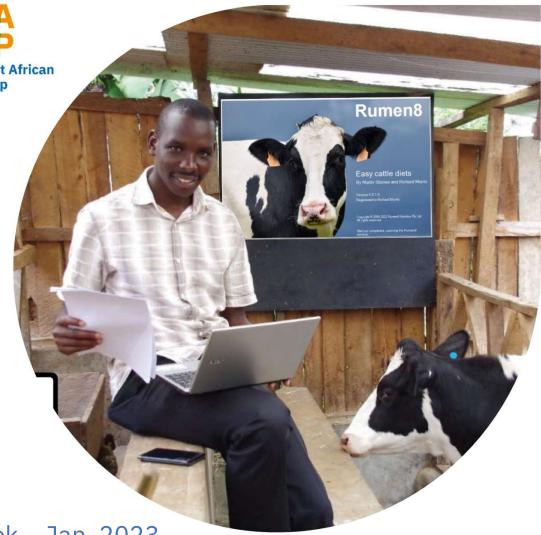


NEA DAP Netherlands East African Dairy Partnership

Dairy cattle nutrition in the tropics using Rumen8

PART 6: Case studies



By M. Staines, J. Creemers and H. Perdok – Jan. 2023



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- East Africa photo credits: Jos Creemers, Hink Perdok, Martin Staines, Victor Otieno, Tseard van der Kooi, Nieke Westerik and Imre van der Kolk and SNV



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Part 6 Case studies from East Africa



Course Goal

To improve knowledge and skills of trainees so that they can confidently use the Rumen8 software application to make informed onfarm nutrition decisions to improve farm profit







Instructions for case studies

- Eight case-studies are presented here.
- Each case-study consists of 2-3 slides that introduce the scenario(s) and the required tasks
- This is followed by 1 or 2 hidden slides that show possible solutions for each scenario
- First get trainees to attempt to solve the scenarios themselves. Allow up to 20 min for trainees to work with each case study
- Then ask trainees to present and discuss their results
- Finally show trainees the results in the hidden slide(s) (by 'unhiding') and discuss the solutions shown compared to those developed by trainees
- A rumen8 file is available for each case study, if access to more details is required





- A farmer has 3 Friesian cows under a zero-grazing system (0.5 km) Formulate a ration using Rumen8
- Cows mean LW 500 kg , LWC 0.07 kg/d; 150 days in milk, 70 days in calf
- Milk production 25 litres/cow/day (milk fat 3.7%; milk protein 3.1%).
 - Milk price 35 KES/litre.
- The following feeds are available
 - Napier grass 60cm
 - Maize silage 30-35% DM
 - Rhodes hay low CP
 - Cotton seed meal decorticated
 - Maize grain
 - Wheat bran
 - Soya bean meal fat <40 g/kg
 - Minerals: Limestone Maclick super Dairy premix

KES 2,000/tonne KES 6,000/tonne KES 23,000/tonne KES 63,000/tonne KES 70,000/tonne KES 29,000/tonne KES 130,000/tonne KES 15,000/tonne KES 240,000/tonne



se study 6-	Feed cost Compare	Napier fresh 60 cm	KES/t DM 9615 🖨	KES/t as-fed	
Dairy cow V Hol	stein V	Maize silage DM <> 30-35%	17910 ≑	6000 ≑	Netherlands East Dairy Part
Live weight (kg)	500 🖨 🤤	Rhodes hay Low CP (Chloris gayana)	25901 븆	23000 🖨	
Live weight change (kg/d)	0.07 🖨 😑	Cottonseed meal decorticated	69307 ≑	63000 🖨	
Days in milk		Maize grain	79007 ≑	70000 🖨	
Days pregnant		Wheat bran	32843 🖨	29000 🖨	
Milk yield (I/d)	3 ÷ ● ↓ 25.0 ÷ ●	Soyabean meal fat < 40 g/kg	145089 ≑	130000 🖨	
Milk fat (%m/v)	3.70	Limestone (CaC03)	15000 ≑	15000 ≑	
Milk true protein (%m/v)	3.10 🖨 🤤	Minerals Maclick Super	244898 ≑	240000 ≑	
Fat:Protein ratio	1.19	Minerals Dairy Premix	459184 ≑	450000 \$	
Fat, Protein, F+P (kg/d) DMI estimation method	0.93 0.78 1.70	NDF intake			l
Farm terrain	Distance wa				
● Flat ○ Undulating ○ Steep		······			

<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew <u>H</u> elp			
			DM	As-fed
1.	Napier fresh 60 cm	\sim	0.00 ≑	0.00
2.	Maize silage DM <> 30-35%	~	11.00 🜩	32.84 ≑
3.	Rhodes hay Low CP (Chloris gayana)	\sim	0.00	0.00 ≑
4.	Cottonseed meal decorticated	~	5.00 ≑	5.50 ‡
5.	Maize grain	\sim	1.60 🜩	1.81 ≑
6.	Wheat bran	~	0.00	0.00 🜩
7.	Soyabean meal fat < 40 g/kg	\sim	0.00	0.00 🜩
8.	Limestone (CaC03)	~	0.21 ≑	0.21 ≑
9.	Minerals Maclick Super	\sim	0.01 🜩	0.01 ≑
10.	Minerals Dairy Premix	\sim	0.00	0.00 ≑
11.		\sim	0.00	0.00 🛓
12.			0.00 💠	0.00 🔹
se	study 6-1		0.00 😂	0.00 🗘

0.00 ≑

0.00 🗘 40.4

17.8

Case	study	6-1
Possi	ble so	lution

Total dally intake (kg/d)

R

Feed costs		Milk income
KES/t DM	37910	KES/L raw milk
KES/MJ ME	3.4	KES/kg ECM
KES/kg CP	216	KES/kg F+P
KES/cow/d	676	KES/cow/d

airy Diet Diet de	tail Price	Feed cost Comp	are Notes	Optimise		
Metabolisable energy	. 🔵	NDF (%DM)	36.3 单	Starch (%DM)	24.2 😑	
Supply (MJ)	198	NDF (kg)	6.470	Sugar (%DM)	2.9 😐	fr
Demand (MJ)	198	peNDF (%DM)	25.1 👄	NFC (%DM)	36.9 😑	er
Balance (MJ)	0	NDF frg (%NDF)	75.3 😑	Forage : Conc	62:38 😑	
Density (MJ/kg DM)	11.1	NDF frg (%lw)	0.97 😑	Ash (%DM)	5.6	
Metabolisable proteir	. 😑	RDP/UDP protei	n	Enteric methane		
Supply (g)	1925	RDP (%CP)	62.6 👄	Total (g/cow)	336	
Demand (g)	1702	UDP (%CP)	37.4 😑	Intensity (g/L)	13.5	
Balance (g)	223	Excess protein (g)	223			
CP (%DM)	17. <mark>5</mark>	Milk loss (I)	0.35	Fat (%DM)	3.7 😑	
OM intake estimate		Calcium (g)		Phosphorus (g)	0	
Max. NDF intake%	100	Supply	115.6	Supply	91.8	
Maximum DMI%	93	Demand	114.5	Demand	64.8	
OMI as % liveweight	3.6	Balance	1.1	Balance	27.0	
Active recommended leve	ls	Magnesium (g)	0	DCAD		
One O Four		Supply	48.3	Calculated		
● Two		Demand	34.1	Recommended	>250	
◯ Three ◯ Off		Balance	14.3			
Mid Lactation (14-18 Its)	A			Rumen8 pH	6.1	
Food	efficiency			Margin		
		1.3			199	
	M/kg DM			KES/cow/d		
-	/kg DM	95		KES/herd/d	598	
515 Feed 9	% income	77 😑				

- A farmer has 8 cross-bred cows under a zero-grazing system (0.5 km) Formulate a ration using Rumen8
- Mean cow LW 450 kg; LWC -0.35 kg/d. 90 days in milk; 20 days in calf
- Milk production 22 litres/cow/day (milk fat 4.0%; milk protein 3.2%)
 - Milk price KES 40/litre
- The following feeds are available:
 - Napier grass 60cm
 - Maize silage <30% DM
 - Rhodes hay high CP
 - Rapeseed meal fat <40 g/kg
 - Maize grain
 - Wheat bran
 - Minerals Limestone Maziwa (Vital) Dairy premix

KES 2,000/tonne KES 6,000/tonne KES 23,000/tonne KES 80,000/tonne KES 70,000/tonne KES 29,000/tonne KES 15,000/tonne KES 150,000/tonne







Dairy Diet Diet detail f	Price Feed cost C	Compare Notes Optimise	_	Netherlands East Dairy Partr
Dairy cow	✓ Other ✓		KES/t DM	KES/t as-fed
Live weight (kg)	450 🖨 🌘	Maize silage DM < 30%	22901 🖨	6000 🖨
Live weight change (kg/d)	-0.35 🜩 🤅	Napier fresh 60 cm	9615 ≑	2000 ≑
Days in milk	90 🖨 🤅	Rhodes hay High CP (Chloris gayana)	25989 🖨	23000 🖨
Days pregnant	20 🖨 🧯	Maize grain	79007 ≑	70000 ≑
Number of animals in herd Milk yield (I/d)	8 🔹 🤇	Rapeseed (Canola) meal fat < 40 g/kg	88889 ≑	80000 🖨
Milk fat (%m/v)	4.00	Wheat bran	32843 🜩	29000 ≑
Milk true protein (%m/v)	3.20 🜩	Minerals Dairy Premix	459184 🜩	450000 ≑
Fat:Protein ratio	1.25	Limestone (CaC03)	15000 ≑	15000 🖨
Fat, Protein, F+P (kg/d)	0.88 0.7	Minerals Maziwa (Vital)	153061 🖨	150000 🖨
DMI estimation method	○ Convention	onal 💿 NDF intake		
Farm terrain	D	Distance walked (km/d) 0.5		
● Flat ○ Undulating ○	Steep 🤄)		13



	<u>F</u> ile	<u>E</u> dit <u>A</u> nimal	View	<u>H</u> elp				[
						DM	As-fed	
	1.	Napier fresh 60	cm		\sim	4.70 🜩	22.60 ≑	
	2 .	Maize silage DM	1 < 30%		\sim	3.00 🜩	11.45 🜩	
	3.	Rhodes hay Hig	h CP (Ch	loris gayana	\sim	0.00	0.00 🜩	
	4.	Rapeseed (Can	ola) mea	l fat < 40 g/kg	\sim	3.60 🗮	4.00 ≑	
	<mark>5</mark> .	Maize grain			\sim	4.00 -	4.51 🜩	
	6.	Wheat bran			\sim	0.00	0.00 ≑	
	7.	Limestone (CaC	03)		\sim	0.10	0.10 🜩	
	<mark>8</mark> .	Minerals Maziwa	a (Vital)		\sim	0.00	0.00 ≑	
	9.	Minerals Dairy F	remix		\sim	0.01 🗮	0.01 ≑	
	10.				\sim	0.00 +	0.00 🗘	
Ca	se	stud	v 6	-2			0.00 🗘	
		ible s				0.00	0.00 🗘	
	33					0.00	0.00 🌩	
	14.						0.00 🜩	
	15.				~	0.00 후	0.00	
	Total o	daily intake (kg/o	I)			15.4	42.7	
		Feed costs			1	Milk income		
		KES/t DM		49060	ł	KES/L raw mil	k	
		KES/MJ ME		4.4	ł	KES/kg ECM		
	1	KES/kg CP		276		KES/kg F+P		
he w		KES/cow/d		756		KES/cow/d		

Dairy Diet Diet detai	Price	Feed cost Com	pare Notes	Optimise	
Metabolisable energy		NDF (%DM)	37.8 🔎	Starch (%DM)	24.0 😑
Supply (MJ)	170	NDF (kg)	5.819	Sugar (%DM)	5.5 👄
Demand (MJ)	170	peNDF (%DM)	27.8 😑	NFC (%DM)	32.6 👄
Balance (MJ)	0	NDF frg (%NDF)	74.4 😑	Forage : Conc	50:50 😑
Density (MJ/kg DM)	11.0	NDF frg (%lw)	0.96 👄	Ash (%DM)	8.6
Metabolisable protein	0	RDP/UDP prote	in	Enteric methane	
Supply (g)	1869	RDP (%CP)	50.5 👄	Total (g/cow)	311
Demand (g)	1484	UDP (%CP)	49.5 😑	Intensity (g/L)	14.1
Balance (g)	385	Excess protein (g)	385		
CP (%DM)	17.8	Milk loss (I)	0.58	Fat (%DM)	3.2 😑
DM intake estimate		Calcium (g)		Phosphorus (g)	0
Max. NDF intake%	99	Supply	88.8	Supply	70.0
Maximum DMI%	91	Demand	91.5	Demand	51.9
DMI as % liveweight	3.4	Balance	-2.7	Balance	18.1
Active recommended levels		Magnesium (g)	0	DCAD	•
One Four		Supply	42.1	Calculated	<u>, </u>
O Two O Five		Demand	28.8	Recommended	>250
◯ Three ◯ Off		Balance	13.3		
Early lactation (18-22 lt A				Rumen8 pH	6.2
Feed eff	ficiency			Margin	
40 kg ECM/	kg DM	1.4		KES/cow/d	124
40 g F+P/kg	DM	1 <mark>0</mark> 3		KES/herd/d	<mark>992</mark>
556 Feed % i	ncome	86 👄			
880 KES Milk	(KES Fee	d 1.2		Milk yield (l/d	l) 22.0 ≑

