

BAB V

KESIMPULAN DAN SARAN

5.1. KESIMPULAN

Berdasarkan hasil penelitian **Pengkajian Pengaruh Lama Penyimpanan Terhadap Mutu Biji Kakao Mulia (*Criollo/Theobroma cacao* Linn) dan Kakao Lindak (*Ferastero/Theobroma leiocarpa*)** yang dilakukan dapat disimpulkan bahwa:

1. Waktu penyimpanan hanya berpengaruh terhadap biji kakao pada parameter tertentu yaitu bilangan iod dan kadar air.
2. Biji kakao mulia mempunyai mutu kadar lemak, bilangan iod, kadar air, kadar protein dan asam amino yang hampir sama dengan biji kakao lindak.

5.2. SARAN

Peningkatan mutu dan nilai ekonomis biji kakao lindak dan kakao mulia sebaiknya dilakukan dengan pengolahan melalui beberapa tahap, yaitu fermentasi, pengeringan, sortasi dan penyimpanan sehingga diperoleh biji kakao yang mempunyai mutu baik, disamping itu biji kakao yang sudah kering sebaiknya disimpan pada gudang yang bersih dan memiliki lubang pergantian udara, sehingga mutu yang sudah diperoleh dengan baik pada waktu fermentasi tidak akan berubah dan berkurang sehingga kakao Indonesia akan memperoleh harga yang layak dipasaran dunia.



