In Food Science, Technology And Nutrition, 195-229.
- Buentello, J.A., Neill, W.H., & Gatlin III, D.M. (2010). Effects of dietary prebiotics on the growth, feed efficiency and non-specific immunity of juvenile red drum *Sciaenops ocellatus* fed soybean-based diets. *Aquaculture Research*, 41(3), 411-418.
- Burr, G., Gatlin, D., & Ricke, S. (2005). Microbial ecology of the gastrointestinal tract of fish and the potential application of prebiotics and probiotics in finfish aquaculture. *Journal of the World Aquaculture Society*, 36(4), 425-436.
- Carvalho, L.S., Reis, L.V., Ribeiro, L.F., Mauro, C.S., Brunelli, L.T., Rodríguez-Jasso, R.M., Teixeira, J.A., Ruiz, H.A. (2018). Prebiotic oligosaccharides from banana peels: Structural analysis and digestibility by *Bifidobacterium* spp. *Carbohydrate Polymers* 199, 1-8.
- Dawood, M. A., Koshio, S., Ishikawa, M., & Yokoyama, S. (2017). β -Glucan improved growth performance, innate immunity, and disease resistance in Nile tilapia. *Fish & Shellfish Immunology*, 67, 104-114.

- Dawood, M. A., Koshio, S., & Esteban, M. Á. (2019). Beneficial roles of feed additives as immunostimulants in aquaculture: a review. *Reviews in Aquaculture*, 11(3), 687-709.
- Dawood, M. A., Abo-Al-Ela, H. G., & Hasan, M. T. (2020). Modulation Of Transcriptomic Profile In Aquatic Animals: Probiotics, Prebiotics And Synbiotics Scenarios. *Fish & Shellfish Immunology*, 97, 268-282.
- Dawood, M. A., Metwally, A. E., El-Sharawy, M. E., Atta, A. M., Elbially, Z. I., Abdel-Latif, H. M., & Paray, B. A. (2021). The role of β -glucan in the growth, intestinal morphometry, and immune-related gene and heat shock protein expressions of Nile tilapia (*Oreochromis niloticus*) under different stocking densities. *Aquaculture*, 531, 735864.
- Dawood, M. A., Metwally, A. E., El-Sharawy, M. E., Atta, A. M., Elbially, Z. I., Abdel-Latif, H. M., & Paray, B. A. (2022). The role of dietary synbiotics in enhancing the growth performance, antioxidative status, and immune response of Nile tilapia (*Oreochromis niloticus*). *Aquaculture*, 738, 739611.
- Dawood, M. A., Metwally, A. E., El-Sharawy, M. E., Atta, A. M., Elbially, Z. I., Abdel-Latif, H. M., & Paray, B. A. (2023). The role of dietary synbiotics in enhancing the growth performance, antioxidative status, and immune response of Nile tilapia (*Oreochromis niloticus*). *Aquaculture*, 738, 739611.
- Dekic, R., Ivanc, A., Erić, Ž., Gnjato, R., Trbić, G., Lolić, S., & Manojlović, M. (2021). The effects of a diet supplemented with Spirulina and inulin on the digestive enzyme activity of rainbow trout (*Oncorhynchus mykiss*, Walbaum 1792). *Turkish Journal of Fisheries and Aquatic Sciences*, 21(3), 131-139.
- Essa, M. A., Mabrouk, H. A., & Zaki, M. A. (2021). Feed Efficiency In Aquaculture: An Overview. *Reviews In Aquaculture*, 13(1), 514-530.
- Geurden, I., Mennigen, J., Plagnes-Juan, E., Veron, V., Cerezo, T., Mazurais, D., ... & Panserat, S. (2014). High or low dietary carbohydrate:protein ratios during first-feeding affect glucose metabolism and intestinal microbiota in juvenile rainbow trout. *Journal of Experimental Biology*, 217(19), 3396-3406.
- Gibson, G.R., Scott, K.P., Rastall, R.A., Tuohy, K.M., Hotchkiss, A., Dubert-Ferrandon, A., ... & Buddington, R. (2010). Dietary prebiotics: current status and new definition. *Food Science and Technology Bulletin: Functional Foods*, 7(1), 1-19.
- Gibson, G. R., Hutkins, R., Sanders, M. E., Prescott, S. L., Reimer, R. A., Salminen, S. J., ... & Reid, G. (2017). Expert Consensus Document: The International Scientific Association For Probiotics And Prebiotics (ISAPP) Consensus Statement On The Definition And Scope Of Prebiotics. *Nature Reviews Gastroenterology & Hepatology*, 14(8), 491-502.
- Glencross, B.D., Booth, M., & Allan, G.L. (2007). A feed is only as good as its ingredients—a review of ingredient evaluation strategies for aquaculture feeds. *Aquaculture nutrition*, 13(1), 17-34.
- Guerreiro, I., Enes, P., Rodiles, A., Merrifield, D., & Oliva-Teles, A. (2015). Effects of rearing temperature and dietary short-chain fructooligosaccharides supplementation on allochthonous gut microbiota, digestive enzymes activities and intestine health of turbot (*Scophthalmus maximus* L.) juveniles. *Aquaculture Nutrition*, 22(3), 631-642.
- Guerreiro, I., Serra, C.R., Enes, P., Couto, A., Salvador, A., Costas, B., & Oliva-Teles, A. (2016). Effect of short chain fructooligosaccharides (scFOS) on immunological status and gut microbiota of gilthead sea bream (*Sparus*

