

DAFTAR PUSTAKA

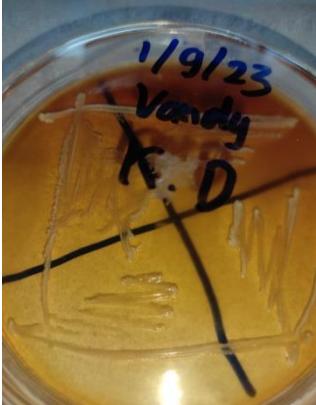
- Abdelshafy, A. M., El-Naggar, E. A., & Kenawi, M. N. (2022). Moringa leaves for improving the health benefits of quinoa fermented by probiotics. *Food Bioengineering*, 1(3–4), 264–275. <https://doi.org/10.1002/fbe2.12035>
- Agustine, L., Okfrianti, Y., & Jum, J. (2018). Identifikasi Total Bakteri Asam Laktat (BAL) pada Yoghurt dengan Variasi Sukrosa dan Susu Skim. *Jurnal Dunia Gizi*, 1, 79. <https://doi.org/10.33085/jdg.v1i2.2972>
- Anindita, N. S., Novalina, D., & Sholihah, A. N. (2021). *Isolasi Dan Identifikasi Fenotipik Bakteri Asam Laktat (BAL) Indigenous Asal Air Susu Ibu (ASI)*. 5(1), 18–23.
- Aydin, S. (2020). Total phenolic content, antioxidant, antibacterial and antifungal activities, ft-ir analyses of Brassica oleracea L. var. acephala AND Ornithogalum umbellatum L. *Genetika*, 52(1), 229–244. <https://doi.org/10.2298/GENS2001229A>
- Bujna, E., Farkas, N. A., Tran, A. M., Dam, M. S., & Nguyen, Q. D. (2017). Lactic acid fermentation of apricot juice by mono- and mixed cultures of probiotic Lactobacillus and Bifidobacterium strains. *Food Science Biotechnology*, 27(2), 547-554. <https://doi.org/10.1007/s10068-017-0269-x>
- Conway, P. L., Gorbach, S. L., & Goldin, B. R. (1987). Survival of Lactic Acid Bacteria in the Human Stomach and Adhesion to Intestinal Cells. *Journal of Dairy Science*, 70(1), 1–12. [https://doi.org/10.3168/jds.S0022-0302\(87\)79974-3](https://doi.org/10.3168/jds.S0022-0302(87)79974-3)
- Dewi, I. G. A. K., & I Gusti Nandri Andriwiyuto D Putra, N. S. (Universitas U. (2013). Pengembangan Starter Dari Lactobacillus Spp. Isolat Susu Kuda Sumbawa Untuk Pembuatan Susu Terfermentasi. *Jurnal Farmasi Udayana*, 2.
- Dian, V., Nursyirwani, & Effendi2, I. (2018). ISOLATION AND IDENTIFICATION OF LACTIC ACID BACTERIA FROM CINCALUK AND THE ACTIVITY AGAINST BACTERIA Vibrio alginolyticus AND Aeromonas hydrophila. *Journal of Rehabilitation Medicine*, 35(1), 1–6.
- Diyaulhaq, R. G., Miftah, A. M., & Arumsari, A. (2020). *Minuman Probiotik Sari Daun Kelor (Moringa oleifera Lam .) dengan Kultur Starter Bakteri Lactobacillus acidophilus*. 6, 208–214.
- Dwidjoseputro. (2005). *Dasar-Dasar Mikrobiologi* (12th ed.). Jakarta.
- FAO/WHO. (2002). Fao Who 2002. In *WHO working group report on drafting guidelines for the evaluation of probiotics in food* (p. 30).
- Gibson GR, R. M. (1995). Dietary modulation of the human colonic microbiota: introducing the concept of prebiotics. *J Nutri*, 125(6), 1–12. <https://doi.org/10.1093/jn/125.6.1401>
- Hardiningsih, R., Nonta, R., Napitupul, R., & Yulinery, T. (2005). Isolation and resistance test of several isolates of Lactobacillus in low pH. *Biodiversitas Journal of Biological Diversity*, 7(1), 15–17. <https://doi.org/10.13057/biodiv/d070105>
- Karina, R. P. (2018). *Isolasi dan Karakterisasi Bakteri Asam Laktat Asal Jejunum Kelinci (Oryctolagus cuniculus) Sebagai Kandidat Probiotik*. <http://repository.ub.ac.id/161467/>
- Khedid, K., Faid, M., Mokhtari, A., Soulaymani, A., & Zinedine, A. (2009). Characterization of lactic acid bacteria isolated from the one humped camel milk produced in Morocco. *Microbiological Research*, 164(1), 81–91. <https://doi.org/10.1016/j.micres.2006.10.008>