Ei	le <u>E</u> dit <u>A</u> nimal	<u>V</u> iew <u>H</u> elp				Dairy Diet	Diet detail	Price	Feed cost Compa	are Notes	Optimise		
				DM	As-fed								NE/
1.	Napier fresh 60 cm	n	~	0.00 ÷	0.00	Metabolisa	ble energy		NDF (%DM)	37.3 😑	Starch (%DM)	22.9 😑	
2	Maize silage DM <	< 30%	~	9.10 🜩	34.73 ≑	Supply (MJ)		171	NDF (kg)	5.826	Sugar (%DM)	3.4 🔵	st Africa
3.	Phodos bay High	CP (Chloris gayana		0.00	0.00 ≑	Demand (MJ		170	peNDF (%DM)	25.6	NFC (%DM)	38.1 😑	rtnershi
	[Balance (MJ Density (MJ/		0 10.9	NDF frg (%NDF) NDF frg (%lw)	75.9 9 0.98 9	Forage : Conc Ash (%DM)	59:41	
4.	Rapeseed (Canol	a) meal fat < 40 g/kg	<u> </u>	4.00 🜩	4.44 🗧	Denoity (mor	kg Dilly	10.0	nor ng(//m/)	0.00	A Sh (ABBAN)	0.0	
5.	Maize grain		~	2.40 🜩	2.71 ≑	Metabolisa	ble protein		RDP/UDP protein		Enteric methane		
6.	Wheat bran		~	0.00 ÷	0.00	Supply (g)		1503	RDP (%CP)	61.1 👄	Total (g/cow)	314	
7.	Limestone (CaC0)	3)		0.12 ≑	0.12 ≑	Demand (g)		1485	UDP (%CP)	38.9 😑	Intensity (g/L)	14.3	
	[Balance (g) CP (%DM)		18 15.6	Excess protein (g) Milk loss (l)	18 0.03	Fat (%DM)	3.0 👄	
8.	Minerals Maziwa ((Vital)		0.00 🜩	0.00 ÷			10.0	141111 1035 (1)	0.00		0.0	
9.	Minerals Dairy Pre	emix	~	0.01 ≑	0.01 ≑	DM intake e	estimate		Calcium (g)		Phosphorus (g)	0	
10.			~	0.00 🗘	0.00 🗘	Max. NDF int		100	Supply	97.2	Supply	73.3	
11	-			0.00141	0.00 ‡	Maximum DN		92	Demand	96.8	Demand	52.7	
Cas	e study	16-2				DMI as % liv	-	3.5	Balance	0.4	Balance	20.7	
C. Paul -			<u> </u>	0.00 ‡	0.00 ≑		mended levels		Magnesium (g)	0	DCAD		
Pos	sible so	olutior		0.00	0.00 🜲	One	O Four		Supply	36.0	Calculated	-	
14.			~	0.00 \$	0.00 ‡	O Two O Three	O Five		Demand Balance	28.9 7.2	Recommended	>250	
10					0.00 ‡	Early lactatio	-		Dulance	1.2	Rumen8 pH	6.1	
Ter	tal daily intake (kg/d)			15.6	42.0	Lany locialio					Rumeno pri	0.1	
10	tai ualiy intake (kg/u)			15.0	42.0								
	Feed costs Milk incom		ilk income			Feed eff	iciency			Margin			
	KES/t DM	48622	K	ES/L raw mi	lk	40	kg ECM/k	g DM	1.4		KES/cow/d	120	
	KES/MJ ME	4.5	K	ES/kg ECM		40	g F+P/kg	DM	101		KES/herd/d	960	
	KES/kg CP	312	KE	ES/kg F+P		556	Feed % in	ncome	86 😐				
	KES/cow/d	760	K	ES/cow/d		880	KES Milk,	/KES Fee	ed 1.2		Milk yield (l/d) 22.0	

Case study 6



Case study 6-3 (1/2)

Explore the effects of grass cut at different stages of maturity on milk yield and margin above feed costs

- Zero-grazing, cross-bred dairy cow 400 kg. 60 days in milk, not pregnant. LW change -0.3 kg/d
- Milk fat 3.7%, milk protein 3.1%. Milk price KES 35/litre
- Grasses available (all KES 1,500 per tonne as fed)
 - Setaria grass late vegetative
 - Setaria grass vegetative
 - Setaria grass early vegetative

Task 1

- How many litres can the cow produce on 'Setaria grass late vegetative' and what is the margin?
- What is the DM intake as a % of LW?
- Store (S) the results on the Compare tab and give this ration the name 'Setaria grass late vegetative'





Case study 6-3 (2/2)

Task 2

- How many litres can the cow produce on 'Setaria grass vegetative' and what is the margin?
- What is the DM intake as a % of LW?
- Save the results on the Compare tab and give this ration the name 'Setaria grass vegetative'

Task 3

- How many litres can the cow produce on 'Setaria grass early vegetative' and what is the margin?
- What is the DM intake as a % of LW?
- Save the results on the Compare tab and give this ration the name 'Setaria early vegetative'



	Feed cost her v	Compare Notes Optimise		NET Netherlands East African Dairy Partnership
Live weight (kg)	400 🖨	· · · · · · · · · · · · · · · · · · ·		Dairy Farmership
Live weight change (kg/d)	-0.30 🜩			
Days in milk	60 ≑	· · · · · · · · · · · · · · · · · · ·		
Days pregnant Number of animals in herd Milk yield (I/d) Milk fat (%m/v) Milk true protein (%m/v) Fat:Protein ratio Fat, Protein, F+P (kg/d)	■ 0 • 1 • 3.70 • 3.10 • 1.19	 Setaria grass Late Vegetative Setaria grass Vegetative Setaria grass Early vegetative Limestone (CaC03) Energy corrected 	KES/t DM 3659 € 6494 € 10345 € 15000 €	KES/t as-fed 1500 € 1500 € 1500 €
DMI estimation method	⊖ Conver	ntional NDF intake		
Farm terrain		Distance walked (km/d)	0.5	
● Flat ○ Undulating ○ Steep		⊡ - Ū		
				19



	<u>F</u> ile <u>E</u> dit <u>A</u> nimal <u>V</u> iew	<u>H</u> elp			Dairy Diet Diet de	etail Price	Feed cost Compa	are Notes	Optimise	
			DM	As-fed						
	1. Setaria grass Late Vege	etative	∽ 7.00 🜩	17.07 ≑	Metabolisable energ	y 🔴	NDF (%DM)	73.4 😑	Starch (%DM)	1.0 👄
	2. Setaria grass Vegetative	e	✓ 0.00 €	0.00	Supply (MJ)	60	NDF (kg)	5.187	Sugar (%DM)	4.0 👄
			✓ 0.00 €	0.00 ≑	Demand (MJ)	60	peNDF (%DM)	69.7 😑	NFC (%DM)	5.0 👄
	3. Setaria grass Early vege	etative			Balance (MJ)	0 8.4	NDF frg (%NDF)	100.0 O	Forage : Conc	- - 11.0
	4. Limestone (CaC03)		∨ 0.07≑	0.07 ≑	Density (MJ/kg DM)	0.4	NDF frg (%lw)	1.30 😖	Ash (%DM)	11.0
	5.		~		Metabolisable protei	in 😑	RDP/UDP protein		Enteric methane	
	6.		✓ 0.00 ‡	0.00 ‡	Supply (g)	309	RDP (%CP)	79.4 😑	Total (g/cow)	280
			R a constant		Demand (g)	354	UDP (%CP)	20.6 👄	Intensity (g/L)	116.7
	7.		✓ 0.00 ÷	0.00 🜩	Balance (g)	-45	Excess protein (g)	0		
	8.		✓ 0.00 🔹	0.00 🔹	CP (%DM)	8.6	Milk loss (I)	0.00	Fat (%DM)	2.1 😑
	9.		✓ 0.00 ♣	0.00 🜩	DM intake estimate		Calcium (g)	0	Phosphorus (g)	0
	10.		✓ 0.00 €	0.00 ÷	Max. NDF intake%	100	Supply	42.0	Supply	15.4
					Maximum DMI%	82	Demand	41.1	Demand	12.9
	11.		✓ 0.00 €	0.00 🜩	DMI as % liveweight	1.8	Balance	0.9	Balance	2.5
Case	e study 6	-3	✓ 0.00 🜩	0.00 +	Dairy cow	~	Other ~	0	DCAD	
	13. .		0.00	0.00	Dully Coll			14.6	Calculated	-
Solu	ition task	(1)	0.00	0.00 ≑	Live weight (kg)		400 🖨	9.1	Recommended	>250
								5.5	D 0 11	6.4
	15.		<u> </u>	0.00 🜩	Live weight change	(kg/d)	-0.30 🖨		Rumen8 pH	6.4
	Total daily intake (kg/d)		7.1	17.1	Days in milk		60 🖨			
	Feed costs		Milk income						Margin	
	KES/t DM	3771	KES/L raw m		Days pregnant				KES/cow/d	57
	KES/MJ ME	0.4	KES/kg ECM	100 C	NUMBER				KES/herd/d	-
	KES/kg CP	44	KES/kg F+P		Number of animals i	in herd	1 🖨			
RUM	KES/cow/d	27	KES/cow/d		Milk yield (I/d)		2.4 ≑			2.4 🖨
Easy dairy					initial Justice (if a)		<u> </u>			.

	<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew	<u>H</u> elp				Dairy Diet	Diet detail	Price	Feed cost Comp	are Notes	Optimise		
					DM	As-fed								E/
	1.	Setaria grass Late Vege	etative	~	0.00 ≑	0.00 ≑	Metabolisa	ble energy		NDF (%DM)	72.9 😑	Starch (%DM)	1.0 👄	Ā
	2.	Setaria grass Vegetative	e	~	7.10 🜩	30.74 🜩	Supply (MJ)		62	NDF (kg)	5.176	Sugar (%DM)	5.0 👄	Afric
	3.	Setaria grass Early vege	etative		0.00 ≑	0.00 ≑	Demand (MJ)		62 1	peNDF (%DM)	69.3 😑 100.0 😑	NFC (%DM)	3.5 ●	ners
			CILITIVE				Balance (MJ) Density (MJ/I		8.8	NDF frg (%NDF) NDF frg (%lw)	1.29 😜	Forage : Conc Ash (%DM)	100:0 😑 10.1	
	4.	Limestone (CaC03)			0.00	0.00								
	5.			~	0.00 ≑	0.00 ≑	Metabolisa	ble protein	0	RDP/UDP protein	1	Enteric methane		
	6.			~	0.00 ≑	0.00 🜩	Supply (g)		395	RDP (%CP)	78.6 😑	Total (g/cow)	279	
	7.				0.00 ‡	0.00 🜩	Demand (g)		372	UDP (%CP)	21.4 👄	Intensity (g/L)	96.3	
							Balance (g) CP (%DM)		23 11.4	Excess protein (g) Milk loss (l)	92 0.15	Fat (%DM)	2.1 😑	
	8.				0.00 🔹	0.00 후	Ci (ADIVI)		11.4	MIII 1035 (I)	0.15		2.1	
	9.			~	0.00 🗘	0.00 ≑	DM intake e	estimate		Calcium (g)		Phosphorus (g)	0	
	10.				0.00 ‡	0.00	Max. NDF int	ake%	100	Supply	43.3	Supply	31.2	
_					0.00 \$	0.00	Maximum DN		81	Demand	44.0	Demand	13.6	
	1.1.						DMI as % live	eweight	1.8	Balance	-0.7	Balance	17.7	
5	JS	e study	/ 6-3	5		0.00 ≑						DCAD		
						0.00 ≑	Dairy cow		~	Other ~	14.2	Calculated	340	
5 C)[[ution ta	ISK 2	41		0.00 🗘	Live weight ((ka)		400 🖨	9.5 4.7	Recommended	>250	
	15				0.00	0.00					4.7	Rumen8 pH	6.4	
	15. Totel	daily intake (kg/d)			7.1	30.7	Live weight of	change (kg/	d)	-0.30 🜩		Numerio pri	0.4	
	TUtart	daliy intake (kg/u)			7.1	30.7	Days in milk			60 🖨				
		Feed costs		Mi	il <mark>k incom</mark> e		22,2			hanna		Margin		
		KES/t DM	6494	KE	E <mark>S/L raw m</mark> i	k	Days pregna	ant		0 ≑		KES/cow/d	55	
		KES/MJ ME	0.7	KE	ES/kg ECM		Number of a	nimals in he	ard	1		KES/herd/d	-	
_		KES/kg CP	57	KE	ES/kg F+P		Number of a		and a					
-~	Ú	KES/cow/d	46	KE	ES/cow/d		Milk yield (I/	d)		2.9 🖨		yield (l/d	l) 2.9	

