

DAFTAR PUSTAKA

- Admin, 2009. Seleksi Telur Tetras. ([http://belajarsemua.blogspot.com /2009/04/menetakkan telur ayam.html](http://belajarsemua.blogspot.com/2009/04/menetakkan-telur-ayam.html)). Diakses 10 April 2012
- Akiba, Y., and H. Murakami. 1995. Partitioning of energy and protein during early growth of broiler chicks and contribution of vitelline residue. 10th European Symposium on Poultry Nutrition, Antalya, Turkey.
- Al-Murrani, W. K., 1982. Effect of injecting amino acids into the egg on embryonic and subsequent growth in the domestic fowl. *Br. Poult. Sci.* 23, 171-174.
- Al-Shamery N.J. & Al-Shuhaib M.B.S. (2015). Effect of *in ovo* injection of various nutrients on the hatchability, mortality ratio and weight of the broiler chickens. *IOSR Journal of Agriculture and Veterinary Science*, 8(2):30-33
- Anang, A. dan Suharyanto. 2008. *Panen Ayam Kampung*. PT. Penebar Swadaya. Jakarta.
- Asmawati. 2014. Peningkatan kualitas embrio dan pertumbuhan ayam buras melalui *in ovo feeding*. Disertasi. Prog Studi Ilmu Pertanian Prog Pascasarjana Universitas Hasanuddin, Makassar.
- Azahan E.A.E., Azma I.A. & Noraziah, M. (2014). Effects of strain, sex and age on growth performance of Malaysian kampung chickens. *Malaysian Journal Animal Science*, 17(1):27-33
- Azhar M. 2016. Performa ayam kampung pra- dan pasca-tetas hasil *in ovo feeding* L-Arginin. Tesis. Fakultas Ilmu dan Teknologi Peternakan Pasca Sarjana Universitas Hasanuddin. Makassar.
- Azzam, M. M. M., X. Y. Dong, P. Xie, C. Wang and T. Zou. 2011. The effect of supplemental L-threonine on laying performance, serum free amino acids, and immune function of laying hens under high-temperature and high-humidity environmental climates. *Journal. Appl. Poult. Res.* 20:361–370.
- Badaruddin, R., J. Hafoloan., T. Yuanta 2013. Analisis Fenotip Genetik Ayam Kampung Tolaki Pada Masa Pertumbuhan. *Jurnal Peternakan UGM*. 37 (2). P 79-86.
- Baranylova, E., and J. Holman. 1976. Morphological changes in the intestinal wall in fed and fasted chickens in the first week after hatching. *Acta Vet. (Brno)* 45:151–158.
- Bayer, R. C., C. B. Chawan, F. H. Bird, and S. D. Musgrave. 1975. Characteristics of the absorptive surface of the small intestine of the chicken from 1 day to 14 weeks of age. *Poult. Sci.* 54:155–169.
- Chen R., Wang W., Liu S., Pan J., Li T. & Yin Y. (2013). Dietary Arginin supplementation altered expression of IGFs and IGF receptors in weaning piglets. *Academic Journals*, 7(4):44-50

- Chen, W., Y. T. Lv, H. X. Zhang, D. Ruan, S. Wang, & Y. C. Lin. 2013. Review: Developmental specificity in skeletal muscle of late-term avian embryos and its potential manipulation. *Poult. Sci.* 92:2754-2764. <https://doi.org/10.3382/ps.2013-03099>.
- Fauzi dkk. 2013. Perkembangan Embrio Ayam. Laboratorium Embriologi Fakultas Kedokteran Hewan Universitas Syiah Kuala. Banda Aceh
- Gaspersz. 1991. Teknik Analisis Dalam Penelitian Percobaan. Tarsito, Bandung.
- Huettner, A.F. 1961. Fundamentals of Comparative Embryology of The Vertebrates. The Mc Millan Company, New York
- Iji P. A., R. J. Hughes, M. Choct dan D. R. Tivey. 2001. Intestinal Structure and Function of Broiler Chickens on Wheat-based Diets Supplemented with Microbial Enzyme. *Asian-Aust. J. Anim. Sci.*, 14(1):54-60.
- Kornasio, R., O. Halevy, O. Kedar, and Z. Uni. Effect of *in ovo* feeding and its interaction with timing of first feed on glycogen reserves, muscle growth, and body weight. *Poult. Sci.* 90:1467-1477.
- Leeson, S. dan J. D. Summers. 2005. Commercial Poultry Nutrition. 3rd ed. UK. Nottingham University Press, Nottingham
- M. Azhar , Mirnawati , U. Sara , D.P. Rahadja , dan W. Pakiding. 2019. Pengaruh *In ovo feeding* L-Arginin terhadap Konsumsi Pakan.
- Moran, E.T. 1982. Comparative Nutrition of Fowl and Swine, The Gastrointestinal System. Ontario Agricultural Collage. University of Guelph.
- Murtidjo.B.A. 1992. Mengelola ayam Buras. Kanisius. Yogyakarta
- Nayak, N., Rajini, R.A., Ezhilvalavan, S., Sahu, A.R. and Kirubakaran, J.J. 2017. Comparative effect of arginine and/or tryptophan *in ovo* feeding on hatchability percentage, growth performance and economic importance of commercial broiler. *Indian Journal of Animal Sciences* 87 (2): 153-158
- Nissen, S., J. C. Fuller, Jr., J. Sell, P. R. Ferket, and D. V. Rives. 1994. The effect of beta-hydroxy-beta-methylbutyrate on growth, mortality, and carcass qualities of broiler chickens. *Poult. Sci.* 73:137–155.
- Nunes EA, Goncalves-Neto LM, Ferreira FB, dos Santos C, Fernandes LC, Boschero AC, et al. Glucose intolerance induced by glucocorticoid excess is further impaired by co-administration with beta-hydroxy-beta methylbutyrate in rats. *Appl Physiol Nutr Metabol* 2013;38(11):1137e46.
- Ostaszewski, P., and S. Nissen. 1988. Effect of hyperglucagonemia on whole-body leucine metabolism in immature pigs before and during a meal. *Am. J. Physiol.* 254:E372–E377.
- Pengaruh *In ovo feeding* L-Arginin terhadap Konsumsi Pakan, Pertambahan Berat Badan, dan Konversi Pakan Ayam Kampung
- Pertambahan Berat Badan, dan Konversi Pakan Ayam Kampung. *Jurnal Peternakan Lokal: Volume 1, No. 2, September 2019.*