- Khotimah, K., & Kusnadi, J. (2014). Antibacterial Activity of Probiotic Date Fruit (*Phoenix dactilyfera* L.) Beverages Using *Lactobacillus plantarum* and *Lactobacillus casei*. *Jurnal Pangan Dan Agroindustri*, 2(3), 110–120.
- Kittibunchakul, S., Yuthaworawit, N., Whanmek, K., Suttisansanee, U., & Santivarangkna, C. (2021). Health beneficial properties of a novel plant-based probiotic drink produced by fermentation of brown rice milk with GABA-producing *Lactobacillus pentosus* isolated from Thai pickled weed. *Journal of Functional Foods*, 86(August), 104710. <https://doi.org/10.1016/j.jff.2021.104710>
- Kurnia, M., Amir, H., & Handayani, D. (2020). Isolasi Dan Identifikasi Bakteri Asam Laktat Dari Makanan Tradisional Suku Rejang Di Provinsi Bengkulu: “Lemea.” *Alotrop*, 4(1), 25–32. <https://doi.org/10.33369/atp.v4i1.13705>
- Lagos, R. (2013). Bacteriocins. *Brenner's Encyclopedia of Genetics: Second Edition*, 1, 277–279. <https://doi.org/10.1016/B978-0-12-374984-0.00291-6>
- Lokapirnasari, W. P., Agustono, B., Al Arif, M. A., Maslachah, L., Chandra, E. H., & Yulianto, A. B. (2022). Effect of probiotic and *Moringa oleifera* extract on performance, carcass yield, and mortality of Peking duck. *Veterinary World*, 15(3), 694–700. <https://doi.org/10.14202/vetworld.2022.694-700>
- McNaught, C. E., Woodcock, N. P., MacFie, J., & Mitchell, C. J. (2002). A prospective randomised study of the probiotic *Lactobacillus plantarum* 299v on indices of gut barrier function in elective surgical patients. *Gut*, 51(6), 827–831. <https://doi.org/10.1136/gut.51.6.827>
- Meti, K., Nurpalah, & Restaviani, R. (2021). Pemanfaatan Kubis Ungu (*Brassica Oleracea* L) Sebagai Indikator Fermentasi Karbohidrat Pada Media Uji Biokimia. *Journal of Indonesian Medical Laboratory and Science*, 3(1), 27–37.
- Mubin, & E. Zubaidah. (2016). Studi pembuatan kefir nira siwalan (*Borassus flabellifer* L.) (pengaruh pengenceran nira siwalan dan metode inkubasi). *Jurnal Pangan Dan Agroindustri*, 4, 291–301.
- Muh. Amin, Sulistijowati, R., & Mile, L. (2015). Efektivitas Penghambatan Filtrat Asam Laktat *Lactobacillus* Sp. Hasil Isolasi Dari UsusIkan Bandeng (*Chanos chanos*) Terhadap Bakteri Patogen. *Prosiding Seminar Nasional Perikanan Dan Kelautan V*, 363–366.
- Nugrahani, G., Apridamayanti, P., & Sari, R. (2021). Aktivitas antibakteri yogurt hasil fermentasi *Lactobacillus plantarum* terhadap bakteri *Escherichia coli* dan *Staphylococcus aureus*. *Jurnal Cerebellum*, 6(2), 55. <https://doi.org/10.26418/jc.v6i2.45306>
- Peñuela-Martínez, A. E., Moreno-Riascos, S., & Medina-Rivera, R. (2023). Influence of Temperature-Controlled Fermentation on the Quality of Mild Coffee (*Coffea arabica* L.) Cultivated at Different Elevations. *Agriculture (Switzerland)*, 13(6). <https://doi.org/10.3390/agriculture13061132>
- Prado, F. C., Parada, J. L., Pandey, A., & Soccol, C. R. (2008). Trends in non-dairy probiotic beverages. *Food Research International*, 41(2), 111–123. <https://doi.org/10.1016/j.foodres.2007.10.010>
- Primurdia, E. G., & Kusnadi, J. (2014). Aktivitas Antioksidan Minuman Probiotik Sari Kurma (*Phoenix dactilyfera* L) dengan Isolat *L. plantarum* dan *L. casei*. *Jurnal Pangan Dan Agroindustri*, 2, 98–109.