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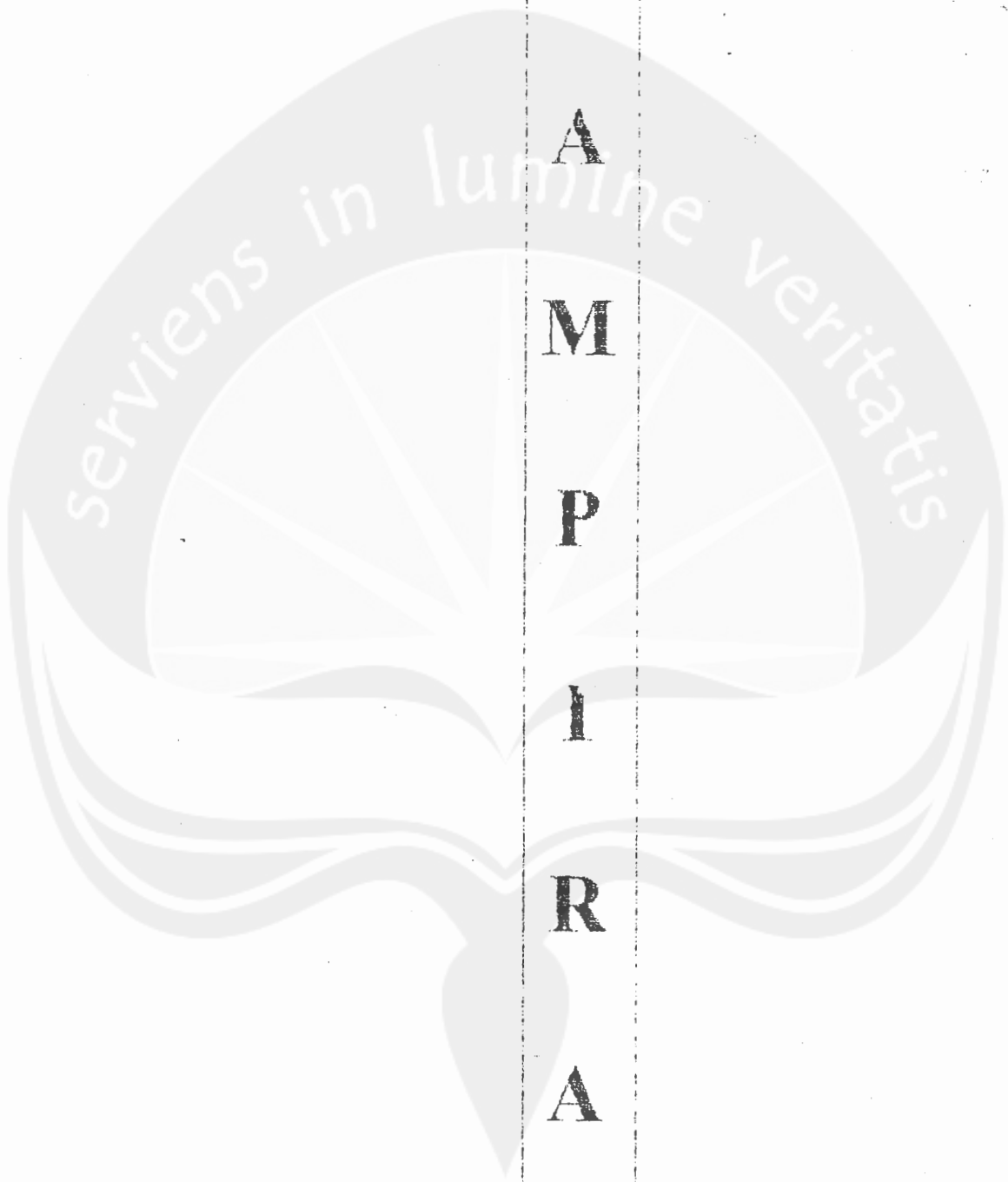
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