- aurata) reared at two temperatures. *Fish & shellfish immunology*, 49, 122-131.
- Hendrajat, E.A., Ratnawati, E., & Mustafa, A. (2018). Penentuan Pengaruh Kualitas Tanah dan Air terhadap Produksi Total Tambak Polikultur Udang Vaname dan Ikan Bandeng di Kabupaten Lamongan, Provinsi Jawa Timur Melalui Aplikasi Analisis Jalur. *Jurnal Ilmu dan Teknologi Kelautan Tropis*, 10(1), 179-195.
- Haryati, E., Saade, & Pranata, A. (2011). Substitusi Tepung Ikan Dengan Tepung Maggot Terhadap Retensi Nutrisi, Komposisi Tubuh, Dan Efisiensi Pakan Ikan Bandeng (*Chanos chanos* Forskal). *Jurnal Iktiologi Indonesia*, 11(2), 185-194.
- Haryati, T., Supriyati, & Susana, I. W. R. (2018). Prebiotics: Types, Sources, Mechanisms of Action, and Their Roles in Animal Nutrition. *Wartazoa*, 28(3), 133-144.
- Hoseinifar, S. H., Mirvaghefi, A., & Merrifield, D. L. (2011). The effects of dietary inactive brewer's yeast *Saccharomyces cerevisiae* var. ellipsoideus on the growth, physiological responses and gut microbiota of juvenile beluga (*Huso huso*). *Aquaculture*, 318(1-2), 90-94.
- Hoseinifar, S. H., Mirvaghefi, A., & Merrifield, D. L. (2013). The effects of dietary inactive brewer's yeast *Saccharomyces cerevisiae* var. ellipsoideus on the growth, physiological responses and gut microbiota of juvenile beluga (*Huso huso*). *Aquaculture*, 397, 1-7.
- Hoseinifar, S. H., Soleimani, N., & Ringø, E. (2014). Effects of dietary fructo-oligosaccharide supplementation on the growth performance, haemato-immunological parameters, gut microbiota and stress resistance of common carp (*Cyprinus carpio*) fry. *British Journal of Nutrition*, 112(8), 1296-1302.
- Hoseinifar, S. H., Esteban, M. Á., Cuesta, A., & Sun, Y. Z. (2015). Prebiotics And Fish Immune Response: A Review Of Current Knowledge And Future Perspectives. *Reviews In Fisheries Science & Aquaculture*, 23(4), 315-328.
- Hoseinifar, S.H., Ringø, E., Shenavar Masouleh, A., & Esteban, M.Á. (2016). Probiotic, prebiotic and synbiotic supplements in sturgeon aquaculture: a review. *Reviews in Aquaculture*, 8(1), 89-102.
- Hoseinifar, S.H., et al. (2017). The effects of prebiotic and synbiotic supplementation on growth performance and intestine morphology and microbiota in rainbow trout (*Oncorhynchus mykiss*). *Aquaculture Nutrition*, 23(6), 1275-1282.
- Hoseinifar, S. H., Sun, Y. Z., Wang, A., & Zhou, Z. (2017). Probiotics as means of diseases control in aquaculture, a review of current knowledge and future perspectives. *Frontiers in Microbiology*, 8, 1986.
- Hoseinifar, S. H., Sun, Y. Z., Wang, A., & Zhou, Z. (2019). Probiotics as means of diseases control in aquaculture, a review of current knowledge and future perspectives. *Frontiers in Microbiology*, 10, 2429.
- Hoseinifar, S. H., Khalili, M., Raeisi, H., Athari, S. S., Cerezuela, R., & Esteban, M. Á. (2020). Galacto-oligosaccharides derived from banana peel: a novel prebiotic candidate for aquaculture. *Fish & Shellfish Immunology*, 105, 266-273.
- Hoseinifar, S. H., Sun, Y. Z., Caipang, C. M., & Natrah, F. M. (2021). Dietary prebiotics, probiotics and synbiotics: An emerging functional food in aquaculture. *Reviews in Aquaculture*, 13(4), 1856-1881.

- Hoseinifar, S. H., Zou, H. K., Van Doan, H., Kolangi Miandare, H., & Hoseini, S. M. (2023). Dietary sodium alginate as prebiotic improved growth performance, innate immunity, and disease resistance of common carp (*Cyprinus carpio*) fingerlings. *Aquaculture*, 547, 737089.
- Hui-Yuan, L., Zhigang, Z., Rudeaux, F., & Respondek, F. (2007). Effects Of Dietary Short Chain Fructo-Oligosaccharides On Intestinal Microflora, Mortality And Growth Performance Of *Oreochromis aureus*♂× *O. niloticus*♀. *Chinese Journal Of Animal Nutrition*, 19(6), 691-697.
- Krogdahl, Å., Hemre, G.I., & Mommsen, T.P. (2005). Carbohydrates in fish nutrition: digestion and absorption in postlarval stages. *Aquaculture Nutrition*, 11(2), 103-122.
- Little, D. C., Newton, R. W., & Beveridge, M. C. M. (2016). Aquaculture: A Rapidly Growing And Significant Source Of Sustainable Food? Status, Transitions And Potential. *Proceedings Of The Nutrition Society*, 75(3), 274-286.
- Mahious, A. S., Gatesoupe, F. J., Hervi, M., Metailler, R., & Ollevier, F. (2006). Effect Of Dietary Inulin And Oligosaccharides As Prebiotics For Weaning Turbot, *Psetta maxima* (Linnaeus, C. 1758). *Aquaculture International*, 14(3), 219-229.
- Mandal, B., Bera, A., Kailasam, M., Pradiyar, A., Ambasankar, K., Alavandi, S. V., & Vijayan, K. K. (2018). A Guide to Milkfish (*Chanos chanos*) Aquaculture. Central Institute of Brackishwater Aquaculture, Chennai. ISBN: 978-81-932937-5-1.
- Masriah, Andi. (2020). Penambahan Limbah Cairan Rumen Sapi Pada Berbagai Level Karbohidrat Dalam Pakan Terhadap Retensi Nutrien Dan Komposisi Kimia Tubuh Ikan Bandeng (*Chanos chanos* Forsskal). Vol 9. No.1. Universitas Muhammadiyah Makassar. Makassar.
- Merrifield, D. L., Dimitroglou, A., Foey, A., Davies, S. J., Baker, R. T., Bøggwald, J., ... & Ringø, E. (2010). The Current Status And Future Focus Of Probiotic And Prebiotic Applications For Salmonids. *Aquaculture*, 302(1-2), 1-18.
- Mustari, Tuthy. Tazkiah. (2022). Effect of Various Prebiotic Sources in Functional Feed on Body Chemical Composition and Liver and Muscle Glycogen Levels of Milkfish (*Chanos chanos*). Universitas Hasanuddin.
- National Research Council (NRC). (2011). Nutrient requirements of fish and shrimp. National academies press.
- Putra, A. N. (2010). Kajian Probiotik, Prebiotik, Dan Sinbiotik Untuk Meningkatkan Kinerja Pertumbuhan Ikan Nila (*Oreochromis niloticus*). Tesis. Program Pascasarjana. Institut Pertanian Bogor. Bogor.
- Putra, A. N., & Utama, I. H. (2015). Pengaruh Penambahan Prebiotik Pada Pakan Komersial Terhadap Pertumbuhan Dan Sintasan Ikan Patin (*Pangasius hypophthalmus*). *Jurnal Akuakultur Indonesia*, 14(1), 25-32.
- Putra, A. N. (2016). Efek Prebiotik Terhadap Pertumbuhan Dan Retensi Pakan Ikan Nila (Effect Prebiotic On Growth And Feed Retention Of Tilapia). *Jurnal Perikanan Dan Kelautan* Vol. 7(1): 18-24
- Putri, Triska Ariyanti. (2012). Pengaruh Berbagai Konsentrasi Silase Limbah Kulit Pisang Kepok Terhadap Tingkat Kecernaan Nutrisi Pada Ikan Bandeng (*Chanos chanos* Forsskal). Skripsi. Program Studi Budidaya Perairan. Universitas Hasanuddin. Makassar.
- Ringo, E., Olsen, R. E., Gifford, J. S., Dalmo, R. A., Amlund, H., Hemre, G. I., & Bakke, A. M. (2010). Prebiotics In Aquaculture: A Review. *Aquaculture Nutrition*, 16(2), 117-136.

