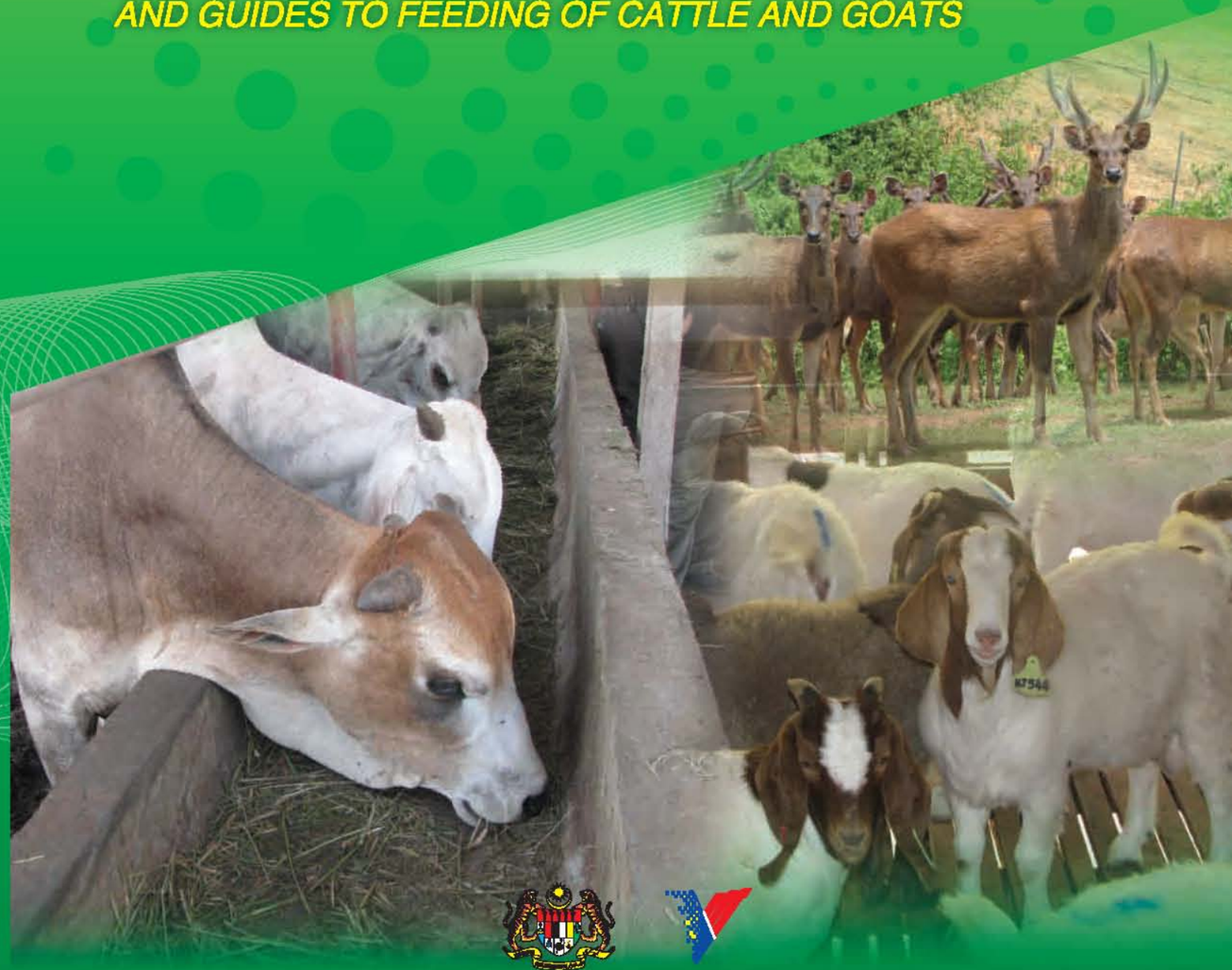
FEEDING GUIDE SERIES

EDISI 2

KANDUNGAN NUTRIEN BAHAN MAKANAN TERNAKAN DI MALAYSIA DAN PANDUAN PEMBERIAN MAKANAN UNTUK LEMBU DAN KAMBING

NUTRIENT COMPOSITION OF MALAYSIAN FEED MATERIALS AND GUIDES TO FEEDING OF CATTLE AND GOATS



JABATAN PERKHIDMATAN VETERINAR
KEMENTERIAN PERTANIAN DAN INDUSTRI ASAS TANI MALAYSIA

DEPARTMENT OF VETERINARY SERVICES
MINISTRY OF AGRICULTURE AND AGRO-BASED INDUSTRY MALAYSIA

Dicetak oleh : Gemplta Maju Sdn. Bhd.

KANDUNGAN NUTRIEN BAHAN MAKANAN TERNAKAN DI MALAYSIA DAN PANDUAN PEMBERIAN MAKANAN UNTUK LEMBU DAN KAMBING

Prakata

Buku edisi kedua ini diterbitkan bagi mengemaskini, memperbaiki, dan mempelbagaikan lagi kandungan Buku Panduan Teknikal Pemberian Makanan Kepada Ternakan Lembu Untuk Kegunaan Pengurus Ladang Jabatan Dan Penternak Panduan Ini, Jun 1990, untuk disesuaikan dengan keperluan semasa. Semenjak buku tersebut diterbitkan sehingga kini banyak lagi bahan-bahan ditemui, yang sesuai dijadikan makanan ternakan dinegara ini dan semenjak itu perubahan halatuju penternakan juga telah banyak berubah.

Dahulunya tumpuan penternakan ruminan lebih dititikberatkan kepada penternakan lembu tenusu, tetapi masakini tumpuan banyak terpaling kepada penternakan kambing dan integrasi ternakan dengan perladangan komoditi utama negara.

Banyak panduan pemberian makanan kepada ternakan-ternakan ini dan keperluan zat-zat nutrien yang sudah semestinya berbeza dengan ternakan yang diberi penekanan dahulu dimuatkan didalam edisi ini.

Adalah diharapkan edisi ini akan lebih bermakna kepada pengusaha ternakan ruminan dan semoga ianya dapat digunakan sepenuhnya demi meningkatkan produk penternakan, sesuai dengan kehendak semasa.

NUTRIENT COMPOSITION OF MALAYSIAN FEED MATERIALS AND GUIDES TO FEEDING OF CATTLE AND GOATS

Preface

This second edition is produced to update, improve and diversify the contents of the Technical Guidebook For Cattle Feeding For Use By Department Farm Managers And Farmers, Jun 1990, to suit to the current needs. Since the publication of the that book till this day more feed products had been found that are suitable as feedstuffs for our animals. Since then also the government's focus had been somewhat diverted.

The main focus those days was towards dairy cattle compared to the present focus towards goats, for milk and mutton and to meet the wider acceptance of animal/ plantation crop integration by the bigger plantation groups to integrade.

A lot more guidance on feeding methodology for animals and surely the wide differences in these animals' nutrient requirements when compared to previously focused animals are also stressed in this edition

It is sincerely hoped this edition would be more meaningful and helpful to animal entrepreneurs and this guidebook would be wisely utilized to contribute to the future of our livestock industry, suitable for the present needs.

HJ MD YUSOFF BIN SUDIN
SHARIF BIN SANIMAN
NOORMAH MIW ABDULLAH

JULAI 2005

BUKU PANDUAN TEKNIKAL PEMBERIAN MAKANAN KEPADA TERNAKAN LEMBU UNTUK KEGUNAAN PENGURUS LADANG JABATAN DAN PENTERNAK

Prakata:

Adalah amat perlu ternakan diberi makanan yang seimbang dan mencukupi supaya ianya boleh menghasilkan produk yang optima dan bermutu didalam masa yang sesingkat mungkin. Oleh itu pengusaha perlulah mengetahui bahan-bahan makanan yang ada dan boleh didapati dengan mudah dan murah, serta mengenali kandungan nutrien bahan-bahan tersebut. Penternak juga perlu mengetahui berat badan, taraf pengeluaran dan kebuntingan serta kesihatan ternakannya.

Buku Panduan Teknikal ini dimuatkan dengan kandungan berbagai jenis bahan makanan yang boleh didapati di negara ini. Bahan-bahan makanan tradisional, sisa, pokok renek dan lain-lain yang dimuatkan telah didapati daripada seluruh negara, dianalisis di Kluang mengikut kaedah-kaedah ujian yang diiktiraf yangmana setiap contoh adalah angka ujian daripada kutipan selama lebih lima tahun dan setiap bahan adalah purata daripada sekurang-kurangnya lima ujian. Jenis-jenis analisis yang dijalankan dan dimuatkan didalam buku ini ialah analisis Proximat yang dijalankan menggunakan kaedah-kaedah AOAC (1980), Tenaga Metabolisme (ruminan) menggunakan kaedah "Gas Test oleh Menke (1979). Tenaga Metabolisme (unggas) menggunakan kaedah KM. Clegg (1956), Cerakinan Serat (Fibre fraction) menggunakan kaedah Goering dan Van Soest (1970), logam menggunakan Atomic Absorption Spectrophotometer dan Fosforus menggunakan kaedah Komplek Molybate/Metavanadate.

Selain daripada itu buku panduan ini memuatkan juga anggaran keperluan-keperluan nutrien bagi berbagai kelas ternakan lembu. Kebanyakannya didapati daripada Nutrient Requirements of Dairy Cattle, NRC (1978), kedalam bentuk yang lebih mudah diterima. Beberapa kaedah perumusan makanan juga telah dibincangkan dan akhir sekali suatu panduan yang di jadualkan bagi penternak mengetahui dengan mudah jumlah makanan konsentrat yang perlu diberikan apabila mereka mengetahui berat lembu, taraf pengeluaran, nombor laktasi dan kandungan tenaga di dalam foraj yang digunakan semasa.

Adalah diharapkan buku panduan ini sekurang-kurangnya dapat memudahkan pengendalian pemberian makanan oleh penternak dan ladang-ladang dan menyemak kandungan bahan-bahan makanan yang akan digunakan serta merumus sendiri makanan ternakan mereka berpandukan kaedah yang ditunjukkan. Semoga buku panduan ini dapat memberi manfaat kepada penternak-penternak, terutamanya penternak tenusu bagi memperbaiki prestasi dan produk ternakan mereka.

TECHNICAL GUIDEBOOK FOR CATTLE FEEDING FOR USE BY DEPARTMENT FARM MANAGERS AND FARMERS

Preface:

It is very important that animals are given balanced and sufficient feeds to ensure that the produce optimum and quality products in the shortest possible time. To achieve this farmers need to know types of feeds that are available and can be obtained cheaply and easily. They also need to know the nutrient contents of the feed materials. Farmers need also to recognize their animals; i.e their body weights, milk production, pregnancy and health status and stage and number of lactations. With those he would know the nutrient requirements of the animals. Knowledge of the feed formulation techniques would also be of benefits to him to formulate several feed ingredients at hand himself to form a balanced ration for his animals. All these will ensure an optimum production for his animals.

This technical guidebook provides nutrient contents of various types of feedstuffs; traditional, waste products, shrub tree crops and others which are available from all over the country. They were analysed in Kluang laboratory using standard and approved methods and each feed sample is a cumulative data of over five years and each one of the feedstuffs tested value is the average of at least five test samples.The types of analyses included in this booklet are proximate analyses, tested using AOAC (1980) methods, Metabolizable energy (ruminant) using "Gas Test" methods of Menke (1979), Metabolizable energy (poultry) using KM. Clegg method (1956), fibre fractionation using Goering and Van Soest (1970) method and metals done with Atomic Absorption Spectrophotometer and phosphorus using molvbdate -metavanadate complex method.

Besides those this booklet also contains estimated requirements of nutrients for various groups of Cattle, mostly being adapted from Nutrient Requirements of Dairv Cattle, NRC (1978) simplified into a more degistible form especiallv for dairy producers. A few formulation techniques are also being outline and discussed and finally a guide is tabled for farmers to know with simplicity the amount of concentrate supplementation he need to fortify his animals with, knowing the animal body weights, production status and energy contents of the forage (pasture grass) he is currently using.

It is very much hoped that this handbook would at least simplify feeding management for the animals in farms and at the farmers level, to check their feed nutrient contents, and for them to formulate them selves simple balanced ration using formulation method discussed. Hopefully this handbook would be of benefits to farmers, especialy dairy producers, to improve the performances and production of their animals.

Haji Md. Yusoff bin Haji Sudin
Sharif bin Haji Saniman
Noormah Miw bte Abdullah

MUQADDIMAH KETUA PENGARAH

Saya ingin mengucapkan terima kasih kerana diberi peluang memberi sepatah dua kata untuk menerbitkan buku panduan Makanan Ternakan ini. Sebenarnya memang telah sampai waktu-nya buku panduan berupa "Handbook" seperti ini diterbitkan untuk kegunaan terutamanya oleh pegawai-pegawai jabatan ini di- lapangan bagi kerja-kerja pengembangan dan menasihati penternak-penternak memberi makan ternakan mereka dengan cara yang betul dan berkesan.

Buku ini saya dapati bukan sahaja memuatkan kandungan bahan-bahan yang sesuai sebagai makanan ternakan, bahkan ia dilengkapi dengan anggaran keperluan nutrien bagi berbagai kelas ternakan lembu, kaedah merumus catuan makanan untuk ternakan dan cara pem-berian makanan berasaskan mutu foraj yang ada, yang biasanya sentiasa berbeza dan lokasi ke lokasi dan dan masa ke- semasa.

Dengan ini penternak dapat memahami betapa pentingnya meningkatkan mutu foraj yang diberikan kepada ternakan mereka dan disamping itu dapat mereka mengurangkan penggunaan konsenteret. Banyak perbelanjaan akan dapat diselamatkan, kos pengeluaran mereka akan lebih rendah dan keuntungan akan berlipat ganda.

Saya mengucapkan syabas kepada penulis-penulis buku ini dan berharap banyak lagi "Handbook" yang mudah difahami seperti ini akan dapat diterbitkan.

Terirna kasih.

THE DIRECTOR GENERAL NOTE

I would like to record my appreciation for being given this opportunity to say a few words on the publication of this guide or "Handbook" in animal feeding. At this moment a guidebook such as this is timely for use by our officers in the field for their extension duties to assist and advice farmers on how to feed their animals in the right and effective way.

I found this book to be useful, containing not only nutrient contents of most of the potential feed stuffs, but it also carries estimated nutrient requirements for different classes of cattle, method of feed formulations and methods of utilization of feeds based on forage quality in-situ, which normally varies from location to location and from time to time.

With this "Handbook" the importance of enhancing the quality of forage given to their animals and consequently the farmers would be able to reduce concentrate feed utilization. A lot of money would be saved, production cost would he reduced and their profits would be increased.

I would like to congratulate the authors of this guidebook and hope more guidance of this type, which are made simple for farmers to understand, would be published.

Thank you.

Dato ' Dr. Hadi bin Dato ' Hashim.
Director General
Veterinary Services Dept. Malaysia.