- Peterson, A. L., M. A. Qureshi, P. R. Ferket, and J. C. Fuller, Jr. 1999. In vitro exposure with beta-hydroxy-beta-methylbutyrate enhances chicken macrophage growth and function. *Vet. Immunol. Immunopathol.* 67:67–78.
- Rahardja, D. P. 2021. Early nutrition programming – an approach for improving production performance of Indonesian native chicken – Kampung chicken. The 3rd International Conference of Animal Science and Technology. IOP Conf. Series : earth and Environmental Science 788.
- Salmanzadeh M., Y. Ebrahimnezhad, H.A. Shahryar, dan J.G. Ghaleh-Kandi. 2016. The effects of *in ovo feeding* of glutamine in broiler breeder eggs on hatchability, development of the gastrointestinal tract, growth performance and carcass characteristics of broiler chickens. *Arch. Anim. Breed*, 59: 235–242.
- Sell, J. L., C. R. Angel, F. J. Piquer, E. G. Mallarino, and H. A. alBatshan. 1991. Developmental patterns of selected characteristics of the gastrointestinal tract of young turkeys. *Poult. Sci.* 70:1200–1205.
- Shafey T.M., Mahmoud A.H., Alsobayel A.A. and Abouheif M.A. (2014). Effects of *in ovo* administration of amino acids on hatchability and performance of meat chickens. *South African Journal of Animal Science*, 44(2):123-130
- Siwicki, A. K., J. C. Fuller, Jr., S. L. Nissen, P. Ostaszewski, and M. Studnicka. 2000. In vitro effects of β -hydroxy- β -methylbutyrate (HMB) on cell-mediated immunity in fish. *Vet. Immunol. Immunopathol.* 76(3–4):191–197.
- Sklan, D. 2001. Development of the digestive tract of poultry. *Worlds Poult. Sci. J.* 57:415–427
- Sobolewska, A., G. Elminowska-Wenda, J. Bogucka, M. Szpinda, K. Walasik, M. Bednarczyk, & M. Paruszevska Ahtel. 2011. Myogenesis - Possibilities of its Stimulation in Chickens. *Folia Biol. (Krakow)* 59:85-90. https://doi.org/10.3409/fb59_3-4.85-90.
- Surjono. 2001. Proses perkembangan embrio. Jakarta: Universitas Terbuk
- Susila, A.B.. 1997. Pengaruh Frekwensi Pematangan Telur dan Berat Telur Terhadap Fertilitas, Daya Tetas, Mortalitas, dan Berat DOD itik Tegal. FP-USU. Medan.
- Tamzil, M. H., M. Ichsan, N. S. Jaya dan M. Taqiuddin. 2015. Growth rate, carcass weight and percentage weight of carcass parts of laying type cockerels, kampung chicken and arabic chicken in different ages. *J. Nurt. Pakistan.* 14 (7) : 377 ± 382.
- Uni, Z., and P. R. Ferket. 2003. Enhancement of Development of Oviparous species by *In ovo feeding*. U. S. Uni, Z., and P. R. Ferket. 2004. Methods for early nutrition and their potential. *World's Poultry Science Journal.* 60:101-111.
- Uni, Z., dan PR Ferket. 2004. Metode nutrisi dini dan potensinya. *Unggas Dunia. Sains. J.* 60:101–111.