- Ringø, E., Olsen, R. E., Gifstad, T. Ø., Dalmo, R. A., Amlund, H., Hemre, G. I., & Bakke, A. M. (2014). Prebiotics in aquaculture: a review. *Aquaculture Nutrition*, 20(2), 117-136.
- Rodrigues, P. M., Bezerra, R. S., Dos Santos Bezerra, R., Dos Santos, A. A., Fernandes, A. C. C., & Vanetti, M. C. D. (2012). Growth, Digestive Enzymes And Body Composition Of *Epinephelus coioides* Juveniles Fed Diets With Banana Flour And Banana Biomass. *Aquaculture Research*, 43(9), 1274-1282.
- Samrongpan, C., Areechon, N., Yoonpundh, R., & Sritunyalucksana, K. (2018). Tailor-made prebiotic galactooligosaccharide shows a protective effect against *Vibrio harveyi* in *Litopenaeus vannamei*. *Aquaculture*, 489, 122-131.
- Selim, K. M., & Reda, R. M. (2015). Beta-Glucans And Mannan Oligosaccharides Enhance Growth And Immunity In Nile Tilapia. *North American Journal Of Aquaculture*, 77(1), 22-30.
- Shalaby, A. M., Khattab, Y. A., & Abdel Rahman, A. M. (2019). Effects Of Garlic (*Allium sativum*) And Inulin As Natural Feed Additives On Growth Performance, Nutrient Utilization, And Whole-Body Composition Of Nile Tilapia (*Oreochromis niloticus*). *Aquaculture Reports*, 13, 100175.
- Sipahutar, Y. H., Ikasari, D., & Supriyanto, A. (2019). Utilization Of Banana Peel Oligosaccharides As Prebiotic For Growth And Feed Efficiency Of Catfish (*Clarias* sp). *Aquaculture Studies*, 19(2), 77-85.
- SNI: 6148.3 – (2013). Ikan Bandeng (*Chanos chanos*, Forskal) - Bagian 3: Produksi Benih
- Slavin, J. (2013). Fiber And Prebiotics: Mechanisms And Health Benefits. *Nutrients*, 5(4), 1417-1435.
- Song, S. K., Beck, B. R., Kim, D., Park, J., Kim, J., Kim, H. D., & Ringø, E. (2014). Prebiotics As Immunostimulants In Aquaculture: A Review. *Fish & Shellfish Immunology*, 40(1), 40-48.
- Song, S. K., et al. (2020). Effects of dietary supplementation of xylo-oligosaccharide on growth performance, innate immunity and disease resistance of olive flounder (*Paralichthys olivaceus*) against *Edwardsiella tarda*. *Fish & Shellfish Immunology*, 102, 21-30.
- Sutikno, E., Pramesti, R., & Subarijanti, H. U. (2020). The Utilization Of Banana Peel Oligosaccharides As A Prebiotic In Improving Growth And Immune Response Of Nile Tilapia (*Oreochromis niloticus*). *Jurnal Akuakultur Indonesia*, 19(1), 42-49.
- Syafura, Suraya Kaffi., Rani, Hertini, & Zulfahmi. (2016). Karakteristik Fruktooligosakarida (FOS) Hasil Isolasi Dari Kulitpisang Sebagai Prebiotic Pada Ternak. Poliektnik Negeri Lampung.
- Syahid M, A Subhan, dan R Armando. (2006). Budidaya Bandeng Organik secara Polikultur. Jakarta: Penebar Swadaya.
- Talpur, A. D., Memon, A. J., Khan, M. I., Ikhwannuddin, M., Danish Daniel, M. N. B., & Abol-Munafi, A. B. (2013). Banana Plant Wastes Act As Potential Growth Promoters In Asian Seabass *Lates calcarifer* Fingerlings. *International Aquatic Research*, 5(1), 1-12.
- Tocher, D.R. (2003). Metabolism and functions of lipids and fatty acids in teleost fish. *Reviews in fisheries science*, 11(2), 107-184.
- Torrecillas, S., Makol, A., Caballero, M. J., Montero, D., Robaina, L., Real, F., Sweetman, J., Tort, L., & Izquierdo, M. S. (2007). Immune stimulation and

- improved infection resistance in European sea bass (*Dicentrarchus labrax*) fed mannan oligosaccharides. *Fish & Shellfish Immunology*, 23(5), 969-981.
- Torrecillas, S., Montero, D., & Izquierdo, M. (2014). Improved Health And Growth Of Fish Fed Mannan Oligosaccharides: Potential Mode Of Action. *Fish & Shellfish Immunology*, 36(2), 525-544.
- Torrecillas, S., Montero, D., Caballero, M. J., Robaina, L., Zamorano, M. J., Sweetman, J., & Izquierdo, M. (2015). Effects of dietary concentrated mannan oligosaccharides supplementation on growth, gut mucosal immune system and liver lipid metabolism of European sea bass (*Dicentrarchus labrax*) juveniles. *Fish & Shellfish Immunology*, 42(2), 508-516.
- Torrecillas, S., Caballero, M. J., Mompel, D., Montero, D., & Izquierdo, M. (2021). Disease resistance and immune parameters in Atlantic salmon (*Salmo salar*) fed mannan oligosaccharides. *Fish & Shellfish Immunology*, 115, 723-731.
- Torrecillas, S., Caballero, M. J., Mompel, D., Montero, D., & Zamorano, M. J. (2022). Prebiotics in fish nutrition: a review of the current knowledge. *Reviews in Aquaculture*, 14(2), 1006-1025.
- Torrecillas, S., Caballero, M. J., Mompel, D., Montero, D., & Zamorano, M. J. (2023). Recent advances in the use of prebiotics in fish nutrition. *Aquaculture*, 566, 739141.
- Wahyudi. (2019). Aplikasi Prebiotik dari Jenis Kacang-kacangan Terhadap Kinerja Mikroflora pada Saluran Pencernaan Ikan Bandeng (*Chanos chanos* Forsskal, 1775) [Tesis]. Program Studi Magister Ilmu Perikanan. Universitas Hasanuddin, Makassar.
- Wahyuningsih, Y., Pinandoyo, & Widowati, L. L. (2015). Pengaruh Berbagai Jenis Pakan Segar Terhadap Laju Pertumbuhan Dan Kelulushidupan Kepiting Bakau (*Scylla serrata*) Cangkang Lunak Dengan Metode Popeye Effect. *Journal Of Aquaculture Management And Technology*, 4(4), 95-100.
- Winarsih, W. H., Priyambodo, T., Rahardjo, & Husein, A. (2011). Budi Daya dan Pengelolaan Ikan Bandeng. Universitas Airlangga. ISBN 978-602-8967-37-2.

