
APPENDICES

Appendix Table 1. Chemical composition of fodder feed for dairy cattle

Type of feed	% DM	Chemical component, % DM					
		Protien	Fiber	Fat	N.F.E.	Ash	T.D.N
Local grass							
Feb. - May	28.6	7.5	31.2	2.1	45.2	15.3	53.2
Jun. - Sep.	21.8	8.3	33.3	3.0	39.5	15.9	50.6
Oct. - Jan.	24.8	6.0	34.5	2.1	48.5	8.9	56.1
Napier grass							
Jun. - Sep.	18.5	6.5	32.9	2.7	46.5	11.4	49.2
Oct. - Jan	24.95	4.25	33.42	3.14	48.6	10.6	55.3
Para grass							
Feb. - May.	19.6	6.1	38.1	1.9	42.6	11.4	50.4
Jun. - Sep.	24.5	6.1	34.6	2.9	47.4	9.0	56.0
Oct. - Jan.	29.6	5.1	35.5	2.7	50.1	6.6	57.6
Guinie grass							
Feb. - May.	29.0	7.9	30.7	3.1	43.8	14.5	53.9
Jun. - Sep.	23.0	7.4	37.0	2.6	43.0	10.0	47.0
Ruzy grass*							
Jul. - Sep.	25.2	nd	nd	nd	nd	nd	nd
Jumbo grass*							
Jul. - Sep.	28.5	nd	nd	nd	nd	nd	nd
Baby corn stalk	30.9	6.6	28.5	2.0	54.6	8.3	60.1
Baby corn husk	18.0	12.6	21.0	1.8	59.4	5.2	69.7
Rice straw	90.4	4.3	34.8	1.4	40.4	19.1	40.7
Rice straw with Urea 6%	92.3	10.8	35.9	1.4	32.3	19.6	42.3
Rice straw with Molas*	91.4	nd	nd	nd	nd	nd	nd

Note: * is data from formal survey and nd is no data.

: D.M = Dry Matter (% per 1 kg), T.D.N = Total digestible nutrient and N.F.E = Nitrogen free extract.

Source: Cheva-Isarakul, B. et al. 1986, and formal survey, 1997.

Appendix Table 2 Amount of fodder feed per one push car

Type of fodder feed	kg per 1 push car
Napier grass	180
Jumbo grass	180
Ruzy grass	120
Guinie grass	180
Para grass	100
Local grass	300
Baby corn stalk	200
Baby corn husk	200

Source: Formal survey, 1997.

Appendix Table 3 Price of fodder feed in the study area

Fodder feed	Price (baht/kg)
Grass fodder inside dairy farmers' grass land:	
-Napier	0.10
-Ruzy	0.20
-Para	0.15
-Guinie	0.18
-Jumbo	0.10
Grass fodder outside dairy farmers' grass land	0.34
Baby corn stalk	0.50
Baby corn husk	0.50
Rice straw	0.50
Rice straw with molasses	0.60
Silage	0.55

Source: Formal survey, 1997.

Appendix Table 4. Grass production per 1 rai (kg/rai)

Grass	Cut above ground 5 cm.			Cut above ground 15 cm.		
	RS (kg/rai.)	DS (kg/rai.)	ALL (kg/rai)	RS (kg/rai)	DS (kg/rai)	ALL (kg/rai)
Napier	3,094.13	731.52	3,825.37	3,310.73	675.35	3,386.07
Ruzy	2,095.05	264.85	2,359.95	2,998.28	230.15	2,228.42
Para	2,046.18	401.05	2,447.96	2,981.30	349.87	2,331.17
Guinie	2,215.40 ¹	333.15	2,551.54	2,228.63	354.15	2,582.76
Jumbo	2,257.20*	nd	nd	nd	nd	nd

Note: kg is weighted in dry matter and * is data from formal survey.

¹: RS = rainy season, DS = dry season and ALL = through the year

Source: Livestock Office, 1991. and Formal survey, 1997.

Appendix Table 5. Daily water consumption of dairy cattle

Age (weeks)	Body Weight (lb)	Condition	Water Consumption (gal)
4	112	Growing	1.3-1.5
8	152	Growing	1.6-2.0
12	204	Growing	2.3-2.5
16	263	Growing	3.1-3.5
20	327	Growing	4.0-4.5
26	416	Growing	4.5-6.0
60	779	Growing	6.0-8.0
84	1,023	Pregnant	8.0-10.0
1-2 years	1,000-1,200	Fattening	8.0-9.0
2-8 years	1,200-1,600	Lactating	10.0-25.0
2-8 years	1,200-1,600	Grazing	4.5-9.0

Note: 1 gal water = 8.33 lb.

Source: Ensminger, M. E., 1993.