- Uni, Z., E. Tako, O. Gal-Garber, and D. Sklan. 2003b. Morphological, molecular, and functional changes in the chicken small intestine of the late-term embryo. *Poult. Sci.* 82:1747–1754.
- Uni, Z., S. Ganot, and D. Sklan. 1998. Posthatch development of mucosal function in the broiler small intestine. *Poult. Sci.* 77:75–82.
- Uni, Z., Y. Noy, and D. Sklan. 1995. Posthatch changes in morphology and function of the small intestines in heavy- and lightstrain chicks. *Poult. Sci.* 74:1622–1629.
- Uni, Z., Y. Noy, and D. Sklan. 1999. Posthatch development of small intestinal function in the poult. *Poult. Sci.* 78:215–222.
- Vukovich, M. D., and G. D. Dreifort. 2001. Effect of beta-hydroxy-beta-methylbutyrate on the onset of blood lactate accumulation and V(O)(2) peak in endurance-trained cyclists. *J. Strength Cond. Res.* 15:491–497.
- Vukovich, M. D., G. Slater, M. B. Macchi, M. J. Turner, K. Fallon, T. Boston, and J. Rathmacher. 2001. Beta-hydroxy-beta-methylbutyrate (HMB) kinetics and the influence of glucose ingestion in humans. *J. Nutr. Biochem.* 12:631–639.
- Wardiny, T.M. 2002. Evaluasi Hubungan antara Indeks Bentuk Telur dengan Persentase Telur yang Menetas pada Ayam Kampung Galur Arab. *Jurnal Matematika, Sains dan Teknologi*, Vol. 3 Nomor 2, September 2002.
- Yamauchi, K., H. Kamisoyama, and Y. Isshiki. 1996. Effects of fasting and refeeding on structures of the intestinal villi and epithelial cells in White Leghorn hens. *Br. Poult. Sci.* 37:909–921.
- Yatim, W. 1982. *Embriologi dan Reproduksi*. Tarsito. Bandung.
- Patten, B.M. 1971. *Early Embriology of Chick*. Mc Graw-Hill Publishing Company, New York.

LAMPIRAN

Lampiran 1 Analisis ragam pengaruh injeksi HMB (hidroksin metil butirat) dan asam amino (L-threonin, L-tryptopan dan L-Arginin,) secara in ovo feeding terhadap Performa Pratetas

Descriptives

Berat Tetas

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	33.1000	2.28692	1.32035	27.4190	38.7810	30.50	34.80
HMB+ARG	3	34.0000	1.25300	.72342	30.8874	37.1126	32.80	35.30
HMB+TRY	3	30.8000	1.70880	.98658	26.5551	35.0449	29.20	32.60
HMB+THR	3	33.8667	2.59679	1.49926	27.4159	40.3175	31.60	36.70
NHMB+ARG	3	31.0000	2.78747	1.60935	24.0755	37.9245	29.10	34.20
NHMB+TRY	3	32.5000	4.30929	2.48797	21.7951	43.2049	29.30	37.40
NHMB+THR	3	34.2000	1.38924	.80208	30.7489	37.6511	32.60	35.10
Total	21	32.7810	2.50332	.54627	31.6415	33.9205	29.10	37.40

ANOVA

Berat Tetas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	35.866	6	5.978	.935	.500
Within Groups	89.467	14	6.390		
Total	125.332	20			

Descriptives

Berat Yolk

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	7.1333	2.10792	1.21701	1.8970	12.3697	4.80	8.90
HMB+ARG	3	5.9667	.96090	.55478	3.5797	8.3537	5.10	7.00
HMB+TRY	3	8.0333	.40415	.23333	7.0294	9.0373	7.60	8.40
HMB+THR	3	7.4333	1.00167	.57831	4.9451	9.9216	6.30	8.20
NHMB+ARG	3	5.9667	.96090	.55478	3.5797	8.3537	5.10	7.00
NHMB+TRY	3	8.0333	.40415	.23333	7.0294	9.0373	7.60	8.40
NHMB+THR	3	7.4333	1.00167	.57831	4.9451	9.9216	6.30	8.20
Total	21	7.1429	1.24120	.27085	6.5779	7.7078	4.80	8.90

ANOVA

Berat Yolk

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.565	6	2.261	1.835	.164
Within Groups	17.247	14	1.232		
Total	30.811	20			

Descriptives

Rasio Berat Embrio dan Berat Telur

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	53.1667	6.26844	3.61909	37.5950	68.7383	47.90	60.10
HMB+ARG	3	52.6000	2.12838	1.22882	47.3128	57.8872	50.30	54.50
HMB+TRY	3	56.6000	5.45069	3.14696	43.0597	70.1403	51.10	62.00
HMB+THR	3	51.8333	4.85421	2.80258	39.7748	63.8919	47.10	56.80
NHMB+ARG	3	58.5667	2.55799	1.47686	52.2123	64.9211	55.90	61.00
NHMB+TRY	3	55.4333	7.13956	4.12203	37.6977	73.1690	47.90	62.10
NHMB+THR	3	52.4333	5.33135	3.07806	39.1895	65.6772	46.80	57.40
Total	21	54.3762	4.90672	1.07073	52.1427	56.6097	46.80	62.10

ANOVA

Rasio Berat Embrio dan Berat Telur

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	115.445	6	19.241	.736	.629
Within Groups	366.073	14	26.148		
Total	481.518	20			

Lampiran 2. Analisis ragam pengaruh injeksi HMB (hidroksin metil butirat) dan asam amino (L-threonin, L-tryptopan dan L-Arginin,) secara in ovo feeding terhadap Performa Pascatetas