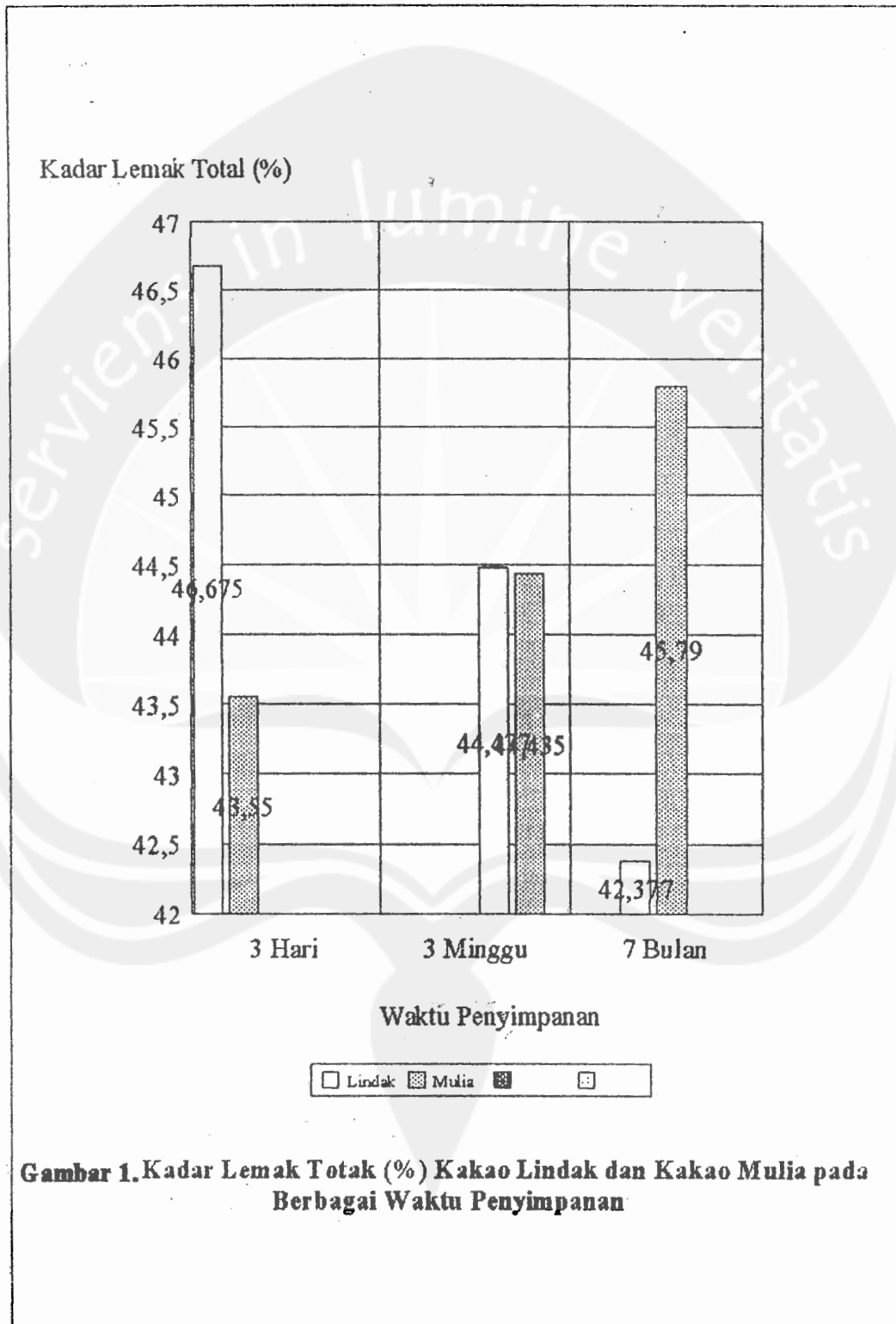
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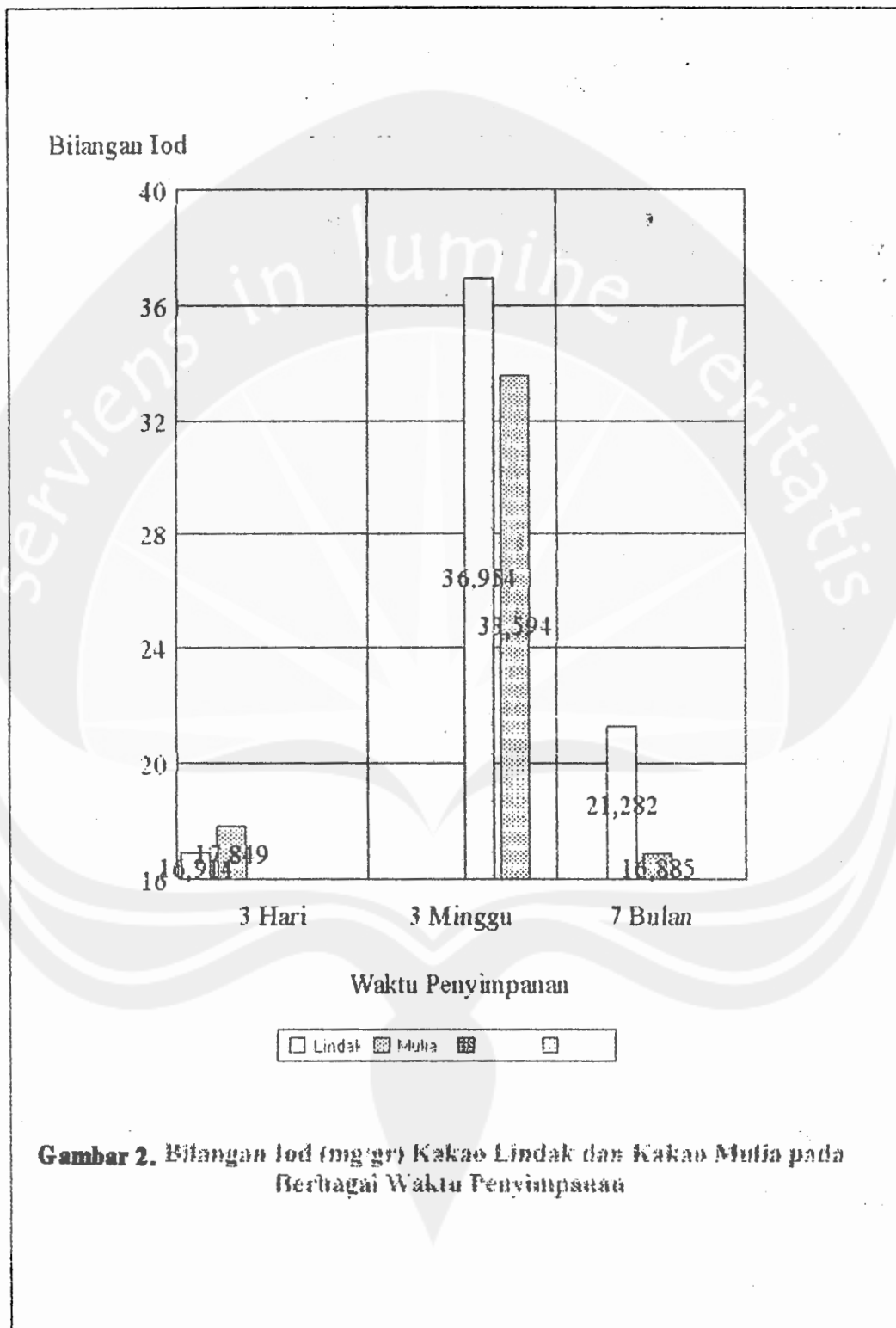