Appendix Table 6. Total gross income in dairy farming in the study area

Items	Baht/hh/year
Cash Income:	
Raw milk income	186,030
Selling male calves and culling cows	19,645
Selling manure	4,651
Total cash income (TCI)	210,326
Variable cost:	
grazing land (preparing land, seed, fertilizer)	7,293
Concentrate feed	60,000
Fodder feed	35,000
Powder milk for calves	3,474
Treatment for dairy cattle	2,805
Mineral	1,756
Electricity	848
Fuel	5,200
Tax	275
Fixing equipment and dairy barn	7,500
Other	9,000
Total variable cost (TVC)	133,151
TCI - TVC	= 77,175

Source: Formal survey, 1997.

Appendix Table 7. The percent of income per total income and percent of variable costs per total variable costs in dairy farming.

Items	% of income or variable costs per total income or variable costs in dairy farming
Cash Income:	
Raw milk income	88.5
Selling male calves and culling cows	9.3
Selling manure	2.2
Variable cost:	
grazing land (preparing land, seed, fertilizer)	5.5
Concentrate feed	45.1
Fodder feed	26.3
Powder milk for calves	2.6
Treatment for dairy cattle	2.1
Mineral	1.3
Electricity	0.6
Fuel	3.9
Tax	0.2
Fixing equipment and dairy barn	5.6
Other	6.8

Source: Formal survey, 1997.

Appendix Table 8. The chi-square distribution

Degree of freedom	Level of Significance	
	(Probability of a value of at least as Large as the Table Entry	
	10%	5%
1	2.71	3.84
2	4.61	5.99
3	6.25	7.81
4	7.78	9.49
5	9.24	11.07
6	10.64	12.59
7	12.02	14.07
8	13.36	15.51
9	14.68	16.92
10	15.99	18.31
11	17.28	19.68
12	18.55	21.00
13	19.81	22.40
14	21.10	23.70
15	22.3	25.00

Source: Studenmund, 1991.

Appendix Table 9. Simple correlation among the variables in the final model

Variables	Yield	Ln	Lb	C	Mt	F
Yield	1.000					
Ln	.084	1.000				
Lb	.445	.191	1.000			
C	.415	.030	.167	1.000		
NMt	.660	.008	.414	.396	1.000	
F	.251	.143	.249	.277	.213	1.000
YR	.307	-.046	.148	-.015	.209	-.111
FS	.487	-.076	.211	.281	.562	.179
G	-.018	-.092	-.017	-.060	-.096	-.064
AI	-.259	.005	-.017	-.060	-.127	-.130
D1	.228	-.170	.012	.114	.204	.092
D2	-.019	.167	.128	-.010	-.099	.009

Appendix Table 9. Simple correlation among the variables in the final model (Con't)

Variables	YR	FS	G	AI	D1	D2
YR	1.000					
FS	.204	1.000				
G	.076	.352	1.000			
AI	-.021	-.078	-.038	1.000		
D1	.344	.131	.029	-.006	1.000	
D2	-.208	-.094	-.073	-.111	-.756	1.000

Appendix Table 10. OLS estimates of the production function of milk in the final model

Variable	Coefficient	Std. Error	T-ratio	Significance Level
Constant	5.451	2.819	1.934	0.056
Ln	0.032	0.042	0.076	0.450
Lb	0.252	0.121	2.084	0.040
C	0.113	0.056	2.016	0.047
NMt	0.430	0.118	3.649	0.000
F	0.073	0.073	1.004	0.318
YR	0.126	0.060	2.115	0.037
FS	0.260	0.109	2.379	0.020
G	-1.140	0.570	-2.000	0.049
AI	-0.243	0.103	-2.365	0.020
D1	0.273	0.152	1.792	0.077
D2	0.258	0.174	1.481	0.142

Breusch-Pagan Chi-Squared (D.F.) = 25.27 (11)

Appendix Table 11. OLS estimates of milk production function when dropped land and fodder feed in the model

Variable	Coefficient	Std. Error	T-ratio	Significance Level
Constant	6.025	2.771	2.174	0.032
Lb	0.296	0.116	2.560	0.012
C	0.127	0.054	2.336	0.022
NMt	0.431	0.118	3.668	0.000
YR	0.119	0.059	2.014	0.047
FS	0.262	0.109	2.405	0.018
G	-1.157	0.568	-2.037	0.045
AI	-0.259	0.102	-2.547	0.013
D1	0.230	0.148	1.552	0.124
D2	0.225	0.170	1.318	0.191
Breusch-Pagan Chi-Squared (D.F.) = 27.156 (9)				

Appendix Table 12. GLS estimates of milk production function when dropped land and fodder feed in the model

Variable	Coefficient	Std. Error	T-ratio	Significance Level
Constant	6.025	2.739	2.200	0.028
Lb	0.296	0.118	2.511	0.012
C	0.127	0.045	2.800	0.005
NMt	0.432	0.125	3.458	0.001
YR	0.119	0.056	2.129	0.033
FS	0.262	0.121	2.168	0.030
G	-1.157	0.543	-2.130	0.033
AI	-0.259	0.131	-1.974	0.048
D1	0.230	0.115	1.994	0.046
D2	0.225	0.143	1.575	0.115

R-squared = 0.608

Adjust R-squared = 0.569

F-Statistics (9,90) = 15.49

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