LAMPIRAN

Lampiran 1. Hasil Analisis Ragam Kecernaan Pakan

Kecernaan Total

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	1837.3333	12.22020	7.05534	1806.9767	1867.6900	1824.00	1848.00
1%	3	1883.3333	19.50214	11.25956	1834.8873	1931.7793	1864.00	1903.00
2%	3	1879.0000	11.53256	6.65833	1850.3515	1907.6485	1868.00	1891.00
3%	3	1863.6667	11.84624	6.83943	1834.2390	1893.0944	1850.00	1871.00
4%	3	1882.6667	10.69268	6.17342	1856.1046	1909.2287	1871.00	1892.00
Total	15	1869.2000	21.38825	5.52242	1857.3556	1881.0444	1824.00	1903.00
		Sum of Squares		df	Mean Square		F	Sig.
Between Groups		4569.733		4	1142.433		6.227	.009
Within Groups		1834.667		10	183.467			
Total		6404.400		14				

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	2
0%	3	1837.3333	
3%	3	1863.6667	1863.6667
2%	3		1879.0000
4%	3		1882.6667
1%	3		1883.3333
Sig.		.198	.435

Kecernaan Protein

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	9114.6667	44.79211	25.86074	9003.3969	9225.9364	9065.00	9152.00
1%	3	9258.3333	66.01010	38.11095	9094.3552	9422.3115	9193.00	9325.00
2%	3	9245.0000	38.50974	22.23361	9149.3365	9340.6635	9207.00	9284.00
3%	3	9192.6667	38.73414	22.36316	9096.4457	9288.8876	9148.00	9217.00
4%	3	9257.0000	36.05551	20.81666	9167.4331	9346.5669	9217.00	9287.00
Total	15	9213.5333	68.96362	17.80633	9175.3426	9251.7241	9065.00	9325.00
		Sum of Squares		df	Mean Square		F	Sig.
Between Groups		45289.733		4	11322.433		5.317	.015
Within Groups		21294.000		10	2129.400			
Total		66583.733		14				

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	2
0%	3	9114.6667	
3%	3	9192.6667	9192.6667
2%	3		9245.0000
4%	3		9257.0000
1%	3		9258.3333
Sig.		.303	.453

Kecernaan Lemak

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	9125.0000	22.33831	12.89703	9069.5086	9180.4914	9107.00	9150.00
1%	3	9353.0000	54.34151	31.37409	9218.0082	9487.9918	9305.00	9412.00
2%	3	9369.0000	76.72679	44.29823	9178.4001	9559.5999	9282.00	9427.00
3%	3	9319.6667	61.61439	35.57309	9166.6080	9472.7253	9256.00	9379.00
4%	3	9330.6667	19.75686	11.40663	9281.5879	9379.7454	9313.00	9352.00
Total	15	9299.4667	101.98520	26.33247	9242.9891	9355.9442	9107.00	9427.00
		Sum of Squares		df	Mean Square		F	Sig.
Between Groups		118562.400		4	29640.600		10.957	.001
Within Groups		27051.333		10	2705.133			

Total	145613.733	14		
-------	------------	----	--	--

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	2
0%	3	9125.0000	
3%	3		9319.6667
4%	3		9330.6667
1%	3		9353.0000
2%	3		9369.0000
Sig.		1.000	.772

Kecernaan Energi

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	8928.3333	126.23919	72.88423	8614.7378	9241.9289	8818.00	9066.00
1%	3	8948.3333	64.37650	37.16779	8788.4133	9108.2534	8874.00	8986.00
2%	3	9065.3333	123.03387	71.03364	8759.7003	9370.9664	8944.00	9190.00
3%	3	8713.0000	65.59726	37.87259	8550.0474	8875.9526	8659.00	8786.00
4%	3	8794.3333	58.82460	33.96240	8648.2049	8940.4617	8742.00	8858.00
Total	15	8889.8667	149.82078	38.68356	8806.8987	8972.8347	8659.00	9190.00
		Sum of Squares		df	Mean Square		F	Sig.
Between Groups		228285.067		4	57071.267		6.639	.007
Within Groups		85962.667		10	8596.267			
Total		314247.733		14				

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	2
3%	3	8713.0000	
4%	3	8794.3333	
0%	3	8928.3333	8928.3333
1%	3	8948.3333	8948.3333
2%	3		9065.3333
Sig.		.066	.419

Kecernaan Karbohidrat

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	8755.0000	236.91349	136.78207	8166.4743	9343.5257	8531.00	9003.00
1%	3	8627.0000	131.55987	75.95613	8300.1872	8953.8128	8489.00	8751.00
2%	3	8853.6667	272.91085	157.56515	8175.7185	9531.6148	8609.00	9148.00
3%	3	8227.0000	108.58637	62.69237	7957.2565	8496.7435	8156.00	8352.00
4%	3	8345.3333	109.15280	63.01940	8074.1828	8616.4839	8233.00	8451.00
Total	15	8561.6000	292.81632	75.60485	8399.4437	8723.7563	8156.00	9148.00
		Sum of Squares		df	Mean Square		F	Sig.
Between Groups		857136.267		4	214284.067		6.243	.009
Within Groups		343243.333		10	34324.333			
Total		1200379.600		14				

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
3%	3	8227.0000		
4%	3	8345.3333	8345.3333	
1%	3	8627.0000	8627.0000	8627.0000
0%	3		8755.0000	8755.0000
2%	3			8853.6667
Sig.		.135	.122	.585

Lampiran 2. Hasil Analisis Ragam Konsumsi & Efisiensi Pakan

Konsumsi Pakan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Kontrol	3	368,3900	28,54915	16,48286	297,4700	439,3100	341,77	398,54
1%	3	319,0000	32,74998	18,90821	237,6446	400,3554	291,15	355,08
2%	3	379,3433	25,18115	14,53835	316,7899	441,8968	359,37	407,63
3%	3	369,8133	75,83754	43,78483	181,4224	558,2042	285,75	433,09
4%	3	422,8567	50,41847	29,10912	297,6102	548,1031	366,86	464,65
Total	15	371,8807	52,12028	13,45740	343,0174	400,7439	285,75	464,65

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16401,202	4	4100,301	1,896	,188
Within Groups	21630,121	10	2163,012		
Total	38031,323	14			