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
A	RUMPUT *(GRASSES)*																
1	African star *Cynodon plectostachyus*																
	a. 1 minggu, (1 week)	18.0	23.9	24.7	3.0	12.7	35.7	53.7	7.95	60.6	31.8	8.6	28.8	23.2	0.34	0.54	0.20
	b. 2 minggu, (2 weeks)	20.9	20.6	28.0	2.2	10.7	38.5	52.1	7.32	64.1	35.6	4.6	28.3	31.0	0.36	0.36	0.20
	c. 3 minggu, (3 weeks)	23.4	16.8	31.3	2.8	10.6	38.5	52.8	7.80	63.6	34.3	5.8	29.3	28.5	0.34	0.31	0.28
	d. 4 minggu, (4 weeks)	22.8	13.8	29.7	1.8	10.4	44.3	50.5	7.25	63.0	33.0	7.0	30.0	26.0	0.31	0.26	0.35
2	Brachiaria brizantha *Br. brizantha*																
	a. 2 minggu, (2 weeks)	15.2	19.3	24.7	3.2	18.2	34.4	50.1	7.36	54.9	30.4	3.0	24.3	27.4	0.30	0.26	0.27
	b. 3 minggu, (3 weeks)	18.4	18.9	23.2	2.9	15.3	39.7	5.1	7.55	56.0	30.8	2.9	25.2	27.9	0.50	0.78	0.52
	c. 4 minggu, (4 weeks)	29.8	16.1	25.0	2.4	13.7	42.8	52.4	7.73	60.9	31.1	3.1	29.8	28.0	0.31	0.32	0.40
3	Brachiara decumbens (Signal grass) *Br. decumbens*																
	a. 2 minggu, (2 weeks)	17.6	17.7	27.1	3.0	10.3	41.9	54.9	8.16	52.0	28.6	2.7	23.4	25.9	0.30	0.40	0.29
	b. 3 minggu, (3 weeks)	18.4	19.0	25.6	2.9	13.9	38.6	54.7	8.12	53.3	29.0	2.7	24.3	26.3	0.74	0.52	0.53
	c. 4 minggu. (4 weeks)	17.3	11.9	30.1	3.7	10.7	43.8	57.1	8.51	60.2	31.0	3.0	29.2	28.0	0.25	0.55	0.40
	d. 6 minggu, (6 weeks)	25.9	10.3	30.6	2.7	6.4	45.6	51.8	7.64	62.0	31.4	2.9	30.6	28.5	0.25	0.28	0.42
	e. 8 minggu, (8 weeks)	28.1	8.6	35.0	2.2	5.6	53.0	48.6	7.10	64.2	33.0	3.2	31.2	29.8	0.39	0.20	0.30
	f. Rumput kering (hay)	89.3	6.8	42.2	2.0	3.7	45.3	52.5	7.75	-	-	-	-	-	0.08	0.07	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
4	Brachiaria humidicola																
	Br. humidicola																
	a. 2 minggu, (2 weeks)	11.3	19.1	26.3	4.8	14.1	35.7	54.3	8.04	60.6	38.0	5.2	22.6	32.8	0.25	0.21	-
	b. 3 minggu, (3 weeks)	18.4	19.0	25.6	2.9	13.9	38.6	53.9	7.98	61.2	39.0	6.0	22.2	33.0	0.74	0.52	-
	c. 4 minggu, (4 weeks)	24.2	14.1	27.6	2.9	7.7	47.7	53.5	7.92	69.0	34.9	4.2	34.1	30.7	0.28	0.22	-
	d. 6 minggu, (6 weeks)	18.8	10.2	30.4	3.2	7.2	49.0	52.8	7.84	70.8	39.0	5.1	31.8	33.9	0.29	0.30	-
	e. 8 minggu, (8 weeks)	21.8	8.0	36.2	2.6	5.3	47.9	49.6	7.28	72.0	42.0	5.3	30.0	36.7	0.24	0.43	-
5	Brachiaria mutica, (Para grass)																
	Br. mutica																
	a. 2 minggu, (2 weeks)	12.1	15.8	25.5	3.4	17.9	37.4	43.6	6.28	58.6	32.9	2.7	25.7	30.2	0.49	0.31	0.23
	b. 3 minggu, (3 weeks)	11.7	13.5	27.9	3.3	14.9	40.4	49.9	7.32	60.0	33.0	3.0	27.0	30.0	0.39	0.43	0.21
	c. 4 minggu, (4 weeks)	13.8	12.2	27.8	2.6	7.3	50.1	51.6	7.60	66.0	35.0	2.9	31.0	32.1	0.26	0.35	0.21
	d. 5 minggu, (5 weeks)	19.9	11.9	30.8	3.0	13.3	43.0	51.1	7.52	68.0	37.0	3.4	31.0	33.6	0.38	0.36	0.20
6	Brachiaria ruziziansis																
	Br. ruziziansis																
	a. 2 minggu, (2 weeks)	16.0	9.6	30.4	3.3	8.8	47.9	55.5	8.25	65.0	36.8	4.6	28.2	32.2	0.42	0.18	-
	b. 3 minggu, (3 weeks)	17.2	12.0	35.9	1.9	9.1	41.1	56.4	8.39	65.8	38.7	4.3	27.1	34.4	0.30	0.15	-
	c. 4 minggu, (4 weeks)	18.4	14.0	35.6	3.3	10.4	36.7	52.8	8.00	66.6	40.6	3.9	26.0	36.7	0.60	0.22	-
	d. 5 minggu, (5 weeks)	22.4	12.2	34.8	0.1	10.6	42.3	56.4	7.80	59.0	33.0	3.9	26.0	29.1	0.40	0.17	-
	e. 6 minggu, (6 weeks)	22.0	11.2	33.9	2.7	9.5	42.7	52.8	7.70	64.6	36.6	4.0	28.0	32.9	0.65	0.20	-
	f. 8 minggu, (8 weeks)	25.9	8.8	38.8	2.7	9.8	39.9	51.4	7.57	63.9	34.9	3.8	29.0	31.1	0.38	0.21	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
7	Guinea, Common (Rumput Kuda)																
	Panicum maximum																
	a. 1 minggu, (1 week)	16.6	18.8	29.2	3.0	11.3	37.7	51.6	7.60	61.2	37.2	3.7	24.0	33.0	0.43	0.32	0.28
	b. 2 minggu, (2 weeks)	16.6	22.0	28.2	2.5	9.3	38.0	54.6	8.09	66.5	37.4	3.9	29.1	33.5	0.30	0.42	0.30
	c. 3 minggu, (3 weeks)	16.4	13.5	28.0	2.2	12.4	43.9	52.7	7.79	68.2	38.3	4.1	29.9	34.2	0.36	0.28	0.25
	d. 4 minggu, (4 weeks)	23.1	12.4	33.8	1.8	9.2	42.8	51.7	7.12	69.4	38.7	4.2	30.7	34.3	0.35	0.32	0.27
	e. 6 minggu, (6 weeks)	24.2	11.1	34.3	1.7	6.4	46.3	48.8	6.75	70.2	41.0	5.0	29.2	36.0	0.34	0.37	0.29
	f. 8 minggu, (8 weeks)	24.2	10.4	37.3	2.4	7.3	42.6	46.0	6.68	72.0	41.5	4.8	30.3	36.7	0.32	0.37	0.24
8	Guinea, Green panic																
	Panicum maximum																
	a. 1 minggu, (1 week)	16.0	21.8	21.3	3.4	15.3	38.2	58.8	8.79	66.5	40.0	5.0	26.5	35.0	0.26	0.28	0.30
	b. 2 minggu, (2 weeks)	13.2	21.2	26.3	3.1	15.3	33.9	52.2	7.70	67.5	40.6	4.8	26.9	35.8	0.34	0.25	0.28
	c. 3 minggu, (3 weeks)	22.3	13.8	37.9	2.1	10.6	35.6	51.2	7.54	68.4	41.2	4.6	27.2	36.6	0.42	0.22	0.27
	d. 4 minggu, (4 weeks)	18.4	14.4	35.3	1.6	10.4	38.3	50.2	7.37	68.9	41.6	5.1	27.3	36.3	0.40	0.21	0.26
	e. 5 minggu, (5 weeks)	20.7	13.9	36.9	2.1	11.4	35.7	45.9	6.67	69.4	42.0	5.2	27.4	36.8	0.42	0.22	0.25
	f. 6 minggu, (6 weeks)	22.7	11.2	38.1	1.3	10.4	38.8	41.6	5.96	70.2	43.1	5.0	27.1	38.1	0.10	0.19	0.26
9	Guinea, Hamil (Rumput Kuda)																
	Panicum maximum																
	a. 1 minggu, (1 week)	15.3	19.6	29.0	2.9	13.4	35.1	55.4	8.23	61.6	36.0	3.3	25.6	32.5	0.32	0.47	0.25
	b. 2 minggu, (2 weeks)	15.3	16.4	29.2	2.3	12.1	39.8	55.5	8.25	65.8	40.0	5.0	26.3	35.0	0.43	0.37	0.21
	c. 3 minggu, (3 weeks)	16.1	15.8	37.2	2.5	13.0	31.5	55.2	8.20	68.4	41.2	4.6	27.2	36.6	0.54	0.31	0.28
	d. 4 minggu, (4 weeks)	16.2	15.2	37.8	2.4	12.6	32.0	53.9	7.98	69.1	42.0	4.4	27.1	37.6	0.30	0.38	0.32

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
10	Guinea, purple																
	Paniaim maximum																
	a. 3 minggu, (3 weeks)	20.1	14.4	34.3	3.0	13.3	32.0	50.9	7.49	63.7	34.9	3.8	29.0	31.1	0.23	0.21	-
	b. 4 minggu, (4 weeks)	25.7	11.9	36.3	3.2	9.3	38.9	54.8	8.13	70.3	43.2	4.4	27.1	38.8	0.33	0.22	-
	c. 5 minggu, (5 weeks)	24.4	11.7	35.8	3.0	9.4	40.1	54.0	8.00	70.0	41.4	4.3	28.6	37.1	0.29	0.16	-
	d. 6 minggu, (6 weeks)	20.2	11.4	35.9	2.9	9.6	40.2	52.6	7.76	70.6	42.3	4.6	28.3	37.7	0.34	0.19	-
	e. 8 minggu, (8 weeks)	16.0	11.2	35.9	2.7	9.8	40.4	51.0	7.51	71.0	42.0	5.0	29.0	37.0	0.38	0.21	-
11	Guinea, K280																
	Panicum maximum																
	a. 2 minggu, (2 weeks)	14.0	15.4	27.9	2.8	10.4	36.2	54.5	8.08	70.2	42.3	4.0	27.9	38.3	0.80	0.18	-
	b. 3 minggu, (3 weeks)	17.1	16.6	33.0	3.9	12.2	39.4	58.6	8.76	65.7	38.0	3.7	27.7	34.3	0.38	0.29	-
	c. 4 minggu, (4 weeks)	24.3	12.1	35.2	3.0	9.1	42.8	55.1	8.18	61.2	33.7	3.4	27.3	30.4	0.55	0.21	-
	d. 5 minggu, (5 weeks)	36.4	9.3	35.0	2.1	7.1	46.5	45.0	6.52	73.2	45.3	7.0	27.9	38.3	0.17	0.12	-
	e. 6 minggu, (6 weeks)	27.1	8.6	39.0	1.6	8.5	42.3	45.0	6.52	75.1	46.0	6.6	29.1	40.0	0.25	0.11	-
	f. 8 minggu, (8 weeks)	26.0	8.3	41.3	2.1	8.7	39.6	41.4	5.92	77.0	46.6	6.1	30.4	40.5	0.25	0.17	-
12	Mardi Digit (Pangola daun lebar)																
	Digitaria setivalva																
	a. 1 minggu, (1 week)	15.5	17.2	26.1	3.7	13.0	40.0	51.6	7.60	59.1	32.4	5.1	26.7	27.3	0.30	0.21	0.20
	b. 2 minggu, (2 weeks)	13.6	16.6	27.8	3.7	13.3	38.4	51.4	8.57	62.6	35.4	3.1	27.2	32.3	0.34	0.24	0.28
	c. 3 minggu, (3 weeks)	18.3	16.2	28.7	3.1	12.6	39.4	55.0	8.17	62.3	30.8	4.8	31.3	26.0	0.32	0.23	0.24
	d. 4 minggu, (4 weeks)	18.6	16.4	29.0	3.0	12.0	39.6	55.4	8.23	62.6	35.8	4.0	26.8	31.8	0.33	0.26	0.26
	e. 5 minggu, (5 weeks)	18.5	13.7	29.2	3.2	11.0	42.9	55.2	8.20	63.4	36.0	4.2	27.4	31.8	0.36	0.21	0.24

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No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
13	Napier, Common (Rumput Gajah)																
	Pennisetum purpureum																
	a. 1 minggu, (1 week)	9.6	19.3	24.7	4.3	13.8	37.9	52.8	7.73	51.8	29.4	2.0	22.4	27.4	0.23	0.34	0.14
	b. 2 minggu, (2 weeks)	11.3	19.6	24.9	3.3	15.5	36.7	53.6	7.93	53.3	30.4	3.6	22.9	26.8	0.36	0.36	0.13
	c. 3 minggu, (3 weeks)	10.1	18.9	24.0	3.8	14.7	38.6	53.0	7.83	55.2	30.7	3.0	24.5	27.7	0.30	0.28	0.20
	d. 4 minggu, (4 weeks)	16.9	12.7	24.1	2.6	12.6	48.0	55.7	8.27	62.6	30.5	2.7	32.1	27.8	0.32	0.29	0.11
	e. 5 minggu, (5 weeks)	18.4	12.2	26.0	2.3	11.3	48.0	53.7	7.95	66.0	31.0	3.6	35.0	27.4	0.30	0.24	0.19
	f. 6 minggu, (6 weeks)	19.8	11.6	28.6	2.7	10.0	47.1	52.5	7.63	68.2	32.6	4.0	35.6	28.6	0.26	0.26	0.17
	g. 8 minggu, (8 weeks)	19.7	10.9	36.4	3.2	7.5	42.0	52.0	7.44	71.0	33.0	4.2	38.0	28.8	0.28	0.26	0.22
	h. Foder, sisa napier (Fodder refuse)	21.6	9.8	42.1	1.4	4.4	42.3	51.9	7.65	-	-	-	-	-	0.39	0.24	
14	Napier, Uganda (Rumput Gajah)																
	Pennisetum purpureum																
	a. 1 minggu, (1 week)	9.5	20.7	26.3	4.0	15.0	34.0	53.6	7.93	79.2	32.7	2.5	46.5	30.2	0.22	0.34	0.12
	b. 2 minggu, (2 weeks)	10.1	19.0	26.4	3.1	14.8	36.7	45.9	6.66	55.5	33.3	5.6	32.2	27.7	0.28	0.37	0.20
	c. 3 minggu, (3 weeks)	10.7	19.2	26.2	3.0	15.3	36.3	55.1	8.17	57.0	35.0	4.6	22.0	30.4	0.50	0.44	0.22
	d. 4 minggu, (4 weeks)	11.3	17.8	26.4	3.3	15.2	37.3	54.9	8.14	58.4	36.6	3.6	21.8	33.0	0.73	0.50	0.11
15	Napier, Common (Rumput Gajah)																
	Pennisetum purpureum																
	a. fresh, 75 days	31.6	8.6	46.9	1.9	6.9	35.7	44.6	6.45	76.1	43.9	6.7	32.2	37.0	0.36	0.16	-
	b. ensiled plain, 75 days	28.6	6.2	38.1	2.7	6.8	46.2	41.6	5.95	71.6	45.9	7.1	25.9	38.7	0.34	0.14	-
	c. ensiled, 1% urea, 75 days	36.2	7.4	27.5	1.3	9.3	54.3	48.7	7.12	50.0	32.4	5.2	17.4	27.1	0.72	0.14	-

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No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
16	Napier, dwarf																
	Pennisetum purpureum																
	a. Daun (leaf)	6.6	21.0	34.0	3.6	13.6	27.6	40.4	8.07	66.7	36.4	13.2	30.3	23.2	0.35	0.31	-
	b. Daun dan batang (whole plant)	11.2	20.8	34.0	3.3	13.0	28.9	42.2	7.81	66.9	35.2	13.0	31.7	22.2	0.23	0.43	-
	c. Batang (stem)	6.9	19.3	28.3	2.7	18.7	30.8	-	-	-	-	-	-	-	0.27	0.49	-
17	Napier, Taiwan	13.5	16.9	30.3	4.2	13.5	35.1	53.3	7.88	-	-	-	-	-	0.95	0.36	-
	Pennisetum purpureum																
18	Pasphalum (Rumput Tanduk)																
	Pasphalum conjugatum																
	a. 2 minggu, (2 weeks)	17.6	17.7	27.1	3.0	10.3	41.9	54.9	8.16	52.7	28.2	3.0	24.3	25.2	0.30	0.30	-
	b. 3 minggu, (3 weeks)	17.3	14.8	28.6	3.4	10.0	43.2	56.1	8.34	53.8	30.0	3.6	23.8	26.4	0.28	0.40	-
	c. 4 minggu, (4 weeks)	17.3	11.9	30.1	3.7	10.5	43.8	55.1	8.51	55.6	31.0	4.0	24.6	27.0	0.25	0.55	-
	d. 6 minggu, (6 weeks)	25.9	10.3	32.6	2.7	6.4	48.0	52.8	7.64	62.0	31.4	4.2	30.6	27.2	0.25	0.28	-
	e. 8 minggu, (8 weeks)	28.1	8.6	35.0	2.2	5.6	48.6	51.5	7.58	64.2	32.2	3.9	32.2	28.3	0.39	0.20	-
19	Rumput Kazungula																
	Setaria sphacelata cv kazungula																
	a. 1 minggu, (1 week)	11.7	17.4	24.8	3.8	14.4	39.6	51.4	7.40	50.0	27.6	2.0	22.4	25.6	0.36	0.52	-
	b. 2 minggu, (2 weeks)	13.8	15.2	26.9	3.6	12.0	42.3	61.5	9.23	55.6	28.2	2.4	27.4	24.6	0.34	0.45	-
	c. 4 minggu, (4 weeks)	15.9	14.1	29.0	3.5	10.8	43.8	50.7	7.36	56.0	29.0	2.8	27.0	26.2	0.33	0.38	-
	d. 5 minggu, (5 weeks)	14.9	12.9	31.0	3.0	9.1	45.4	50.7	7.46	57.0	28.8	3.1	28.2	25.7	0.22	0.33	-
	e. 6 minggu, (6 weeks)	32.4	11.5	33.6	2.4	7.3	45.2	50.8	7.37	61.0	29.6	3.0	34.4	26.6	0.10	0.28	-

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No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
20	Rumput Splendida																
	Setaria sphacelata var. splendida																
	a. 1 minggu, (1 week)	92.0	23.1	22.4	5.6	17.3	31.4	51.9	7.66	46.1	26.6	2.0	19.5	24.6	0.25	0.29	-
	b. 2 minggu, (2 weeks)	10.0	20.6	22.2	5.2	15.0	37.0	51.4	7.57	52.5	28.5	2.3	24.0	26.2	0.25	0.25	-
	c. 3 minggu, (3 weeks)	10.1	19.3	22.4	4.9	14.7	38.7	51.8	7.63	56.6	27.8	2.5	28.7	25.3	0.36	0.33	-
	d. 4 minggu, (4 weeks)	12.2	17.7	23.9	3.5	12.3	42.6	53.7	7.95	56.3	28.5	3.6	27.8	24.9	0.08	0.33	-
	e. 5 minggu, (5 weeks)	15.5	16.0	24.0	3.8	13.4	42.8	51.7	7.62	56.8	29.0	2.7	27.8	26.3	0.33	0.34	-
	f. 6 minggu, (6 weeks)	22.3	14.4	27.9	3.1	10.8	43.8	49.8	7.30	60.9	29.6	3.2	31.3	26.4	0.51	0.32	-
21	Lalang, (Satin tail)																
	Imperata cylindrica																
	a. 1 minggu, (1 week)	22.1	10.2	35.9	2.2	7.3	44.4	45.7	6.63	-	-	-	-	-	0.27	0.35	-
	b. 2 minggu, (2 weeks)	30.6	11.7	38.0	2.1	5.3	45.3	47.5	6.92	75.9	39.8	4.3	36.1	35.5	0.10	0.32	-
	c. 4 minggu, (4 weeks)	36.3	9.1	38.6	1.9	7.5	52.0	49.8	7.31	80.8	44.3	6.8	36.5	37.5	0.20	0.28	-
22	Hay																
	a. Br. decumbens 1	93.7	6.2	46.3	0.9	6.2	40.4	35.5	4.95	-	-	-	-	-	0.18	0.06	-
	b. Br. decumbens 2	85.7	6.1	42.4	1.5	6.8	43.2	37.1	5.22	77.2	49.5	10.8	27.7	38.7	0.22	0.08	-
23	Serai wangi, daun *Cymbopogon nardus*	80.7	6.7	38.1	2.9	7.0	45.3	51.9	7.66	-	-	-	-	-	0.96	0.22	-
24	Silaj (silage)																
	Pennisetum purpureum																
	Rumput Napier (Napier grass)	30.0	6.6	44.4	1.9	5.9	41.2	47.7	6.96	77.9	50.6	27.3	9.3	41.3	0.23	0.30	-