- Rahayu, E. S., Wardani, A. K., & Margino, S. (2004). Skrining Bakteri Asam Laktat Penghasil Bakteriosin dari Daging dan Produk Olahannya. In *Agritech* (Vol. 24, Issue 2, pp. 74–81).
- Rahman, I. W., Fadlilah, R. N., Ka’bah, Kristiana, H. N., & Dirga, A. (2022). Potensi Ekstrak Daun Jambu Biji (*Psidium guajava*) dalam Menghambat Pertumbuhan *Serattia marcescens*. *Jurnal Ilmu Alam Dan Lingkungan*, 13(1), 14–22.
- Ray, B. (2005). Food microbiology laboratories. In *Nutrition & Food Science* (Vol. 35, Issue 1). <https://doi.org/10.1108/nfs.2005.01735aab.015>
- Sari, Anita, R., Nofiani, R., & Ardiningsih, P. (2012). KARAKTERISASI BAKTERI ASAM LAKTAT GENUS *Leuconostoc* DARI PEKASAM ALE-ALE HASIL FORMULASI SKALA LABORATORIUM. *Jurnal Kimia*, 1(1 ISSN 2302-1077), 14–20.
- Satriani. (2017). Karakteristik Whey Dangke Yang Difermentasi Dengan *Lactobacillus casei* Pada Penambahan CaCO₃. *Skripsi*, 1(1), 1–45.
- Suhaeni. (2018). Uji Total Asam Dan Organoleptik Yoghurt Katuk (*Sauropus Androgynus*). 09(1), 21–28.
- Suhaeni, & Syakur, A. (2016). Isolasi dan Identifikasi Bakteri Asam Laktat Dangke Asal Kabupaten Enrekang Sulawesi Selatan. *Jurnal Ilmiah Biologi*, 4(2), 79–83.
- Suryono, Sudono, A., Sudarwanto, M., & Apriyantono, A. (2005). Studi Pengaruh Penggunaan *Bifidobacteria* terhadap Flavor Yoghurt. 16, 62–70.
- Tyl, C., & Sadler, G. D. (2017). pH and Titratable Acidity. In: Nielsen, S.S. (eds) Food Analysis. Food Science Text Series. Springer, Cham. *Food Analysis*, 389–406. <https://doi.org/10.1007/978-3-319-45776-5>
- Wasis, N. O., Antara, N. S., & Gunam, I. B. W. (2019). Viability study of lactic acid bacteria isolates isolated from cabbage at low pH and bile salts. *Jurnal Rekayasa Dan Manajemen Agroindustri*, 7, 1–10. <https://doi.org/10.24843/JRMA.2019.v07.i01.p01>
- Yanti, D. I. W., & Dali, F. A. (2013). Karakterisasi Bakteri Asam Laktat Yang Diisolasi Selama Fermentasi Bakasang. *Jphpi*, 16(2), 133–141.
- Zahro, F. (2014). Isolasi dan Identifikasi Bakteri Asam Laktat Asal Fermentasi Markis Ungu (*Passiflora edulis* var.) Sebagai Penghasil Eksopolisakarida. *Applied Microbiology and Biotechnology*, July, 1–100. <http://elibrary.almaata.ac.id/1714/%0Ahttps://osf.io/yejcm/%0Ahttp://elibrary.almaata.ac.id%0Ahttps://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2019-030624%0Ahttps://ppjp.ulm.ac.id/journal/index.php/JPKMI/article/view/2758%0Ahttp://stikara.ac.id/jupermik>
- Zakaria, Y. (2009). Pengaruh Jenis Susu dan Persentase Starter yang Berbeda terhadap Kualitas Kefir. *Jurnal Agripet*, 9(1), 26–30. <https://doi.org/10.17969/agripet.v9i1.618>