Tukey HSD^a

		Subset for alpha = 0.05	
Perlakuan	N	1	
1%	3	319,0000	
0%	3	368,3900	
3%	3	369,8133	
2%	3	379,3433	
4%	3	422,8567	
Sig.		,117	

Efisiensi Pakan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	1507.6667	62.42863	36.04318	1352.5854	1662.7480	1463.00	1579.00
1%	3	1977.0000	127.73801	73.74958	1659.6812	2294.3188	1869.00	2118.00
2%	3	2031.0000	352.00426	203.22976	1156.5729	2905.4271	1680.00	2384.00
3%	3	2349.0000	172.05813	99.33781	1921.5839	2776.4161	2167.00	2509.00
4%	3	2484.6667	137.31836	79.28079	2143.5489	2825.7844	2376.00	2639.00
Total	15	2069.8667	388.55940	100.32561	1854.6896	2285.0437	1463.00	2639.00

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1728534.400	4	432133.600	11.219	.001
Within Groups	385163.333	10	38516.333		
Total	2113697.733	14			

Tukey HSD^a

		Subset for alpha = 0.05	
Perlakuan	N	1	2
0%	3	1507.6667	
1%	3	1977.0000	1977.0000
2%	3	2031.0000	2031.0000
3%	3		2349.0000
4%	3		2484.6667
Sig.		.052	.061

Lampiran 3. Hasil Analisis Ragam Retensi Nutrisi

Retensi Protein

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
0%	3	9804.2467	8919.16082	5149.47990	-12352.1771	31960.6704
1%	3	25000.9300	6801.33585	3926.75308	8105.4751	41896.3849
2%	3	23515.8267	8545.99323	4934.03149	2286.4026	44745.2507
3%	3	22599.6933	11951.43376	6900.16350	-7089.3140	52288.7007
4%	3	20631.6467	8765.96743	5061.03365	-1144.2236	42407.5169
Total	15	20310.4687	9565.72216	2469.85884	15013.1483	25607.7890

Retensi Protein

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	
0%	3	9804.2467	
4%	3	20631.6467	
3%	3	22599.6933	
2%	3	23515.8267	
1%	3	25000.9300	
Sig.		.317	

Transform Retensi Protein

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
0%	3	92.6238	42.86757	24.74961	-13.8652	199.1127
1%	3	157.1936	20.89667	12.06470	105.2834	209.1038
2%	3	151.4544	29.42936	16.99105	78.3478	224.5610
3%	3	145.8986	44.38384	25.62502	35.6431	256.1542
4%	3	141.1362	32.68552	18.87099	59.9408	222.3315
Total	15	137.6613	38.17021	9.85551	116.5233	158.7993

Transform Retensi Protein

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	
0%	3	92.6238	
4%	3	141.1362	
3%	3	145.8986	
2%	3	151.4544	
1%	3	157.1936	
Sig.		.238	

Retensi Lemak

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
0%	3	4104.5800	2990.73448	1726.70136	-3324.8163	11533.9763
1%	3	6458.1500	5861.25537	3383.99736	-8102.0155	21018.3155
2%	3	5526.4000	2694.09371	1555.43573	-1166.0998	12218.8998
3%	3	6797.9733	5788.95120	3342.25254	-7582.5787	21178.5253
4%	3	5368.7400	3896.10758	2249.41876	-4309.7278	15047.2078
Total	15	5651.1687	3890.07956	1004.41422	3496.9144	7805.4229

Retensi Lemak

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	

0%	3	4104.5800
4%	3	5368.7400
2%	3	5526.4000
1%	3	6458.1500
3%	3	6797.9733
Sig.		.942

Transform Retesi Lemak

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
0%	3	61.4812	22.06717	12.74049	6.6633	116.2991
1%	3	75.2593	34.51506	19.92728	-10.4809	160.9994
2%	3	72.9810	17.32776	10.00418	29.9365	116.0256
3%	3	70.8885	51.56735	29.77242	-57.2119	198.9889
4%	3	70.1007	26.11417	15.07702	5.2295	134.9719
Total	15	70.1421	27.99072	7.22717	54.6414	85.6429

Transform Retesi Lemak

Tukey HSD^a

Perlakuan	N	Subset for alpha =	
		0.05	1
0%	3	61.4812	
4%	3	70.1007	
3%	3	70.8885	
2%	3	72.9810	
1%	3	75.2593	
Sig.		.984	

Retensi Energi

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
0%	3	107.8667	12.46428	7.19625	76.9037	138.8297
1%	3	121.5867	20.53908	11.85824	70.5648	172.6086
2%	3	113.9533	20.91411	12.07477	61.9998	165.9069
3%	3	104.9367	35.32006	20.39205	17.1968	192.6766
4%	3	70.0033	10.17992	5.87738	44.7150	95.2917
Total	15	103.6693	26.00789	6.71521	89.2666	118.0720

Retensi Energi

Tukey HSD^a

Perlakuan	N	Subset for alpha =	
		0.05	1
4%	3	70.0033	
3%	3	104.9367	
0%	3	107.8667	
2%	3	113.9533	
1%	3	121.5867	
Sig.		.091	

Transform Retesi Energi

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
0%	3	10.3741	.60628	.35004	8.8680	11.8802
1%	3	11.0006	.92827	.53593	8.6946	13.3065
2%	3	10.6462	.95761	.55288	8.2674	13.0251
3%	3	10.1531	1.66675	.96230	6.0126	14.2935
4%	3	8.3522	.60469	.34912	6.8501	9.8544
Total	15	10.1052	1.29023	.33314	9.3907	10.8197

Transform Retesi EnergiTukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	2
4%	3	8.3522	
3%	3	10.1531	
0%	3	10.3741	
2%	3	10.6462	
1%	3	11.0006	
Sig.		.062	

Retensi Karbohidrat

N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
0%	3	1682.4167	842.86071	-1944.1203	5308.9536
1%	3	5278.3733	610.84278	2650.1290	7906.6177
2%	3	4057.1567	359.38545	2510.8459	5603.4674
3%	3	3999.7100	946.22818	-71.5813	8071.0013
4%	3	3148.1767	696.71294	150.4628	6145.8905
Total	15	3633.1667	418.30240	2735.9973	4530.3361

Retensi KarbohidratTukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	2
0%	3	1682.4167	
4%	3	3148.1767	3148.1767
3%	3	3999.7100	3999.7100
2%	3	4057.1567	4057.1567
1%	3		5278.3733
Sig.		.212	.294