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No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
B	KEKACANG *(LEGUMES)*																
1	Alfalfa ((Lucern) *Medicago sativa*																
	a. Alfalfa pellet 1	90.4	15.5	15.8	3.2	13.9	51.6	66.8	10.11	-	-	-	-	-	1.02	0.16	-
	b. Alfalfa pellet 2	89.8	14.1	17.3	3.7	5.2	59.7	71.9	10.94	-	-	-	-	-	0.07	0.82	-
	c. Alfalfa, daun (Lucern, leaves)	27.5	27.6	28.8	1.9	13.6	28.2	56.6	8.42	-	-	-	-	-	0.29	0.03	-
2	Assystasia (Rumput nyonya) *Assystasia spp.*																
	a. Muda (Young shoot)	13.1	22.3	28.8	2.8	10.9	35.2	60.7	9.10	48.0	28.2	10.7	19.8	17.5	0.48	0.30	-
	b. Tua, matang (Mature)	15.7	15.8	35.8	1.6	6.7	40.1	59.6	8.92	49.6	31.0	4.0	18.6	20.0	0.46	0.31	-
3	American joint vetch. *Aechynomenes americana*																
	a. 2 minggu, (2 weeks)	28.9	20.0	26.5	2.7	7.5	43.3	66.8	7.43	53.2	36.8	22.0	16.4	14.8	1.81	0.28	-
	b. 3 minggu, (3 weeks)	15.0	21.8	30.3	3.6	9.4	34.9	60.5	7.61	61.5	43.0	10.8	18.5	32.2	1.86	0.35	-
	c. 4 minggu, (4 weeks)	23.3	21.1	30.3	2.2	6.7	39.3	62.5	7.49	47.5	32.0	6.3	0.2	25.7	1.84	0.32	-
	d. 5 minggu, (5 weeks)	27.8	20.5	30.6	3.8	8.1	37.0	59.9	7.02	56.2	39.9	12.9	16.3	27.0	1.68	0.25	-
	e. 6 minggu, (6 weeks)	20.2	18.9	31.4	3.3	9.3	37.1	48.5	7.09	58.0	35.5	11.6	22.5	23.9	1.65	0.29	-
	f. 8 minggu, (8 weeks)	20.3	16.2	34.7	3.2	8.1	37.8	44.4	6.42	62.0	37.7	12.3	24.3	25.4	1.29	0.28	-
4	Calapogonium (Calapo) *Calapogonium mucunoides*																
	a. 4 mmggu, (4 weeks)	33.8	18.1	34.1	1.8	6.4	39.6	47.4	6.91	58.0	40.0	8.0	18.0	32.0	0.10	0.17	-
	b. 6 minggu, (6 weeks)	31.9	15.7	35.7	1.7	6.2	40.7	44.9	6.50	60.2	43.1	9.6	17.1	33.5	0.13	0.10	-

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No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
5	Centrosema (Centro)																
	Centrosema pubescens																
	a. 2 minggu, (2 weeks)	15.7	24.6	24.5	4.0	11.6	35.3	42.9	6.17	54.6	35.1	7.9	19.5	27.2	0.93	0.34	0.32
	b. 4 minggu, (4 weeks)	17.8	25.3	25.9	2.8	9.7	36.3	42.9	6.92	58.0	42.0	9.2	16.0	32.8	1.08	0.32	-
6	Kacang Dun (Hidroponik, 6 hari) (Dun pea, Hydrophonic, 6 days)	8.4	56.2	11.7	3.2	6.5	22.4	39.1	5.55	-	-	-	-	-	0.06	0.92	-
7	Glyricidia																
	Glyricidia maculata																
	a. Pucuk, muda (Young shoot)	18.7	21.0	13.2	4.1	8.5	53.2	46.1	6.70	-	-	-	-	-	1.22	0.26	-
	b. tua, matang (Mature)	23.7	15.6	16.3	4.5	9.3	54.1	44.0	6.35	-	-	-	-	-	1.40	0.29	-
8	Petai belalang, (Ipil Ipil)																
	Leucaena leucocephala																
	a. Pucuk, muda (Young shoot)	19.1	40.4	8.4	1.7	6.6	42.9	33.4	4.61	41.2	18.1	6.0	23.1	12.1	0.37	0.51	-
	b. Tua, matang (Mature)	33.2	26.0	13.3	3.0	7.0	50.3	37.7	5.31	35.5	25.5	8.6	28.0	26.9	0.76	0.22	-
	c. Daun (leaf)	90.3	25.2	13.5	4.7	6.0	50.6	74.5	11.37	-	-	-	-	-	0.69	0.28	-
9	Kacang pintoi (Arachis pintoi)																
	Arachis sp.																
	a. pokok (whole plant)	22.1	22.4	19.1	2.5	11.8	442.0	65.0	9.81	51.1	33.0	8.4	18.1	24.6	1.54	0.29	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
10	Pigeon pea																
	Cajanus cajan																
	a. 2 minggu, (2 weeks)	18.4	24.3	24.4	6.7	6.4	38.3	43.3	6.24	53.3	35.9	13.4	17.4	22.5	0.45	0.35	-
	b. 3 minggu, (3 weeks)	24.5	23.9	31.0	7.7	6.1	31.3	35.8	5.00	54.7	31.6	13.9	23.1	17.7	0.83	0.25	-
	c. 4 minggu, (4 weeks)	24.3	21.0	38.1	6.3	5.3	29.3	41.1	5.88	54.1	30.0	14.5	24.1	15.5	0.59	0.25	-
	d. 6 minggu. (6 weeks)	39.7	25.6	26.3	7.2	5.9	35.0	41.1	5.88	49.6	27.8	11.0	21.8	16.8	0.48	0.28	-
	e. 8 minggu, (8 weeks)	50.2	23.3	21.6	8.4	5.7	41.0	38.3	5.42	48.7	26.3	11.5	22.4	14.8	0.59	0.24	-
	f. pucuk, 3 minggu (young shoot, 3 weeks)	27.5	25.5	24.8	7.8	5.8	36.1	42.1	6.04	51.9	40.2	12.8	11.7	27.4	0.55	0.25	-
	g. pucuk, 5 minggu (young shoot, 5 weeks)	32.7	20.1	21.4	6.7	5.9	45.9	38.0	5.36	48.3	28.3	13.0	20.0	15.3	1.04	0.16	-
	h. 5 minggu. tua (5 weeks, old)	37.8	24.1	25.9	7.3	7.1	35.6	38.3	5.42	49.0	40.7	11.7	8.3	29.0	0.80	0.32	-
11	Pueraria (kekacang)																
	Pueraria phaseoloides																
	a. 4 minggu, (4 weeks)	23.5	22.8	33.5	2.1	10.1	31.5	64.1	9.66	60.9	42.0	11.2	18.9	30.8	1.32	0.36	-
12	Stylosanthes (kekacang)																
	Stylosanthes guinensis																
	a. 2 minggu, (2 weeks)	17.9	25.3	19.1	3.6	11.6	40.4	61.6	9.25	54.1	35.8	10.9	18.3	24.9	1.46	0.43	0.27
	b. 4 minggu, (4 weeks)	17.1	25.3	25.2	3.1	10.9	35.3	54.1	8.01	-	-	-	-	-	1.20	0.35	-
13	Turi																
	Sesbania grandiflora																
	a. Pucuk muda (young shoot)	19.7	38.0	10.0	4.7	8.6	38.7	51.6	7.60	-	-	-	-	-	0.69	0.56	-
	b. Old, matang (Mature leaves)	21.8	30.6	13.5	6.6	9.8	39.5	50.6	7.43	-	-	-	-	-	1.70	0.32	-

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No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
C	DEDAUN *(LEAVES)*																
1	Akasia (Akasia daun lebar) *Broadleaved Acacia*																
	a. *Acacia mangium*	31.7	16.7	27.5	4.9	4.4	46.5	28.3	3.77	59.4	36.3	20.7	23.1	15.6	0.54	0.11	0.10
	b. *Acacia auriculiformis* (Akasia kuning)	34.2	17.8	27.9	3.5	4.6	46.2	28.4	3.79	60.5	44.7	29.2	15.8	15.5	0.52	0.09	0.11
2	Bakau, daun (Mangrove, leaves) *Rhizophora spp*	29.5	7.9	15.9	3.8	7.3	65.1	71.6	10.89	51.9	23.9	9.8	28.9	13.2	0.38	0.11	-
3	Betik, daun (Papaya, leaf) *Carica spp*	21.3	26.4	10.7	13.9	11.0	38.0	48.1	7.03	-	-	-	-	-	0.70	0.35	-
4	Buncis, daun (French bean, leaf) *Phaseolus vulgaris*	8.3	28.3	13.2	1.7	8.6	48.2	61.9	9.29	-	-	-	-	-	0.51	0.67	-
5	Bunga Raya, Oren, daun (hibiscus) *Hibiscus rosa-sinensis*	22.5	19.9	12.6	5.5	10.5	51.5	62.0	9.31	44.2	15.5	3.8	28.7	11.7	1.54	0.31	0.49
6	Cekur manis, asin asin, (sweet shoot) *Sauropus androgynus*	11.3	35.9	14.4	6.8	8.5	34.4	52.4	7.13	27.2	20.9	20.0	6.3	0.9	0.49	0.32	0.31
7	Dedap, daun *Ervthrina spp*	22.6	19.9	26.2	5.5	10.5	51.5	44.0	6.35	56.0	43.1	25.0	12.9	18.1	0.40	0.29	-

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No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
8	Jambu air, daun (Rose apple, leaf) *Eugenia aquea*	30.5	10.6	26.7	2.2	6.0	54.5	23.7	3.01	50.6	42.6	22.2	8.0	20.4	0.68	0.20	-
9	Jambu batu, daun (Guava) *Psidiurn guajava*	30.8	13.8	18.2	2.0	5.9	60.1	24.8	3.20	51.2	40.7	20.4	10.5	20.0	0.60	0.22	-
10	Kaduk, daun (a type of herb) *Piper stylosum*	18.2	18.4	18.5	3.0	14.1	46.0	44.0	8.29	42.5	30.8	6.3	11.7	24.5	0.17	0.24	0.42
11	Kacang panjang (Long beans) *Vigna sinensis*																
	a. daun (leaf)	20.6	25.2	14.6	4.0	13.6	42.6	54.5	8.08	-	-	-	-	-	2.06	1.03	-
	b. pokok (plant)	19.1	20.7	25.0	2.2	9.1	43.0	50.6	7.43	-	-	-	-	-	0.93	0.47	-
12	Kangkung, daun (water convolvulus) *Ipomoea reptans*	8.4	23.7	15.3	3.3	12.4	45.3	56.9	8.48	-	-	-	-	-	0.53	0.68	-
13	Kekabu, daun (Kapok) *Ceiba pentandra L. Gaertn.*	24.8	17.7	21.3	2.5	6.4	52.1	43.1	6.21	42.0	27.1	14.9	14.1	13.0	0.20	0.30	-
14	Keladi, Daun (Yam root, leaf) *Colocasia antiquorum*	37.2	27.6	10.7	5.8	12.0	43.9	49.5	7.06	-	-	-	-	-	0.52	0.26	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
15	Kelapa sawit, daun (Oil palm, leaves)																
	Elaeis quineensis																
	a. Muda (Young leaves)	44.6	13.1	24.7	2.9	8.3	51.0	38.6	5.47	68.8	47.0	14.3	21.8	32.7	0.79	0.16	-
	b. Tua (Old leaves)	33.1	10.9	34.9	1.8	5.9	46.5	33.5	4.62	67.2	42.0	13.7	35.2	28.3	0.54	0.25	-
16	Keledek (Sweet potato)																
	Ipornoea batatas																
	a. daun (leaf)	15.3	23.9	12.9	3.7	19.7	39.8	41.1	5.87	37.1	27.4	5.8	9.7	21.6	0.80	0.29	-
	b. daun dan tangkai, (leaf and stalk)	12.2	18.0	15.6	3.8	16.9	45.7	46.9	6.83	44.6	29.8	6.5	14.8	23.3	0.70	0.39	-
	c. Pucuk (Young shoot)	11.7	21.5	14.3	3.4	16.4	44.4	47.6	6.95	-	-	-	-	-	0.55	0.46	-
	d. pokok (plant)	14.2	10.8	21.3	7.2	13.8	46.9	54.3	8.05	38.6	30.7	7.4	7.9	23.4	1.17	0.28	-
	e. batang (stem)	14.5	5.5	26.0	2.1	7.2	59.2	60.6	9.08	42.7	30.4	6.0	12.3	24.4	0.91	0.25	-
	f. tangkai (stalk)	8.2	6.3	17.5	2.7	12.9	60.6	63.2	9.51	29.6	25.9	3.5	3.7	22.4	0.62	0.23	-
	g. ubi (tuber)	28.1	6.4	3.2	0.9	4.7	84.8	75.9	11.60	-	-	-	-	-	0.21	0.22	-
17	Kelempong, daun	11.1	31.7	16.4	3.3	17.9	30.7	40.1	5.71	-	-	-	-	-	1.08	0.54	-
	Ficus obpyramidara																
18	Kenaf (Indian hemp)																
	Habiscus cannabinus																
	a. pokok, 2 minggu (whole plant, 2 wks)	12.7	34.4	5.8	3.3	11.9	44.5	76.0	11.61	-	-	-	-	-	0.15	0.06	-
	b. pokok, 5 minggu (whole plant, 5 wks)	93.4	28.1	14.0	3.2	11.9	42.8	70.0	10.64	-	-	-	-	-	0.12	0.05	-
	c. batang, 3 minggu (stem, 3 weeks)	12.2	28.0	21.7	3.1	9.5	37.7	65.4	9.87	-	-	-	-	-	-	0.04	-
	d. batang, 4 minggu (stem, 4 weeks)	7.5	12.4	35.5	2.0	14.0	36.1	55.7	8.27	-	-	-	-	-	0.20	0.02	-
	e. batang, 5 minggu (stem, 5 weeks)	10.9	12.8	28.7	3.6	10.6	44.4	64.9	9.80	-	-	-	-	-	0.26	0.05	-
	f. batang, 5 minggu (stem, 5 weeks)	12.1	8.6	46.7	1.3	8.8	34.5	55.7	8.28	-	-	-	-	-	0.29	0.04	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
	g. batang, 8 minggu (stem, 8 weeks)	17.4	6.4	54.1	1.2	5.0	33.3	54.0	8.00	-	-	-	-	-	-	0.01	-
	h. hay, 45 hari (hay, 45 days)	88.6	16.0	42.9	1.6	7.9	31.6	42.7	6.14	-	-	-	-	-	-	-	-
	i. hay, 60 hari (hay, 60 days)	87.2	5.1	71.5	0.4	3.4	19.7	33.2	4.58	-	-	-	-	-	-	-	-
	j. wafer, 2 bulan (wafer, 2 months)	87.0	13.3	53.7	1.5	9.4	22.0	30.0	4.04	-	-	-	-	-	-	-	-
19	Kacang kelor (horse-radish tree) *Moringga oleifera*	19.7	26.3	10.8	5.9	9.8	47.2	54.7	8.12	37.1	21.8	23.9	15.3	-	1.64	0.35	0.23
20	Kobis, daun (Cabbage) *Brassica spp*	6.9	22.3	11.7	1.5	12.8	51.7	55.6	9.16	-	-	-	-	-	0.67	0.91	-
21	Labu, daun (pumpkin, leaf) *Cucurbita maxima*	17.6	19.6	11.0	3.3	19.6	465.0	56.4	8.40	39.7	21.4	2.7	18.3	18.7	3.33	0.33	0.46
22	Leban, halban (daun) *Vitex pubescens*	35.0	11.7	32.3	2.1	4.8	49.1	32.9	4.53	61.3	51.3	26.0	10.0	25.3	0.38	0.15	-
23	Ludai, daun (Mamah Pelanduk) *Sapium baccotum*																
	a. Daun (leaf)	96.3	10.3	15.2	7.9	5.2	61.4	33.5	4.62	-	-	-	-	-	0.50	0.18	-
	b. Daun (leaf)	37.3	12.4	13.1	7.7	5.9	60.9	35.8	5.00	38.2	24.1	1.9	14.1	16.2	0.66	0.07	0.07