LAMPIRAN

Lampiran 1. Uji Morfologi Bakteri Asam Laktat

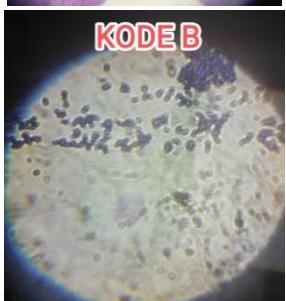
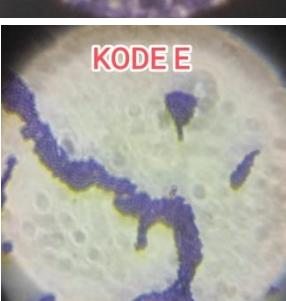
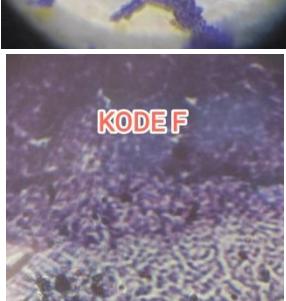
Isolat	Bentuk	Tepian	Elevasi	Warna	Gambar
A	Sirkuler	Entire	Raised	Krem	
B	Sirkuler	Entire	Raised	Krem	
D	Sirkuler	Entire	Raised	Krem	
E	Sirkuler	Entire	Raised	Krem	

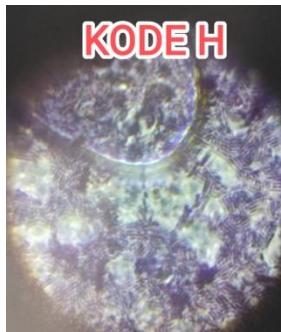
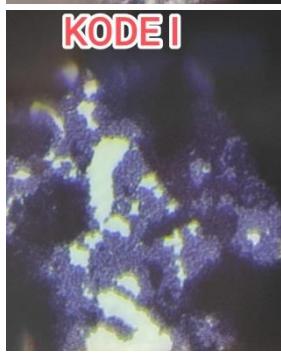
F	Sirkuler	Entire	Raised	Krem	
H	Sirkuler	Entire	Convex	Krem	
I	Sirkuler	Entire	Raised	Krem	
J	Sirkuler	Entire	Convex	Krem	