Descriptives

Daya Tetas

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	73.3333	2.88675	1.66667	66.1622	80.5044	70.00	75.00
HMB+ARG	3	65.0000	8.66025	5.00000	43.4867	86.5133	60.00	75.00
HMB+TRY	3	73.3333	5.77350	3.33333	58.9912	87.6755	70.00	80.00
HMB+THR	3	48.3333	17.55942	10.13794	4.7133	91.9534	30.00	65.00
NHMB+ARG	3	51.6667	2.88675	1.66667	44.4956	58.8378	50.00	55.00
NHMB+TRY	3	58.3333	7.63763	4.40959	39.3604	77.3062	50.00	65.00
NHMB+THR	3	38.3333	14.43376	8.33333	2.4779	74.1888	30.00	55.00
Total	21	58.3333	15.02775	3.27932	51.4928	65.1739	30.00	80.00

ANOVA

Daya Tetas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3116.667	6	519.444	5.194	.005
Within Groups	1400.000	14	100.000		
Total	4516.667	20			

Daya Tetas

Duncan

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
KONTROL	3	38.3333		
HMB+ARG	3	48.3333	48.3333	
HMB+TRY	3	51.6667	51.6667	
HMB+THR	3		58.3333	58.3333
NHMB+ARG	3		65.0000	65.0000
NHMB+TRY	3			73.3333
NHMB+THR	3			73.3333
Sig.		.143	.079	.111

Means for groups in homogeneous subsets are displayed.

Descriptives

Berat Tetas

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	33.1000	2.28692	1.32035	27.4190	38.7810	30.50	34.80
HMB+ARG	3	34.0000	1.25300	.72342	30.8874	37.1126	32.80	35.30
HMB+TRY	3	30.8000	1.70880	.98658	26.5551	35.0449	29.20	32.60
HMB+THR	3	33.8667	2.59679	1.49926	27.4159	40.3175	31.60	36.70
NHMB+ARG	3	31.0000	2.78747	1.60935	24.0755	37.9245	29.10	34.20
NHMB+TRY	3	32.5000	4.30929	2.48797	21.7951	43.2049	29.30	37.40
NHMB+THR	3	34.2000	1.38924	.80208	30.7489	37.6511	32.60	35.10
Total	21	32.7810	2.50332	.54627	31.6415	33.9205	29.10	37.40

ANOVA

Berat Tetas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	35.866	6	5.978	.935	.500
Within Groups	89.467	14	6.390		
Total	125.332	20			

Lampiran 3. Analisis ragam pengaruh injeksi HMB (hidroksin metil butirat) dan asam amino (L-threonin, L-tryptopan dan L-Arginin,) secara in ovo feeding terhadap Pertumbuhan

Descriptives

Konsumsi Pakan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	44.0000	.06245	.03606	43.8449	44.1551	43.95	44.07
HMB+ARG	3	44.5567	.48014	.27721	43.3639	45.7494	44.25	45.11
HMB+TRY	3	44.4033	.35529	.20513	43.5207	45.2859	44.04	44.75
HMB+THR	3	43.5100	.35384	.20429	42.6310	44.3890	43.19	43.89
NHMB+ARG	3	47.0167	.38018	.21949	46.0723	47.9611	46.63	47.39
NHMB+TRY	3	44.3333	.28184	.16272	43.6332	45.0335	44.11	44.65
NHMB+THR	3	45.5333	1.48109	.85511	41.8541	49.2126	44.31	47.18
Total	21	44.7648	1.23188	.26882	44.2040	45.3255	43.19	47.39

ANOVA

Konsumsi Pakan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	24.543	6	4.091	9.862	.000
Within Groups	5.807	14	.415		
Total	30.350	20			

Konsumsi Pakan

Duncan

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
KONTROL	3	43.5100		
HMB+ARG	3	44.0000		
HMB+TRY	3	44.3333	44.3333	
HMB+THR	3	44.4033	44.4033	
NHMB+ARG	3	44.5567	44.5567	
NHMB+TRY	3		45.5333	
NHMB+THR	3			47.0167
Sig.		.092	.053	1.000

Means for groups in homogeneous subsets are displayed.

Descriptives

Pertambahan Bobot Badan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	14.8433	.48840	.28198	13.6301	16.0566	14.45	15.39
HMB+ARG	3	14.1900	.78313	.45214	12.2446	16.1354	13.35	14.90
HMB+TRY	3	14.0367	1.93655	1.11807	9.2260	18.8473	11.82	15.40
HMB+THR	3	13.8800	.14799	.08544	13.5124	14.2476	13.71	13.98
NHMB+ARG	3	13.8767	1.21055	.69891	10.8695	16.8838	12.57	14.96
NHMB+TRY	3	14.1933	1.20022	.69295	11.2118	17.1749	12.98	15.38
NHMB+THR	3	14.4967	.64166	.37047	12.9027	16.0906	13.83	15.11
Total	21	14.2167	.95091	.20750	13.7838	14.6495	11.82	15.40

ANOVA

Pertambahan Bobot Badan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.201	6	.367	.323	.914
Within Groups	15.883	14	1.135		
Total	18.084	20			

Descriptives

Feed Conversi Rate

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
					Lower Bound	Upper Bound			
KONTROL	3	2.9667	.09452	.05457	2.7319	3.2015	2.86	3.04	
HMB+ARG	3	3.1467	.15308	.08838	2.7664	3.5269	3.03	3.32	
HMB+TRY	3	3.2100	.50587	.29206	1.9534	4.4666	2.86	3.79	
HMB+THR	3	3.1333	.05859	.03383	2.9878	3.2789	3.09	3.20	
NHMB+ARG	3	3.4067	.31262	.18049	2.6301	4.1833	3.12	3.74	
NHMB+TRY	3	3.1367	.25697	.14836	2.4983	3.7750	2.90	3.41	
NHMB+THR	3	3.1467	.24338	.14051	2.5421	3.7513	2.93	3.41	
Model	21	3.1638	.25847	.05640	3.0462	3.2815	2.86	3.79	
Fixed Effects			.27116	.05917	3.0369	3.2907			
Random Effects				.05917 ^a	3.0190 ^a	3.3086 ^a			-.00747

a. Warning: Between-component variance is negative. It was replaced by 0.0 in computing this random effects measure.