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
24	Mengkudu *Morinda spp*																
	a. Daun (leaf)	20.8	19.6	16.2	4.5	9.8	49.9	55.3	8.22	-	-	-	-	-	0.54	0.16	-
	b. Buah (fruit)	14.2	7.6	33.9	2.3	4.6	51.7	67.6	10.24	-	-	-	-	-	0.39	0.14	-
25	Mengkirai, daun *Ilex cymosa*	39.6	16.5	12.4	3.0	8.2	59.9	74.0	10.84	36.3	35.3	9.6	15.3	25.7	1.68	0.20	-
26	Meranti, daun (Shorea, leaf) *Shorea spp*																
	a. Muda (Young shoot)	7.9	32.0	11.0	4.7	22.2	30.1	33.1	5.44	48.8	19.9	5.8	28.9	14.1	1.32	0.50	0.28
	b. Tua, matang (Mature leaves)	11.2	19.9	20.9	3.7	10.4	45.1	54.7	8.11	40.0	27.2	5.7	12.8	21.5	1.26	0.41	0.37
27	Margosa, sadu daun (Neem, Margosa) *Melia indica*	36.1	16.3	14.3	2.6	11.3	55.4	64.0	9.64	-	-	-	-	-	5.02	0.21	-
28	Nangka, daun (Jack fruit, leaf) *Arrocarpus integra*	39.3	13.6	19.3	4.5	10.5	52.1	50.9	7.19	-	-	-	-	-	0.50	0.10	-
29	Narung, daun (a type of shrub) *Trema orientalis*	32.1	17.7	13.7	2.5	6.6	59.5	37.2	5.23	57.9	47.9	25.6	10.0	22.3	0.57	0.18	0.37
30	Padi (Rice) *Oryza saliva*																
	a. pokok (plant)	35.0	6.7	26.4	1.9	10.1	54.9	49.9	7.32	-	-	-	-	-	0.06	0.16	-
	b. jerami (sraw)	98.8	6.7	29.4	2.9	10.6	50.4	35.6	4.97	-	-	-	-	-	0.09	0.10	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
	c. Jerami, hay (hay, straw)	90.6	5.0	32.3	1.2	16.3	45.2	36.4	5.10	-	-	-	-	-	0.34	0.06	-
31	Pegaga *Centella Asiatica L.*	9.8	17.9	21.8	1.9	4.2	54.2	51.8	7.63	-	-	-	-	-	0.12	0.10	-
32	Pisang, daun Pisang Awak (Banana leaf) *Musa sapientum*	24.8	14.4	28.9	2.0	8.9	45.8	39.2	5.92	70.3	44.6	14.1	25.7	30.5	0.40	0.19	-
33	Pucuk paku merah, daun (fernleaf, red) *Petyridophytes*	9.5	29.4	19.8	1.1	9.7	40.0	39.1	5.55	57.0	44.7	22.7	12.0	22.0	0.10	0.45	0.24
34	Pucuk paku hijau, daun (fernleaf, green) *Petyridophytes*	8.6	19.7	21.3	1.9	12.5	44.6	38.7	5.48	69.4	59.9	35.8	9.5	24.1	0.16	0.64	0.34
35	Rosell, daun (Rosell, leaves) *Hibiscus sabdariffa L.*	19.7	13.8	11.5	4.0	9.0	61.7	64.8	9.78	-	-	-	-	-	2.88	0.25	-
36	Sawi, daun (Spinach mustard) *Brassica rugosa*	7.0	24.9	10.3	4.0	33.8	27.0	23.9	3.04	-	-	-	-	-	3.07	0.67	-
37	Selaput tunggul (Mikania) *Mikania cordata/Ceroma*																
	a. Muda (Young shoot)	16.5	29.5	15.4	3.6	12.1	39.4	49.9	7.16	-	-	-	-	-	0.10	0.62	-
	b. Tua, matang (Mature leaves)	16.4	26.8	22.2	3.7	11.6	35.7	46.5	6.60	-	-	-	-	-	0.10	0.48	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
38	Senduduk, daun (melastoma) *Melastoma malabathricum*	30.9	11.0	20.7	2.8	10.7	54.8	36.3	5.09	33.3	27.7	9.3	5.6	18.4	2.47	0.13	-
39	Sisek puyuh, daun *Caralia suffruticosa*	98.3	8.7	40.5	1.5	5.7	43.6	37.9	5.34	61.2	43.8	8.0	17.4	35.8	1.69	0.03	-
40	Sukun, daun (bread fruit) *Artocapus communis*	24.5	14.6	19.8	4.0	12.3	49.3	53.2	7.87	46.3	33.0	7.1	13.3	25.9	2.01	0.19	0.28
41	Tampu rengat, (Malayan bramble) *Rubus molucanus*	24.0	16.5	26.0	3.2	10.2	44.2	48.0	7.01	55.2	36.7	7.7	18.5	29.0	1.68	0.25	0.52
42	Tebu, pucuk (Sugarcane top) *Saccharum officinarum*	30.9	6.2	35.9	1.7	6.2	50.0	50.0	7.34	-	-	-	-	-	0.26	0.11	-
43	Teh, daun (Tea, leaf) *Camellia sinensis*	42.4	22.2	19.3	2.2	6.6	49.7	69.8	10.60	-	-	-	-	-	0.18	0.08	-
44	Tembikai, (Watermelon, plant) *Citrulus lanatus*																
	a. pokok, (whole plant)	14.0	30.6	14.5	1.9	24.3	28.7	34.2	4.74	-	-	-	-	-	3.29	1.65	-
45	Tembusu, daun *Fagraea fragrans*	33.2	7.7	16.5	3.5	3.0	69.3	53.2	7.87	36.3	29.5	15.6	6.8	13.9	0.65	0.07	30.00

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
46	Ubi Kayu (Cassava)																
	Manihot utilissimalM. esculanta																
	a. Ubi merah, daun (leaf)	29.5	33.9	6.4	6.4	12.2	41.1	50.7	7.17	-	-	-	-	-	0.76	0.68	-
	b. Ubi Gajah, daun (leaf)	28.1	25.4	11.8	6.4	6.5	49.9	50.6	7.13	-	-	-	-	-	0.68	0.31	-
D	BAHAN MAKANAN KONVENSIONAL *(CONVENTIONAL FEEDSTUFFS)*																
1	Barli, hampas bir (Brewers grain) Hordeum vulgare	25.4	26.6	16.0	8.6	3.5	45.2	38.6	5.46	-	-	-	-	-	0.67	0.53	-
2	Bijan, kek (sesame cake) *Sesamum indicium*	91.2	41.0	4.0	9.1	15.0	30.9	62.3	9.12	-	-	-	-	-	2.51	0.95	-
3	Sisa kanji jagung (Corn gluten feed) *Zea mays*																
	a. Corn gluten feed 1	90.9	18.0	7.4	2.6	4.5	67.5	73.3	11.17	-	-	-	-	-	0.20	0.68	-
	b. Corn gluten feed 2	90.7	18.5	11.1	0.7	5.3	64.4	67.6	10.24	-	-	-	-	-	0.06	0.76	-
4	Gandum, dedak (wheat bran) *Triticum aestivum*																
	a. Gandum, dedak 1	88.0	14.4	9.0	4.5	6.2	65.9	60.3	9.03	-	-	-	-	-	0.08	0.96	-
	b. Gandum, dedak 2	85.8	16.6	11.4	2.4	5.0	64.6	67.3	10.19	-	-	-	-	-	0.10	0.68	-
	c. Gandum, dedak 3	88.2	17.1	4.4	4.4	9.9	64.2	68.0	10.30	-	-	-	-	-	0.04	0.79	-
	d. Wheat pollard	90.3	18.3	10.8	3.7	4.2	63.0	69.9	10.61	-	-	-	-	-	0.05	0.67	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
5	Gula merah (Molases)																
	a. Molases 1	93.2	1.4	0.7	3.0	0.4	94.4	90.2	13.96	-	-	-	-	-	0.08	0.09	-
	b. Molases 2	81.0	3.7	0.0	0.0	11.8	84.4	82.0	12.61	-	-	-	-	-	0.92	0.23	-
6	Ikan, dedak (Fish meal)																
	a. Ikan, dedak 1 (fish meal 1)	92.5	54.6	1.4	5.9	35.7	2.4	24.3	3.11	-	-	-	-	-	7.90	2.09	-
	b. Ikan, dedak 2 (fish meal 2)	95.1	47.3	0.8	11.8	36.8	3.3	24.8	3.20	-	-	-	-	-	8.40	4.47	-
	c. Ikan, dedak 3 (fish meal 3)	88.2	62.3	10.2	27.7	0.9	1.2	29.6	3.99	-	-	-	-	-	4.55	4.43	-
	d. Ikan, dedak 4 (fish meal 4)	88.7	54.6	6.0	31.2	1.5	6.7	-	-	-	-	-	-	-	5.17	1.65	-
	e. Ikan, dedak 5 (fish meal 5)	90.9	15.5	7.9	15.5	8.4	52.7	56.7	7.55	-	-	-	-	-	1.60	0.07	-
	f. Ikan, dedak import (imported)	92.0	74.0	9.8	14.6	0.5	1.1	-	-	-	-	-	-	-	0.17	1.34	-
7	Isirung kelapa sawit (Palm kernel cake)																
	Elaeis guinensis																
	a. Dedak expeller 1	91.8	15.3	15.0	8.9	5.0	55.8	65.4	9.80	-	-	-	-	-	0.20	0.52	-
	b. Dedak expeller 2	90.0	17.9	11.7	3.4	4.8	62.2	67.0	10.14	-	-	-	-	-	0.20	0.63	-
	c. Dedak solvent (pellet) 1	90.7	17.3	13.6	5.3	3.9	59.9	73.2	11.15	-	-	-	-	-	0.25	0.65	-
	d. Dedak solvent (pellet) 2	88.2	16.8	16.7	3.4	4.8	58.3	67.1	10.16	-	-	-	-	-	0.21	0.61	-
	e. Palm kernel meal	86.8	17.5	13.1	0.9	5.0	63.5	74.6	11.39	-	-	-	-	-	0.75	0.61	
8	Jagung (maize)																
	Zea mays																
	a. Biji (whole)	87.7	9.3	3.1	5.2	2.0	80.4	81.2	12.48	-	-	-	-	-	0.32	0.35	-
	b. Biji (whole)	90.0	9.4	3.0	1.8	1.6	84.4	79.7	12.22	-	-	-	-	-	0.01	0.23	
	c. Jagung (maize)	89.5	9.9	5.7	7.6	2.4	74.4	87.0	13.44	-	-	-	-	-	-	-	
	d. Hancur (ground)	89.7	10.6	4.3	4.6	1.5	79.0	83.5	12.85	-	-	-	-	-	0.31	0.21	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
9	Kacang soya (soya bean) *Glycine max*																
	a. Biji (whole)	89.9	40.6	12.6	18.1	5.6	23.1	70.1	10.69	-	-	-	-	-	0.34	0.85	-
	b. Dedak (meal)	87.4	45.5	6.6	2.6	7.0	38.3	74.1	11.16	-	-	-	-	-	0.33	0.75	-
	c. Dedak (meal)	86.0	48.4	8.5	1.8	7.7	33.7	74.6	11.39	-	-	-	-	-	0.20	0.77	
10	Kacang tanah, dedak (Ground nut meal) *Arachis hypogaea*	90.5	40.4	8.2	1.5	4.2	45.7	72.0	10.90	-	-	-	-	-	-	-	-
11	Kelapa, dedak kopra (Copra cake) *Cocos nucifera*	93.1	21.5	9.9	12.7	6.9	49.0	66.1	9.99	-	-	-	-	-	0.42	0.38	-
12	Oat, biji (grain) *Avena sativa*																
	a. Oat 1	90.8	10.2	15.0	5.4	2.4	67.0	60.2	9.01	-	-	-	-	-	0.23	0.34	-
	b. Oat 2	88.2	17.1	10.0	5.3	4.2	63.4	84.0	12.94	-	-	-	-	-	0.11	0.11	-
13	Padi, dedak (Rice bran) *Oryza sativa*																
	a. Halus (fine)	91.6	14.0	5.5	13.8	7.2	59.5	55.7	8.27	-	-	-	-	-	0.04	1.41	0.37
	b. Kasar (rough)	93.3	16.6	11.6	2.0	5.0	64.8	60.3	9.03	-	-	-	-	-	0.10	0.49	0.11
	c. Dedak (rice bran)	89.5	14.9	10.5	18.3	7.9	48.4	51.5	7.59	-	-	-	-	-	0.03	1.68	-
	d. Dedak (rice bran)	89.5	14.9	18.3	7.9	10.5	48.4	51.5	7.59	-	-	-	-	-	0.03	1.68	-
14	Rapeseed meal (Cannola meal) *Brassica rapa*	89.6	37.1	9.7	1.0	8.6	43.6	54.1	8.02	-	-	-	-	-	0.82	1.05	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
15	Susu gantian (Milk replacer, CMR 26)	96.7	28.4	0.2	18.9	6.8	45.7	58.4	8.72	-	-	-	-	-	1.02	0.75	0.12
16	Sekoi, biji (Sorghum) *Sorghum vulgare*	90.1	11.7	7.2	3.6	3.8	73.7	74.1	11.31	-	-	-	-	-	0.03	0.33	-
17	Ubi kayu (Cassava) *Manthot utilissimalM. esculenta*																
	a. Chip kering (dry chip)	86.2	4.4	2.9	0.5	2.2	90.0	84.4	13.00	-	-	-	-	-	0.39	0.51	-
	b. Pellet (pellet)	87.4	2.4	4.0	0.3	7.9	85.4	81.7	12.55	-	-	-	-	-	0.20	0.10	-
E	BAHAN SISA *(BYPRODUCTS)*																
1	Barli (Barley) *Hordeum vulgare*																
	a. Barli chaff, (barley chaff)	87.7	8.3	27.7	1.4	4.2	58.4	60.0	8.98	-	-	-	-	-	0.16	0.13	-
	b. Brewers grain	88.2	23.1	20.1	6.9	10.1	39.8	64.0	9.65	-	-	-	-	-	0.35	-	-
2	Betik, kulit buah (Papaya, fruit skin) *Carica spp*	12.6	21.0	10.2	3.7	12.5	52.6	51.5	7.63	-	-	-	-	-	1.30	0.67	-
3	Biskut tawar (kilang) Biscuit, sour (Factory reject)	89.1	12.7	0.4	5.5	1.5	79.9	69.5	11.61	-	-	-	-	-	0.04	0.11	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
4	Bunga matahari (sun flower)																
	a. Biji baru (fresh seeds)	98.1	16.7	30.9	27.6	5.9	18.9	-	-	-	-	-	-	-	-	-	-
	b. Biji lama (old seeds)	97.5	15.8	35.5	26.9	3.4	18.4	-	-	-	-	-	-	-	0.12	0.23	-
5	Dhal, dedak (Lentil) *Lens esculenta*	87.2	18.3	21.7	1.4	3.8	54.8	43.0	6.19	-	-	-	-	-	0.31	0.29	-
6	Durian, biji (thorny fruit, seed) *Durio zibethinus*	47.8	7.6	3.6	1.1	3.4	84.3	70.9	10.78	-	-	-	-	-	0.03	0.17	0.19
7	Getah, biji (rubber seed) *Hevea brasiliensis*	63.3	20.4	17.6	3.9	3.5	19.4	49.9	7.33	-	-	-	-	-	0.08	0.45	0.23
8	Ikan, kepala bilis (bilis head)	34.6	54.7	0.4	9.3	29.5	6.1	24.7	3.18	-	-	-	-	-	4.00	0.43	-
9	Jagung (Corn)																
	a. Pokok, hidroponik 8 hari (hydrophonic 8 days)	15.3	16.1	13.5	4.2	2.9	63.3	69.2	10.50	-	-	-	-	-	0.12	0.47	-
	b. Pokok, segar	23.1	6.9	31.7	1.2	3.8	56.3	55.9	8.32	-	-	-	-	-	0.06	2.16	-
	c. Silaj batang jagung	17.9	10.2	35.1	1.8	4.1	48.8	-	-	48.8	56.3	8.38	-	-	0.25	0.13	-
10	Jagung, jagung manis (Sweet corn) *Zea mays*																
	a. Daun, muda (young leaf)	23.7	19.6	26.2	3.0	9.6	41.6	52.4	7.74	65.3	32.6	4.0	32.7	28.6	0.32	0.34	-
	b. Daun, tua (old leaf)	37.6	17.5	24.0	2.0	9.2	47.3	45.0	6.52	68.4	33.7	4.9	34.7	28.8	0.38	0.28	-
	c. Batang, muda (young stem)	12.6	12.2	29.6	1.0	9.1	48.1	55.0	8.17	60.4	36.3	4.3	24.1	32.0	0.27	0.27	-
	d. Batang, tua (old stem)	24.5	6.8	29.6	0.7	5.2	57.7	51.0	7.50	71.9	40.7	7.3	31.2	33.4	0.16	1.72	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
	e. Kulit tongkol (Cob leaves)	24.2	4.6	25.8	1.9	3.1	64.6	60.6	9.08	74.4	34.9	3.6	39.5	31.3	0.05	0.14	-
	f. Pokok (whole)	29.5	9.7	29.6	1.5	6.5	52.7	47.9	7.00	64.7	36.0	5.7	28.7	30.3	0.32	0.21	-
	g. Silaj pokok (Plant silage)	15.0	13.6	30.9	1.6	9.6	44.3	56.4	8.40	57.9	35.2	6.5	22.7	28.7	0.25	0.40	0.16
11	Jagung, jagung manis (Sweet corn)																
	Zea mays																
	a. 4O day, age	16.4	12.5	30.8	1.6	8.5	46.6	56.4	8.40	-	-	-	-	-	0.26	0.20	-
	b. 60 day, age	16.5	11.9	32.4	1.8	8.8	45.1	52.9	7.82	-	-	-	-	-	0.37	0.16	-
	c. 75 day, age	25.0	9.6	34.6	1.6	8.2	46.1	52.9	7.82	54.3	34.4	5.7	19.9	28.7	0.46	0.15	-
	d. 75 day, age; ensued, plain.	23.3	8.2	33.8	1.6	8.2	48.2	41.0	5.86	62.5	40.8	5.6	21.7	35.2	0.46	0.22	-
	e. 75 day, age; ensiled, with 1% molases	28.1	11.2	29.7	1.8	8.7	48.6	43.5	6.27	50.8	33.3	4.4	17.5	28.9	0.67	0.17	-
	f. 75 day, age: ensiled, with 2% urea.	26.8	12.4	31.9	1.4	8.9	45.5	42.4	6.09	53.9	34.8	4.9	19.1	29.9	0.53	0.20	-
12	Kacang hijau, biji (Small green pea)	88.5	20.4	17.1	2.7	4.1	55.7	54.0	7.91	-	-	-	-	-	0.28	0.26	-
	Phaseolus aureus																
13	Kacang soya (Soya bean)																
	Glycine max																
	a. Kulit kacang, (Soya bean skin)	96.4	14.6	35.5	4.2	4.5	41.2	77.8	11.92	-	-	-	-	-	0.39	0.17	-
	b. Soyabean hull, (Soya bean hull)	88.6	14.5	13.1	3.1	5.2	64.1	71.4	10.86	62.4	36.7	9.4	25.7	27.3	0.21	0.19	-
	c. Kulit kacang, (Soya bean skin)	89.3	20.6	20.3	3.5	7.1	48.5	73.0	11.13	-	-	-	-	-	0.58	0.61	-
	d. Hampas tauhu, (Tauhu waste)	15.5	30.4	19.1	11.1	4.4	35.0	69.5	9.54	-	-	-	-	-	0.41	0.32	-
	e. Hampas tauhu, (Tauhu waste)	17.4	25.1	16.4	8.8	4.6	45.0	73.2	11.16	-	-	-	-	-	0.21	0.10	-
	f. Hampas kicap (Soy sauce waste)	82.6	28.0	14.1	7.2	9.7	41.0	49.0	7.18	-	-	-	-	-	0.54	0.18	-
	g. Kacang soya (hampas)	12.0	22.6	17.5	7.4	-	-	63.1	9.50	-	-	-	-	-	-	-	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
14	Kacang sepat, kulit (Bonavista bean, skin) *Dolichos lablab*	88.0	8.1	42.8	0.4	3.6	45.1	52.9	7.81	-	-	-	-	-	0.35	0.16	-
15	Kacang Hitam (Kidney bean)																
	a. Dedak (meal)	86.6	16.4	21.9	2.3	4.7	54.7	54.1	8.02	-	-	-	-	-	0.28	0.24	-
	b. Hampas (waste)	90.3	18.8	21.0	2.3	4.1	53.8	69.5	10.55	-	-	-	-	-	0.30	0.30	-
16	Kelapa (coconut) *(Cocos nucifera)*																
	a. Hampas santan (coconut waste)	19.0	6.4	33.1	47.1	1.1	12.3	50.9	7.48	-	-	-	-	-	0.24	0.12	-
	b. Hampas santan (coconut waste)	87.9	19.1	12.6	13.5	7.3	47.5	67.8	10.27	-	-	-	-	-	0.09	0.37	-
17	Kelapa sawit (oil palm) *Elaeis guineensis*																
	a. Pelepah (stem)	34.9	2.1	47.3	0.6	5.5	44.5	36.1	5.14	-	-	-	-	-	0.32	0.05	-
	b. Pelepah dan daun (leaf and stem)	36.4	4.1	44.8	1.2	6.6	43.3	35.1	4.89	-	-	-	-	-	0.55	0.09	-
	c. Daun dan lidi (leaf & vein)	54.3	3.1	29.9	2.2	6.2	58.6	40.3	5.74	-	-	-	-	-	0.28	0.17	-
	d. Batang (oil palm trunk, OPT)																
	(i) Cincang, kering (chipped, dried)	92.6	2.6	38.7	0.6	3.6	54.5	46.5	6.76	74.4	52.2	-	12.2	-	0.18	0.05	-
	(ii) Disilaj (ensiled)	27.8	2.2	36.3	0.8	4.0	56.7	47.9	7.00	66.1	48.5	-	17.6	-	0.20	0.06	-
	(iii) Dicerna dengan 6% NaOH (treated with 6% NaOH)	32.6	2.0	35.4	0.5	8.3	53.8	52.2	7.70	62.3	46.3	-	16.0	-	0.23	0.05	-
	(iv) Diwapkan (steam treated)	33.6	1.7	36.0	0.7	3.0	58.6	52.8	7.80	56.0	48.3	-	7.7	-	0.16	0.04	-
	e. Pelepah, silaj (silaj palm fronds)	95.8	5.2	42.7	2.1	3.9	46.1	49.0	7.17	-	-	-	-	-	0.14	0.13	-
	f. Pelepah sawit (oil palm fronds)	36.7	1.9	54.4	0.5	2.6	40.7	32.1	4.39	-	-	-	-	-	0.15	0.07	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
18	Enapcemar sawit (Palm oil mill effluent)																
	a. Basah (Pond sludge, wet)	53.0	3.3	5.2	11.3	70.4	9.8	45.2	6.50	-	-	-	-	-	0.70	0.10	-
	b. Kering (Decanted, dried)	91.1	11.1	17.0	12.0	9.0	50.5	45.0	6.52	-	-	-	-	-	0.70	0.50	-
19	Gentian asak sawit (Palm press fibre)	62.6	5.8	48.6	5.8	3.3	36.5	29.8	4.02	80.6	56.9	28.3	23.7	28.6	0.32	0.27	-
20	Kopi (Coffee)																
	Coffea arabica																
	a. Buah (fruit)	32.5	11.4	22.9	2.6	5.2	57.9	33.5	4.62	-	-	-	-	-	-	-	-
	b. Kulit (skin)	92.2	8.7	29.4	1.8	5.7	54.4	32.5	4.46	-	-	-	-	-	0.38	0.24	-
21	Koko, lenggai (Cocoa pod)	86.2	7.6	29.5	1.5	14.3	47.1	38.6	5.46	-	-	-	-	-	0.34	0.82	-
	Theobroma cacao																
22	Mi (Mee)																
	a. Hampas mi (Instant noodle waste)	91.7	11.7	0.2	19.0	2.1	67.0	70.0	10.63	-	-	-	-	-	0.01	0.09	-
	b. Sisa mee hoon (Mee hoon waste)	85.7	4.6	0.1	0.2	0.0	95.2	88.9	13.74	-	-	-	-	-	1.07	1.69	-
23	Nangka, (Jack fruit)																
	Artocarpus comosus																
	a. Kulit (fruit skin)	15.1	10.8	18.8	6.5	3.8	60.1	71.2	10.83	-	-	-	-	-	0.32	0.17	0.14
	b. Biji (fruit seed)	17.9	14.4	11.3	3.2	3.1	68.0	69.5	10.55	-	-	-	-	-	0.23	0.25	0.12
24	Nenas (Pineapple)																
	Ananas comosus																
	a. Kulit (fruit skin) 1	14.7	5.3	10.7	0.5	8.4	75.1	75.4	11.52	-	-	-	-	-	0.20	0.10	-
	b. Kulit (fruit skin) 2	9.1	8.3	20.3	0.9	-	-	70.8	10.77	-	-	-	-	-	-	-	-