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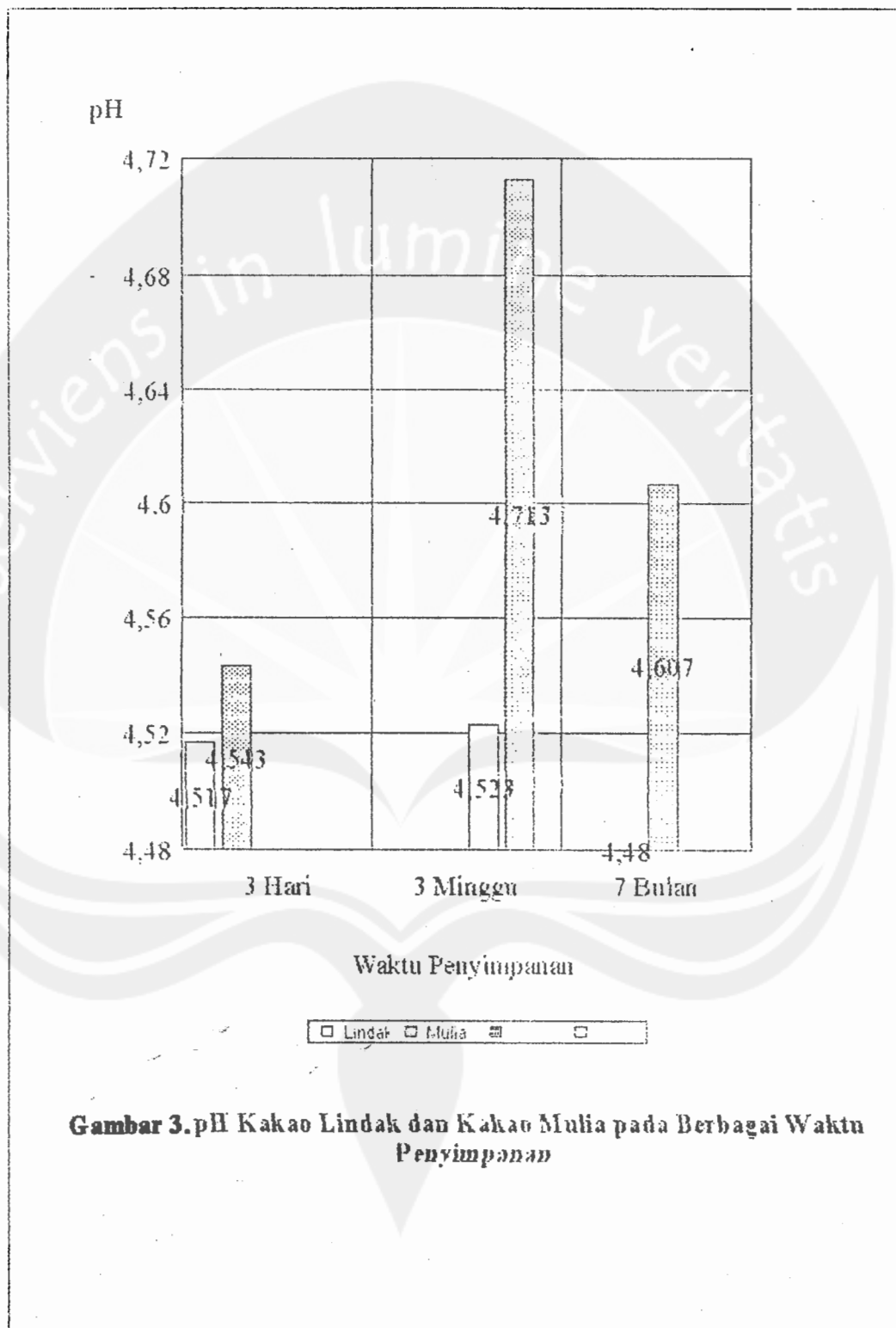
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