	<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew <u>H</u> elp			
				DM	As-fed
	1.	Setaria grass Late Vegetative	~	0.00 ÷	0.00 ≑
	<mark>2</mark> .	Setaria grass Vegetative	~	0.00	0.00 ≑
	<mark>3</mark> .	Setaria grass Early vegetative	~	9.50 🜩	65.52 ≑
	<mark>4</mark> .	Limestone (CaC03)	~	0.12 🜩	0.12 ≑
	5.		~	0.00 🔹	0.00 ÷
	6.		~	0.00 +	0.00
	7.		~	0.00 +	0.00 +
	<mark>8</mark> .		~	0.00 -	0.00 +
	9.		~	0.00 ÷	0.00 +
	10.		~	0.00 🔹	0.00 ‡
	11.		~	0.00 ≑	0.00 ‡
Ca	ISE	e study 6-	· 3 ~		0.00 ‡
		tion task			0.00 ‡
50	14.	lion lask	J		0.00 ÷
	15.		~	0.00 🗘	0.00 🗘
	Total	daily intake (kg/d)		9.6	65.6
		Feed costs	Mil	k income	
		KES/t DM 10403	KES	S/L raw mi	k
		KES/MJ ME 1.1		S/kg ECM	
		KES/kg CP 60		S/kg F+P	
		KES/cow/d 100		S/cow/d	

ke

Dairy	Diet	Diet detail	Price	Feed cost Com	pare Notes	Optimise	
Meta	bolisab	le energy		NDF (%DM)	54.2 😑	Starch (%DM)	2.3 👄
Supply	y (MJ)		93	NDF (kg)	5.216	Sugar (%DM)	7.7 😑
Dema	nd (MJ)		93	peNDF (%DM)	51.5 😑	NFC (%DM)	14.2 😑
Balan	ce (MJ)		0	NDF frg (%NDF)	100.0 😑	Forage : Conc	- 😑
Densit	ty (MJ/k	g DM)	9.7	NDF frg (%lw)	1.30 😑	Ash (%DM)	11.2
Meta	bolisab	le protein	\bigcirc	RDP/UDP protei	in	Enteric methane	
Supply	y (g)		824	RDP (%CP)	71.9 😑	Total (g/cow)	265
Dema	nd (g)		699	UDP (%CP)	28.1 👄	Intensity (g/L)	30.1
Balan	ce (g)		125	Excess protein (g)	413		
CP (%	DM)		17.5	Milk loss (I)	0.66	Fat (%DM)	2.9 👄
DM in	itake e	stimate		Calcium (g)		Phosphorus (g)	0
Max. I	NDF inta	ike%	100	Supply	69.3	Supply	22.8
Maxim	num DM	1%	90	Demand	70.6	Demand	26.4
DMI a	s % live	weight	2.4	Balance	-1.3	Balance	-3.6 !
D :	10.10.000			out	0	DCAD	
Dairy	COW		~	Other ~	20.0	Calculated	-
				400 ≑	15.3	Recommended	>250
Livew	eight (k	(g)		400 -	4.7		
Live w	eight c	hange (kg/d)		-0.30 🖨		Rumen8 pH	6.3
Days i	n milk			60 🜩			
Davs r	oregnar	nt		0		Margin	
	-					KES/cow/d	208
Numbe	er of an	im <mark>al</mark> s in here	1	1 🜩		KES/herd/d	-
Milk yi	ield (l/d)		8.8		Milk yield (l/d)	8.8 🜩



1PELL



- Cow LW 500 kg; LW change -0.5 kg/d; 50 days in milk; not pregnant. Zero grazing 0.5 km/d
- Milk production 27 litres/cow/day (milk fat 3.7%; milk protein 3.1%).
 - Milk price KES 35/litre.
- The following feeds are available
 - Maize silage 30-35% Dry Matter:
 - Rhodes hay High CP:

KES 6,000/tonne KES 23,000/tonne

- Formulate a diet using the two forages listed with concentrates of your choice
- Create a dairy meal mix



Dairy cow V Hol	stein ~			Neth	PRIMA NEA DAIRY Partnership
Live weight (kg)	500 🌲	Θ^{-}		WEAL AND	
Live weight change (kg/d)	-0.50 🌩	Θ-	Maize silage DM <> 30-35%	KES/t DM	KES/t as-fed
Days in milk		<u> </u>	Rhodes hay High CP (Chloris gayana)	28049 ≑	23000 🖨
Days pregnant 🛛 🖬 Number of animals in herd			Dairy Meal High Yield	58427 🜩	52000 🜩
Milk yield (I/d)	27.0 ≑	Θ-	Dairy Meal Standard	47831 ≑	43000 🖨
Milk fat (%m/v)	3.70 🜩	Θ-	Cottonseed meal decorticated	69307 ≑	63000 🜩
Milk true protein (%m/v)	3.10 🌻	Θ-	Maize grain	79007 ≑	70000 ≑
Fat:Protein ratio	1.19		Limestone (CaC03)	15000 ≑	15000 🜩
Fat, Protein, F+P (kg/d)	1.00 (D.84	1.84 25.8 kg/d		
DMI estimation method	○ Conve	ntional	NDF intake		
Farm terrain		Dista	nce walked (km/d) 0.5		
● Flat ◯ Undulating ◯ Steep		9-€)		25

RUMEN8 Easy dairy & beef cattle diets

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	<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew	<u>H</u> elp				Dairy	Diet	Die
				_	DM	As-fed			
	1.	Maize silage DM <> 30-35	i% ~		7.80 ≑	23.28 ≑	Meta	bolisa	ble ene
	2.	Rhodes hay High CP (Chl	oris gayanaj 🗠		0.00 🜩	0.00 🜩		y (MJ) nd (MJ)	
	3.	Dairy Meal High Yield	~		0.00 🜩	0.00 ≑		ce (MJ)	
	4.	Dairy Meal Standard	~		6.30 🜩	7.01 ≑	Densi	ty (MJ/I	kg DM)
	5.	Cottonseed meal decortica	ated ~		2.80 🜩	3.08 ≑	Meta	bolisal	ble pro
	6.	Maize grain	~		0.00 🜩	0.00 ÷	Suppl	y (g) Ind (g)	
	7.	Limestone (CaC03)	~		0.00 🜩	0.00 +	Balan		
	8.		~		0.00 +	0.00	CP (%	DM)	
	9.		~		0.00	0.00 ÷	DM ir	ntake e	stimat
	10.		~		0.00[0]	0.00 🜩		NDF int	
Ca	se	study 6	-4		0.00 🔃	0.00 ÷		is % live	
	12.		Ŷ		0.00	0.00 ÷	Activ	e recomn	nended
Up	TIC	on 1			0.00	0.00 ÷	0 0		O F₀
	14.		~		0.00[0]	0.00 🜩	OT		
	15.		~		0.00	0.00 ≑	Early	lactation	n <mark>(18-2</mark> 2
	Total	daily intake (kg/d)			16.9	33.4			
		Feed costs		Mill	k income				Fe
		KES/t DM 3	87580	KES	S/L raw mi	lk	35		kg
		KES/MJ ME	3.3	KES	kg ECM		37		g F
		KES/kg CP	233	KES	S/kg F+P		515		Fe
		KES/cow/d	635	KES	6/cow/d		945		KE

airy Diet Diet	detail Price	Feed cost Compa	are Notes	Optimise	
letabolisable ener	gy 😑	NDF (%DM)	37.3 🔍	Starch (%DM)	21.4 🔎
Supply (MJ)	190	NDF (kg)	6.312	Sugar (%DM)	3.8 😑
emand (MJ)	190	peNDF (%DM)	20.2 😑	NFC (%DM)	35.0 😑
alance (MJ)	0	NDF frg (%NDF)	54.7 😑	Forage : Conc	46:54 😑
ensity (MJ/kg DM)	11.3	NDF frg (%lw)	0.69 😑	Ash (%DM)	6.9
letabolisable prote	ein 🦲	RDP/UDP protein		Enteric methane	
upp <mark>ly (g</mark>)	1679	RDP (%CP)	66.9 👄	Total (g/cow)	319
emand (g)	1683	UDP (%CP)	33.1 .	Intensity (g/L)	11.8
alance (g)	-4	Excess protein (g)	0		
₽ (%DM)	16.2	Milk loss (I)	0.00	Fat (%DM)	4.6 😑
M intake estimate		Calcium (g)		Phosphorus (g)	0
1ax. NDF intake%	97	Supply	97.1	Supply	85.1
1aximum DMI%	96	Demand	95.6	Demand	59.2
MI as % liveweight	3.4	Balance	1.5	Balance	25.9
Active recommended le	vels	Magnesium (g)	\bigcirc	DCAD	
One OFour	4	Supply	46.9	Calculated	-
O Two O Five		Demand	34.0	Recommended	>250
◯ Three ◯ Off		Balance	12.9		
Early lactation (18-22 lt	A			Rumen8 pH	6.0
Fee	d efficiency			Margin	
35 kg E	CM/kg DM	1.5		KES/cow/d	310
37 g F+	P/kg DM	109		KES/herd/d	
515 Feed	d % income	67 👄			
945 KES	Milk/KES Fee	d 1.5		Milk yield (l/d)	27.0 🜩