Transform Retesi Karbohidrat

N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
3	38.6539	16.80605	9.70297	-3.0947	80.4024
3	72.4202	7.10893	4.10434	54.7606	90.0797
3	63.5754	4.79548	2.76867	51.6627	75.4880
3	62.2404	13.73898	7.93220	28.1109	96.3699
3	55.4546	10.46192	6.04019	29.4657	81.4434
15	58.4689	15.16188	3.91478	50.0725	66.8652

Transform Retesi KarbohidratTukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	2
0%	3	38.6539	
4%	3	55.4546	55.4546
3%	3	62.2404	62.2404
2%	3	63.5754	63.5754
1%	3		72.4202
Sig.		.130	.416

Lampiran 4. Hasil Analisis Ragam Pertumbuhan
Pertumbuhan Bobot Mutlak

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	6,2767	,79400	,45842	4,3043	8,2491	5,36	6,75
1%	3	6,9333	1,61658	,93333	2,9175	10,9491	5,20	8,40
2%	3	12,0667	5,32900	3,07670	-1,1713	25,3046	8,57	18,20
3%	3	13,8500	2,82611	1,63166	6,8296	20,8704	11,97	17,10
4%	3	11,8100	,82928	,47878	9,7500	13,8700	11,12	12,73
Total	15	10,1873	3,93718	1,01657	8,0070	12,3677	5,20	18,20
		Sum of Squares		df	Mean Square		F	Sig.
Between Groups		136,386		4	34,096		4,229	,029
Within Groups		80,633		10	8,063			
Total		217,019		14				

Tukey HSD^a

		Subset for alpha = 0.05	
Perlakuan	N	1	
0%	3	6,2767	
1%	3	6,9333	
4%	3	11,8100	
2%	3	12,0667	
3%	3	13,8500	
Sig.		,052	

Transform Pertumbuhan Bobot Mutlak

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	3	25.0185	1.61695	.93355	21.0017	29.0352	23.15	25.98
2.00	3	26.2064	3.13689	1.81109	18.4139	33.9988	22.80	28.98
3.00	3	34.2148	7.35008	4.24357	15.9562	52.4734	29.27	42.66
4.00	3	37.0923	3.70712	2.14031	27.8833	46.3013	34.60	41.35
5.00	3	34.3517	1.19917	.69234	31.3728	37.3306	33.35	35.68
Total	15	31.3767	6.05639	1.56375	28.0228	34.7306	22.80	42.66

Tukey HSD^a

		Subset for alpha = 0.05	
PERLAKUAN	N	1	2
1.00	3	25.0185	
2.00	3	26.2064	
3.00	3	34.2148	34.2148
5.00	3	34.3517	34.3517
4.00	3		37.0923
Sig.		.102	.901

Pertumbuhan Bobot Relatif

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	40,9433	6,36007	3,67199	25,1441	56,7426	34,60	47,32
1%	3	47,3533	10,62645	6,13518	20,9558	73,7509	35,37	55,63

2%	3	79,9833	30,89389	17,83660	3,2387	156,7280	57,40	115,19
3%	3	89,4500	14,25090	8,22776	54,0488	124,8512	78,49	105,56
4%	3	77,4733	1,86433	1,07637	72,8421	82,1046	75,54	79,26
Total	15	67,0407	24,15769	6,23749	53,6626	80,4187	34,60	115,19

Pertumbuhan Bobot Relatif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5541,580	4	1385,395	5,270	,015
Within Groups	2628,736	10	262,874		
Total	8170,316	14			

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05	
		1	2
0%	3	40,9433	
1%	3	47,3533	47,3533
4%	3	77,4733	77,4733
2%	3	79,9833	79,9833
3%	3		89,4500
Sig.		,085	,059

Pertumbuhan Panjang Mutlak

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	5,7633	,15822	,09135	5,3703	6,1564	5,59	5,90
1%	3	6,5700	,42226	,24379	5,5211	7,6189	6,20	7,03
2%	3	8,7267	1,01791	,58769	6,1980	11,2553	8,08	9,90
3%	3	11,0467	,85500	,49364	8,9227	13,1706	10,25	11,95
4%	3	10,2100	,23065	,13317	9,6370	10,7830	9,99	10,45
Total	15	8,4633	2,17211	,56084	7,2605	9,6662	5,59	11,95

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3520,921	4	880,230	53,384	,000
Within Groups	164,887	10	16,489		
Total	3685,807	14			

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
0%	3	42,1267		
1%	3	49,1133		
2%	3		66,2267	
4%	3		74,7200	74,7200
3%	3			82,9333
Sig.		,288	,152	,172

Pertumbuhan Panjang Relatif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3520,921	4	880,230	53,384	,000
Within Groups	164,887	10	16,489		
Total	3685,807	14			

Tukey HSD^a

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
0%	3	42,1267		
1%	3	49,1133		
2%	3		66,2267	
4%	3		74,7200	74,7200
3%	3			82,9333
Sig.		,288	,152	,172

Lampiran 5. Hasil Analisis Ragam Sintasan

Sintasan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	60,0000	10,00000	5,77350	35,1586	84,8414	50,00	70,00
1%	3	43,3333	11,54701	6,66667	14,6490	72,0177	30,00	50,00
2%	3	43,3333	25,16611	14,52966	-19,1828	105,8494	20,00	70,00
3%	3	53,3333	25,16611	14,52966	-9,1828	115,8494	30,00	80,00
4%	3	80,0000	10,00000	5,77350	55,1586	104,8414	70,00	90,00
Total	15	56,0000	20,63284	5,32738	44,5739	67,4261	20,00	90,00

Transform Sintasan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	3	7.7279	.64796	.37410	6.1183	9.3375	7.07	8.37
2.00	3	6.5398	.92021	.53128	4.2539	8.8257	5.48	7.07
3.00	3	6.3878	1.94800	1.12468	1.5487	11.2269	4.47	8.37
4.00	3	7.1642	1.73540	1.00193	2.8532	11.4752	5.48	8.94
5.00	3	8.9326	.56021	.32344	7.5409	10.3242	8.37	9.49
Total	15	7.3504	1.45323	.37522	6.5457	8.1552	4.47	9.49

Transform Sintasan

Tukey HSD^a

PERLAKUAN	N	Subset for alpha = 0.05	
		1	
3.00	3	6.3878	
2.00	3	6.5398	
4.00	3	7.1642	
1.00	3	7.7279	
5.00	3	8.9326	
Sig.		.191	