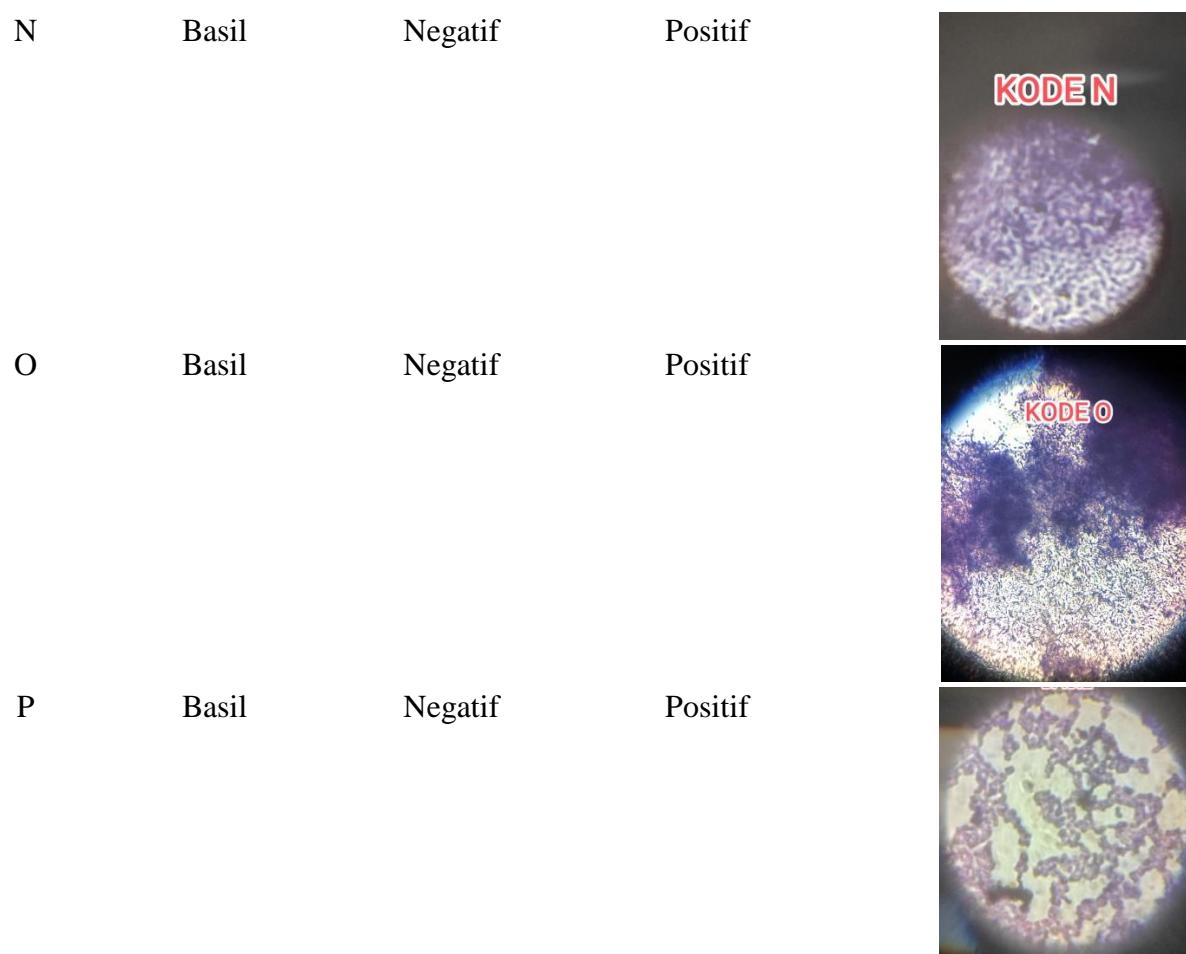
Isolat	Bentuk Isolat	Katalase	Gram	Gambar	
K	Sirkuler	Entire	Raised	Krem	
M	Sirkuler	Entire	Raised	Krem	
N	Sirkuler	Entire	Raised	Krem	
O	Sirkuler	Entire	Raised	Krem	
P	Sirkuler	Entire	Raised	Krem	

Lampiran 2. Hasil Uji Gram dan Katalase

Isolat Bentuk Isolat Katalase Gram Gambar

A	Basil	Positif	Positif	
B	Basil	Negatif	Positif	
D	Basil	Negatif	Positif	
E	Basil	Negatif	Positif	
F	Basil	Negatif	Positif	

H	Basil	Negatif	Positif	
I	Basil	Negatif	Positif	
J	Basil	Negatif	Positif	
K	Basil	Negatif	Positif	
M	Basil	Negatif	Positif	



Lampiran 3. Data Penelitian dan Pengujian Ketahanan Asam, Sidik Ragam, Duncan

KODE ISOLAT	KETAHANAN ASAM (JAM)								
	pH2			pH4			pH6		
	U1	U2	U3	U1	U2	U3	U1	U2	U3
B	0.775	0.770	0.764	1.675	1.670	1.672	1.730	1.738	1.734
D	1.031	1.038	1.039	2.000	2.000	2.000	2.300	2.300	2.300
E	1.210	1.200	1.253	1.880	1.889	1.880	2.200	2.200	2.200
H	1.163	1.117	1.119	1.827	1.833	1.825	2.200	2.200	2.200
I	0.541	0.570	0.537	0.765	0.770	0.752	1.603	1.605	1.621
J	1.121	1.127	1.138	1.901	1.893	1.700	2.000	1.995	1.954
M	0.715	0.702	0.710	1.028	1.030	1.025	2.200	2.200	2.200
N	0.429	0.430	0.425	0.545	0.538	0.549	1.913	1.902	1.906
O	0.485	0.450	0.501	1.697	1.735	1.762	1.770	1.800	1.777
P	0.580	0.547	0.558	0.927	0.926	0.901	1.608	1.610	1.613
Kontrol	0.020	0.020	0.018				0.120	0.120	0.125