<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew	<u>H</u> elp				Dairy Diet	Diet detai	Price	Feed cost Compa	are Notes	Optimise		
				DM	As-fed								
1.	Maize silage DM <> 30-3	5%	~	9.00 ≑	26.87 🖨	Metabolisa	ble energy		NDF (%DM)	36.6 🔎	Starch (%DM)	23.9 🔎	
2.	Rhodes hay High CP (Ch	loris gavana		0.00	0.00	Supply (MJ)		190	NDF (kg)	6.176	Sugar (%DM)	3.3 😑	iri
2	· · · ·				0.00					22.4 👄			er er
J.	Dairy Meal High Yield												
4.	Dairy Meal Standard		~	3.30 ≑	3.67 ≑	Density (MJ)	kg Divi)	11.2	NDF frg (%IW)	0.80 👳	Ash (%DIVI)	0.1	
5.	Cottonseed meal decorti	cated	~	3.50 🜩	3.85 🜩	Metabolisa	ble protein		RDP/UDP protein	i.	Enteric methane		
6.	Maize grain		$\overline{}$	1.00 ≑	1.13 🜩	Supply (g)		1699	RDP (%CP)	64.8 👄	Total (g/cow)	321	
					human	Demand (g)		1686	UDP (%CP)	35.2 😑	Intensity (g/L)	11.9	
7.	Limestone (CaC03)			0.08	0.08 🜩				Excess protein (g)	13			
<mark>8</mark> .			~	0.00 🜩	0.00 ≑	CP (%DM)		16.4	Milk loss (I)	0.02	Fat (%DM)	4.1 😑	
9.	-		~	0.00 🜩	0.00 🜩	DM intake	estimate		Calcium (g)		Phosphorus (g)	0	
10.			1	0.00 0	0.00 🖨	Max. NDF in	take%	95	Supply	96.5	Supply	83.2	
		<u>л</u>				Maximum D	MI%	96	Demand	100.2	Demand	59.9	
SE	estuay	6-4			0.00 ≑	DMI as % liv	eweight	3.4	Balance	-3.7	Balance	23.3	
12					0.00 ≑	Active recom	mended levels -		Magnesium (g)	0	DCAD		
TI	on 2				0.00	One	◯ Four		Supply	44.9	Calculated	-	
						O Two	◯ Five		Demand	34.2	Recommended	>250	
14.			<u> </u>	0.00 🜩	0.00 🜩	O Three	OOff		Balance	10.7			
15.			~	0.00 🗘	0.00 ≑	Early lactation	n (18-22 lt A				Rumen8 pH	6.1	
Total o	daily intake (kg/d)			16.9	35.6								
	Feed costs		м	ilk income			Feed eff	iciency			Margin		
		38022			lk	35			15		_	202	
	1							-			The second s	505	
	KES/kg CP	232		ES/kg F+P		515			68 👄		REO/neid/d	-	
	1. 2. 3. 4. 5. 6. 7. 8. 9. 9. 0. 5. 5.	1. Maize silage DM ⇔ 30-3 2. Rhodes hay High CP (CH 3. Dairy Meal High Yield 4. Dairy Meal Standard 5. Cottonseed meal decortie 6. Maize grain 7. Limestone (CaC03) 8.	1. Maize silage DM <> 30-35% 2. Rhodes hay High CP (Chloris gayana 3. Dairy Meal High Yield 4. Dairy Meal Standard 5. Cottonseed meal decorticated 6. Maize grain 7. Limestone (CaC03) 8.	1. Maize silage DM <> 30-35% ✓ 2. Rhodes hay High CP (Chloris gayana) ✓ 3. Dairy Meal High Yield ✓ 4. Dairy Meal Standard ✓ 5. Cottonseed meal decorticated ✓ 6. Maize grain ✓ 7. Limestone (CaC03) ✓ 8. ✓ ✓ 9. ✓ ✓ 9. ✓ ✓ 10. Sestudy 6-4 ✓ 5. ✓ ✓ 6. Sestudy 6-4 ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓ 10. ✓ ✓	I. Maize silage DM <> 30-35% 9.00 ÷ 2. Rhodes hay High CP (Chloris gayana) 0.00 ÷ 3. Dairy Meal High Yield 0.00 ÷ 4. Dairy Meal Standard 3.30 ÷ 5. Cottonseed meal decorticated 3.50 ÷ 6. Maize grain 1.00 ÷ 7. Limestone (CaC03) 0.88 ÷ 8. 0.00 ÷ 0.00 ÷ 9. 0.00 ÷ 0.00 ÷ 5. Cottonseed Meal decorticated 0.00 ÷ 8. 0.00 ÷ 0.00 ÷ 9. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10. 0.00 ÷ 0.00 ÷ 10.<	DM As-fed 1. Maize silage DM <> 30-35% 9.00 € 26.87 € 2. Rhodes hay High CP (Chloris gayana) 0.00 € 0.00 € 3. Dairy Meal High Yield 0.00 € 0.00 € 4. Dairy Meal Standard 3.30 € 3.67 € 5. Cottonseed meal decorticated 3.50 € 3.85 € 6. Maize grain 1.00 € 1.13 € 7. Limestone (CaC03) 0.08 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 10.00 € 0.00 € 0.00 € 0.00 € 10.00 € 0.00 € 0.00 € 0.00 € 10.00 € 0.00 € 0.00 € 0.00 € 10.00 € 0.00 € 0.00 € 0.00 €<	DM As-fed 1. Maize silage DM <> 30-35% 9.00 € 26.87 € 2. Rhodes hay High CP (Chloris gayana) 0.00 € 0.00 € 0.00 € 3. Dairy Meal High Yield 0.00 € 0.00 € 0.00 € 4. Dairy Meal Standard 3.30 € 3.67 € Metabolisa 5. Cottonseed meal decorticated 3.50 € 3.85 € Metabolisa 6. Maize grain 1.00 € 1.13 € Demand (MJ 7. Limestone (CaC03) 0.08 € 0.08 € Balance (MJ 8. 0.00 € 0.00 € 0.00 € Demand (g) 9. 0.00 € 0.00 € 0.00 € DM intake of 6. Maize grain 0.00 € 0.00 € DM intake of 7. Limestone (CaC03) 0.00 € 0.00 € DM intake of 8. 0.00 € 0.00 € 0.00 € DM intake of 9. 0.00 € 0.00 € 0.00 € Two 9. 0.00 € 0.00 € 0.00 € Two 9. 0.00 € 0.00 €	DM As-fed 1. Maize silage DM <> 30-35% 9.00 26.87 2 2. Rhodes hay High CP (Chloris gayana) 0.00 200 200 2 3. Dairy Meal High Yield 0.00 200 200 2 4. Dairy Meal Standard 3.30 2 5. Cottonseed meal decorticated 3.50 2 6. Maize grain 1.00 2 7. Limestone (CaC03) 0.00 2 8. 0.00 2 9. 0.00 2 0.00 2 0.00 2 8. 0.00 2 0.00 2 9. 0.00 2 0.00 2 0.00 2 8. 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2 0.00 2	DM As-fed 1. Maize silage DM <> 30-35% 9.00 (a) 26.87 (b) 2. Rhodes hay High CP (Chloris gayana) 0.00 (b) 0.00 (b) 3. Dairy Meal High Yield 0.00 (b) 0.00 (c) 4. Dairy Meal Standard 3.30 (b) 3.67 (c) 5. Cottonseed meal decorticated 3.50 (c) 3.85 (c) 6. Maize grain 1.00 (c) 1.13 (c) 7. Limestone (CaC03) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 0.00 (c) 7. Limestone (CaC03) 0.00 (c) 0.00 (c) 8. 0.00 (c) 0.00 (c) 0.00 (c) 9. 0.00 (c) 0.00 (c) 0.00 (c) 9. </td <td>DM As-fed 1. Maize silage DM ⇔ 30-35% 9.00 € 26.87 € 2. Rhodes hay High CP (Chloris gayana ∨ 0.00 € 0.00 € 3. Dairy Meal High Yield 0.00 € 0.00 € 4. Dairy Meal Standard 3.30 € 3.67 € 5. Cottonseed meal decorticated 3.50 € 3.85 € 6. Maize grain 1.00 € 1.13 € 7. Limestone (CaC03) 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € <td< td=""><td>DM As-fed 1. Maize silage DM <> 30-35% 9.00 (a) 26.87 (b) NDF (% DM) 36.6 2. Rhodes hay High CP (Chloris gayana) 0.00 (c) 0.00 (c) 0.00 (c) Supply (MJ) 190 NDF (% DM) 22.4 3. Dairy Meal High Yield 0.00 (c) 0.00 (c) 0.00 (c) Demand (MJ) 190 NDF frg (% NDF) 64.6 0 4. Dairy Meal Standard 3.30 (c) 3.67 (c) Density (MJ/kg DM) 11.2 NDF frg (% NDF) 64.6 0 5. Cottonseed meal decorticated 3.50 (c) 3.85 (c) Metabolisable protein Metabolisable protein RDP/UDP protein 8. 0.00 (c) 0.00 (c)<</td><td>DM Ae-fed 1 Maize silage DM < 30-35%</td> 9.00€ 26.87€ 2 Rhodes hay High CP (Chloris gayana 0.00€ 0.00€ 0.00€ 3 Dairy Meal High Yield 0.00€ 0.00€ 0.00€ 0.00€ 4 Dairy Meal Standard 3.30€ 3.67€ Balance (MJ) 0 NDF frg (%MDF) 6.4.6 Forage : Conc 5 Cottonseed meal decorticated 3.50€ 3.85€ Metabolisable protein RDP/UDP protein Enteric methane 6 Maize grain 1.00€ 1.13€ Maixe estimate RDP/UDP (%CP) 64.8 Total (g/cow) 7 Lineestone (CaC03) 0.00€ 0.00€ 0.00€ 0.00€ 0.00€ 1.13€ Balance (g) 13 Excess protein (g) 13 CP (%DM) Fat (%DM) 8 0.00€ 0.00€ 0.00€ 0.00€ 0.00€ Milk lose (l) 0.02 Phosphorus (g) 8 0.00€ 0.00€ 0.00€ 0.00€ 0.00€ Milk lose (l) 0.02 Demand (g) 16.4 Milk lose (l) 0.02 Demand <tr< td=""><td>DM Ae-fed 1. Maize silage DM <> 30-35% 9.00 € 26.87 € 2. Rhodes hay High CP (Chloris gayana 0.00 € 0.0</td></tr<></td<></td>	DM As-fed 1. Maize silage DM ⇔ 30-35% 9.00 € 26.87 € 2. Rhodes hay High CP (Chloris gayana ∨ 0.00 € 0.00 € 3. Dairy Meal High Yield 0.00 € 0.00 € 4. Dairy Meal Standard 3.30 € 3.67 € 5. Cottonseed meal decorticated 3.50 € 3.85 € 6. Maize grain 1.00 € 1.13 € 7. Limestone (CaC03) 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 9. 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € 0.00 € <td< td=""><td>DM As-fed 1. Maize silage DM <> 30-35% 9.00 (a) 26.87 (b) NDF (% DM) 36.6 2. Rhodes hay High CP (Chloris gayana) 0.00 (c) 0.00 (c) 0.00 (c) Supply (MJ) 190 NDF (% DM) 22.4 3. Dairy Meal High Yield 0.00 (c) 0.00 (c) 0.00 (c) Demand (MJ) 190 NDF frg (% NDF) 64.6 0 4. Dairy Meal Standard 3.30 (c) 3.67 (c) Density (MJ/kg DM) 11.2 NDF frg (% NDF) 64.6 0 5. Cottonseed meal decorticated 3.50 (c) 3.85 (c) Metabolisable protein Metabolisable protein RDP/UDP protein 8. 0.00 (c) 0.00 (c)<</td><td>DM Ae-fed 1 Maize silage DM < 30-35%</td> 9.00€ 26.87€ 2 Rhodes hay High CP (Chloris gayana 0.00€ 0.00€ 0.00€ 3 Dairy Meal High Yield 0.00€ 0.00€ 0.00€ 0.00€ 4 Dairy Meal Standard 3.30€ 3.67€ Balance (MJ) 0 NDF frg (%MDF) 6.4.6 Forage : Conc 5 Cottonseed meal decorticated 3.50€ 3.85€ Metabolisable protein RDP/UDP protein Enteric methane 6 Maize grain 1.00€ 1.13€ Maixe estimate RDP/UDP (%CP) 64.8 Total (g/cow) 7 Lineestone (CaC03) 0.00€ 0.00€ 0.00€ 0.00€ 0.00€ 1.13€ Balance (g) 13 Excess protein (g) 13 CP (%DM) Fat (%DM) 8 0.00€ 0.00€ 0.00€ 0.00€ 0.00€ Milk lose (l) 0.02 Phosphorus (g) 8 0.00€ 0.00€ 0.00€ 0.00€ 0.00€ Milk lose (l) 0.02 Demand (g) 16.4 Milk lose (l) 0.02 Demand <tr< td=""><td>DM Ae-fed 1. Maize silage DM <> 30-35% 9.00 € 26.87 € 2. Rhodes hay High CP (Chloris gayana 0.00 € 0.0</td></tr<></td<>	DM As-fed 1. Maize silage DM <> 30-35% 9.00 (a) 26.87 (b) NDF (% DM) 36.6 2. Rhodes hay High CP (Chloris gayana) 0.00 (c) 0.00 (c) 0.00 (c) Supply (MJ) 190 NDF (% DM) 22.4 3. Dairy Meal High Yield 0.00 (c) 0.00 (c) 0.00 (c) Demand (MJ) 190 NDF frg (% NDF) 64.6 0 4. Dairy Meal Standard 3.30 (c) 3.67 (c) Density (MJ/kg DM) 11.2 NDF frg (% NDF) 64.6 0 5. Cottonseed meal decorticated 3.50 (c) 3.85 (c) Metabolisable protein Metabolisable protein RDP/UDP protein 8. 0.00 (c) 0.00 (c)<	DM Ae-fed 1 Maize silage DM < 30-35%	DM Ae-fed 1. Maize silage DM <> 30-35% 9.00 € 26.87 € 2. Rhodes hay High CP (Chloris gayana 0.00 € 0.0

	File	Edit Animal View	Help			Da
	Turc	East Vinnar View	Terb	DM	As-fed	
	1.	Maize silage DM <> 30)- <mark>35%</mark> ~	6.70 🜩	20.00 🜩	M
	2.	Rhodes hay High CP (Chloris gayana) 🗠	1.00 🖨	1.22 🖨	S
	3.	Dairy Meal High Yield	~	5.60 🜩	6.29 ≑	D
	<mark>4</mark> .	Dairy Meal Standard	~	0.00	0.00 🜩	D
	5.	Cottonseed meal deco	rticated ~	4.00 🖨	4.40 🜩	M
	6.	Maize grain	~	0.00	0.00 ≑	S
	7.	Limestone (CaC03)	~	0.01 🖨	0.01 ≑	D
	8.		~	0.00	0.00 ‡	С
	9.		~	0.00 🜩	0.00 +	D
	10.		~	0.00 🗘	0.00 ‡	M
Ca	se	study	6-4		0.00 ÷	D
					0.00 ‡	
Up	T 3 (on 3			0.00 ‡	
-	14.		0	0.00	0.00 ≑	
	15.		~	0.00	0.00 🗘	
	Totals	S	542 g/kg DM	1 17.3 kg	31.9 kg	
		Feed costs		Milk income		
		KES/t DM	43479	KES/L raw mi	lk	
		KES/MJ ME	3.9	KES/kg ECM		
		KES/kg CP	234	KES/kg F+P		5
		KES/cow/d	753	KES/cow/d		g