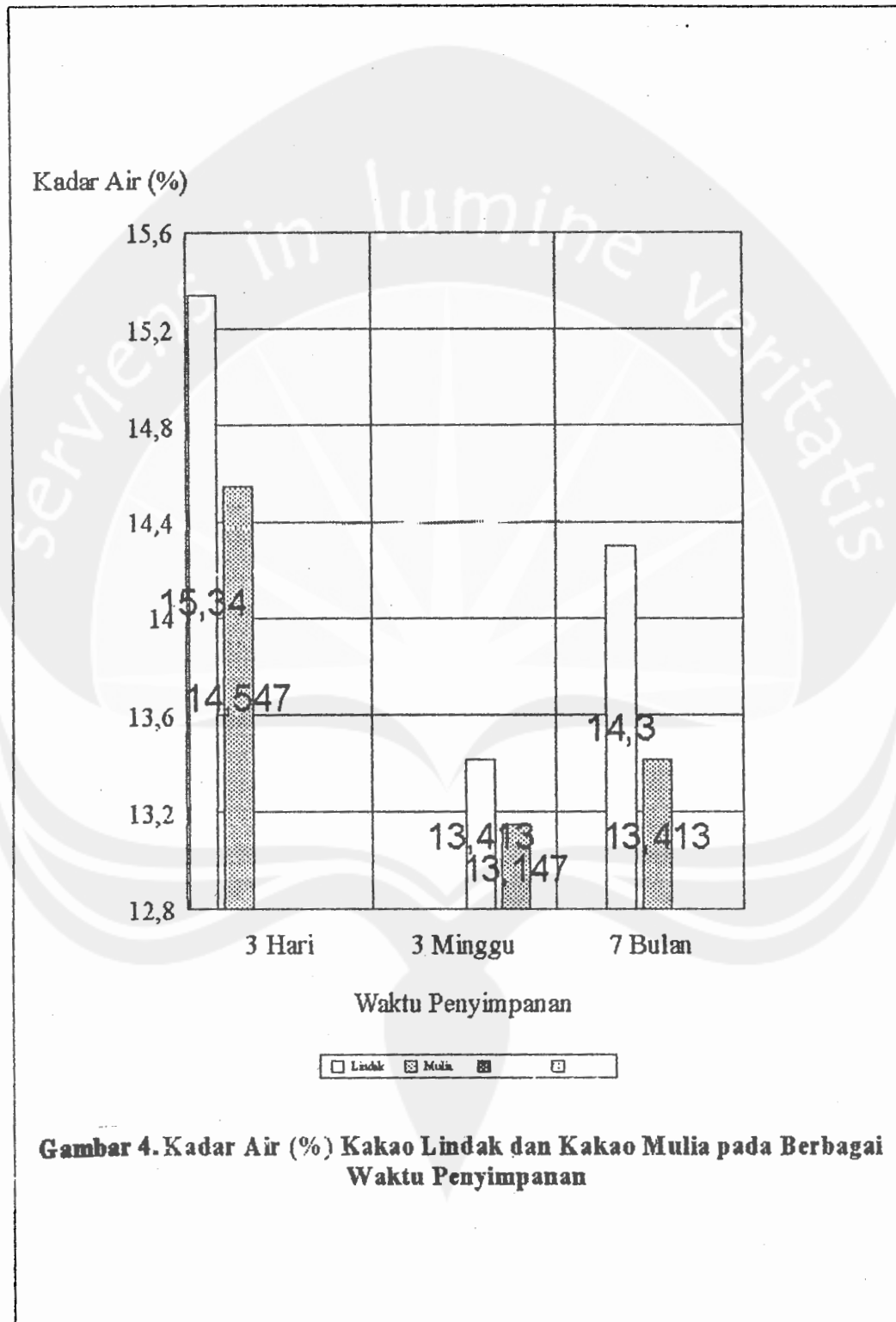
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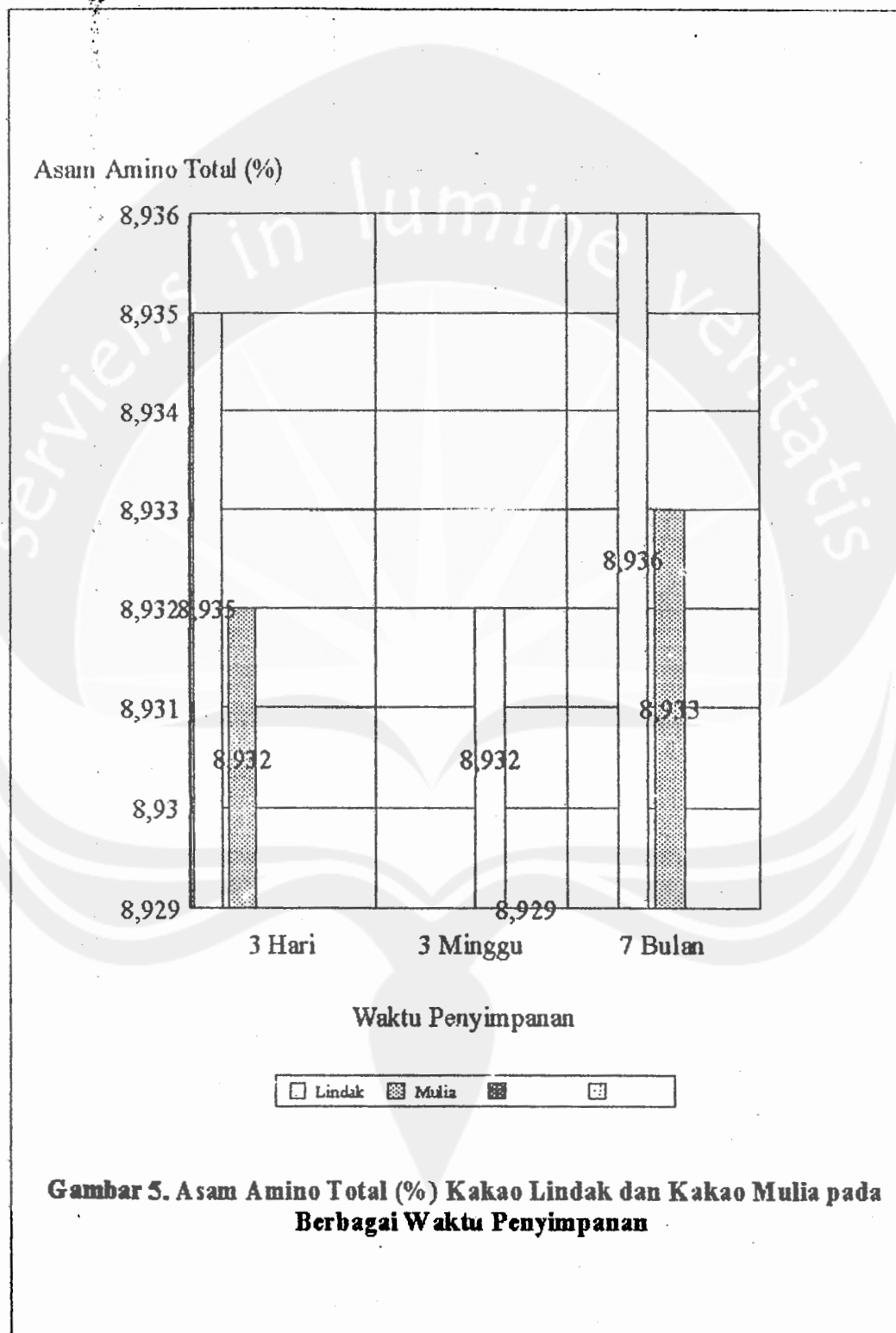