KANDUNGAN NUTRIEN

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25	Padi (Rice)																
	Oryza sativa																
	a. Padi (grain)	90.9	8.0	10.3	1.9	4.3	75.5	69.5	10.55	-	-	-	-	-	0.02	0.29	0.10
	b. Beras (rice)	88.2	7.1	0.3	0.5	0.5	91.6	84.6	13.03	-	-	-	-	-	0.01	0.14	0.12
	c. Beras ceroh, (polished rice)	90.9	15.2	7.4	21.2	8.6	47.6	49.9	7.32	-	-	-	-	-	0.04	1.60	1.60
	d. Beras tidak ceroh, (unpolished rice)	90.1	7.9	1.7	5.8	1.7	82.9	80.7	12.39	-	-	-	-	-	0.01	0.36	0.11
	e. Beras hancur (broken rice)	89.1	7.4	0.2	0.5	0.6	91.3	87.1	13.45	-	-	-	-	-	0.01	0.13	0.03
	f. Beras temukut (rice and germ)	90.9	11.2	2.2	5.9	2.4	78.3	77.0	11.78	-	-	-	-	-	0.03	0.43	0.15
	g. Sekam padi (rice husk)	95.0	2.2	50.5	0.2	18.6	28.5	62.4	11.16	73.3	59.4	14.0	13.9	45.4	0.04	0.05	-
	h. Jerami (straw)	89.6	9.2	43.1	1.3	2.6	43.8	49.7	7.29	-	-	-	-	-	0.08	0.04	-
26	Pisang (Banana)																
	Musa sapientum																
	a. Pisang, buah	17.4	5.4	4.7	1.7	5.4	82.8	67.5	10.21	-	-	-	-	-	0.04	0.12	-
	b. Pisang masak	15.2	6.1	4.8	0.9	6.7	81.6	65.8	9.93	-	-	-	-	-	0.03	0.11	-
	c. Kulit, Pisang Tanduk (skin)	17.8	10.2	8.0	5.0	13.4	63.4	58.4	8.73	-	-	-	-	-	0.48	0.28	-
	d. Kulit, Pisang Nipah (skin)	19.9	6.7	10.8	10.4	1.7	70.4	51.1	7.52	-	-	-	-	-	0.46	0.33	-
	e. Batang, Pisang Awak (stem)	5.6	2.0	48.2	1.4	14.9	33.5	25.9	3.37	-	-	-	-	-	0.12	0.06	-
	f. Batang, Pisang Tanduk (stem)	4.8	6.2	35.6	1.0	18.9	38.3	49.5	7.26	-	-	-	-	-	0.75	0.57	-
	g. Empulur, Pisang Awak (pith)	4.7	7.0	19.6	2.2	20.0	51.2	45.2	6.55	-	-	-	-	-	0.22	0.11	-
	h. Pelepah, Pisang Awak (petiole)	11.3	3.6	38.2	1.6	7.0	49.6	45.8	6.65	-	-	-	-	-	0.14	0.07	-
	i. Tandan, Pisang Awak (bunch)	11.7	4.9	37.1	2.0	3.9	52.1	42.4	6.09	-	-	-	-	-	0.20	0.08	-
	j. Jantung, Pisang Awak (inflorescence)	11.6	15.4	13.1	7.4	13.3	50.8	44.3	6.41	-	-	-	-	-	0.70	0.35	-

KANDUNGAN NUTRIEN

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27	Popiah (Spring roll)																
	a. Kulit 1 (skin)	75.1	8.0	0.1	2.4	2.2	87.3	83.8	12.91	-	-	-	-	-	0.10	0.12	0.02
	b. Kulit 2 (skin)	82.9	8.6	0.4	0.6	0.2	90.5	90.0	13.92	-	-	-	-	-	-	-	-
28	Sagu rumbia (Palm sago)																
	Metroxylon spp.																
	a. Empulur, batang (pith)	34.4	1.3	4.1	0.6	5.4	88.6	88.1	13.61	-	-	-	-	-	0.24	0.12	-
	b. Hampas, (processing waste)	14.7	1.4	15.4	0.6	7.8	74.8	72.8	11.11	-	-	-	-	-	0.19	0.04	-
	c. Hampas, (processing waste)	22.2	1.6	10.3	0.1	4.8	83.1	72.4	11.02	-	-	-	-	-	0.14	0.03	-
	d. Kerak sagu, (Sago discards)	91.3	0.2	0.2	0.2	10.3	89.1	94.8	14.72	-	-	-	-	-	-	-	-
	e. Sagu batang, kering (Dry ground pith)	47.9	1.3	4.5	0.4	3.7	90.1	67.1	10.15	-	-	-	-	-	-	-	-
29	Najis																
	a. Najis cacing (Tiger worm cast)	89.5	1.8	5.0	0.2	61.5	31.5	17.3	1.95	-	-	-	-	-	-	0.60	-
	b. Najis lembu (Cattle dung)	14.9	11.5	36.2	4.9	8.8	38.6	54.3	8.04	-	-	-	-	-	0.69	0.32	-
30	Taugeh (Bean sprout)	19.5	19.1	23.6	0.7	2.2	54.4	40.3	5.74	-	-	-	-	-	0.40	0.32	-
	Pisum sativum																
31	Tebu (Sugarcane)																
	Saccharum officinarum																
	a. Hampas tebu (bagasse)	45.9	2.0	31.2	0.5	1.5	64.8	47.5	6.93	-	-	-	-	-	0.10	0.03	-
	b. Molas Molases 1	76.4		0.0	0.1	10.5	85.2	73.5	11.21	-	-	-	-	-	0.91	0.09	-
	c. Niolas (Molases) 2	77.0	5.2	0.0	0.1	10.5	84.2	76.1	11.63	-	-	-	-	-	0.89	0.09	-
	d. Molas kering (Molatin)	94.6	5.4	9.3	1.2	35.2	48.9	46.4	6.74	-	-	-	-	-	0.80	0.18	-
	e. Cane top, manual burn	26.0	3.9	34.6	0.9	6.3	54.2	56.3	8.38	-	-	-	-	-	0.09	0.21	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
	f. Sugarcane filter cake	29.4	5.3	13.5	3.4	52.9	24.9	25.6	3.33	-	-	-	-	-	0.77	1.03	-
32	Tembikai (Watermelon) *Citrullus vulgaris*																
	a. Kulit, buah (fruit skin)	5.3	12.2	20.5	1.1	13.6	52.6	55.5	8.24	32.5	32.4	-	0.1	-	0.46	0.58	-
33	Ubi Kayu (Cassava) *Manihot utilissima/M. esculenta*																
	a. Kulit, Ubi Putih (skin)	41.5	6.9	10.1	1.1	5.2	76.7	69.4	10.54	-	-	-	-	-	0.26	0.13	-
	b. Kulit ubi kayu (skin)	31.1	4.6	9.8	0.8	-	-	64.4	9.71	-	-	-	-	-	-	-	-
	c. Hampas tepung ubi, kering (Flour waste, dry)	88.4	1.9	17.0	0.2	4.2	76.7	80.9	12.43	-	-	-	-	-	0.52	0.89	-
34	Kepala udang (Prawn head)	27.5	46.4	16.6	2.6	31.2	3.2	56.8	8.46	-	-	-	-	-	2.28	8.84	-
35	Nasi, lebih (Waste rice)	38.6	8.7	0.5	1.1	0.4	89.3	88.5	13.67	-	-	-	-	-	0.05	0.09	-
36	Roti, kepala roti (Bread trimmings)	93.4	13.5	0.2	3.0	1.2	82.1	87.8	13.56	-	-	-	-	-	0.04	0.12	-
37	Najis ayam (Poultry dung)	85.6	24.0	27.3	0.9	23.1	24.7	56.8	8.32	53.0	33.9	9.5	19.1	24.4	5.16	1.11	0.55
38	Najis ayam dan habuk kayu (Poultry litter)	88.6	18.6	25.4	2.1	18.1	45.8	52.5	7.69	80.4	70.9	47.6	9.5	23.3	1.58	0.30	0.10
39	Sisa pemerosesan ayam (Poultry rendering product)	91.6	84.2	0.1	7.2	1.4	7.1	80.4	12.34	-	-	-	-	-	-	0.14	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
F.	RUMPAI *(WEEDS)*																
1	Bayam duri (Thory spinach) *Amaranthus spinosus*	16.3	24.3	14.6	2.6	16.2	42.3	42.0	6.03	34.8	22.3	5.9	12.5	16.4	0.50	0.56	-
2	Rumpai batang daun lebar *Boreria spp*	8.6	15.7	18.2	4.1	15.2	46.8	52.9	7.81	29.0	28.5	4.4	0.5	24.1	0.42	0.26	-
3	Rumput sambau (Goose Grass) *Eleucine indica*	14.0	18.0	26.2	3.0	13.3	39.5	46.1	6.70	59.7	33.2	2.5	29.7	30.7	1.01	0.44	-
4	Kiambang, halus (Water hyacinth) *Pisstia strariores*	3.9	16.5	12.4	6.4	18.8	45.9	23.6	2.99	-	-	-	-	-	0.17	0.28	-
5	Lidah ular *Hedyotis verticillata*	35.2	21.2	26.1	2.3	8.8	41.6	49.5	7.26	41.2	31.7	6.5	9.5	25.2	0.30	0.35	-
6	Maman *Cleome icosandra*																
	a. Muda (Young shoot)	7.7	29.2	13.0	3.7	19.8	33.4	47.9	7.00	32.4	29.9	6.8	2.5	23.1	0.20	0.73	-
	b. Daun tua (Older leaves)	13.9	20.3	27.7	4.2	14.7	33.1	47.3	6.90	41.8	35.3	8.7	6.5	26.6	0.18	0.39	-
7	Pokok kapal terbang (Eupatorium) *Eupatorium odoratum*	13.9	23.3	15.6	4.8	11.4	44.9	46.6	6.78	43.2	30.3	9.5	12.9	10.8	0.22	0.32	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
8	Purun *Lepironi articulata (mucronata)*	39.0	6.6	3.9	1.7	3.6	84.2	27.4	3.62	77.2	45.3	8.3	31.9	37.0	0.22	0.16	-
9	Semalu *Mimosa spp*																
	a. Merah (Mimosa pudica)	24.0	14.6	28.7	1.8	5.3	49.6	30.6	4.94	55.1	47.0	19.3	8.1	27.7	0.55	0.21	-
	b. Hijau (Mimosa invisa)	28.6	23.5	26.8	2.2	3.6	43.9	43.9	6.34	39.4	32.5	9.0	6.9	23.5	0.50	0.27	-
10	Sendayan *Rhynocospora corymbia*																
	a. Bunga besar (large inflorescence)	33.4	8.9	34.4	2.2	7.1	47.4	32.9	4.53	69.8	45.8	8.7	24.0	37.1	0.16	0.13	-
	b. Bunga bulat (round inflorescence)	18.7	9.9	32.2	3.4	7.0	47.5	33.5	4.62	65.9	40.2	7.6	25.7	32.6	0.38	0.19	-
11	Teratai (Water lillies) *Nalumbium nelumbo*	9.3	20.2	22.3	5.4	12.7	39.4	41.8	5.99	-	-	-	-	-	0.42	0.31	-
G	MAKANAN TERUMUS *(FORMULATED FEEDS)*																
1	Makanan Arnab (Rabbit feeds)																
	a. Pembesaran (Grower)	89.4	16.7	14.7	4.0	13.3	51.3	69.1	10.49	-	-	-	-	-	2.76	0.69	-
	b. Pembiak (Breeder)	89.7	21.2	16.8	2.8	11.1	48.2	62.9	9.46	-	-	-	-	-	0.03	0.38	-
	c. Bunting (Gestation)	89.0	21.3	15.0	3.6	10.3	49.8	67.0	10.13	-	-	-	-	-	0.05	0.59	-
	d. Penyusuan 1 (Lactation 1)	91.3	15.8	15.3	4.6	14.5	49.8	63.9	9.36	-	-	-	-	-	2.93	0.96	-
	e. Penyusuan 2 (Lactation 2)	90.3	18.5	15.8	5.0	13.3	47.4	64.9	9.80	-	-	-	-	-	2.93	1.30	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
	f. Penyusuan 3 (Lactation 3)	89.3	20.0	18.5	3.1	11.3	47.1	61.4	9.21	-	-	-	-	-	0.06	0.75	-
2	Makanan ayam (Poultry feeds)																
	a. Pembesaran (Grower mash)	90.3	23.0	3.5	5.5	9.6	58.4	-	13.50	-	-	-	-	-	1.48	0.85	-
	b. Penelur (Layer mash)	90.5	17.5	6.2	5.2	9.1	62.0	-	13.50	-	-	-	-	-	1.19	0.76	-
	c. Baka (Breeder mash)	91.0	18.1	4.7	9.2	16.7	51.3	-	13.10	-	-	-	-	-	4.65	0.98	-
	d. Pedaging, permulaan (Starter mash)	91.7	19.8	4.0	9.3	13.2	53.7	-	13.20	-	-	-	-	-	3.18	0.97	-
	e. Pedaging pre-mula (Pre-starter crumble)	90.2	22.6	6.9	10.0	7.9	52.6	-	13.80	-	-	-	-	-	1.09	0.80	-
	f. Pedaging, pengakhir (Broiler finisher pellet)	90.1	20.0	6.3	6.9	9.1	57.7	-	13.20	-	-	-	-	-	1.31	0.68	-
	g. Makanan ayam kampung (pellet)	88.7	20.0	12.9	1.6	7.1	58.5	76.6	11.72	-	-	-	-	-	0.37	0.51	-
	h. Makanan ayam serama (anak)	90.7	19.5	11.9	7.9	8.0	52.7	-	-	-	-	-	-	-	0.01	0.08	-
	i. Makanan ayam serama (dewasa)	90.8	17.2	10.1	7.5	10.0	55.2	-	-	-	-	-	-	-	0.50	0.05	-
3	Makanan itik penelur (Layer duck feeds)																
	a. Penelur 1 (Layer 1)	86.6	17.1	22.0	5.9	14.6	40.4	-	9.00	-	-	-	-	-	2.21	1.21	-
	b. Penelur 2 (Layer 2)	47.9	19.4	20.8	7.3	14.4	38.1	-	9.10	-	-	-	-	-	1.98	1.12	-
	c. Itik penelur permulaan (pre-layer)	87.4	24.3	5.1	6.3	8.3	56.0	-	10.70	-	-	-	-	-	1.51	0.89	-
4	Makanan bebiri (Goat feeds)																
	a. Campuran anak bebiri (Creep mix. 1)	86.2	16.8	5.5	2.1	5.0	70.6	74.8	11.42	-	-	-	-	-	0.53	0.31	-
	b. Campuran anak bebiri (Creep mix. 2)	86.2	18.0	11.3	3.0	7.2	60.5	69.8	10.60	-	-	-	-	-	0.50	0.33	-
	c. Bebiri membesar (Sheep grower)	89.6	16.3	10.8	6.0	9.3	57.5	76.1	11.64	-	-	-	-	-	1.35	0.55	-
	d. Konsentrat anak bebiri (Sheep creep feed)	90.1	20.0	9.5	3.5	8.1	59.0	80.0	12.27	-	-	-	-	-	0.71	0.45	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
5	Makanan Kambing (Goats feeds)																
	a. Campuran kambing tenusu (Dairy mixture)	90.4	17.9	5.8	9.8	7.8	58.7	66.9	10.12	-	-	-	-	-	0.39	0.71	-
	b. Konstrentrat kambing tenusu (dairy goat concentrate)	84.1	18.8	5.3	1.7	7.4	66.7	61.9	9.30	-	-	-	-	-	-	-	-
	c. Konsentrat kambing (Goat pellet)	89.3	18.5	3.9	9.6	6.0	62.0	68.7	10.42	-	-	-	-	-	0.17	0.85	-
6	Konsentrat lembu (Cattle supplements)																
	a. Campuran anak (Calf, starter)	88.4	17.7	7.0	3.9	7.9	63.5	70.7	10.75	-	-	-	-	-	0.83	0.80	-
	b. Campuran tenusu (Dairy feeds 1)	90.6	18.7	3.0	15.5	5.3	57.4	-	-	-	-	-	-	-	0.37	0.69	-
	c. Campuran tenusu (Dairy feeds 2)	89.5	16.6	10.1	3.8	6.1	63.4	72.8	11.10	-	-	-	-	-	0.77	0.66	-
	d. Campuran tenusu, Jitra (Dairy)	89.6	18.0	3.7	15.2	8.7	54.3	68.0	10.30	-	-	-	-	-	1.03	0.15	-
	e. Campuran tenusu, Jitra (Dairy)	89.0	16.6	3.6	16.4	6.6	56.8	70.4	10.69	-	-	-	-	-	0.33	0.70	-
	f. Campuran Fidlot, FIMA (Fidlot)	87.3	14.5	4.6	16.8	7.6	56.5	68.4	10.38	-	-	-	-	-	0.11	0.70	-
	g. Campuran pejantan (Bull feeds 1)	24.5	11.6	3.7	24.7	9.8	50.2	56.6	8.42	-	-	-	-	-	-	-	-
	h. Campuran pejantan (Bull feeds 2)	91.2	13.7	18.3	6.0	15.8	46.2	64.8	9.77	-	-	-	-	-	0.50	0.33	-
7	Makanan kuda (Horse feeds)																
	a. Makanan kuda (Horse feeds, cubes)	89.0	15.7	12.5	3.5	9.5	58.8	71.9	10.95	-	-	-	-	-	0.10	0.43	-
	b. Makanan kuda (horse pellets)	90.5	14.9	17.3	3.6	8.7	55.4	64.0	9.64	-	-	-	-	-	0.27	0.09	-
8	Makanan rusa (Deer feeds)																
	a. Konsentrat rusa (Deer feeds 1)	89.2	19.3	6.2	4.6	6.3	63.6	71.2	10.83	-	-	-	-	-	0.94	0.58	-
	b. Konsentrat rusa (Deer feeds 2)	87.4	20.4	4.5	3.4	7.6	64.1	72.9	11.11	-	-	-	-	-	0.90	0.70	-
	c. Konsentrat rusa (Deer feeds 3)	90.2	18.7	5.0	7.3	11.8	57.1	76.8	11.76	-	-	-	-	-	1.60	0.97	-
9	Makanan ikan sangkar (Fish feed)	95.1	49.0	3.7	14.0	10.6	22.7	-	-	-	-	-	-	-	1.28	1.07	-