Dairy Die	et Diet d	etail Price	Feed cost Comp	are Notes	Optimise		NEA
		-					
	sable energ		NDF (%DM)	36.6 😑	Starch (%DM)	23.5 🔍	DAP
Supply (M.		192	NDF (kg)	6.339	Sugar (%DM)	3.7 😑	ast African Partnership
Demand (N		191	peNDF (%DM)	21.6 😑	NFC (%DM)	35.4 😐	arthership
Balance (N	-	0	NDF frg (%NDF)	57.9 🔎	Forage : Conc	45:55 👄	
Density (M	IJ/kg DM)	11.1	NDF frg (%lw)	0.73 😑			
Metabolis	sable prote	in 😑	RDP/UDP protei	n	Enteric methane	i i	
Supply (g)		1943	RDP (%CP)	65.3 😑	Total (g/cow)	330	
Demand (g	g)	1686	UDP (%CP)	34.7 🔵	Intensity (g/L)	12.2	
Balance (g))	258	Excess protein (g)	372			
CP (%DM)		18.6	Milk loss (I)	0.58	Fat (%DM)	3.7 👄	
DM intak	e estimate		Calcium (g)		Phosphorus (g)	0	
Max. NDF	intake%	98	Supply	94.7	Supply	95.7	
Maximum	DMI%	99	Demand	94.6	Demand	59.8	
DMI as %	liveweight	3.5	Balance	0.1	Balance	35.9	
Active reco	ommended lev	els	Magnesium (g)	0	DCAD		
One	⊖ Four		Supply	52.8	Calculated	-	
⊖ Two	◯ Five		Demand	34.1	Recommended	>250	
○ Three	OOff		Balance	18.7			
Early lacta	ition (18-22 lt.	. A	Ash (%DM)	5.7	Rumen8 pH	6.1	
	Feed	efficiency			Margin		
35	kg E0	CM/kg DM	1.5		KES/cow/d	192	
37		P/kg DM	106		KES/herd/d	-	
515	-	% income	80 👄				
945		Milk/KES Fee			Milk yield (l/d	d) 27.0 🖨	28



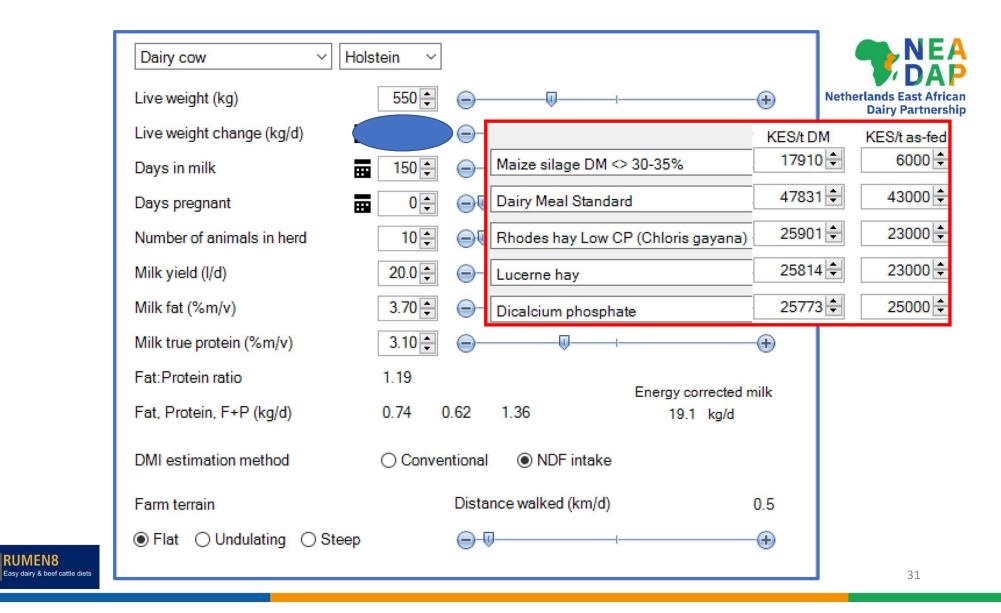


- A farmer has 10 Friesian cows in mid lactation under zero-grazing (0.5 km/d) Formulate a ration using Rumen8
- Cow LW 550 kg liveweight change unknown
- 150 days in milk and 70 days in calf
- Milk production 20 litres/cow/day (milk fat 3.7%; milk protein 3.1%).
 - Milk price KES 30/litre.
- The following feeds are fed
 - Maize silage <>30-35%DM 15 kg
 - Dairy meal standard 6 kg
 - Rhodes hay low CP 3 kg
 - Lucerne hay 5 kg
 - Dicalcium phosphate
 0.1 kg

KES 6,000/tonne KES 43,000/tonne KES 23,000/tonne KES 23,000/tonne

• Suggest ways how this farmer can improve the diet and margin above feed costs





	<u>F</u> ile	<u>E</u> dit <u>A</u> nimal	<u>V</u> iew <u>H</u>	lelp				Dairy	Die
						DM	As-fed		
	1.	Maize silage DM	< <u>30-35%</u>		\sim	5.03 🜩	15.00 韋	Meta	bolis
	2.	Dairy Meal Stand	ard		~	5.39 🜩	6.00 ≑	Supp Dema	
	<mark>3</mark> .	Rhodes hay Low	CP (Chlori	s gayana)	\sim	2.66 🔹	3.00 🜩	Balan	
	4.	Lucerne hay			\sim	4.46 🜩	5.00 🜩	Densi	ity (M
	<mark>5</mark> .	Dicalcium phosph	nate		~	0.10 🜩	0.10 🜩	Meta	bolis
	6.				\sim	0.00	0.00 🗘	Suppl Dema	
	7.				\sim	0.00 🔹	0.00 🗘	Balan	
	<mark>8</mark> .				~	0.00 🔹	0.00 🗘	CP (%	6DM)
	9.				\sim	0.00 🜩	0.00 ≑	DM i	ntake
	10.	-			\sim	0.00 🗘	0.00 ≑	Max. Maxir	
Ca	as	e stud	dv (6-5			0.00 ≑	DMI a	
		e sce					0.00 🗘	Activ	e reco
	15	esce	IIdi	10			0.00 ≑	0 0 0 T	
	14.				Ť	0.00 🗘	0.00 ‡	_	hree
	15.				\sim	0.00	0.00 🜩	Mid	actati
	Total	daily intake (kg/d)				17.6	29.1		
		Feed costs				Milk income			
		KES/t DM	30	301		KES/L raw mi	lk	30	
		KES/MJ ME		3.1		KES/kg ECM		31	
		KES/kg CP		251		KES/kg F+P		441	
ken		KES/cow/d		535		KES/cow/d		600	

Dairy	Diet	Diet detail	Price	Feed cost C	ompare Notes	optimise		
Metal	olisabl	e energy		NDF (%DM)	46.0 👄	Starch (%DN	I) 15.6 👄	EA
Supply	(MJ)		173	NDF (kg)	8.120	Sugar (%DM)	3.7 😑	AF
Demai	nd (MJ)		173	peNDF (%DM) 34.4 👄	NFC (%DM)	29.5 😑	African nership
Baland	ce (MJ)		1	NDF frg (%ND)F) 78.2 으	Forage : Conc	69:31 😑	
Densit	y (MJ/kg	JDM)	9.8	NDF frg (%lw)	1.15 😑	Ash (%DM)	8.8	
Metal	olisabl	e protein		RDP/UDP pr	rotein	Enteric meth	ane	
Supply	(g)		1219	RDP (%CP)	74.6 😑	Total (g/cow)	363	
Dema	nd (g)		1460	UDP (%CP)	25.4 👄	Intensity (g/L)	18.1	
Baland	ce (g)		-240		0			
CP (%	DM)		12.1	Milk loss (I)	0.00	Fat (%DM)	3.6 👄	
DM in	take es	timate	\bigcirc	Calcium (g)	0	Phosphorus	(g) 😑	
Max. N	NDF intal	ke%	114	Supply	172.4	Supply	78.8	
Maxim	num DMI	%	97	Demand	102.8	Demand	55.2	
DMI as	s % livew			ander of	550	alance	23.6	
Active	e recomme	n Live we	eight (kg)	550	CAD		
OOr	ne	Live we	ight cha	ange (kg/d)	-0.15	alculated	-	
● Tv	vo		-			ecommende	<u>1 >25</u> 0	
OTh	nree	Days in	milk		150	€ <		
Mid L	actation (1	¹⁴ Days p	regnant			🔹 umen8 pH	6.3	
		Numbe	r of anin	nals in herd	10	÷		
		Milk yie	eld (l/d)		20.0	.▲ argin		
30		Mail	101	N N	0.70	ES/cow/d	<mark>65</mark>	
31		Milk fat	(%m/v)	3.70	ES/herd/d	655	
441		Milk tru	e protei	n (%m/v)	3.10	÷	Record	2
600						Milk yiel	d (l/d) 20.0 🖨	3

<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew	<u>H</u> elp			Dairy Diet	Diet detail	Price	Feed cost Comp	are Notes	Optimise	
	r		DM	As-fed							
1.	Maize silage DM <> 30-	35%	✓ 11.50 🖨	34.33 ≑	Metabolisat	ole energy		NDF (%DM)	41.3 😑	Starch (%DM)	19.5 😑
2.	Dairy Meal Standard		√ 0.00 €	0.00 ≑	Supply (MJ)		177	NDF (kg)	6.953	Sugar (%DM)	2.8 😑
3.	Rhodes hay Low CP (CI	blorie gavana)	✓ 0.00≑	0.00	Demand (MJ)		177	peNDF (%DM)	31.5 😑	NFC (%DM)	34.6 😑
					Balance (MJ) Density (MJ/k		0 10.5	NDF frg (%NDF) NDF frg (%lw)	87.9 O	Forage : Conc Ash (%DM)	82:18 😑 5.9
4.	Lucerne hay		✓ 2.20 €	2.47 ≑	Bonony (mor	ig billy	10.0	(ind (ind))		/ un (/obin)	0.0
5.	Dicalcium phosphate		✓ 0.00 €	0.00 🜩	Metabolisat	ole protein		RDP/UDP protein	1	Enteric methane	
6.	Cottonseed meal decort	icated	√ 3.00 €	3.30 🜩	Supply (g)		1461	RDP (%CP)	68.9 😑	Total (g/cow)	347
7.	Lineaters (0-002)		✓ 0.13 ≑	0.13 ≑	Demand (g)		1460	UDP (%CP)	31.1 😑	Intensity (g/L)	17.3
	Limestone (CaC03)				Balance (g)		0 15.1	Excess protein (g)	0 <0.01	Fat (%DM)	3.1 👄
8.			∨ 0.00 ‡	0.00 ≑	CP (%DM)		15.1	Milk loss (I)	<0.01	Fat (%DIVI)	3.1 👼
9.		0	✓ 0.00 ♣	0.00 ÷	DM intake e	stimate		Calcium (g)		Phosphorus (g)	0
10.	-		V 10003	0.00 ‡	Max. NDF inte	ake%	97	Supply	114.8	Supply	67.4
					Maximum DN		93	Demand	120.3	Demand	57.1
ase	e study	6-5		0.00 🜩	DMI as % live	weight	3.1	Balance	-5.5	Balance	10.3
				0.00 ≑	Active recomm	nended levels –	1	Magnesium (g)	0	DCAD	
ITe	rnative			0.00 ‡	One	O Four	Live	weight (kg)		550 📮 culated	-
14.			0.00	0.00 ‡	Two Three	O Five	Live	weight change (kg/d)		0.07	>250
15.			✓ 0.00 ‡	0.00 🗘		(14-18 Its) A	Days	in milk		150 ren8 pH	6.2
	daily intake (kq/d)		16.8	40.2			Days	pregnant		0÷	
							Num	ber of animals in herd		100	
	Feed costs		Milk income	l.		Feed eff	ici			gin	
	KES/t DM	28083	KES/L raw m	ilk	30	kg ECM/k	g	yield (l/d)		20.0 🜩 s/cow/d	127
_	KES/MJ ME	2.7	KES/kg ECM		31	g F+P/kg		fat (%m/v)	3	3.70 🖨 3/herd/d	1274
	KES/kg CP	186	KES/kg F+P		441	Feed % in	nce Milk	true protein (%m/v)	3	3.10 🜩	
6	KES/cow/d	473	KES/cow/d		600	KES Milk	KLUTA			Milk yield (I/d) 20.0 🖨



- A farmer has 30 cross-bred cows in mid lactation
- Cow LW 450 kg; liveweight change unknown.
- 150 days in milk and 70 days in calf
- Milk production 12 litres/cow/day (milk fat 3.7%; milk protein 3.1%).
 - Milk price KES 30/litre.
- Cows are grazing 4 ha (10 acres) of star grass (Naivasha) pastures for 4 hours per day KES 1,000/tonne