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

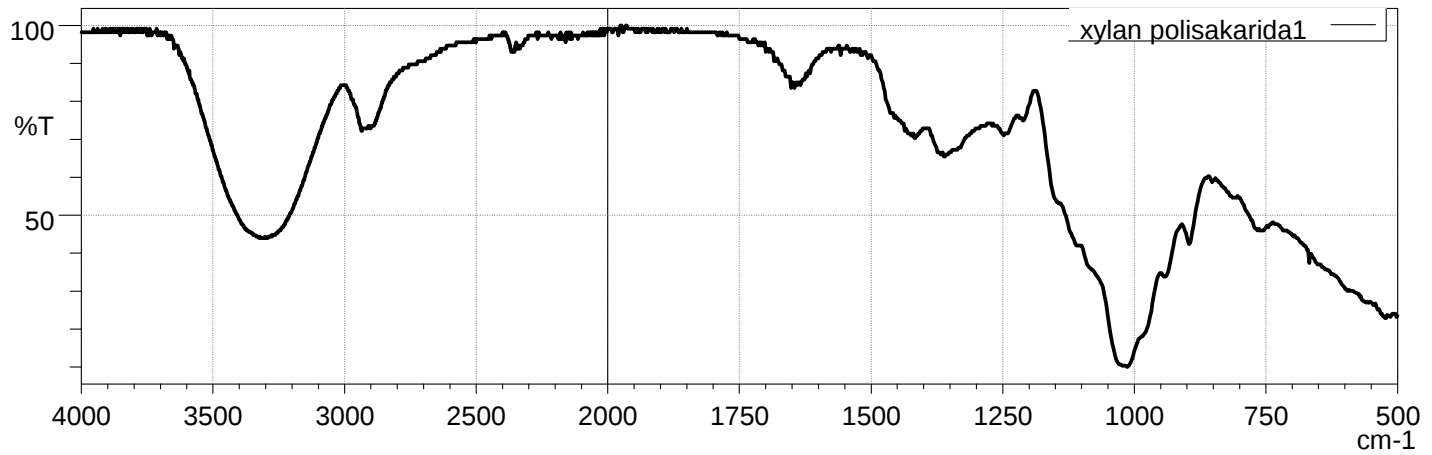
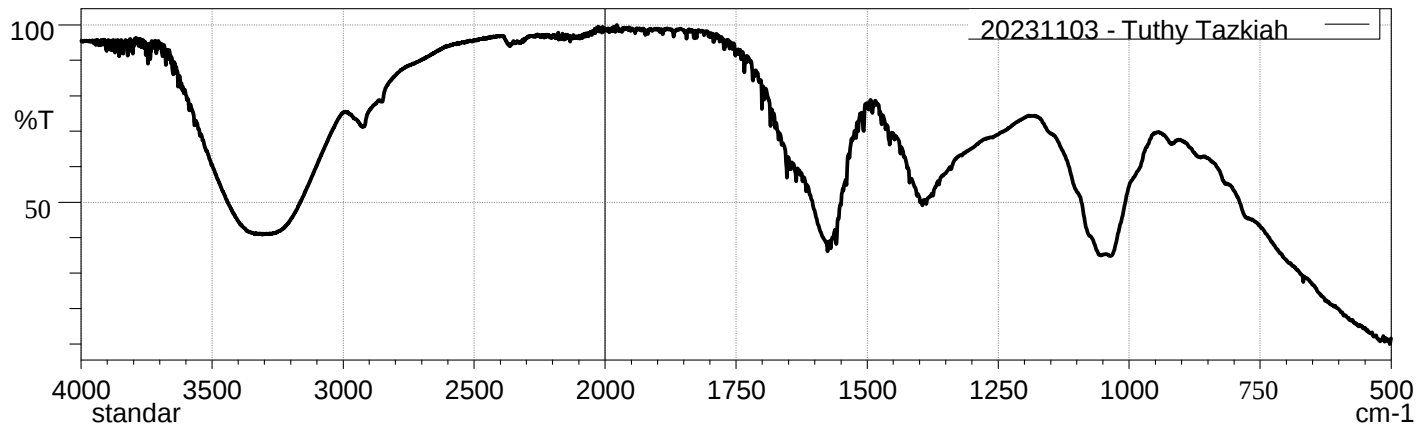
Kruskal-Wallis Test

	Ranks	
	PERLAKUAN	Mean Rank
Transform Sintasan	1.00	8.83
	2.00	5.17
	3.00	5.33
	4.00	7.50
	5.00	13.17
	Total	15

Lampiran 6. Prosedur analisis nilai pencernaan pakan (Takeuchi 1988)

- Feses ditimbang sebanyak 0,1 – 0,2 g dalam berat kering dan ditambahkan 5,0 mL larutan asam nitrat (specific gravity 1,42), kemudian dipanaskan perlahan-lahan selama 30 menit sampai volume larutan 1,0 mL
- Larutan didinginkan, setelah dingin larutan diaduk untuk menghancurkan feses, kemudian tambah 3,0 mL asam perklorat (70%)
- Selanjutnya larutan didekstruksi (untuk menghancurkan logam-logam) dengan cara memanaskan larutan dengan suhu tidak terlalu panas $\pm 80^{\circ}\text{C}$ selama 10 menit sampai kelihatan uap putih dan larutan berganti warna dari hijau menjadi kuning atau orange
- Larutan didinginkan dan diencerkan dengan akuades sampai 100 mL, kemudian didiamkan selama beberapa menit pada suhu ruang
- Absorbansi larutan diukur pada panjang gelombang 350 nm
- $Y = 0,2089X + 0,0032$
 dimana : Y = Absorpsi
 X = Cr_2O_3 mg/100 ml