KANDUNGAN NUTRIEN

No	Jenis Bahan *(Type of Material)*	DM (%)	CP (%)	CF (%)	EE (%)	Ash (%)	NFE (%)	TDN (%)	ME (MJ/Kg)	NDF (%)	ADF (%)	ADL (%)	Hemi-Cellulose (%)	Cellulose (%)	Ca (%)	P (%)	Mg (%)
10	Blok garam jilat (Mineral block)	95.5	-	-	-	84.6	-	-	-	-	-	-	-	-	11.42	10.21	-
11	Triple super phosphate, baja (Fertilezer)	-	-	-	-	56.4	-	-	-	-	-	-	-	-	8.90	8.69	-
12	Urea, baja (urea, chemical fertilizer)	-	38.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Nota *(Note)*

DM = Bahan Kering *(Dry Matter)*
CP = Protin Kasar *(Crude Protein)*
CF = Serat Kasar *(Crude Fibre)*
EE = Lemak Kasar *(Crude Fat)*
Ash = Jumlah Abu *(Total Ash)*
NFE = Ekstrak Tanpa Nitrogen *(Nitrogen Free Extract)*
TDN = Jumlah Nutrien Tecerna *(Total Digestable Nutrient)*
ME = Tenaga Metabolisma *(Metabolisable Energy)*
NDF = Serat Nutral Detergen *(Neutral Detergent Fibre)*
ADF = Serat Asid Detergen *(Acid Detergent Fibre)*
ADL = Lignin Asid Detergen *(Acid Detergent Lignin)*
Ca = Kalsium *(Calsium)*
P = Fosforus *(Phosphorus)*
Mg = Magnesium *(Magnesium)*

Semua keputusan analisis bahan adalah diambil dari purata pengumpulan sampel yang dianalisa di Makmal Pemakanan Institut Haiwan, Kluang selama beberapa tahun.
(All analysis of the material published are the average result of samples collected and analysed at the Nutrition Laboratory at Institut Haiwan, Kluang over a period of several years)

JADUAL 2: **KEPERLUAN NUTRIEN BAGI BERBAGAI KUMPULAN LEMBU**
(TABLE 2): *(NUTRIENT REQUIREMENTS FOR VARIOUS GROUPS OF CATTLE)*

Susu ***Milk*** (litres/day)	**DM** (Kg/day)	**ME** (MJ/day)	**Protein** (g/day)	**Ca** (g/day)	**P** (g/day)
Lembu Penusu, Berat badan 350kg. pengeluaran susu @4% lemak *(Lactating cows, at 350kg body weights producing milk @4% fat)*					
Penusuan Pertama *(First lactation)*					
0	8.8	48	436.9	14	10
5	9.0	77	693.5	30	20
6	9.1	83	745.2	32	22
7	9.2	88	815.5	36	24
8	9.3	94	885.7	39	26
9	9.4	100	956.0	43	28
10	9.5	105	1026.3	46	30
12	9.7	117	1166.8	53	34
15	9.8	126	1377.6	62	40
18	10.0	151	1588.4	72	46
20	10.5	162	1728.9	80	50
Penusuan Kedua *(Second lactation)*					
0	8.8	44	400.5	14	10
5	9.0	72	657.1	30	20
6	9.1	79	708.8	32	22
7	9.2	84	779.1	36	24
8	9.3	90	849.3	39	26
9	9.4	96	919.6	43	28
10	9.5	101	989.9	46	30
12	9.7	123	1130.4	53	34
15	9.8	130	1341.2	62	40
18	10.0	147	1552.0	72	46
20	10.5	159	1692.5	80	50
Penusuan Ketiga dan seterusnya *(Third and subsequent lactation)*					
0	8.8	40	364.1	14	10
5	9.0	69	620.7	30	20
6	9.1	75	672.4	32	22
7	9.2	80	742.7	36	24
8	9.3	86	812.9	39	26
9	9.4	92	883.2	43	28

Susu ***Milk*** (litres/day)	**DM** (Kg/day)	**ME** (MJ/day)	**Protein** (g/day)	**Ca** (g/day)	**P** (g/day)
10	9.5	97	953.5	46	30
12	9.7	109	1094.0	53	34
15	9.8	126	1304.8	62	40
18	10.0	143	1515.6	72	46
20	10.5	154	1656.1	80	50
Lembu Penusu, Berat badan 400kg. pengeluaran susu @4% lemak *(Lactating cows, at 400kg body weights producing milk @4% fat)*					
Penusuan Pertama *(First lactation)*					
0	10.2	70.0	447.6	16	11
5	10.4	86.2	882.6	32	22
6	10.5	91.4	969.6	35	23
7	10.6	96.6	1056.6	38	25
8	10.7	101.8	1143.6	42	27
9	10.8	107.0	1230.6	45	29
10	11.0	112.1	1317.6	48	31
12	11.2	118.4	1491.6	55	35
15	12.8	138.1	1715.3	64	41
18	13.5	153.7	1976.3	74	47
20	14.4	164.1	2150.3	80	51
Penusuan Kedua *(Second lactation)*					
0	10.2	70.0	410.3	16	11
5	10.4	81.4	845.3	32	22
6	10.5	86.4	932.3	35	23
7	10.6	91.6	1019.3	38	25
8	10.7	96.8	1106.3	42	27
9	10.8	102.0	1193.3	45	29
10	11.0	107.2	1280.3	48	31
12	11.2	117.5	1454.3	55	35
15	12.8	132.6	1715.3	64	41
18	13.5	148.7	1976.3	74	47
20	14.4	159.0	2150.3	80	51
Penusuan Ketiga dan seterusnya *(Third and subsequent lactation)*					
0	10.2	70.0	391.7	32	21
5	10.4	78.2	826.7	35	23
6	10.5	83.4	913.7	38	25
7	10.6	88.6	1000.7	42	27
8	10.7	93.8	1087.7	45	29

Susu ***Milk*** (litres/day)	**DM** (Kg/day)	**ME** (MJ/day)	**Protein** (g/day)	**Ca** (g/day)	**P** (g/day)
9	10.8	99.0	1174.7	48	31
10	11.0	104.2	1261.7	55	35
12	11.2	114.6	1435.7	64	41
15	12.8	130.1	1696.7	74	36
18	13.5	145.7	1957.7	80	51
20	14.4	156.1	2131.7	96	61
Lembu Penusu, Berat badan 450kg. pengeluaran susu @4% lemak *(Lactating cows, at 450kg body weights producing milk @4% fat*					
Penusuan Pertama (First lactation)*)*					
0	10.5	65.2	483.6	30	18
5	10.7	91.2	918.6	46	28
6	10.8	96.3	1005.6	49	30
7	10.9	101.5	1092.6	52	32
8	11.0	106.7	1179.6	56	34
9	11.2	111.9	1266.6	59	36
10	11.5	117.1	1333.6	62	38
12	12.5	127.5	1527.6	69	42
15	13.5	143.1	1788.6	78	48
18	13.9	158.6	2049.6	88	54
20	15.3	169.0	2223.6	94	58
Penusuan Kedua *(Second lactation)*					
0	10.5	59.8	443.3	30	18
5	10.7	85.8	878.3	46	28
6	10.8	90.9	965.3	49	30
7	10.9	96.1	1052.3	52	32
8	11.0	131.3	1139.3	56	34
9	11.2	106.5	1226.3	59	36
10	11.5	111.7	1313.3	62	38
12	12.5	122.1	1487.3	69	42
15	13.5	149.1	1748.3	78	48
18	13.9	153.2	2009.3	88	54
20	15.3	163.6	2183.3	94	58

Susu ***Milk*** (litres/day)	**DM** (Kg/day)	**ME** (MJ/day)	**Protein** (g/day)	**Ca** (g/day)	**P** (g/day)
Penusuan Ketiga dan seterusnya *(Third and subsequent lactation)*					
0	10.5	57.1	423.2	30	18
5	10.7	83.2	858.2	46	28
6	10.8	88.3	945.2	49	30
7	10.9	93.4	103.2	52	32
8	11.0	98.6	1119.2	56	34
9	11.2	103.8	1206.2	59	36
10	11.5	109.0	1293.2	62	38
12	12.5	119.4	1467.2	69	42
15	13.5	135.0	1728.2	78	48
18	13.9	150.5	1989.2	88	54
20	15.3	160.9	2163.2	94	58
Berat badan ***Body wts.*** (kg)	**DM** (Kg/day)	**ME** (MJ/day)	**Protein** (g/day)	**Ca** (g/day)	**P** (g/day)
Keperluan saradiri bagi Lembu Kering dan Bunting, 2 bulan yang akhir *(Requirements for dry cows, during 2 month of gestation)*					
350	8.75	57.9	820	23	14
400	10.00	63.9	875	26	16
450	11.25	69.7	928	30	18
500	12.50	75.5	978	33	20
Keperluan saradiri bagi Lembu Kering dan Kosong *(Requirements for non-pregnant, dry cows)*					
350	8.75	45.80	295	14	10
400	10.00	50.25	318	16	11
450	11.25	54.90	340	18	13
500	12.50	59.41	364	20	14
Keperluan sararidi untuk anak lembu betina membesar @ 500g sehari *(Nutrient Requirements of young growing females growing @ 500g per day Average)*					
100	2.60	29.2	421	17	19
150	3.60	38.2	567	18	11
200	4.60	47.1	630	20	14
250	5.68	56.0	681	21	16
300	6.87	65.1	824	23	17
350	8.20	74.8	985	24	18
400	9.74	85.2	1169	24	19

Berat badan ***Body wts.*** (kg)	**DM** (Kg/day)	**ME** (MJ/day)	**Protein** (g/day)	**Ca** (g/day)	**P** (g/day)
Keperluan saradiri bagi anak lembu jantan membesar @ 500 g sehari *(Nutrient requirements of young growing males gaining @ 500g per day average)*					
100	2.45	27.4	392	16	8
150	3.28	35.8	525	18	11
200	4.12	43.7	573	20	13
250	4.99	51.5	598	21	14
300	5.89	59.2	707	23	17
350	6.86	67.0	823	24	18
400	7.90	74.9	947	24	19
Keperluan sararidi bagi Lembu Pejantan (matang) *(Maintenance of Mature Breeding Bulls)*					
500	7.89	66.1	789	20	12
600	9.05	75.7	905	24	15
700	10.16	84.6	1016	28	18
800	11.23	94.6	1123	32	20
900	12.27	102.6	1227	36	22
1000	13.28	111.1	1328	41	25
1100	14.26	119.3	1426	45	28
1200	15.22	127.4	1522	49	30

Nota:

Sebahagian daripada unjuran keperluan nutrient untuk ternakan dalam buku ini diadaptasikan daripada terbitan Nutrient Requirements of Dairy Cattle (NRC), Washington, DC, 1981 and 1988.

Parts of the estimated nutrient requirements of animal in this book were adapted from publications by Nutrient Requirements of Dairy Cattle (NRC), Washington, DC, 1981 and 1988.

JADUAL 3: KEPERLUAN GALIAN BAGI LEMBU
(TABLE 3): (DAILY MINERAL REQUIREMENTS FOR CATTLE)

Galian [1] *Mineral*	**Berat lembu** *Body weight (kg)*	**Pengeluaran Susu sehari** *Daily milk production (litre)*				**Kering/ Bunting** *Dry/ Pregnant*	**Jantan dewasa** *Mature bull*	**Membesar Jantan/ Betina** *Growing Male/Female*
	<400	< 8	8 - 13	13 - 18	> 18			
	500	< 18	11 - 17	17 - 23	> 23			
	600	< 14	14 - 21	21 - 29	> 29			
	700	< 18	18 - 26	26 - 35	> 35			
Kalsium, *Calcium, %*		0.43	0.46	0.54	0.6	0.37	0.24	0.40
Fosforus, *Phosphosus,* %		0.21	0.34	38	0.40	0.26	0.18	0.26
Magnesium, *Magnesium, %*		0.20	0.20	0.20	0.20	0.16	0.16	0.16
Garam, Sod. chloride, %		0.46	0.46	0.46	0.46	0.25	0.25	0.25
Kalium, *Potassium, %*		0.90	0.90	0.90	0.90	0.65	0.65	0.65
Cobalt, *Cobalt, ppm*		0.1	0.1	0.1	0.1	0.1	0.1	0.1
Kuprum, Copper, ppm		5 - 10	5 - 10	5 - 10	5 - 10	5 - 10	5 - 10	5 - 10
Manganese, *Manganese, ppm*		40	40	40	40	40	40	40
Zinc, *Zinc, ppm*		40	40	40	40	40	40	40
Selenium, *Selenium, ppm*		0.3	0.3	0.3	30	0.3	0.3	30

[1] Peratus kandungan berdasarkan bahan kering makanan *(Content based on Dry Matter)*

KEPERLUAN AIR

Keperluan air adalah tidak kurang pentingnya kepada ternakan malahan kepada semua hidupan. Banyak fakta menentukan keperluan sebenar air bagi setiap ternakan. Lembu membesar boleh meminum air sebanyak 10 hingga 30 liter sehari, bergantung kepada cuaca dan lain-lain fakta. Di antara lain fakta-fakta yang menentukan keperluan air ialah berat badan ternakan, cuaca dan jumlah bahan kering dimakan.

Biasanya lembu memerlukan 6 liter air bagi setiap kilogram bahan kering dimakan. Lembu pedaging boleh meminum 21 hingga 30 liter air sehari. Setiap 1 liter susu dihasilkan, memerlukan 5 liter air untuk diminum oleh lembu penusu. Jadual 4 memberikan gambaran am keperluan air bagi ternakan setiap hari.

WATER REQUIREMENT

The importance of water to animals is very clear and in fact for all living being. Many factors contribute to the actual requirements of water to each animal. Growing animals can take between 10 to 30 litres of water daily depending on the weather and other factors. Among the factors determining the requirements are body weight, weather and total dry matter intake.

Normally cattle require 6 litres of water for every kilogram of dry matter of feeds consumed. Beef cattle can drink between 21 to 30 litres of water daily. Every 1 litre of milk produced need the cow to consume about 5 litres of water. Table 4 gives an estimated daily water requirement for cattle.