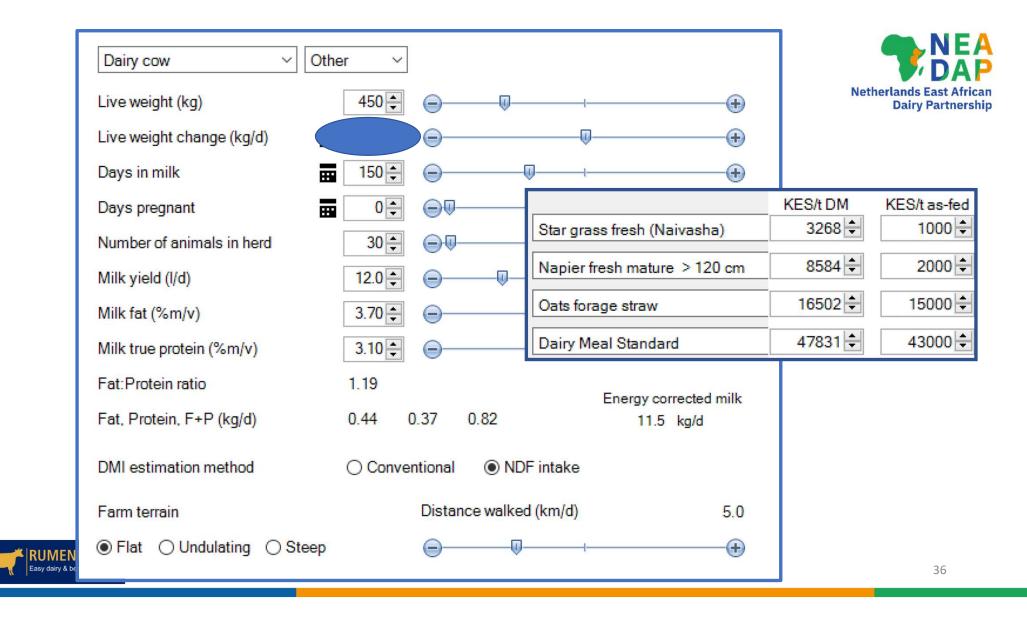
•	The following	supplements are fec

- Napier grass fresh 2 meters tall 4 kg

 - Oat straw 3 kg
 - Dairy meal standard 7 kg

- KES 2,000/tonne KES 15,000/tonne KES 43,000/tonne
- Suggest ways how this farmer can improve the diet and margin above feed costs





	<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew	<u>H</u> elp		DM	As-fed	Dairy	Diet	Diet detail	Price	Feed cost Comp	are Notes	Optimise	
	1.	Star grass fresh (Naivash	ua)	$\overline{}$	3.61 +	As-red	Meta	bolisab	energy		NDF (%DM)	52.7 😑	Starch (%DM)	10.8 鱼
	2.	Napier fresh mature > 12			0.93 🖨	4.00 ≑		ly (MJ)		133	NDF (kg)	7.140	Sugar (%DM)	2.9 😑
		Napler tresh mature > 12	20 cm				Dema	and (MJ)		132	peNDF (%DM)	38.8 😑	NFC (%DM)	23.1 😐
	3.	Oats forage straw		~	2.73 ≑	3.00 ≑	Balar	ice (MJ)		1	NDF frg (%NDF)	71.0 😑	Forage : Conc	54:46 😑
	4.	Dairy Meal Standard		\sim	6.29 🜩	7.00 🜩	Dens	ity (MJ/k	g DM)	9.8	NDF frg (%lw)	1.13 😑	Ash (%DM)	9.5
	5.	Urea		\sim	0.00	0.00 €	Metabolisable protein		le protein		RDP/UDP proteir	1	Enteric methane	
	6.			\sim	0.00	0.00 🜩	Supp	ly (g)		890	RDP (%CP)	71.8 👄	Total (g/cow)	309
								and (g)		1008	UDP (%CP)	28.2 😑	Intensity (g/L)	25.7
	7.			~	0.00 🜩	0.00 🗘		ice (g)		-119		0		
	8.			~	0.00 ≑	0.00 ≑	CP (%	6DM)		10.9	Milk loss (I)	0.00	Fat (%DM)	3.8 😑
	9.			\sim	0.00	0.00 🜩	DM in	ntake e	stimate	0	Calcium (g)	0	Phosphorus (g)	\bigcirc
-	10.				0.00	0.00 ≑		NDF inte		122		93.4	Supply	48.2
							Maxir	num D M	1%	99	Demand	70.3	Demand	<mark>38.3</mark>
้ลร	se.	study	5-6			0.00 🜩	DMI a	as % live	weight	3.0	Balance	23.1	Balance	9.9
	12.	orday				0.00 🜩	Activ	e recomm	ended levels		Magnesium (g)	0	DCAD	
ลร	6	scenar	10			0.00 ≑	00	ne	O Four		Supply	34.0	Calculated	-
, ac		ocorrai					T (1)		O Five		Demand	20.0	Recommended	>250
-	14.				0.00 🗘	0.00 🜩	U1		O Off		Balance	14.0		
	15.			\sim	0.00 ≑	0.00 🗘	Mid	Lactation	(14-18 lts) A				Rumen8 pH	6.3
(Total daily intake (kg/d)			13.6	25.8									
	Feed costs		N	lilk income				Feed effi	ciency			Margin		
	Ú.	KES/t DM	26968	K	ES/L raw mi	lk	30		kg ECM/k	g DM	0.8		KES/cow/d	-6
	1	KES/MJ ME	2.8	K	ES/kg ECM		31		g F+P/kg	DM	60		KES/herd/d	-171
		KES/kg CP	247	K	ES/kgF+P		441		Feed % in	come	102 👄			
R		KES/cow/d 366 k			KES/cow/d		360 KES Milk/KES		KES Fee	ed 1.0		Milk yield (I/d) 12.0	

<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iev	v <u>H</u> elp			Dairy Diet	Diet detail	Price	Feed cost Compa	re Notes	Optimise		
			DM	As-fed								
1.	Star grass fresh (Naiva	asha) 🗸 🗸	3.61 🖨	11.80 🜩	Metabolisat	ole energy		NDF (%DM)	52.3 😑	Starch (%DM)	10.7 😑	
2.	Napier fresh mature >	120 cm ~	0.93 ≑	4.00 🜩	Supply (MJ)		133	NDF (kg)	7.140	Sugar (%DM)	2.9 😑	
3.	Oats forage straw	~	2.73 ≑	3.00 ≑	Demand (MJ) Balance (MJ)		133 0	peNDF (%DM) NDF frg (%NDF)	38.5 👄 71.0 으	NFC (%DM) Forage : Conc	21.8 👄 53:47 👄	
4.	Dairy Meal Standard	~		7.00 🜩	Density (MJ/k		9.7	NDF frg (%lw)	1.13 😑	Ash (%DM)	9.4	
Đ.	Urea	~	0.09 🗢	0.10 ≑	Metabolisat	ole protein		RDP/UDP protein		Enteric methane		
6.		~	0.00 🗘	0.00 🗘	Supply (g)		996	RDP (%CP)	75.8 😑	Total (g/cow)	309	
					Demand (g)		998	UDP (%CP)	24.2 🔵	Intensity (g/L)	25.8	
7.		~	0.00 🜩	0.00 🜩	Balance (g)		-2	Excess protein (g)	31			
8.		~	0.00	0.00	CP (%DM)		12.7	Milk loss (I)	0.05	Fat (%DM)	3.8 😑	
9.		~	0.00 🜩	0.00 🜩	DM intake e	stimate	0	Calcium (g)	0	Phosphorus (g)	0	
10	-	~	0.00	0.00 ‡	Max. NDF inte	ake%	122		93.4	Supply	48.2	
					Maximum DM	11%	100	Demand	70.2	Demand	38.4	
ase	e study	6-6		0.00 ≑	DMI as % live	eweight	3.0	Balance	23.3	Balance	9.8	
12.	••••	×	0.00	0.00 ÷	Active recomm	nended levels		Magnesium (g)	0	DCAD		
'OSS	sible so	DUTIO	n'annial	0.00 ÷	One	O Four		Supply	34.0	Calculated	-	
					Two	O Five		Demand	20.0	Recommended	>250	
14.		~	0.00	0.00 ≑	◯ Three	Olt		Balance	14.0			
15.		~	0.00 🖨	0.00 🗘	Mid Lactation	(14-18 lts) A	1			Rumen8 pH	6.3	
Total	daily intake (kg/d)		13.7	25.9			<u>a</u>					
	Feed costs		Milk income			Feed effi	-			Margin		
	KES/t DM	27488	KES/L raw m		30	kg ECM/k	-	0.8		KES/cow/d	- <mark>1</mark> 5	
	KES/MJ ME	2.8	KES/kg ECN		31	g F+P/kg	DM	60		KES/herd/d	-456	
	KES/kg CP	217	KES/kg F+P		441	Feed % in	come	104 👄				
T.	KES/cow/d	375	KES/cow/d		360	KES Milk/	KES Fee	ed 1.0		Milk yield (I/d) 12.0	÷

	<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew	<u>H</u> elp			Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes	Optimise	
				DM	As-fed									
	1.	Star grass fresh (Naivas	sha) 🗸 🗸	4.60	15.03 🖨	Metal	olisab	e energy		NDF (%DM)	47.7 🔍	Starch (%DM)
	2.	Napier fresh mature > 1	120 cm 🗸 🗸	0.00	0.00	Supply			129	NDF (kg)		.817	Sugar (%DM)	
	3.		~	0.00	0.00		nd (MJ)		129	peNDF (%DN		29.8 😑	NFC (%DM)	
	J.	Oats forage straw	~	0.00	0.00		ce (MJ)		0	NDF frg (%N	2	57.0 🔎	Forage : Conc	3
	4.	Dairy Meal Standard	~	7.60	8.45 🜩	Densit	y (MJ/kg	g DM)	10.6	NDF frg (%lw)	0.74 😑	Ash (%DM)	
	<mark>5</mark> .		~	0.00	0.00	Metal	olisab	e protein	0	RDP/UDP p	rotein		Enteric meth	ane
	6.		~	0.00	0.00 ‡	Supply	/ (g)		984	RDP (%CP)		74.4 😐	Total (g/cow)	
						Demar	nd (g)		955	UDP (%CP)		25.6 😐	Intensity (g/L)	
	7.		~	0.00	0.00 🜩	Baland	ce (g)		29	Excess protei	n (g)	33		
	8.		~	0.00	0.00 ÷	CP (%	DM)		13.1	Milk loss (I)		0.05	Fat (%DM)	
	9.		~	0.00	0.00 🗘	DM in	take es	timate		Calcium (g)		0	Phosphorus	(g)
	10			0.00	0.00 ‡	Max. M	NDF inta	ke%	99	Supply	12	02.5	Supply	
						Maxim	um DMI	%	89	Demand		63.4	Demand	
Ca	cΔ	study	6-6		0.00 ≑	DMI as	s % livev	veight	2.7	Balance		39.0	Balance	
					0.00 🔹	Active	e recomme	ended levels		Magnesium	(g)	0	DCAD	
Po	CC	ible so	lutio	n??	0.00 ‡	OOr	ne	◯ Four		Supply		34.0	Calculated	
	22	1016 20	iuiiu			● Tv	vo	○ Five		Demand		20.0	Recommended	1 3
	14.		~	0.00	0.00 ≑	OTh	nree	OOff		Balance		14.0		
	15.		~	0.00	0.00 🜩	Mid L	actation (14-18 Its) A					Rumen8 pH	
	Total of	daily intake (kg/d)		12.2	23.5									
		Feed costs		Milk incon	00			Feed effi	cioncy				Margin	
			21020			20								
		KES/t DM	31028	KES/L raw		30		kg ECM/kg	-	0.			KES/cow/d	
		KES/MJ ME	2.9	KES/kg EC		31		g F+P/kg [6			KES/herd/d	
		KES/kg CP	236	KES/kg F+		441		Feed % ind			5 👄			
		KES/cow/d	379	KES/cow/d		360		KES Milk/I	KES Fee	ed 1.	0		Milk yield	I (I/d)
1 5 12														



14.0 ● 3.3 ●

25.0 • 38:62 •! 9.5

275 22.9

4.6 😑

0

51.3 35.8 15.6 () 49 >250

6.2

-19 -556

12.0 ≑





Case study 6-7 (1/2)

- A large farm with stall-fed HF cows has the following forages and concentrates available
 - Maize silage <30% Dry Matter
 - Rhodes hay low CP
 - Napier grass >120 cm
 - Maize grain
 - Wheat bran
 - Rapeseed (Canola) meal fat <40 g/kg
 - Soya bean meal fat <40 g/kg
 - Cottonseed meal decorticated
 - Maize bran
 - Sunflower seed meal dehulled

KES 6,000/tonne KES 10,000/tonne KES 2,000/tonne KES 70,000/tonne KES 29,000/tonne KES 63,000/tonne KES 130,000/tonne KES 28,000/tonne KES 28,000/tonne