	pH				
	pH2	pH4	pH6	RATA2	DEVIASI
KONTROL	0.019	0.125	0.122	0.09	0.06
B	0.770	1.672	1.734	1.39	0.5
D	1.036	2.000	2.300	1.78	0.7
E	1.221	1.883	2.200	1.77	0.5
H	1.133	1.828	2.200	1.72	0.5
I	0.549	0.762	1.610	0.97	0.6
J	1.129	1.831	1.983	1.65	0.5
M	0.709	1.028	2.200	1.31	0.8
N	0.428	0.544	1.907	0.96	0.8
O	0.479	1.731	1.782	1.33	0.7
P	0.562	0.918	1.610	1.03	0.5
RATA2	0.802	1.42	1.95		
DEVIASI	0.302	0.543	0.262		

Tests of Between-Subjects Effects

Dependent Variable: pH

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8.695 ^a	9	.966	3.282	.002
Intercept	174.248	1	174.248	591.981	.000
Isolat	8.695	9	.966	3.282	.002
Error	23.548	80	.294		
Total	206.491	90			
Corrected Total	32.243	89			

pH

Duncan^{a,b}

Isolat	N	Subset						
		1	2	3	4	5	6	7
KODE N	9	.96078						
KODE I	9	.97378						
KODE P	9		1.03000					
KODE M	9			1.31222				
KODE O	9			1.33078				
KODE B	9				1.39200			
KODE J	9					1.64767		
KODE H	9						1.72044	
KODE E	9							1.76800
KODE D	9							1.77867
Sig.		.269	1.000	.117	1.000	1.000	1.000	.364

Lampiran 4. Data Penelitian, Sidik Ragam, dan Duncan pH

MIKROORGANISME	ULANGAN			RATA-RATA	DEVIASI
	U1	U2	U3		
	5.49	5.5	5.53	5.51	0.02
NB	5.38	5.4	5.4	5.39	0.01
B	4.19	4.21	4.21	4.20	0.01
D	4.23	4.23	4.21	4.22	0.01
E	4.23	4.2	4.21	4.21	0.02
H	4.21	4.23	4.21	4.22	0.01
J	4.19	4.19	4.19	4.19	0.00

ANOVA

Nilai pH

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.618	6	1.103	6434.259	.000
Within Groups	.002	14	.000		
Total	6.620	20			

Nilai pHDuncan^a

Kode Bakteri	N	Subset for alpha = 0.05			
		1	2	3	4
Kode j	3	4.1900			
Kode B	3	4.2033	4.2033		
Kode E	3	4.2133	4.2133		
Kode H	3		4.2167		
Kode D	3		4.2233		
Kontrol	3			5.3933	
Inisial	3				5.5067
Sig.		.056	.105	1.000	1.000

Lampiran 5. Data Penelitian, Sidik Ragam dan Duncan Total Asam

MIKROORGANISME	ULANGAN			RATA-RATA	DEVIASI
	U1	U2	U3		
	0.256	0.26	0.256	0.26	0.00
NB	0.768	0.77	0.768	0.77	0.00
B	1.792	1.54	1.536	1.62	0.15
D	1.536	1.79	1.536	1.62	0.15
E	1.536	1.54	1.792	1.62	0.15
H	1.536	1.54	1.792	1.62	0.15
J	1.536	1.79	1.536	1.62	0.15

ANOVA

Nilai Total Asam

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.667	6	.945	60.533	.000
Within Groups	.218	14	.016		
Total	5.886	20			

Nilai Total AsamDuncan^a

Kode Bakteri	N	Subset for alpha = 0.05		
		1	2	3
Inisial	3	.25600		
Kontrol	3		.76800	
Kode E	3			1.62133
Kode H	3			1.62133
Kode B	3			1.62133
Kode D	3			1.62133
Kode J	3			1.62133
Sig.		1.000	1.000	1.000