JADUAL 4: ANGGARAN KEPERLUAN AIR OLEH LEMBU SEHARI
(TABLE 4): (ESTIMATED DAILY WATER REQUIREMENTS OF CATTLE)

Penghasilan susu *Milk production (litre)*	**Berat badan, kg** *Body weight, kg*		
	350	400	450
	Keperluan air *Water requirements (litres)*	**Keperluan air** *Water requirements (litres)*	**Keperluan air** *Water requirements (litres)*
0	48	55	62
5	55	62	69
6	57	64	70
7	58	65	72
8	59	66	73
9	61	68	75
10	62	69	76
12	65	72	79
15	69	76	83
18	74	81	87
20	77	83	90

BAGAIMANA MENGGUNAKAN JADUAL INI UNTUK MERUMUS MAKANAN TERNAKAN

Ternakan perlu memakan makanan bagi memperolehi cukup nutrien untuk saradiri, membesar, membiak dan pengeluaran (susu). Penternak perlu mengetahui jenis makanan yang ada (rujuk Jadual Kandungan Nutrien), dengan juga mengetahui kandungan nutrien bagi setiap bahan dan keperluan setiap nutrien bagi berbagai kumpulan berat dan umur lembu serta taraf kebuntingan dan pengeluaran susunya (rujuk Jadual Keperluan Nutrien). Tidak lupa juga jumlah maksima keupayaan ternakan ini boleh mengambil bahan kering setiap hari. Semua ini terdapat di dalam buku yang disediakan ini.

Bagi mendapatkan suatu rumusan makanan bagi setiap ekor ternakan (lembu) tertentu, ransum yang sesuai perlu dibuat. Ransum ini perlulah menentukan lembu tersebut dapat memperolehi cukup semua jenis nutrien yang diperlukan daripada bahan-bahan yang telah ditetapkan, tetapi harus juga diingat kesemua campuran makanan yang diberi itu berjumlah tidak lebih daripada maksima jumlah bahan kering yang mampu dimakan olehnya, seperti yang diberikan di dalam panduan, disebabkan isipadu saluran penghadamannya yang terhad.

Contoh pengiraan ransum (Jadual 5):

Seekor Lembu Penusu, berat badan 450kg, menghasilkan 15 liter susu sehari dalam penusuan ketiga dengan 4% lemak (rujuk Jadual 2) diberikan ransum makanan berdasarkan bahan-bahan berikut:

Rumput Napier (8 minggu), hampas Isirong kelapa sawit (PKC solven, no.2), hampas tahu, jagung kisar dan hampas sagu. Bahan-bahan ini hendaklah dirumus supaya menghasilkan nutrien-nutrien secukupnya untuk kumpulan lembu tersebut, tetapi jumlah bahan tidak melebihi bahan kering yang mampu diambil oleh ternakan berkenaan.

HOW TO USE THIS TABLE TO FORMULATE A RATION FOR A CHOSEN ANIMAL

Animals must consume feedstuff to acquire sufficient nutrient for body maintenance, growth, reproduction and milk production. A farmer need to know the types of feed ingredients he has and also to know their nutrient contents for every single, material (refer Nutrient Contents Table). He also need to know nutrient requirements for the various animal groups, their weights, age, including their production status and stage of pregnancy if any, (refer Nutrient Requirements Table). Do not forget also the capacity of the animal to take in its daily total dry matter. All these are available in this sample booklet.

To obtain a ration for every animal or a specific cow a suitable formulation needs to be worked out. This ration needs to be ascertained that all types of nutrients required must be supplied by the feed ingredients chosen, but care must be taken to ensure that the total dry matter of all the feed ingredients to be given, to obtain the nutrients, do not exceed the total maximum dry matter the particular animal is capable of taking, as given in the table. This is due to the fact that the capacity of the rumen is such that only so much dry matter is able to be taken in by the animal.

Example of how a ration is worked out (Table 5):

A lactating cow, weighing 450 kg and in its third lactation is producing 15 litres milk at 4% fat daily (refer Table 2). The cow is given a ration worked out consisting of the following ingredients:

Napier grass (8 weeks old), palm kernel cake (PKC Solvent, no.2), soya waste, ground maize and sago waste. The ration is as given.

Jadual 5: **Merumus ransum makanan lembu tenusu berat badan 450 Kg, mengeluarkan 15 liter susu, dipenusuan ketiga, dengan 4% lemak.**

(Table 5): *(Computing a dairy ration for a cow, 450 kg body weight in its third lactation producing 15 litres milk at 4% fat)*

Bahan-bahan *Ingredients*	*A*	*B*	*C*	*D*	*E*	*A X B*	*A X B X C*	*A X B X D*	*A X B X E*
	Berat *Weight (Kg)*	**DM** (%)	**ME** *(MJ/Kg)*	**CP** *(%)*	**CF** *(%)*	**DM** *(Kg)*	**ME** *(MJ)*	**CP** *(Kg)*	**CF** *(Kg)*
1. Napier (8 minggu) *Napier grass (8 wks)*	20	19.7	7.44	10.9	36.4	3.94	29.3	0.43	1.34
2. Hampas isirong sawit *(Palm Kernel Cake) (PKC pellet No. 2)*	3	88.2	10.16	16.8	16.7	2.65	26.92	0.45	0.44
3. Hampas tauhu *(Soya waste)*	5	15.5	9.54	30.4	11.1	0.78	7.44	0.24	0.1
4. Hampas Sagu *(Sago waste)*	30	14.7	11.11	1.4	15.4	4.41	48.99	0.1	0.68
5. Jagung kisar *(Ground maize)*	1.8	89.7	12.85	10.6	4.3	1.61	20.69	0.17	0.1
6.									
	(A) **Jumlah Nutrien diperolihi** *(Total Nutrients obtained)*					**Al** 13.4	**A2** 133.5	**A3** 1390	**A4** 2.75
	(B) **Jumlah keperluan Nutrien** *(Total Nutrient Requirement)*					13.5	134	1356.8	>18%
	(C) Peratus Serat Kasar diperolehi *(Percentage of CF obtained)* *(A4 x 100)/A1*								20.52

Note

DM = Bahan kering (Dry matter)
ME = Tenaga Metabolisme (Metabolisable Energy)
CP = Protin Kasar (Crude Protein)
CF = Gentian Kasar (Crude Fibre)

KAEDAH MERUMUS CAMPURAN MAKANAN KONSENTRAT

Kaedah Silang

Suatu kaedah yang mudah bagi merumus sesuatu campuran makanan ialah kaedah silang. Bagi tujuan ini suatu contoh pengiraan bagi mendapatkan suatu campuran yang sesuai sebagai makanan lembu tenusu adalah seperti berikut:

Keperluan nutrien bagi lembu tenusu yang berpengeluaran melebihi 10 liter sehari adalah sebagaimana berikut;

Protein	=	15%
Tenaga	=	10.6 MJ/Kg
Kalsium	=	0.6%
Fosforus	=	0.4%

Kebaikan penggunaan kaedah silang ialah, ianya mudah dan pantas dijalankan tetapi kelemahannya ialah hanya satu nutrien sahaja yang dapat diimbangkan serta imbangan dapat dibuat menggunakan dua bahan makanan sahaja. Tetapi bagi nutrien makanan ruminan, iaitu protin, tenaga dan galian; Tenaga diketepikan dahulu untuk tujuan ini dan dikirakan kandungannya setelah didapati formulasi tersebut. Kalsium, Fosforus dan lain-lain boleh diperolehi dengan mudah kandungannya dengan menetapkan 1.0% Tricalcium phosphate (TCP), 1.0% garam, 0.50% kapur dan 0.50% campuran garam mikro (rujuk Jadual Langkah Pertama)

Hanya protin akan diimbangkan dengan menggunakan kaedah silang ini. Kaedah ini jika perlu digunakan lebih daripada dua bahan untuk diimbang, ia dimulakan sepertimana berikut;

(i) Bahan yang akan digunakan perlulah ditentukan dan diketahui kandungan nutriennya, sekurang-kurangnya kandungan protin, tenaga (ME) dan beberapa galian (Kalsium dan Fosforus).

(ii) Pilih bahan-bahan yang termurah dan boleh diperolehi serta boleh membekalkan nutrien-nutrien seperti di atas. Yangmana terdapat sekurang-kurangnya satu bahan yang tinggi kandungan protein, satu tenaga dan galian.

(iii) Bahan-bahan yang akan digunakan di dalam contoh ini adalah dedak isirong sawit (PKC), dedak soya, urea, dedak padi, TCP, garam, kapur dan galian mikro.

(iv) Sediakan jadual (Langkah Pertama) seperti berikut, dengan menetapkan nisbah beberapa bahan dengan kadar munasabah atau lazim digunakan atau yang selamat dan tinggalkan hanya dua bahan yang satu mengandungi protin yang rendah dan satu lagi bahan mengandungi protin tinggi untuk diimbangkan proteinnya.

FORMULATING A CONCENTRATE FEED MIXTURE

Pearson Square Method

A simple method of formulating a concentrate feed mixture is the "Pearson Square" method. For this purpose it is intended to show the calculation to obtain a feed mixture suitable for dairy cows.

Nutrients required for a cow to produce milk in excess of 10 litres daily are as follows;

Protein	=	*15%*
Energy (ME)	=	*10.6 MJ/Kg*
Calcium	=	*0.6%*
Phosphorus	=	*0.4%*

The advantages of using this method are that, it is simple and fast to be performed, but the limiting factor is it can only balance and perfectly obtain one particular nutrient at a time and the rest of the nutrients are left to chance or experience. Balancing are also to be done for only two feed items. But for ruminant feed concentrates, protein is the nutrient that is to be balanced, while energy is left to the last and can be calculated and see what is obtained. Experience in choosing the feed ingredients and fixing the feed items would usually get the energy right. For Calcium, Phosphorus, trace minerals and salt 1% Tri-calcium phosphate, 1% salt, 0.5% Ground limestone and 0.5% trace mineral premix are fixed (refer First Step Table)

Since only two items can be balanced in this method and if more than two items need to be used, the following procedures are undertaken.

(i) *Feed items to be used are selected and their nutrient contents, especially protein, energy, calcium and phosphorus need to be known; through checking in feed tables or are first sent for analysis.*

(ii) Choose the cheapest items, ones that are obtainable *easily and would supply all the above mentioned nutrients. For example there should be at least one item that can supply either protein, energy or each mineral.*

(iii) *Feed item to be used as an example for this purpose are Palm kernel cake (PKC), Soya bean meal, Urea, Rice bran, Palm sago, TCP, Salt, Ground Limestone and trace Mineral premix.*

(iv) *Prepare a table (First Step) as follows, fixing the ratio of the first few items at rate suitable and commonly used with safety and leave only two last items, one containing higher and the other lower protein for balancing*

Langkah Pertama *(First Step):*

Jadualkan Formula Campuran Kosenterat Lembu Tenusu Pengeluaran 10 Litter Susu Sehari
(Table for Dairy Concentrate Feed Formula, Producing 10 litters Milk /day)

No.	**Bahan** *(Item)*	**Dalam campuran** *(in mixture)* *(%)*	**Kandungan Protin** *(Protein content)* *(%)*	**Jumlah Protin diperolehi** *(Protein obtained)* *(%)*
1.	Dedak soya *(Soya bean meal)*	8.0	40	3.2
2.	Urea *(Urea)*	1.0	240	2.4
3.	Dedak padi *(Rice bran)*	20.0	12	2.4
4.	TCP *(TCP)*	1.0	—	
5.	Garam *(Salt)*	1.0	—	—
6.	Kapur *(Ground limestone)*	*0.5*	—	
7.	Galian mikro *(Trace mineral premix)*	*0.5*	—	—
8.	PKC *(PKC)*	**68**	?	**7**
9.	Sagu kering *(Dried palm sago)*		?	
	JUMLAH	100		**15**

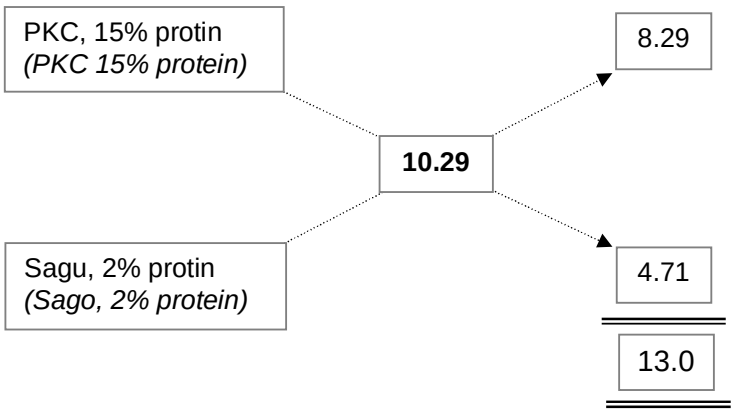
Jumlah Protin dari PKC dan sagu (68 kg) yang diperlukan untuk memperolehi 15% bersama-sama bahan-bahan lain ialah 7.0%.
(Total protein from PKC and sago (68 kg) that is required to obtain 15% overall, together with the other earlier fixed items is 7.0%).

⑧ Peratus protin dalam campuran PKC dan Sagu (68%) ialah;
(⑧Percentage of protein in the mixure of the two items, PKC and sago is:)

$\frac{7 \times 100}{68}$ = **10.29%**

Langkah Kedua *(Second Step) :*

Kaedah Silang diguna untuk mengira peratusan PKC dan Sagu dalam campuran kosenterat .
Using a Pearson Square to Calculate percentage of PKC and Sago in the concentrate.



$\frac{8.29 \times 68}{13.0} = \mathbf{43.5}$

$\frac{4.71 \times 68}{13.0} = \mathbf{24.5}$

Langkah ketiga *(Third Step):*

Formula lengkap bagi campuran kosenterat lembu tenusu diperolehi
(Complete Dairy Concentrate Feed Formula Obtained)

No.	**Bahan** *(Item)*	**Dalam campuran** *(in mixture)* *(%)*	**Kandungan Protin** *(Protein content)* *(%)*	**Jumlah Protin diperolehi** *(Protein obtained)* *(%)*
1.	Dedak soya *(Soya bean meal)*	8.0	40	3.2
2.	Urea *(Urea)*	1.0	240	2.4
3.	Dedak padi *(Rice bran)*	20.0	12	2.4
4.	TCP *(TCP)*	1.0	—	
5.	Garam *(Salt)*	1.0	—	—
6.	Kapur *(Ground limestone)*	*0.5*	—	
7.	Galian mikro *(Trace mineral premix)*	*0.5*	—	—
8.	PKC *(PKC)*	**43.5**	**15**	**6.525**
9.	Sagu kering *(Dried palm sago)*	**24.5**	**2**	**0.49**
		Jumlah protin *(Total protein)*		**15.02**

PANDUAN BAGI MEMUDAHKAN PENGGUNAAN PEMBERIAN KONSENTRAT

Jadual 6 menunjukkan kadar keperluan konsenterat yang dicadangkan diberi (jika perlu) berdasarkan kepada berat lembu, pengeluaran susu sehari dan kandungan tenaga bagi foraj yang digunakan. Bagi pengambilan foraj, dianggap lembu tersebut meragut tidak kurang daripada 6 jam sehari.

Contohnya lembu 350kg yang mengeluarkan susu 7 liter sehari di peringkat penusuan kedua, jika kandungan tenaga bagi foraj ialah 7.8 MJ/Kg ianya memerlukan 4.4 kg konsenteret, tetapi jika kandungan tenaga bagi foraj meningkat kepada 8.6 MJ/Kg ia hanya memerlukan 2.4 kg konsentrat.

A SIMPLIFIED GUIDE FOR FARMERS IN DECIDE AMOUNT OF CONCENTRATES TO BE FED

Table 6 shows rate of concentrate feed requirement recommended (if any), for a particular animal, corresponding to its body weight, daily milk production and energy contents of forage used. For forage intake it is assumed the animal grazes a minimum of 6 hours daily.

An example for a farmer to know his animals concentrate feed requirement, take an animal of 350kg body weight, producing 7 litres milk daily and he is in his second lactation. If the forage energy content is 7.8 MJ/Kg he requires 4.4 kg concentrate supplementation daily and if the forage contains 8.6 MJ/Kg ME he only requires 2.4 kg concentrate.