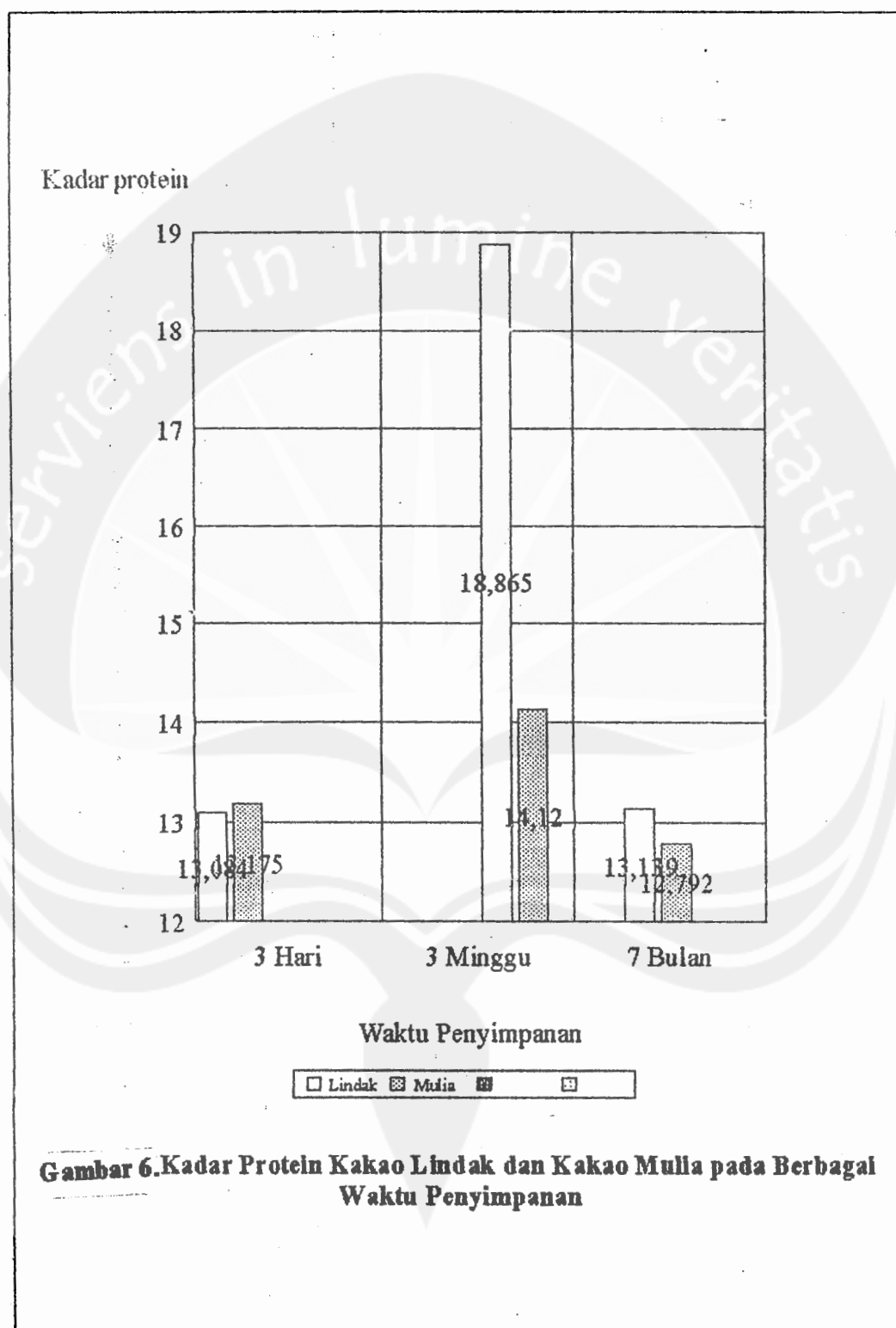




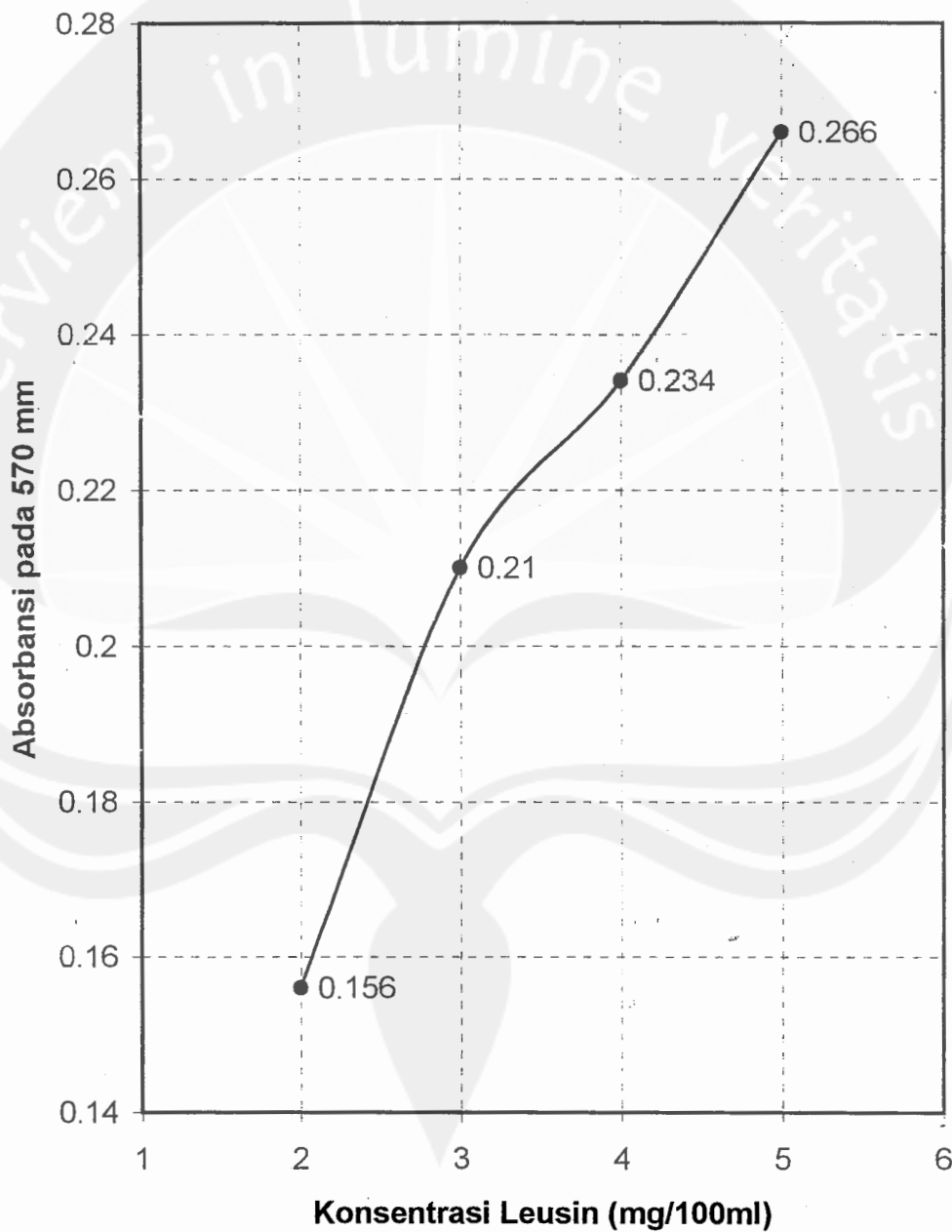








Tabel 8. Kurva Standart Asam Amino



OBS	VARIETAS	LAMA_SPN	UL	LEMAK	BIL_IOD	PROTEIN	PH	AS_AMINO	BRT_KRG
1	A	1	1	43.305	22.7940	13.037	4.41	8.9358	13.22
2	A	1	2	42.235	22.3530	13.274	4.53	8.9359	13.96
3	A	1	3	41.590	18.7000	13.106	4.50	8.9360	15.72
4	A	2	1	45.135	37.9160	13.900	4.48	8.9340	13.66
5	A	2	2	43.524	35.1801	13.793	4.52	8.9302	13.28
6	A	2	3	44.773	37.7670	13.903	4.57	8.9307	13.30
7	A	3	1	37.192	19.3230	13.140	4.61	8.9339	15.31
8	A	3	2	53.240	13.8570	12.860	4.49	8.9363	15.41
9	A	3	3	49.593	17.5610	13.253	4.45	8.9341	15.30
10	B	1	1	45.901	17.6980	12.245	4.55	8.9277	13.32
11	B	1	2	46.491	16.4330	13.061	4.60	8.9354	15.11
12	B	1	3	44.979	16.5230	13.070	4.67	8.9339	14.36
13	B	2	1	44.345	31.9340	14.577	4.78	8.9306	14.08
14	B	2	2	44.845	27.6040	13.209	4.58	8.9285	11.68
15	B	2	3	44.116	41.2430	14.574	4.78	8.9277	13.68
16	B	3	1	44.924	16.4000	12.713	4.50	8.9323	14.34
17	B	3	2	43.149	21.9960	13.508	4.52	8.9338	14.58
18	B	3	3	42.577	15.1520	13.304	4.61	8.9319	14.72

Analysis of Variance Procedure
Class Level Information

Class	Levels	Values
VARIETAS	2	A B
LAMA_SPN	3	1 2 3
UL	3	1 2 3

Number of observations in data set = 18

Analysis of Variance Procedure

Dependent Variable: LEMAK

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
VAR_LAMA	5	35.38756444	7.07751289	0.57	0.7217
VARIETAS	1	0.03042222	0.03042222	0.00	0.9613
LAMA_SPN	2	3.25680078	1.62840039	0.13	0.8783
VARIETAS*LAMA_SPN	2	32.10034144	16.05017072	1.29	0.3100
Error	12	148.90555267	12.40879606		

Corrected Total 17 184.29311711

R-Square	C.V.	Root MSE	LEMAK Mean
0.192018	7.906960	3.522612	44.5507778

Duncan's Multiple Range Test for variable: LEMAK

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 12.4088

Number of Means 2
Critical Range 3.611

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VARIETAS
A	44.592	9	B
A			
A	44.510	9	A

Duncan's Multiple Range Test for variable: LEMAK

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 12.4088

Number of Means	2	3
Critical Range	4.423	4.633

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	LAMA_SPN