ANOVA

Feed Conversi Rate

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.307	6	.051	.695	.658
Within Groups	1.029	14	.074		
Total	1.336	20			

Lampiran 4 Analisis ragam pengaruh injeksi HMB (hidroksin metil butirat) dan asam amino (L-threonin, L-tryptopan dan L-Arginin,) secara in ovo feeding terhadap Morfometrik usus halus

Descriptives

Berat Duodenum

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	2.7667	.46188	.26667	1.6193	3.9140	2.50	3.30
HMB+ARG	3	3.2667	.15275	.08819	2.8872	3.6461	3.10	3.40
HMB+TRY	3	3.1667	.85049	.49103	1.0539	5.2794	2.20	3.80
HMB+THR	3	2.6333	.05774	.03333	2.4899	2.7768	2.60	2.70
NHMB+ARG	3	3.4667	.28868	.16667	2.7496	4.1838	3.30	3.80
NHMB+TRY	3	2.6333	.05774	.03333	2.4899	2.7768	2.60	2.70
NHMB+THR	3	2.7333	.55076	.31798	1.3652	4.1015	2.20	3.30
Total	21	2.9524	.48951	.10682	2.7296	3.1752	2.20	3.80

ANOVA

Berat Duodenum

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.086	6	.348	1.798	.171
Within Groups	2.707	14	.193		
Total	4.792	20			

Descriptives

Berat Jejenum								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	4.1333	.80829	.46667	2.1254	6.1412	3.20	4.60
HMB+ARG	3	5.5333	1.30512	.75351	2.2912	8.7754	4.50	7.00
HMB+TRY	3	5.2000	.70000	.40415	3.4611	6.9389	4.70	6.00
HMB+THR	3	4.8333	1.30512	.75351	1.5912	8.0754	3.80	6.30
NHMB+ARG	3	6.3000	.62450	.36056	4.7487	7.8513	5.60	6.80
NHMB+TRY	3	4.8333	1.30512	.75351	1.5912	8.0754	3.80	6.30
NHMB+THR	3	4.3667	1.68622	.97354	.1779	8.5555	3.20	6.30
Total	21	5.0286	1.19630	.26105	4.4840	5.5731	3.20	7.00

ANOVA

Berat Jejenum					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.650	6	1.608	1.187	.368
Within Groups	18.973	14	1.355		
Total	28.623	20			

Descriptives

Berat Ilemum										
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance	
					Lower Bound	Upper Bound				
KONTROL	3	3.8333	.35119	.20276	2.9609	4.7057	3.50	4.20		
HMB+ARG	3	4.5667	.90738	.52387	2.3126	6.8207	3.90	5.60		
HMB+TRY	3	4.8333	.32146	.18559	4.0348	5.6319	4.60	5.20		
HMB+THR	3	4.0333	.75056	.43333	2.1689	5.8978	3.30	4.80		
NHMB+ARG	3	2.8333	.40415	.23333	1.8294	3.8373	2.60	3.30		
NHMB+TRY	3	3.1000	.43589	.25166	2.0172	4.1828	2.60	3.40		
NHMB+THR	3	3.8667	.28868	.16667	3.1496	4.5838	3.70	4.20		
Model	Fixed Effects	21	3.8667	.81935	.17880	3.4937	4.2396	2.60	5.60	
Random Effects				.54116	.11809	3.6134	4.1199			.42053
				.27207	3.2009	4.5324				

ANOVA

Berat Ilemum					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.327	6	1.554	5.308	.005
Within Groups	4.100	14	.293		
Total	13.427	20			

Berat Ileum

Duncan

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
KONTROL	3	2.8333		
HMB+ARG	3	3.1000	3.1000	
HMB+TRY	3		3.8333	3.8333
HMB+THR	3		3.8667	3.8667
NHMB+ARG	3		4.0333	4.0333
NHMB+TRY	3			4.5667
NHMB+THR	3			4.8333
Sig.		.556	.070	.058

Means for groups in homogeneous subsets are displayed.