Lampiran 7. Oligosakarida



No	Score	Library	Name	Comment
1	778	20 - T_FoodAdditives2	T_Carboxymethyl Cellulose Calcium-4	Carboxymethyl Cellulose Calcium(Product name;E.C.G-FACSales origin;Gotoku CHEMICAL CO.,LTD.)@KBr Wafer
2	776	20 - A_FoodAdditives2	A_Carboxymethyl Cellulose Sodium Salt-4	Carboxymethyl Cellulose Sodium Salt(Sales origin;Wako Pure Chemical Industries, td.)@DuraSamplIR2(diamond)
3	773	21 - T_FoodAdditives2	T_Carboxymethyl Cellulose Sodium Salt-4	Carboxymethyl Cellulose Sodium Salt(Sales origin;Wako Pure Chemical Industries, Ltd.)@KBr Wafer
4	773	19 - A_FoodAdditives2	A_Carboxymethyl Cellulose Calcium-4	Carboxymethyl Cellulose Calcium(Product name;E.C.G-FACSales origin;Gotoku CHEMICAL CO.,LTD.)@DuraSamplIR2(diamond)
5	767	133 - T-Polymer2	T_Polyacrylamide-3	Polyacrylamide(Carboxyl modified)(High carboxyl content) Transmission(Microscope)
6	751	45 - ATR-Organic2	D_Algin	Alginic Acid, Sodium Salt DuraSamplIR-II
7	748	3 - IRs Polymer2	ARABIC	Arabic gum Film
8	746	138 - ATR-Polymer2	D_Polyacrylamide-2	Polyacrylamide(Carboxyl modified)(Low carboxyl content) DuraSamplIR-II
9	743	43 - ATR-Organic2	D_HumicAcid	HumicAcid DuraSamplIR
10	743	143 - T-Polymer2	T_Tencel	Tencel(LENZING Cooperation) Transmission(Microscope)
11	742	49 - T_FoodAdditives2	T_Powdered Cellulose-4	Powdered Cellulose(Product name;VITACEL L-600CSales origin;TOAKASEI CO.,LTD.)@KBr Wafer
12	741	137 - ATR-Polymer2	D_Polyacrylamide-1	Polyacrylamide(non-ionic) DuraSamplIR-II
13	737	139 - ATR-Polymer2	D_Polyacrylamide-3	Polyacrylamide(Carboxyl modified)(High carboxyl content) DuraSamplIR-II
14	735	43 - T_FoodAdditives2	T_Microfibrillated Cellulose_200L-4	Microfibrillated Cellulose(Product name;CELISH FD-200LCSales origin;Daicel Chemical Industries Ltd.)@KBr Wafer
15	734	42 - IRs Reagent2	CH3COOK	Potassium Acetate [CH3COOK] ORIGIN Date: 92/04/08 File: CH3COOK.DX INFRARED SPECTROPHOTOMETER FTIR-8000 SERIES
16	734	27 - T-Polymer2	Polyacetylene	Polyacetylene Transmission(Microscope)
17	732	42 - T_FoodAdditives2	T_Microcrystalline Cellulose_102-4	Microcrystalline Cellulose(Product name;VIVAPUR102CSales origin;TOAKASEI CO.,LTD.)@KBr Wafer
18	732	8 - IRs Polymer2	CELLOPHA	Cellulose ATR/diamond ATRcorrected
19	732	12 - T-Polymer2	Ramie	Ramie Transmission(Microscope)
20	732	41 - T_FoodAdditives2	T_Microcrystalline Cellulose_101-4	Microcrystalline Cellulose(Product name;VIVAPUR101CSales origin;TOAKASEI CO.,LTD.)@KBr Wafer
21	731	8 - T-Polymer2	Paper	Paper Transmission (Microscope)
22	731	11 - T-Polymer2	Cupra	Bemberg(Cupra) Transmission (Microscope)
23	730	22 - T-Polymer2	Soy Bean Powder	Protein(Soy Bean Powder) Transmission(Microscope)

24	726	50 - A_FoodAdditives2	A_Powdered Cellulose-4	Powdered Cellulose (Product name; VITACEL L-600C Sales origin; TOAKASEI CO., LTD.) @DuraSamplIR2 (diamond)
25	725	37 - T-Organic2	Humic Acid	Humic Acid Transmission
26	725	10 - T-Polymer2	Cotton	Cotton Transmission (Microscope)
27	723	43 - A_FoodAdditives2	A_Microfibrillated Cellulose_100G-4	Microfibrillated Cellulose (Product name; CELISH FD-100GC Sales origin; Daicel Chemical Industries Ltd.) @DuraSamplIR2 (diamond)
28	722	42 - A_FoodAdditives2	A_Microfibrillated Cellulose_100F-4	Microfibrillated Cellulose (Product name; CELISH FD-100FC Sales origin; Daicel Chemical Industries Ltd.) @DuraSamplIR2 (diamond)
29	720	27 - ATR-Polymer2	D_Polyacetylene	Polyacetylene DuraSamplIR-II
30	720	39 - T-Organic2	T_Algin	Alginic Acid, Sodium Salt Transmission (Microscope)
31	719	22 - ATR-Polymer2	D_Protein2	Protein (Soy Bean Powder) DuraSamplIR-II
32	718	4 - T-Organic2	Starch	Soluble Starch Transmission
33	717	41 - A_FoodAdditives2	A_Microcrystalline Cellulose_102-4	Microcrystalline Cellulose (Product name; VIVAPUR102C Sales origin; TOAKASEI CO., LTD.) @DuraSamplIR2 (diamond)
34	716	8 - ATR-Polymer2	D_Cellulose2	Paper DuraSamplIR-II
35	715	174 - ATR-Polymer2	D_Tencel	Tencel (LENZING Cooperation) DuraSamplIR-II
36	715	1 - gula dan karbo	xylan polisakarida1	
37	715	44 - A_FoodAdditives2	A_Microfibrillated Cellulose_200L-4	Microfibrillated Cellulose (Product name; CELISH FD-200LC Sales origin; Daicel Chemical Industries Ltd.) @DuraSamplIR2 (diamond)
38	713	11 - ATR-Polymer2	D_Cellulose4	Bemberg (Cupra) DuraSamplIR-I
39	712	40 - A_FoodAdditives2	A_Microcrystalline Cellulose_101-4	Microcrystalline Cellulose (Product name; VIVAPUR101C Sales origin; TOAKASEI CO., LTD.) @DuraSamplIR2 (diamond)
40	709	37 - T-Polymer2	PVAL	Polyvinyl Alcohol (PVAL) Transmission (Microscope)
41	709	111 - ATR-Polymer2	D_Methyl Cellulose	Methyl Cellulose (Methoxyl content 30%) DuraSamplIR-II
42	707	10 - ATR-Polymer2	D_Cellulose3	Cotton DuraSamplIR-II
43	707	109 - IRs Pharmaceuticals	TOBRAMYCIN	Tobramycin formula; c18h37n5o9 mw; 467.51 (asean reference standard) control no. M 191063 (potency 934 iu/mg) water (6.7%) (karl fischer method)
44	706	171 - IRs Pharmaceuticals	Peplomycin Sulfate	Peplomycin Sulfate formula : C61H88N18O21S2.H2SO4 ATR/diamond molecular weight: 1571.67
45	706	151 - IRs Pharmaceuticals	Bleomycin Sulfate	Bleomycin Sulfate formula : C55H84N17O21S3 ATR/diamond molecular weight
46	705	9 - IRs Polymer2	COTTON	Cotton Fiber ATR/diamond ATRcorrected
47	705	184 - ATR-Polymer2	D_Methylcellulose	Methylcellulose DuraSamplIR
48	703	37 - ATR-Polymer2	D_PVAL	Polyvinyl Alcohol (PVAL) DuraSamplIR-II
49	701	23 - T-Organic2	EthyleneGlycol	EthyleneGlycol Transmission
50	701	110 - ATR-Polymer2	D_Hydroxypropyl_Methyl_Cellulose	Hydroxypropyl Methyl Cellulose (10% Hydroxypropyl, 30% Methoxyl) DuraSamplIR-II