A	45.113	6	3
A			
A	44.456	6	2
A			
A	44.083	6	1

Duncan's Multiple Range Test for variable: LEMAK

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 12.4088

Number of Means	2	3	4	5	6
Critical Range	6.255	6.552	6.751	6.855	6.932

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VAR_LAMA
A	46.675	3	A 3
A			
A	45.790	3	B 1
A			
A	44.477	3	A 2
A			
A	44.435	3	B 2
A			
A	43.550	3	B 3
A			
A	42.377	3	A 1

Analysis of Variance Procedure

Dependent Variable: BIL_IOD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
VAR_LAMA	5	1217.607446	243.521489	18.84	0.0001
VARIETAS	1	23.274618	23.274618	1.80	0.2045
LAMA_SPN	2	1170.343573	585.171787	45.27	0.0001
VARIETAS*LAMA_SPN	2	23.989255	11.994628	0.93	0.4220
Error	12	155.110417	12.925868		
Corrected Total	17	1372.717863			

R-Square	C.V.	Root MSE	BIL_IOD Mean
0.887005	15.03473	3.595256	23.9130056

Duncan's Multiple Range Test for variable: BIL_IOD

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 12.92587

Number of Means 2
Critical Range 3.686

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VARIETAS
A	25.050	9	A
A	22.776	9	B

Duncan's Multiple Range Test for variable: BIL_IOD

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 12.92587

Number of Means 2 3
 Critical Range 4.514 4.729

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	LAMA_SPN
A	35.274	6	2
B	19.083	6	1
B	17.381	6	3

Duncan's Multiple Range Test for variable: BIL_IOD

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 12.92587

Number of Means 2 3 4 5 6
 Critical Range 6.384 6.687 6.890 6.996 7.075

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VAR_LAMA
A	36.954	3	A 2
A			
A	33.594	3	B 2
B	21.282	3	A 1
B			
B	17.849	3	B 3
B			
B	16.914	3	A 3
B			
B	16.885	3	B 1

Analysis of Variance Procedure

Dependent Variable: PROTEIN

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
VAR_LAMA	5	3.94380894	0.78876179	4.39	0.0166
VARIETAS	1	0.00000139	0.00000139	0.00	0.9978
LAMA_SPN	2	3.65358211	1.82679106	10.18	0.0026
VARIETAS*LAMA_SPN	2	0.29022544	0.14511272	0.81	0.4684
Error	12	2.15415733	0.17951311		
Corrected Total	17	6.09796628			