Descriptives

Paniang Jejenum

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	34.6667	2.88675	1.66667	27.4956	41.8378	33.00	38.00
HMB+ARG	3	41.3333	5.50757	3.17980	27.6518	55.0149	36.00	47.00
HMB+TRY	3	39.5000	5.63471	3.25320	25.5026	53.4974	36.00	46.00
HMB+THR	3	37.3333	3.05505	1.76383	29.7442	44.9225	34.00	40.00
NHMB+ARG	3	41.6667	.57735	.33333	40.2324	43.1009	41.00	42.00
NHMB+TRY	3	44.3333	5.85947	3.38296	29.7776	58.8891	40.00	51.00
NHMB+THR	3	38.0000	2.00000	1.15470	33.0317	42.9683	36.00	40.00
Total	21	39.5476	4.59321	1.00232	37.4568	41.6384	33.00	51.00

ANOVA

Paniang Jejenum

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	185.119	6	30.853	1.824	.166
Within Groups	236.833	14	16.917		
Total	421.952	20			

Panjang Jejenum

Duncan

Perlakuan	N	Subset for alpha = 0.05	
		1	2
KONTROL	3	34.6667	
HMB+ARG	3	37.3333	37.3333
HMB+TRY	3	38.0000	38.0000
HMB+THR	3	39.5000	39.5000
NHMB+ARG	3	41.3333	41.3333
NHMB+TRY	3	41.6667	41.6667
NHMB+THR	3		44.3333
Sig.		.082	.082

Means for groups in homogeneous subsets are displayed.

Descriptives

Panjang Duodenum

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	16.3333	.57735	.33333	14.8991	17.7676	16.00	17.00
HMB+ARG	3	16.5000	.50000	.28868	15.2579	17.7421	16.00	17.00
HMB+TRY	3	15.6667	1.52753	.88192	11.8721	19.4612	14.00	17.00
HMB+THR	3	17.0000	1.00000	.57735	14.5159	19.4841	16.00	18.00
NHMB+ARG	3	17.3333	.57735	.33333	15.8991	18.7676	17.00	18.00
NHMB+TRY	3	18.0000	2.64575	1.52753	11.4276	24.5724	16.00	21.00
NHMB+THR	3	17.0000	1.00000	.57735	14.5159	19.4841	16.00	18.00
Total	21	16.8333	1.31656	.28730	16.2340	17.4326	14.00	21.00

ANOVA

Panjang Duodenum

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.167	6	1.694	.968	.481
Within Groups	24.500	14	1.750		
Total	34.667	20			

Descriptives

Panjang Ileum

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	31.0000	.00000	.00000	31.0000	31.0000	31.00	31.00
HMB+ARG	3	39.0000	4.35890	2.51661	28.1719	49.8281	36.00	44.00
HMB+TRY	3	37.6667	6.42910	3.71184	21.6959	53.6374	33.00	45.00
HMB+THR	3	37.6667	1.52753	.88192	33.8721	41.4612	36.00	39.00
NHMB+ARG	3	42.0000	5.56776	3.21455	28.1689	55.8311	36.00	47.00
NHMB+TRY	3	36.0000	5.29150	3.05505	22.8552	49.1448	30.00	40.00
NHMB+THR	3	32.6667	3.78594	2.18581	23.2619	42.0715	30.00	37.00
Total	21	36.5714	5.12417	1.11819	34.2389	38.9039	30.00	47.00

ANOVA

Panjang Ileum

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	253.143	6	42.190	2.172	.109
Within Groups	272.000	14	19.429		
Total	525.143	20			

j

Panjang Ileum

Duncan

Perlakuan	N	Subset for alpha = 0.05	
		1	2
KONTROL	3	31.0000	
HMB+ARG	3	32.6667	
HMB+TRY	3	36.0000	36.0000
HMB+THR	3	37.6667	37.6667
NHMB+ARG	3	37.6667	37.6667
NHMB+TRY	3	39.0000	39.0000
NHMB+THR	3		42.0000
Sig.		.065	.152

Means for groups in homogeneous subsets are displayed.

Lampiran 5 Analisis ragam pengaruh injeksi HMB (hidroksin metil butirat) dan asam amino (L-threonin, L-tryptopan dan L-Arginin,) secara in ovo feeding terhadap Histologi Usus

Descriptives

Lebar Vili

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	7.4484E2	12.74292	7.35713	713.1882	776.4985	736.72	759.53
HMB+ARG	3	5.8033E2	54.07337	31.21928	446.0076	714.6590	542.78	642.31
HMB+TRY	3	8.5463E2	214.96968	1.2411E2	320.6157	1388.6443	606.51	984.96
HMB+THR	3	6.0103E2	158.56086	91.54516	207.1430	994.9170	435.25	751.22
NHMB+ARG	3	4.8278E2	115.41339	66.63395	196.0772	769.4828	351.89	569.93
NHMB+TRY	3	7.8774E2	169.61478	97.92714	366.3969	1209.0898	608.30	945.43
NHMB+THR	3	7.1566E2	112.67458	65.05270	435.7642	995.5625	594.30	816.95
Total	21	6.8100E2	168.28059	36.72184	604.4029	757.6037	351.89	984.96

ANOVA

Lebar Vili

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	307917.543	6	51319.590	2.780	.054
Within Groups	258449.613	14	18460.687		
Total	566367.156	20			

Descriptives

Tinggi Vili

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	1.1151E3	139.39056	80.47718	768.8813	1461.4120	971.74	1250.14
HMB+ARG	3	1.4652E3	373.70462	2.1575E2	536.9063	2393.5737	1220.34	1895.38
HMB+TRY	3	3.1082E3	1242.56064	7.1739E2	21.5449	6194.9284	1781.81	4245.16
HMB+THR	3	2.5241E3	126.84303	73.23286	2208.9878	2839.1789	2426.30	2667.41
NHMB+ARG	3	1.5531E3	311.92411	1.8008E2	778.2875	2328.0125	1252.24	1875.03
NHMB+TRY	3	1.8206E3	553.59727	3.1962E2	445.4315	3195.8552	1264.93	2372.10
NHMB+THR	3	1.3989E3	191.17669	1.1037E2	923.9641	1873.7826	1266.69	1618.08
Total	21	1.8551E3	817.69920	1.7843E2	1482.8411	2227.2655	971.74	4245.16