JADUAL 6: KADAR KONSENTRAT YANG DICADANGKAN UNTUK LEMBU TENUSU (BERDASARKAN KANDUNGAN TENAGA FORAJ)

(TABLE 6): RATES OF CONCENTRATE FEEDING RECOMMENDED FOR LACTATING COWS (BASED ON ENERGY CONTENTS OF PASTURE)

Susu (liter sehari) *Milk (litres/day)*	**DM** (kg)	**ME** (MJ/kg)	**Kadar Konsentrat (kg)/Kandungan Tenaga Foraj (MJ/kg)** *Rate of Concentrate (kg)lEnergy contents of pasture (MJ/kg)*			
			7.8 MJ/kg	**8.2** MJ/kg	**8.6** MJ/kg	**9.2** MJ/kg
Berat lembu 350 kg, pengeluaran susu @ 4% lemak *Cows at 350 kg body weights producing milk @ 4% fat)*						
Penusuan Pertama *(First lactation)*						
0	8.8	48.0	0.0	0.0	0.0	0.0
5	9.0	77.0	2.4	1.3	0.0	0.0
6	9.1	83.0	4.3	3.5	2.4	0.0
7	9.2	88.0	5.8	5.2	4.4	2.4
Penusuan Kedua *(Second lactation)*						
0	8.8	44.0	0.0	0.0	0.0	0.0
5	9.0	72.0	0.6	0.0	0.0	0.0
6	9.1	79.0	2.9	1.8	0.4	0.0
7	9.2	84.0	4.4	3.6	2.4	0.0
8	9.3	90.0	6.2	5.7	5.0	3.2

Susu (liter sehari) *Milk (litres/day)*	**DM** (kg)	**ME** (MJ/kg)	**Kadar Konsentrat (kg)/Kandungan Tenaga Foraj (MJ/kg)** *Rate of Concentrate (kg)lEnergy contents of pasture (MJ/kg)*			
			7.8 MJ/kg	**8.2** MJ/kg	**8.6** MJ/kg	**9.2** MJ/kg
Penusuan ketiga dan seterusnya *(Third and subsequent lactation)*						
0	8.8	40.0	0.0	0.0	0.0	0.0
5	9.0	69.0	0.0	0.0	0.0	0.0
6	9.1	75.0	1.4	0.2	0.0	0.0
7	9.2	80.0	2.9	1.9	0.4	0.0
8	9.3	86.0	4.8	4.1	3.0	0.3
9	9.4	92.0	6.7	6.2	5.6	3.9
Berat lembu 400 kg, pengeluaran susu @ 4% lemak *(Cows at 400 kg body weights producing milk @ 4% fat)*						
Penusuan Pertama *(First lactation)*						
0	10.2	70.0	0.0	0.0	0.0	0.0
5	10.4	86.2	1.8	0.4	0.0	0.0
6	10.5	91.4	3.4	2.2	0.5	0.0
7	10.6	96.6	5.0	4.0	2.7	0.0
8	10.7	101.8	6.6	5.9	4.9	2.4
Penusuan Kedua *(Second lactation)*						
0	10.2	70.0	0.0	0.0	0.0	0.0
5	10.4	81.4	0.1	0.0	0.0	0.0
6	10.5	86.4	1.6	0.1	0.0	0.0
7	10.6	91.6	3.2	1.9	0.2	0.0
8	10.7	96.8	4.8	3.8	2.4	0.0
9	10.8	102.0	6.3	5.6	4.6	1.9
Penusuan ketiga dan seterusnya *(Third and subsequent lactation)*						
0	10.2	76.2	0.0	0.0	0.0	0.0
5	10.4	81.4	0.1	0.0	0.0	0.0
6	10.5	86.6	1.7	0.2	0.0	0.0
7	10.6	91.6	3.3	2.0	0.3	0.0
8	10.7	96.9	4.8	3.8	2.4	0.0
9	10.8	102.1	6.4	5.6	4.6	2.0

Susu (liter sehari) *Milk (litres/day)*	**DM** (kg)	**ME** (MJ/kg)	**Kadar Konsentrat (kg)/Kandungan Tenaga Foraj (MJ/kg)** *Rate of Concentrate (kg)/Energy contents of pasture (MJ/kg)*			
			7.8 MJ/kg	**8.2** MJ/kg	**8.6** MJ/kg	**9.2** MJ/kg
Berat lembu 450 kg, pengeluaran susu 4% lemak *(Cows at 450 kg body weights producing milk @ 4% fat)*						
Penusuan Pertama *(First lactation)*						
0	10.50	53.9	0.0	0.0	0.0	0.0
5	10.70	86.8	1.2	0.0	0.0	0.0
6	10.80	92.8	3.1	1.8	0.0	0.0
7	10.80	98.8	4.9	3.9	2.5	0.0
8	11.00	103.8	6.5	5.7	4.6	1.9
Penusuan Kedua *(Second lactation)*						
0	10.50	49.0	0.0	0.0	0.0	0.0
5	10.70	81.9	0.0	0.0	0.0	0.0
6	10.80	83.9	0.0	0.0	0.0	0.0
7	10.90	97.9	4.6	3.6	1.1	0.0
8	11.00	98.9	4.7	3.6	2.2	0.0
9	11.20	104.9	6.3	5.4	4.3	1.3
Penusuan Ketiga dan seterusnya *(Third and subsequent lactation)*						
0	10.50	49.0	0.0	0.0	0.0	0.0
5	10.70	77.0	0.0	0.0	0.0	0.0
6	10.80	83.0	0.0	0.0	0.0	0.0
7	10.90	89.0	1.4	0.0	0.0	0.0
8	11.00	94.0	2.9	1.6	0.0	0.0
9	11.20	100.0	4.5	3.4	1.8	0.0
10	11.50	106.0	5.8	4.9	3.5	0.1
12	12.50	117.0	7.0	6.0	4.7	1.4

Berat Badan Body Weight *(kg)*	**DM** (kg)	**ME** (MJ/kg)	**Kadar Konsentrat (kg)/Kandungan Tenaga Foraj (MJ/kg)** *Rate of Concentrate (kg)lEnergy contents of pasture (MJ/kg)*			
			7.8 MJ/kg	**8.2** MJ/kg	**8.6** MJ/kg	**9.2** MJ/kg
Keperluan saradin bagi Lembu Kering dan Bunting. 2 bulan yang akhir. *(Requirements for dry cows, during last 2 months of gestation)*						
350	8.75	57.9	0.0	0.0	0.0	0.0
400	10.00	63.9	0.0	0.0	0.0	0.0
450	11.25	69.7	0.0	0.0	0.0	0.0
500	12.50	75.5	0.0	0.0	0.0	0.0
Keperluan saradiri bagi Lembu Kering dan Kosong. *(Requirements for non-pregnant, dry cows)*						
350	8.75	45.8	0.0	0.0	0.0	0.0
400	10.00	50.3	0.0	0.0	0.0	0.0
450	11.25	54.9	0.0	0.0	0.0	0.0
500	12.50	59.4	0.0	0.0	0.0	0.0
Keperluan saradiri untuk anak betina membesar @ 500 gm sehari *(Nurirent Requirements of young growing females, growing @ 500 gm per day average)*						
100	2.60	29.2	3.2	3.3	3.4	3.8
150	3.60	38.2	3.6	3.6	3.6	3.6
200	4.60	47.1	4.0	3.9	3.8	3.4
250	5.68	56.0	4.2	3.9	3.6	2.7
300	6.87	65.1	4.1	3.7	3.0	1.4
350	8.20	74.8	3.9	3.2	2.1	0.0
400	9.74	85.2	3.3	2.2	0.7	0.0

Nota *(Note)*:

DM — adalah Bahan Kering *(Dry matter)*

ME — adalah Tenaga Metabolisme *(Metabolisable Energy)*

0.0 — Bermakna ternakan yang bersetentangan dengan pengeluaran susu dan kandungan tenaga bagi foraj berkenaan tidak memerlukan pemberian konsentrat. Ia memadai dengan ragutan pastura tersebut.
Means the animal vertically corresponding with the milk production and horizontally with the energy content of the pasture does not need concentrate supplementation. They only require enough grazing time on such pasture.

konsentrat / *concentrate* — Untuk penyeragaman konsentrat adalah dianggap campuran bahan makanan yang mengandungi sekurang-kurangnya 15% protin, 10.6MJ/kg tenaga metabolisme (ME), 0.60% kalsium, 0.40% fosforus dan 1.0% garam.
For uniformity a concentrate feed is assumed to be a mixture of feed materials containing a minimum of 15% crude protein, 10.6 MJ/kg metabolizable energy (ME), 0.60% calcium, 0.40% phosphorus and 1.0% salt.

INTEGRASI TERNAKAN DENGAN TANAMAN UTAMA LADANG

Ladang tanaman utama seperti getah dan kelapa sawit dinegara ini mempunyai rumpai yang perlu dibersihkan setiap beberapa bulan sekali. Ini memerlukan perbelanjaan yang besar untuk membeli racun rumpai, mengupah buruh untuk merumpai dan peralatan. Sebenarnya rumpai rumpai ini boleh ditukarkan istilahnya menjadi rumput atau bahan serat untuk makanan ternakan ruminan. Keunutungan kepada peladang adalah banyak, seperti menjimat kos merumpai kerana ternakan jika dipelihara diladang in dapat menjalankan tugas merumpai tersebut dan disebalik itu bagi setiap hektar ladang peladang boleh mendapat pendapatan tambahan dalam bentuk pembiakan ternakan yang menjadi suatu aset yang berguna. Dalam hal ini ternakan hendaklah dipelihara dengan betul, menggunakan baka yang bersesuaian, yang boleh memberi pulangan yang terbaik.

Pada waktu ini baka yang terbaik dari segi pembiakan, ketahanan dalam suasana diladang dan boleh menghasilkan anak setiap tahun dengan kadar anak kembar yang terbanyak ialah baka Kedah-Kelantan (KK). Baka ini walaupun kecil saiz badannya ia mempunyai banyak kualiti yang baik. Pada sedikit masa lagi mungkin baka lain pula akan ditemui

ANIMAL / PLANTATION CROP INTEGRATION

The major commodity crop plantations like rubber and oil palm in this country need to be weeded at specific intervals. This require large capital input for the weeding job, such as the cost of the herbicide, labour and implements. In actual fact the term weeds could be changed to feeds for ruminants if they are allowed to graze in the plantations. Many benefits could be gained by the the planter, such as savings on the weeding jobs and in return the planter could harvest breeding animals on every hectare of his plantation. This animals could become a valuable asset for him. In this respect the animals need to be properly taken care of in the plantation, using the most suitable breed that could breed and multiply faster in such environment, as well as using the most suitable technology of husbandry available for the best return.

At this point in time the best breed in terms of breeding capability, adaptability in the plantation environment and production of the most incidents of twinning at every calving is Kedah-Kelantan (KK) breed. This breed, though small in size it has the best quality in many aspects. In the near future it could be other new breed /s that would be found.

JADUAL 7: KEPERLUAN NUTRIEN HARIAN UNTUK LEMBU BERSAIZ KECIL
TABLE 7: (DAILY NUTRIENT REQUIREMENTS OF SMALL SIZED CATTLE)

Berat Badan *Body Weight* (kg)	**ADG** (g)	**Bahan Kering** *Dry matter* (kg)	**Tenaga** *Metabolisable Energy* (MJ)	**Protein Kasar** *Crude Protein* (g)
Jantan membesar *(Growing males):*				
100	<500	2.45	27.4	392
150	<500	3.28	35.8	525
200	<500	4.12	43.7	573
250	<500	4.99	51.5	684

Berat Badan *Body Weight* (kg)	**ADG** (g)	**Bahan Kering** *Dry matter* (kg)	**Tenaga** *Metabolisable Energy* (MJ)	**Protein Kasar** *Crude Protein* (g)
300	<500	5.89	59.2	707
350	<500	6.86	67.0	823
400	<500	7.90	74.9	947
Saradiri untuk pejantan matang *(Maintenance of mature breeding bulls) :*				
500	-	7.90	66.1	789
600	-	9.10	75.7	905
Betina membesar *(Growing females) :*				
100	<400	2.41	26.5	386
150	<400	3.31	35.1	512
200	<400	4.24	43.4	513
250	<400	5.24	51.7	629
300	<400	6.34	60.2	761
350	<400	7.57	69.0	909
400	<400	8.98	76.5	1,078

Jumlah keperluan ini boleh digunakan sebagai panduan bagi mengira rangsum
(This requirement can be used as a guide to formulate an animal's daily ration)

Sebagai panduan, gunakan lembu jantan membesar, berat badan 200 kg
(As a guide, take a growing male of 200 kg body weight) :

Gunakan kaedah yang sesuai untuk memberikan nutrient yang diperlukan
(Use a suitable formulation method to provide the required daily nutrients):

Computing a Complete Daily Feed Ration

Merumus Rangsum Makanan Harian Seimbang

Jenis ternakan: **Lembu jantan membesar** | Animal No: Lembu Jantan *(growing male)* | Note: BERAT 200 kg | **Date** 6 May, 2005

Ingredients	Weight (kg)	Cost (RM/KG)	Total Cost (RM)	Analysis result DM (%)	ME (MJ/Kg)	CP (%)	CF (%)	Total nutrients obtained DM (kg)	ME (MJ)	CP (g)	CF (kg)
1 Napier, 8 wks	19.50		0.00	19.70	7.44	10.90	36.40	3.8	28.6	419	1.40
2			0.00					0.0	0.0	0	0.00
3			0.00					0.0	0.0	0	0.00
Total (forage)	**19.50**		**0.00**					**3.8**	**28.6**	**419**	**1.40**
4 PKC pallet 2	1.70		0.00	88.20	10.16	16.80	16.70	1.5	15.2	252	0.25
5			0.00					0.0	0.0	0	0.00
6			0.00					0.0	0.0	0	0.00
7			0.00					0.0	0.0	0	0.00
8			0.00					0.0	0.0	0	0.00
Total conc.(Jumlah kons.)	**1.70**		**0.00**					**1.5**	**15.2**	**252**	**0.25**
9			0.00					0.0	0.0	0	0.00
10			0.00					0.0	0.0	0	0.00
Total (Lain- lain)	**0.00**		**0.00**					**0.0**	**0.0**	**0**	**0.00**
TOTAL	21.20		0.00	**Total nutrients obtained (DM)**				5.3	43.8	671	1.65
COMPARASION TABLE (Jadual Perbandingan)								**Percent of Crude Fibre Obtained**			31
Total Nutrient Requirements per Day for body weight				**200 KG**				4.1	43.70	573	18
Suggestion (kedudukan Paras Nutrien)								**Error**	**OKAY**	**OKAY**	**OKAY**

Dengan menggunakan kaedah yang sedia ada didapati suatu rangsum yang sesuai adalah seperti berikut :
(By using the formulation method commonly used in this book the ration obtained is as follows) :

Makanan harian untuk lembu jantan membesar, berat 200 kg
(Daily feed ration for a growing male, with 200 kg body weight) :

Rangsum makanan harian *(Daily feed ration) :*

Rumput, meragut *(Grass, grazing)*	=	19.5 kg
PKC *(Palm kernel cake, meal)*	=	1.7 kg
Garam galian jilat *(Mineral salt lick)*	=	Tiada had *(ad-libitum)*

Rangsum makanan ini sesuai dan mudah dipraktikkan didalam ladang
(This feed ration recommended is simple and practicle for plantation use).

JADUAL 8: KEPERLUAN NUTRIEN UNTUK KAMBING
TABLE 8: NUTRIENT REQUIREMENTS OF GOATS

Berat Badan *Body Weight* (kg)	**DM** (kg)	**ME** (MJ)	**CP** (g)	**Ca** (g)	**P** (g)
Untuk saradiri pada tahap aktiviti sedang (Untuk kambing membesar 50g/hari) *Maintenance at medium activity and early pregnancy (Goats gaining 50g/day)*					
20	0.60	5.00	46	2.0	1.4
30	0.81	6.78	62	2.0	1.4
40	1.01	8.45	77	3.0	2.1
50	1.19	9.96	91	4.0	2.8
60	1.36	11.42	105	4.0	2.8
70	1.54	12.84	118	5.0	3.8
Tambah untuk bunting berat (bagi semua saiz kambing) *Additional for late pregnancy (for all goat sizes)*					
-	0.71	5.94	82	2.0	1.4
Keperluan tambahan untuk susu bagi setiap kg, pada kadar berlainan lemak *Additional requirements for milk production/kg, at different fat contents*					
3.5% lemak *(Fat)*	-	5.02	59	2.0	1.4
4.0% lemak *(Fat)*	-	5.23	72	3.0	2.1
4.5% lemak *(Fat)*	-	5.27	77	3.0	2.1
Makanan yang dicadangkan dianggap mengandungi purata 8.4 MJ/kg ME *The feeds allowed are assumed to be containing 8.4 MJ/kg ME on average*					
Cadangan keperluan untuk kambing fidlot, membesar pada kadar 150 g/hari *Proposed allowances for goats on feedlots (gaining over 150 g/day)*					
10	0.36	7.20	67	3.0	2.1
20	0.60	9.52	86	4.0	2.8
30	0.81	11.30	102	4.0	2.8
40	1.30	12.97	117	5.0	3.5
50	1.50	14.48	131	6.0	4.2
60	1.76	15.94	145	6.0	4.2
70	1.95	17.36	158	7.0	5.2
Keperluan tambahan untuk saradiri bagi kambing membesar pada kadar 150 g/hari, atau lebih *Additional requirements to maintenance for goats gaining over 150 g/day*					
-	-	4.52	40	2.0	1.4

CADANGAN RANSUM MAKANAN KAMBING
(SUGGESTED GOAT FEED RATIONS)

1) Kambing fidlot, berat 40 kg, membesar pada kadar >150g sehari
(Feedlot goats, 40 kg body weight, with >150 g ADG)

Rumput Guinea (Guinea grass, 4 wks)	-	3,000 g
PKC (Palm kernel cake)	-	200 g
Hampas sagu (Sago waste)	-	3,500 g

2) Kambing fidlot, berat 30 kg, membesar pada kadar >150 g sehari
(Feedlot goats, 30 kg body weight, with >150 g ADG)

Rumput Napier (Napier grass, 4 wks)	-	2500 g
PKC (Palm kernel cake)	-	250 g
Beras hancur (Broken rice)	-	400 g
Hampas soya (soya waste)	-	100 g

3) Kambing biasa, berat 15 kg, membesar pada kadar 50 g sehari
(Normal feeding goats, 15 kg body weight, with 50 g ADG)

Rumput Pasphalum (Pasphalum grass)	-	2,600 g
Dedak padi (Rice bran)	-	350 g
Dedak kacang hijau (Green beans bran)	-	50 g

Galian Kalsium, Fosforus dan garam boleh dicampur kedalam campuran konsentrat diatas dengan menggunakan campuran garam (40%), Trikalsium fosfat (40%) dan Limestone (20%), sebanyak 2.5%, atau diberi campuran galian ini sebanyak 10 – 20g seekor sehari. Mereka boleh juga dibenarkan menjilat campuran galian tersebut sebagaimana garam jilat. Galian ini perlu dimasukkan kedalam taking kayu dan dibiarkan menjilat sesuka hati, iaitu apabila mereka rasa memerlukannya.

Contoh formula campuran makanan makanan ini tidaklah statik atau tidak boleh diubah. Mereka boleh disesuaikan mengikut kedapatan bahan-bahan setempat.

Minerals Calcium, Phosphorus and Salt can be mixed into the suggested feed mixture, using self-mixed salt comprising of (40%), Tricalcium phosphate (40%) and Ground limestone (20%), at a rate of 2.5%, or they can be offered that mineral mixture at 10 to 20 g per animal per day. They can also be allowed extra minerals by leaving them to lick the same mineral mixture in wooden trough as and when they need them.

The suggested formulae are by no means static and they can be adjusted or manipulated according to availability of feedstuffs in various places.

PENGHARGAAN

Penulis ingin merakamkan penghargaan kepada Ketua Pengarah Jabatan Perkhidmatan Haiwan Malaysia, diatas segala galakan yang diberi, Dr. Ibrahim Che Embong, Encik Idris Abu Bakar, Tuan Syed Hussein Syed Abdullah, Puan Sabariah Basir, Puan Jamaliah Rabu dan Puan Misimah Md. Isa diatas segala galakan, bantuan moral dan kebendaan bagi menjayakan buku panduan ini.

ACKNOWLEDGEMENTS

The authors wish to acknowledge the Director General of the Veterinary Services Department, Malaysia for his encouragements, *Dr. Ibrahim Che Embong, Mr. Idris Abu Bakar, Mr. Syed Hussein Syed Abdullah, Mrs. Sabariah Basir, Mrs. Jamaliah Rabu and Mrs. Misimah Md. Isa for all their assistance, morally and materially to make the publication of this booklet a success.*