R-Square	C.V.	Root MSE	PROTEIN Mean
0.646742	3.170712	0.423690	13.3626111

Duncan's Multiple Range Test for variable: PROTEIN

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.179513

Number of Means 2
Critical Range 0.434

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VARIETAS
A	13.363	9	A
A	13.362	9	B

Duncan's Multiple Range Test for variable: PROTEIN

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.179513

Number of Means 2 3

Critical Range 0.532 0.557

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	LAMA_SPN
A	13.993	6	2
B	13.130	6	3
B			
B	12.966	6	1

Duncan's Multiple Range Test for variable: PROTEIN

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.179513

Number of Means 2 3 4 5 6

Critical Range 0.752 0.788 0.812 0.824 0.834

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VAR_LAMA
A	14.120	3	B 2
A			
B	13.865	3	A 2
B			
B	13.175	3	B 3
B			
B	13.139	3	A 1
B			
B	13.084	3	A 3
C			
C	12.792	3	B 1

Analysis of Variance Procedure

Dependent Variable: PH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
VAR_LAMA	5	0.10649444	0.02129889	3.84	0.0261
VARIETAS	1	0.05893889	0.05893889	10.63	0.0068
LAMA_SPN	2	0.02721111	0.01360556	2.45	0.1278
VARIETAS*LAMA_SPN	2	0.02034444	0.01017222	1.83	0.2017
Error	12	0.06653333	0.00554444		
Corrected Total	17	0.17302778			

R-Square	C.V.	Root MSE	PH Mean
0.615476	1.631526	0.074461	4.56388889

Duncan's Multiple Range Test for variable: PH

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.005544

Number of Means 2
Critical Range .0763

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VARIETAS
A	4.6211	9	B
B	4.5067	9	A

Duncan's Multiple Range Test for variable: PH

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.005544

Number of Means 2 3
 Critical Range .0935 .0979

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	LAMA_SPN
A	4.6183	6	2
A			
A	4.5433	6	1
A			
A	4.5300	6	3

Duncan's Multiple Range Test for variable: PH

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.005544

Number of Means 2 3 4 5 6
 Critical Range 0.132 0.138 0.143 0.145 0.147

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VAR_LAMA
A	4.7133	3	B 2
A			
B	4.6067	3	B 1
B			
B	4.5433	3	B 3
B			
B	4.5233	3	A 2
B			
B	4.5167	3	A 3
B			
B	4.4800	3	A 1

Analysis of Variance Procedure

Dependent Variable: AS_AMINO

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
VAR_LAMA	5	2.50652325	0.50130465	1.00	0.4576
VARIETAS	1	0.49166833	0.49166833	0.98	0.3413
LAMA_SPN	2	1.01458662	0.50729331	1.01	0.3921
VARIETAS*LAMA_SPN	2	1.00026830	0.50013415	1.00	0.3970
Error	12	6.00865191	0.50072099		
Corrected Total	17	8.51517516			

R-Square	C.V.	Root MSE	AS_AMINO Mean
0.294360	8.072248	0.707616	8.76603889

Duncan's Multiple Range Test for variable: AS_AMINO

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.500721

Number of Means 2
Critical Range 0.725

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VARIETAS
A	8.931	9	B
A	8.601	9	A

Duncan's Multiple Range Test for variable: AS_AMINO

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.500721

Number of Means 2 3
Critical Range 0.888 0.931

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	LAMA_SPN
A	8.934	6	1
A			
A	8.934	6	3
A			
A	8.430	6	2

Duncan's Multiple Range Test for variable: AS_AMINO

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.500721

Number of Means 2 3 4 5 6
Critical Range 1.256 1.316 1.356 1.377 1.392

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VAR_LAMA
A	8.936	3	A 1
A			
A	8.935	3	A 3
A			
A	8.933	3	B 3
A			
A	8.932	3	B 1
A			
A	8.929	3	B 2
A			
A	8.932	3	A 2

Analysis of Variance Procedure

Dependent Variable: BRT_KRG

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
VAR_LAMA	5	9.46838333	1.89367667	2.71	0.0731
VARIETAS	1	0.60133889	0.60133889	0.86	0.3721
LAMA_SPN	2	8.41563333	4.20781667	6.02	0.0155
VARIETAS*LAMA_SPN	2	0.45141111	0.22570556	0.32	0.7303
Error	12	8.39386667	0.69948889		
Corrected Total	17	17.86225000			

R-Square	C.V.	Root MSE	BRT_KRG Mean
0.530078	5.902985	0.836355	14.1683333

Duncan's Multiple Range Test for variable: BRT_KRG

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.699489

Number of Means 2
Critical Range 0.857

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VARIETAS
A	14.351	9	A
A	13.986	9	B

Duncan's Multiple Range Test for variable: BRT_KRG

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.699489

Number of Means 2 3
Critical Range 1.050 1.100

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	LAMA_SPN
A	14.943	6	3
A			
B A	14.282	6	1
B			
B	13.280	6	2

Duncan's Multiple Range Test for variable: BRT_KRG

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 12 MSE= 0.699489

Number of Means 2 3 4 5 6
Critical Range 1.485 1.556 1.603 1.628 1.646

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	VAR_LAMA
A	15.340	3	A 3
A			
B A	14.547	3	B 3
B			
B A	14.300	3	A 1
B			
B A	14.263	3	B 1
B			
B	13.413	3	A 2
B			
B	13.147	3	B 2