ANOVA

Tinggi Vili

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9053747.344	6	1508957.891	4.891	.007
Within Groups	4318892.177	14	308492.298		
Total	1.337E7	20			

Tinggi Vili

Duncan

Perla kuan	N	Subset for alpha = 0.05		
		1	2	3
KONTROL	3	1.1151E3		
HMB+ARG	3	1.3989E3		
HMB+TRY	3	1.4652E3		
HMB+THR	3	1.5531E3	1.5531E3	
NHMB+ARG	3	1.8206E3	1.8206E3	
NHMB+TRY	3		2.5241E3	2.5241E3
NHMB+THR	3			3.1082E3
Sig.		.179	.060	.219

Means for groups in homogeneous subsets are displayed.

Lebar Vili

Duncan

Perla kuan	N	Subset for alpha = 0.05		
		1	2	3
KONTROL	3	4.8278E2		
HMB+ARG	3	5.8033E2	5.8033E2	
HMB+TRY	3	6.0103E2	6.0103E2	6.0103E2
HMB+THR	3	7.1566E2	7.1566E2	7.1566E2
NHMB+ARG	3		7.4484E2	7.4484E2
NHMB+TRY	3		7.8774E2	7.8774E2
NHMB+THR	3			8.5463E2
Sig.		.072	.111	.056

Means for groups in homogeneous subsets are displayed.

Descriptives

Luas Permukaan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	3.3955E3	827.83194	4.7794E2	1339.0381	5451.9352	2697.05	4309.90
HMB+ARG	3	5.4050E3	1740.31455	1.0047E3	1081.7957	9728.1577	3702.41	7180.73
HMB+TRY	3	1.0764E4	4335.65293	2.5031E3	-6.6423	21534.0756	6174.99	14791.74
HMB+THR	3	9.0541E3	4262.99705	2.4612E3	-1535.8151	19643.9284	6532.81	13976.05
NHMB+ARG	3	4.9046E3	550.26609	3.1769E2	3537.6866	6271.5601	4419.50	5502.55
NHMB+TRY	3	5.5176E3	1403.25220	8.1016E2	2031.7516	9003.4950	4100.02	6906.07
NHMB+THR	3	5.1170E3	698.44452	4.0324E2	3381.9210	6851.9857	4542.68	5894.48
Total	21	6.3082E3	3232.68510	7.0543E2	4836.7046	7779.7059	2697.05	14791.74

ANOVA

Luas Permukaan

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.221E8	6	2.035E7	3.279	.031
Within Groups	8.689E7	14	6206394.978		
Total	2.090E8	20			

Luas Permukaan

Duncan

Perlu kuan	N	Subset for alpha = 0.05		
		1	2	3
KONTROL	3	3.3955E3		
HMB+ARG	3	4.9046E3	4.9046E3	
HMB+TRY	3	5.1170E3	5.1170E3	
HMB+THR	3	5.4050E3	5.4050E3	
NHMB+ARG	3	5.5176E3	5.5176E3	
NHMB+TRY	3		9.0541E3	9.0541E3
NHMB+THR	3			1.0764E4
Sig.		.359	.085	.415

Means for groups in homogeneous subsets are displayed.

Descriptives

Kedalaman Kriteria

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	6.7569E2	88.99316	51.38022	454.6187	896.7613	585.14	763.04
HMB+ARG	3	7.4203E2	195.66752	1.1296E2	255.9649	1228.0951	516.15	859.38
HMB+TRY	3	8.8536E2	475.46938	2.7451E2	-295.7681	2066.4947	467.81	1402.86
HMB+THR	3	1.0669E3	472.92989	2.7304E2	-107.9096	2241.7363	525.43	1398.97
NHMB+ARG	3	8.1497E2	133.61872	77.14481	483.0460	1146.9006	675.28	941.55
NHMB+TRY	3	7.4874E2	105.12732	60.69529	487.5893	1009.8907	630.52	831.72
NHMB+THR	3	9.8405E2	138.60410	80.02312	639.7383	1328.3617	828.13	1093.28
Total	21	8.4539E2	268.98391	58.69710	722.9543	967.8343	467.81	1402.86

ANOVA

Kedalaman Kriteria

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	358934.477	6	59822.413	.770	.606
Within Groups	1088112.366	14	77722.312		
Total	1447046.844	20			

Lampiran 6 Analisis ragam pengaruh injeksi HMB (hidroksin metil butirat) dan asam amino (L-threonin, L-tryptopan dan L-Arginin,) secara in ovo feeding terhadap Performa Pratetas Histologi Otot Dada Usia 10 Minggu