Lampiran 6. Data Penelitian, Sidik Ragam dan Duncan Antimikroba

(E.COLI)	ULANGAN (mm)			RATA-RATA	DEVIASI
	U1	U2	U3		
	1.72	1.63	1.62	1.66	0.06
NB	0.51	0.82	0.85	0.73	0.19
B	1.99	1.62	1.40	1.67	0.30
D	2.75	2.30	2.33	2.46	0.25
E	4.80	4.18	4.03	4.34	0.41
H	2.94	2.60	2.40	2.65	0.27
J	2.40	2.14	2.20	2.25	0.14
S. AUREUS	ULANGAN (mm)			RATA-RATA	DEVIASI
	U1	U2	U3		
	1.60	1.67	1.65	1.64	0.04
NB	0.86	0.93	0.90	0.90	0.04
B	1.19	1.22	1.02	1.14	0.11
D	4.79	5.28	4.75	4.94	0.30
E	2.33	2.46	2.52	2.43	0.10
H	2.52	2.82	2.40	2.58	0.22
J	2.88	2.44	2.93	2.75	0.27

Descriptives

Antimikroba (E.Coli)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Inisial	3	1.6567	.05508	.03180	1.5199	1.7935	1.62	1.72
Kontrol	3	.7267	.18824	.10868	.2591	1.1943	.51	.85
Kode B	3	1.6700	.29816	.17214	.9293	2.4107	1.40	1.99
Kode D	3	2.4600	.25159	.14526	1.8350	3.0850	2.30	2.75
Kode E	3	4.3367	.40821	.23568	3.3226	5.3507	4.03	4.80
Kode H	3	2.6467	.27301	.15762	1.9685	3.3249	2.40	2.94
Kode J	3	2.2467	.13614	.07860	1.9085	2.5849	2.14	2.40
Total	21	2.2490	1.08615	.23702	1.7546	2.7435	.51	4.80

Descriptives

Antibakteri (S. Aureus)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Inisial	3	1.6400	.03606	.02082	1.5504	1.7296	1.60	1.67
Kontrol	3	.8967	.03512	.02028	.8094	.9839	.86	.93
Kode B	3	1.1433	.10786	.06227	.8754	1.4113	1.02	1.22
Kode D	3	4.9400	.29513	.17039	4.2069	5.6731	4.75	5.28
Kode E	3	2.4367	.09713	.05608	2.1954	2.6779	2.33	2.52
Kode H	3	2.5800	.21633	.12490	2.0426	3.1174	2.40	2.82
Kode J	3	2.7500	.26963	.15567	2.0802	3.4198	2.44	2.93
Total	21	2.3410	1.29347	.28226	1.7522	2.9297	.86	5.28

ANOVA

Antimikroba (E.Coli)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.694	6	3.782	58.788	.000
Within Groups	.901	14	.064		
Total	23.595	20			

ANOVA

Antibakteri (S. Aureus)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	33.001	6	5.500	167.250	.000
Within Groups	.460	14	.033		
Total	33.461	20			

Antimikroba (E.Coli)Duncan^a

Kode Bakteri	N	Subset for alpha = 0.05			
		1	2	3	4
Kontrol	3	.7267			
Inisial	3		1.6567		
Kode B	3		1.6700		
Kode J	3			2.2467	
Kode D	3			2.4600	
Kode H	3			2.6467	
Kode E	3				4.3367
Sig.		1.000	.950	.087	1.000

Antibakteri (*S. Aureus*)Duncan^a

Kode Bakteri	N	Subset for alpha = 0.05			
		1	2	3	4
Kontrol	3	.8967			
Kode B	3	1.1433			
Inisial	3		1.6400		
Kode E	3			2.4367	
Kode H	3			2.5800	
Kode J	3			2.7500	
Kode D	3				4.9400
Sig.		.118	1.000	.063	1.000

Lampiran 7. Lampiran Gambar Penelitian**a. Isolasi Bakteri Asam Laktat****b. Pembuatan Minuman Fermentasi Kelor****c. Pembuatan Starter**



d. Pengujian

- Ketahanan Asam



- pH



- Total Asam



- Antimikroba