Case study 6-7 (2/2)

Formulate dairy meals for the following classes of livestock using some or all of the feeds available on this farm

- Task 1: Friesian dairy cows, 550 kg LW, 100 days in milk, 20 days in calf. Milk production 22 litres/cow/day (milk fat 3.7%; milk protein 3.1%; milk price KES 35/litre)
- Task 2: Friesian dairy cows, 580 kg LW, 200 days in milk, 120 days in calf. Milk production 10 litres/cow/day (milk fat 4.0%; milk protein 3.3%; milk price KES 35/litre)
- Task 3: Dry cows, 600 kg LW, 250 days pregnant
- Task 4: Mated heifers, 350 kg LW, LW gain 0.4 kg/day, 30 days pregnant
- Task 5: Unmated heifers, 250 kg LW, LW gain 0.75 kg/day



	File	Edit Animal View	Help			
					DM	As-fed
	1.	Maize silage DM < 30%		~	7.30 ≑	27.86 ≑
	2.	Rhodes hay Low CP (C	hloris gayana)	~	0.00	0.00 ≑
	3.	Napier fresh mature > 1	20 cm	~ [0.00 🜩	0.00 🖨
	4.	Maize grain		~	1.20 ≑	1.35 ≑
	5.	Wheat bran		~	1.50 🜩	1.70 ≑
	<mark>6</mark> .	Rapeseed (Canola) me	al fat < 40 g/kg	~	0.00	0.00 ≑
	7.	Soyabean meal fat < 40) g/kg	~	0.00	0.00 ≑
	8.	Cottonseed meal decort	icated	~	0.00	0.00 ≑
	9.	Maize bran	~	3.60 🜩	4.06 =	
	10.	Sunflower seed meal de	hulled	~	3.30 🜩	3.67 🚔
	11.	Limestone (CaC03)		~	0.14 🜩	0.14 ≑
	12.	7		× [0.00 🗘	0.00 🜩
Са	ISE	e study	6-7			0.00 🜩
						0.00 🜩
I a	ISK	1:				0.00 ≑
	Total	daily intake (kg/d)			17.0	38.8
		Feed costs		Mi	lk income	
		KES/t DM	33665	KE	S/L raw mi	lk
		KES/MJ ME	3.1		S/kg ECM	
		KES/kg CP	229		S/kg F+P	
1						

KES/cow/d

R

KES/cow/d

Dairy Diet	Diet detai	I Price	Feed cost	Compare	Notes	Optimise	
Metabolisa	able energy		NDF (%DM	/)	42.1	Starch (%DM)	23.0
Supply (MJ)		185	NDF (kg)	7	176	Sugar (%DM)	2.8
Demand (M.	J)	185	peNDF (%D	M)	23.8	NFC (%DM)	33.8
Balance (MJ	J)	0	NDF frg (%)	NDF)	49.4	Forage : Conc	43:57
Density (MJ	/kg DM)	10.9	NDF frg (%I	w)	0.65	Ash (%DM)	5.8
Metabolisa	able protein		RDP/UDP	protein		Enteric metha	ne
Supply (g)		1498	RDP (%CP))	70.6	Total (g/cow)	347
Demand (g)		1500	UDP (%CP)		29.4	Intensity (g/L)	15.8
Balance (g)		-1	Excess prote	ein (g)	0		
CP (%DM)		14.7	Milk loss (I)		0.00	Fat (%DM)	3.6
DM intake	estimate		Calcium (g	J)		Phosphorus (c	ı) 😑
Max. NDF in	itake%	100	Supply		89.6	Supply	78.9
Maximum D	MI%	93	Demand		88.5	Demand	55.1
DMI as % liv	veweight	3.1	Balance		1.1	Balance	23.8
Active recom	nmended levels -		Magnesiu	m (g)	0	DCAD	
One Two	○ Four		Live weight	(kg)		550	>250
	⊙ Off		Live weight	change (kg	/d)	-0.28 🖨	
	A	ų,	Days in milk	c		100 🜩	6.1
			Days pregna	ant		20 🐳	
	Feed eff	ficiency	Number of a	nimals in h	erd	1	
35	kg ECM/	-					196
37	g F+P/kg	DM	Milk yield (I/	u)		22.0 🜩	-
515	Feed % i	ncome	Milk fat (%n	n/v)		3.70 🖨	
770	KES Milk	(/KES F	Milk true pro	otein (%m/v)	3.10	(l/d) 22.0 €



	<u>F</u> ile	Edit Animal View	/ <u>H</u> elp				Dei
	The	Fair Villing Alex	, Tich		DM	As-fed	Dai
	1.	Maize silage DM < 30°	%	\sim	0.00	0.00 🜩	Me
	2.	Rhodes hay Low CP (Chloris gayana)	~	0.00	0.00 ≑	Su
	3.	Napier fresh mature >	120 cm	~	5.64 ≑	24.21 ≑	De Ba
	4.	Maize grain		~	0.00 🜩	0.00 ≑	De
	5.	Wheat bran		$\overline{}$	0.00 ≑	0.00 ≑	Me
	6.	Rapeseed (Canola) m	eal fat < 40 g/kg	$\overline{}$	0.00	0.00 ≑	Su
	7.	Soyabean meal fat<4	10 g/kg	~	0.00	0.00	De
	8.	Cottonseed meal deco	orticated	$\overline{}$	0.00	0.00 ≑	CF
	9.	Maize bran	 Biology Constants in the second s Second second se Second second sec second second sec	$\overline{}$	6.87 ≑	7.75 🜩	D
	10.	Sunflower seed meal of	dehulled	$\overline{}$	1.85 🜩	2.06 ≑	Ma
	11.	Limestone (CaC03)		$\overline{}$	0.10 🗘	0.10 ≑	Ma DN
<u> </u>	12			~	0.00101	0.00 ≑	A
Las	5e	study	6-/		0.00	0.00 ‡	
Tas		2.			0.00 \$	0.00 ‡	
Ias		۷.			0.00	0.00 ‡	
	Total	daily intake (kg/d)			14.5	34.1	
		Feed costs		M	lilk income		
		KES/t DM	24136	K	ES/L raw mil	k	3
		KES/MJ ME	2.4	K	ES/kg ECM		1
100		KES/kg CP	211	K	ES/kg F+P		47
R		KES/cow/d	349	ĸ	ES/cow/d		35
1993 N							

Density (MJ/kg DM) 10.0 NDF frg (%lw) 0.66 Ash (%DM) 9.2 Metabolisable protein	Dairy Diet	Diet detail	Price	Feed cost	Compare	Notes	Optimise			JEA
Demand (M.I) 144 peNDE (%2DM) 32.7 NFC (%DM) 23.4 rtnership Bal Total metabolisable energy supply from the det NDF) 50.9 Ash (%DM) 9.2 Intership Forage : Conc 39.61 1 Bal Total metabolisable energy supply from the det NDF) 50.9 Ash (%DM) 9.2 Intership Metabolisable protein RDP/UDP protein Enteric methane Supply (g) 10.94 RDP (%CP) 56.4 Total (g/cow) 34.4 Balance (g) -3 Excess protein (g) 0 7 8.4 Balance (g) -3 Excess protein (g) 0 Fat (%DM) 3.8 DM intake estimate Calcium (g) Phosphorus (g) • Maximum DMI% 95 Demand 71.4 Demand 40.6 DM as % live weight change (kg/d) 10.39 ÷ Calculated - Recommended >250 Orne Live weight change (kg/d) 10.0 ÷ 120 ÷ Rumen8 pH 6.2 Days pregnant 120 ÷ Margin KES/cow/d 1 KES/herd/d 1 <t< td=""><td>Metabolis</td><td>able energy</td><td></td><td>NDF (%DM</td><td>)</td><td>52.2</td><td>Starch (%DM)</td><td>18.2</td><td></td><td>DAP</td></t<>	Metabolis	able energy		NDF (%DM)	52.2	Starch (%DM)	18.2		DAP
Demand (M.I) 144 peNDE (%2DM) 32.7 NFC (%DM) 23.4 rtnership Bal Total metabolisable energy supply from the det NDF) 50.9 Ash (%DM) 9.2 Intership Forage : Conc 39.61 1 Bal Total metabolisable energy supply from the det NDF) 50.9 Ash (%DM) 9.2 Intership Metabolisable protein RDP/UDP protein Enteric methane Supply (g) 10.94 RDP (%CP) 56.4 Total (g/cow) 34.4 Balance (g) -3 Excess protein (g) 0 7 8.4 Balance (g) -3 Excess protein (g) 0 Fat (%DM) 3.8 DM intake estimate Calcium (g) Phosphorus (g) • Maximum DMI% 95 Demand 71.4 Demand 40.6 DM as % live weight change (kg/d) 10.39 ÷ Calculated - Recommended >250 Orne Live weight change (kg/d) 10.0 ÷ 120 ÷ Rumen8 pH 6.2 Days pregnant 120 ÷ Margin KES/cow/d 1 KES/herd/d 1 <t< td=""><td>Supply (MJ)</td><td></td><td>144</td><td>NDF (kg)</td><td>7.</td><td>544</td><td>Sugar (%DM)</td><td>4.2</td><td></td><td>st African</td></t<>	Supply (MJ)		144	NDF (kg)	7.	544	Sugar (%DM)	4.2		st African
Danity (MJ/kg DM) 10.0 NDF frg (%lw) 0.66 Ash (%DM) 9.2 Metabolisable protein	Demand (M	.D		peNDE (%DA	M) :	32.7		23.4		rtnership
Metabolisable protein RDP/UDP protein Enteric methane Supply (g) 1094 RDP (%CP) 56.4 Demand (g) 1098 UDP (%CP) 43.6 Balance (g) -3 Excess protein (g) 0 CP (%DM) 11.5 Milk loss (I) 0.00 DM intake estimate Calcium (g) Phosphorus (g) • Max. NDF intake% 100 Supply 72.1 Maximum DMI% 95 Demand 71.4 DMI as % liveweight 2.5 Balance 0.7 Active reco Live weight (kg) 580 • • Live weight change (kg/d) 10.39 • • Days in milk 120 • Margin Number of animals in herd 1 • Margin 35 Milk yield (l/d) 10.0 • Margin 35 Milk fat (%m/v) 4.00 • •	Bal Total m	etabolisable ener	gy supply	from the diet	DF)	50.9	Forage : Conc	39:61	1	
Supply (g) 1094 RDP (%CP) 56.4 Total (g/cow) 344 Demand (g) 1098 UDP (%CP) 43.6 Intensity (g/L) 34.4 Balance (g) -3 Excess protein (g) 0 Fat (%DM) 3.8 DM intake estimate Calcium (g) 9 Phosphorus (g) • Max. NDF intake% 100 Supply 72.1 Supply 59.6 Max. NDF intake% 100 Supply 72.1 Demand 40.6 DM as % liveweight 2.5 Balance 0.7 Supply 59.6 Maximum DM1% 95 Demand 71.4 Demand 40.6 DM as % liveweight 2.5 Balance 19.1 DCAD © Active reco Live weight change (kg/d) 10.39 ‡ 0.39 ‡ Recommended >250 Days in milk 120 ‡ Number of animals in herd 1 ‡ Margin KES/cow/d 1 35 Milk fat (%m/v) 4.00 ‡ 4.00 ‡ - -	Density (MJ	/kg DM)	10.0	NDF frg (%lw	/) (D.66	Ash (%DM)	9.2		
Demand (g) 1098 UDP (%CP) 43.6 Intensity (g/L) 34.4 Balance (g) -3 Excess protein (g) 0 Fat (%DM) 3.8 DM intake estimate Calcium (g) Milk loss (l) 0.00 Fat (%DM) 3.8 Phosphorus (g) Supply 59.6 Demand 71.4 Demand 40.6 Balance 19.1 Demand 40.6 Balance 19.1 DCAD Calculated Recommended 250 Days in milk 200 Days pregnant 120 Number of animals in herd Milk yield (l/d) Milk fat (%m/v) 4.00 Milk fat (%m/v) Milk fat (%m/v) Milk fat (%m/v) Maximum Lange (kg/d) Maximum (kg/d) Maximum	Metabolis	able protein		RDP/UDP p	orotein		Enteric methane			
Balance (g) -3 Excess protein (g) 0 CP (%DM) 11.5 Milk loss (l) 0.00 Fat (%DM) 3.8 DM intake estimate Calcium (g) Phosphorus (g) Max. NDF intake% 100 Supply 72.1 Supply 59.6 Maximum DMI% 95 Demand 71.4 Demand 40.6 DMI as % liveweight 2.5 Balance 0.7 Balance 19.1 Active reco Live weight (kg) 580 € Calculated - Live weight change (kg/d) 10.39 € Calculated - Days in milk 200 € Rumen8 pH 6.2 Days pregnant 120 € Margin KES/cow/d 1 35 Milk yield (l/d) 10.0 € KES/cow/d 1 KES/cow/d 1 35 Milk fat (% m/v) 4.00 € 10.0 € 1 KES/herd/d -	Supply (g)		1094	RDP (%CP)		56.4	Total (g/cow)	344		
CP (%DM) 11.5 Milk loss (I) 0.00 Fat (%DM) 3.8 DM intake estimate Calcium (g) Phosphorus (g) Max. NDF intake% 100 Supply 72.1 Supply 59.6 Maximum DMI% 95 Demand 71.4 Demand 40.6 DM aximum DMI% 95 Demand 71.4 Demand 40.6 DM intake record Live weight (kg) 580 * Demand 40.6 Cone Live weight change (kg/d) 10.39 * Rumen8 pH 6.2 Days pregnant 120 * Margin KES/cow/d 1 35 Milk yield (l/d) 10.0 * KES/cow/d 1 35 Milk fat (%m/v) 4.00 * 4.00 * 1	Demand (g)		1098	UDP (%CP)		43.6	Intensity (g/L)	34.4		
DM intake estimate Calcium (g) Max. NDF intake% 100 Maximum DMI% 95 Demand 71.4 DM in as % liveweight 2.5 Balance 0.7 Active recol Live weight (kg) Cone 580 ÷ Live weight change (kg/d) 580 ÷ Days in milk 200 ÷ Days pregnant 120 ÷ Number of animals in herd 1 ÷ Milk yield (l/d) 10.0 ÷ Milk fat (%m/v) 4.00 ÷	Balance (g)		-3	Excess protei	n (g)	0				
Max. NDF intake% 100 Supply 72.1 Supply 59.6 Maximum DMI% 95 Demand 71.4 Demand 40.6 DMI as % liveweight 2.5 Balance 0.7 Balance 19.1 Active reco Ive weight (kg) 580 ÷ Calculated - Ive weight change (kg/d) 0.39 ÷ Rumen8 pH 6.2 Days in milk 120 ÷ Margin KES/cow/d 1 Milk yield (l/d) 10.0 ÷ KES/cow/d 1 1 Milk fat (%m/v) 4.00 ÷ Image: Note that the time that th	CP (%DM)		11.5	Milk loss (I)		0.00	Fat (%DM)	3.8		
Maximum DMI% 95 Demand 71.4 Demand 40.6 DMI as % liveweight 2.5 Balance 0.7 Balance 19.1 Active reco Live weight (kg) 580 ÷ Calculated - One Live weight change (kg/d) 0.39 ÷ Recommended >250 Days in milk 200 ÷ Rumen8 pH 6.2 Days pregnant 120 ÷ Margin KES/cow/d 1 35 Milk yield (l/d) 10.0 ÷ KES/herd/d 1 35 Milk fat (%m/v) 4.00 ÷ 1 KES/herd/d 1	DM intake	estimate		Calcium (g)			Phosphorus (g)	0		
DMI as % liveweight 2.5 Balance 0.7 Balance 19.1 Active reco Live weight (kg) 580 + Calculated - One Live weight change (kg/d) 0.39 + Recommended >250 Days in milk 120 + Rumen8 pH 6.2 Days pregnant 1 + Margin KES/cow/d 1 35 Milk yield (l/d) 10.0 + KES/herd/d 1 35 Milk fat (%m/v) 4.00 + 0 -	Max. NDF in	ntake%	100	Supply		72.1	Supply	59.6		
Active reco Live weight (kg) 580 ÷ DCAD Calculated - 0 ne Live weight change (kg/d) 0.39 ÷ Recommended >250 Days in milk 200 ÷ Rumen8 pH 6.2 Days pregnant 120 ÷ Margin KES/cow/d 1 35 Milk yield (l/d) 10.0 ÷ KES/cow/d 1 479 Milk fat (%m/v) 4.00 ÷ Test (%m/v) 1	Maximum D	MI%	95	Demand		71.4	Demand	40.6		
One Two O ThreeLive weight (kg)580 ÷ S80 ÷CalculatedDays in milk0.39 * S200 *RecommendedDays in milk200 * S20 *Rumen8 pHDays pregnant120 * KES/cow/d1 KES/cow/dMilk yield (l/d)10.0 * KES/herd/dKES/cow/d	DMIas % li	veweight	2.5	Balance		0.7	Balance	19.1		
One Calculated Two Live weight change (kg/d) Days in milk Days pregnant 120 Number of animals in herd 120 Milk yield (l/d) 10.0 KES/cow/d Milk fat (%m/v)	Active reco	Line contains /			F90		DCAD			
O Three Days in milk Days pregnant Number of animals in herd 120+ Number of animals in herd 1+ Milk yield (l/d) 10.0+ KES/cow/d 1 KES/herd/d	One	Live weight (Kg)		500	-	Calculated	-		
Days in milk Image: 200 * Rumen8 pH 6.2 Days pregnant I20 * Number of animals in herd I * Margin 35 Milk yield (I/d) I0.0 * KES/cow/d 1 35 Milk fat (%m/v) 4.00 * KES/herd/d -	-	Live weight o	:hange (kg/d)	0.39	*	Recommended	>250		
Number of animals in herd 1 Margin 35 Milk yield (l/d) 10.0 KES/cow/d 1 35 Milk fat (%m/v) 4.00 -	() Ihree	Days in milk			::' 200	-	Rumen8 pH	6.2		
35 Milk yield (l/d) 10.0 € KES/cow/d 1 35 Milk fat (%m/v) 4.00 € KES/herd/d -		Days pregna	nt		120	-				
35 479 Milk fat (%m/v) 4.00 € KES/herd/d -		Number of a	nimals i	n herd	1	•	Margin			
479 Milk fat (%m/v) 4.00 €	35	Milk yield (I/d	i)		10.0	÷	KES/cow/d	1		
350 Milk true protein (%m/v) 3.30 → Milk yield (l/d) 10.0 →		Milk fat (%m	/v)		4.00	•	KES/herd/d	-		
	350	Milk true pro	tein (%n	n/v)	3.30	•	Milk yield (l/d)	10.0	•	