Descriptives

Jumlah Myofiber

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	1.2467E2	11.46744	6.62073	96.1800	153.1534	116.00	137.67
HMB+ARG	3	1.0889E2	32.01041	18.48122	29.3717	188.4083	84.00	145.00
HMB+TRY	3	77.3300	19.05256	11.00000	30.0008	124.6592	66.33	99.33
HMB+THR	3	94.5567	17.48312	10.09389	51.1262	137.9872	83.00	114.67
NHMB+ARG	3	93.6700	13.74773	7.93725	59.5188	127.8212	78.67	105.67
NHMB+TRY	3	1.2656E2	28.87645	16.67183	54.8236	198.2898	103.67	159.00
NHMB+THR	3	1.3611E2	57.57348	33.24006	-6.9104	279.1304	69.67	171.33
Total	21	1.0883E2	32.03895	6.99147	94.2418	123.4097	66.33	171.33

ANOVA

Jumlah Myofiber

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8205.121	6	1367.520	1.553	.232
Within Groups	12324.766	14	880.340		
Total	20529.887	20			

Jumlah Myofiber

Duncan

Perlakuan	N	Subset for alpha = 0.05	
		1	2
KONTROL	3	77.3300	
HMB+ARG	3	93.6700	93.6700
HMB+TRY	3	94.5567	94.5567
HMB+THR	3	108.8900	108.8900
NHMB+ARG	3	124.6667	124.6667
NHMB+TRY	3	126.5567	126.5567
NHMB+THR	3		136.1100
Sig.		.089	.138

Means for groups in homogeneous subsets are displayed.

Descriptives

Luas Permukaan Myofiber

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	1.5649E3	212.08204	1.2244E2	1038.0623	2091.7443	1346.64	1770.21
HMB+ARG	3	2.4989E3	603.09322	3.4819E2	1000.7067	3997.0399	1866.38	3067.48
HMB+TRY	3	2.2890E3	729.96138	4.2144E2	475.6788	4102.3279	1470.43	2872.35
HMB+THR	3	3.9223E3	3090.40983	1.7842E3	-3754.7069	11599.3003	1728.06	7456.55
NHMB+ARG	3	2.5381E3	976.76329	5.6393E2	111.6821	4964.5112	1579.36	3531.94
NHMB+TRY	3	3.9765E3	1377.94671	7.9555E2	553.5239	7399.5427	3023.78	5556.51
NHMB+THR	3	1.6404E3	195.75674	1.1302E2	1154.1266	2126.7000	1522.43	1866.38
Total	21	2.6329E3	1482.95098	3.2360E2	1957.8431	3307.9055	1346.64	7456.55

ANOVA

Luas Permukaan Myofiber

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.722E7	6	2869378.347	1.501	.248
Within Groups	2.677E7	14	1911900.161		
Total	4.398E7	20			

Descriptives

Diameter

Myofiber

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
KONTROL	3	20.5633	12.68257	7.32229	-10.9419	52.0686	11.41	35.04
HMB+ARG	3	18.2233	2.58523	1.49259	11.8013	24.6454	15.25	19.94
HMB+TRY	3	18.2267	1.42606	.82333	14.6841	21.7692	16.58	19.05
HMB+THR	3	17.8567	1.65847	.95752	13.7368	21.9765	16.05	19.31
NHMB+ARG	3	17.9000	3.20144	1.84835	9.9472	25.8528	15.08	21.38
NHMB+TRY	3	20.9567	2.69419	1.55549	14.2639	27.6494	18.18	23.56
NHMB+THR	3	17.2100	3.62551	2.09319	8.2037	26.2163	14.92	21.39
Total	21	18.7052	4.71007	1.02782	16.5612	20.8492	11.41	35.04

ANOVA

Diameter Myofiber					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	37.761	6	6.293	.217	.965
Within Groups	405.935	14	28.995		
Total	443.696	20			

RIWAYAT HIDUP



A. Ariandi Alimuddin lahir di Ujung Pandang pada tanggal 01 Januari 1989, sebagai anak dari Prof. Dr. Andi Alimuddin Unde, M.Si dan Ir. Andi Husbawati Malanti (rahimahullah). Pada tahun 2001 penulis menyelesaikan pendidikan di Sekolah Dasar Inpres Kampus Unhas Tamalanrea Makassar, dan pada tahun 2004 penulis menyelesaikan pendidikan di Sekolah Menengah Pertama Negeri 06 Makassar, pada tahun 2007 menyelesaikan pendidikan di Sekolah Menengah Atas Negeri 16 Makassar. Pada tahun 2007 penulis diterima sebagai Mahasiswa Diploma 3 Program Studi Teknologi Dan Manajemen Ternak Institut Pertanian Bogor melalui jalur Penelusuran Minat dan Kemampuan (PMDK). Pada tahun 2010 penulis melanjutkan sebagai Mahasiswa Peternakan Universitas Muhammadiyah Malang. Selama mahasiswa, penulis aktif mengikuti kegiatan organisasi kemahasiswaan (ROHIS dan BEM). Pada tahun 2012-2013 penulis diterima di perusahaan Peternakan PT. Japfa Comfeed, Tbk. Pada tahun 2014-2017 penulis diterima di Perusahaan printer. Pada tahun 2018 penulis diterima di Universitas Hasanuddin sebagai staf administrasi. Pada tahun 2022 melanjutkan kuliah magister Fakultas Peternakan Universitas Hasanuddin dan lulus tahun 2024.