<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew	<u>H</u> elp			Dairy Diet
			DM	As-fed	
1.	Maize silage DM < 30%	~	0.00	0.00 ≑	Metabolisable
2.	Rhodes hay Low CP (Ch	loris gayana) 🗸	0.00	0.00 ≑	Supply (MJ) Demand (MJ)
З.	Napier fresh mature > 12	20 cm 🗸 🗸	6.20 ≑	26.61 ≑	Balance (MJ)
4.	Maize grain	~	0.00	0.00 ≑	Density (MJ/kg
5.	Wheat bran	~	0.00	0.00 🜩	Metabolisabl
6.	Rapeseed (Canola) mea	l fat≤40 g/kg ∨	0.00	0.00 🗢	Supply (g) Demand (g)
7.	Soyabean meal fat < 40	g/kg ~	0.00	0.00 🜩	Balance (g)
8.	Cottonseed meal decortion	cated ~	0.00	0.00 🜩	CP (%DM)
9.	Maize bran	~	3.70 🜩	4.17 ≑	DM intake es
10.	Sunflower seed meal deh	nulled 🗸 🗸	0.50 🜩	0.56 🜩	Max. NDF intak Maximum DMI
11.	Limestone (CaC03)	~	0.04 🗮	0.04 🗧	DMI as % livew
	o ctudy	67	0.00 ≑	0.00 🜩	- Active recomme
Las	e study	0-/~		0.00 ≑	⊖ One ⊖ Two
Tas	k 3:			0.00 ‡	O Three
15.		~	0.00 ≑	0.00 🜩	
Total	daily intake (kg/d)		10.4	31.4	
	Feed costs		Milk income		
	KES/t DM	18471	KES/L raw mi	lk	0
	KES/MJ ME	2.0	KES/kg ECM		0
	KES/kg CP	233	KES/kg F+P		0
he w		193	KES/cow/d		0

Dairy Diet Diet detail	Price	Feed cost Compa	are Notes	Optimise	
Metabolisable energy		NDF (%DM)	57.8	Starch (%DM)	14.2
Supply (MJ)	95	NDF (kg)	6.034	Sugar (%DM)	4.7
Demand (MJ)	95	peNDF (%DM)	42.3	NFC (%DM)	20.4
Balance (MJ)	0	NDF frg (%NDF)	70.0	Forage : Conc	60:40
Density (MJ/kg DM)	9.1	NDF frg (%lw)	0.70	Ash (%DM)	10.8
Metabolisable protein		RDP/UDP protein		Enteric methane	
Supply (g)	533	RDP (%CP)	56.3	Total (g/cow)	21
Demand (g)	528	UDP (%CP)	43.7	Intensity (g/L)	-
Balance (g)	5	Excess protein (g)	5		
CP (%DM)	7.9	LWG loss (kg/d)	<0.01	Fat (%DM)	3.1
DM intake estimate		Calcium (g)		Phosphorus (g)	0
Max. NDF intake%	101	Supply	41.9	Supply	36.1
Maximum DMI%	95	Demand	41.8	Demand	26.1
DMI as % liveweight	1.7	Balance	0.1	Balance	10.0
Active recommended levels		Magnesium (g)	۲	DCAD	
One OFour		Live weight (kg))	600 ≑	-
O Two O Five O Three ● Off		Live weight cha	nge (kg/d)	0.00	<200
A	1	Days in milk			6.3
	2	Days pregnant		250 🜩	
Feed eff	iciency	Number of anim	als in herd		
0 kg ECM/k					-193
0 gF+P/kg	-	Milk yield (I/d)		0.0 🜩	100
		Milk fat (%m/v)		0.00 ‡	-
					n
0 KES Milk	KES Fee	Milk true proteir	n (%m/v)	0.00 🌲	l) 0.0 🖨



	File	Edit Animal Vi	ew Help				Dairy Diet	Ĩ
	<u>_</u> c				DM	As-fed	Dairy Diet	
	1.	Maize silage DM < 3	0%	~	0.00	0.00 🜩	Metabolisa	able
	<mark>2</mark> .	Rhodes hay Low CF) (Chloris gayana) ~	0.00	0.00 🜩	Supply (MJ) Demand (M	
	3.	Napier fresh mature	> 120 cm	~	2.50 🜩	10.73 ≑	Balance (MJ	
	4.	Maize grain		~	0.00	0.00 🜩	Density (MJ	/kg l
	5.	Wheat bran		\sim	0.00	0.00 ≑	Metabolisa	able
	6.	Rapeseed (Canola)	meal fat < 40 g/kg	g ~	0.00	0.00 🜩	Supply (g) Demand (q)	
	7.	Soyabean meal fat	< 40 g/kg	~	0.00	0.00 🜩	Balance (g)	
	8.	Cottonseed meal de	corticated	~	0.00	0.00 ÷	CP (%DM)	
	9.	Maize bran		\sim	3.10 ₽	3.49 🜩	DM intake	esti
	10.	Sunflower seed mea	I dehulled	~	0.80 🜩	0.89 🜩	Max. NDF in Maximum D	
	11.	Limestone (CaC03)		~	0.01 🗮	0.01 ‡	DMI as % liv	
	12.	a tu al	. (7	×	0.00	0.00	Active recom	men
La	se	study	/ 6- /			0.00 🗢	One Two	0
Ta	clz	1.				0.00 🗘	O Three	0
ı a	5 15.	4.				0.00 ≑		
	Total	daily intake (kg/d)			6.4	15.1		
		Feed costs			Milk income			
		KES/t DM	24185		KES/L raw mi	lk	0	
		KES/MJ ME	2.4		KES/kg ECM		0	
		KES/kg CP	212		KES/kg F+P		0	
R		KES/cow/d	155		KES/cow/d		0	

Diet Diet detail	Price	Feed c	ost Comp	are Notes	Optimise			
olisable energy		NDF (S	%DM)	52.4	Starch (%DM)	18.4		
(MJ)	64	NDF (kg	g)	3.361	Sugar (%DM)	4.2	2	
d (MJ)	64	peNDF	(%DM)	32.8	NFC (%DM)	23.7	'	1
e (MJ)	0	NDF frg	(%NDF)	50.7	Forage : Conc	39:61	1	
/ (MJ/kg DM)	10.0	NDF frg	(%lw)	0.49	Ash (%DM)	8.7	'	
olisable protein	0	RDP/U	JDP protein		Enteric methane)		
(g)	468	RDP (%	GCP)	64.6	Total (g/cow)	-	6	
d (g)	450	UDP (%	CP)	35.4	Intensity (g/L)	-	-	
e (g)	18	Excess	protein (g)	18				
(MC	11.4	LWG los	ss (kg/d)	<0.01	Fat (%DM)	3.8	1	
ake estimate		Calciu	m (g)		Phosphorus (g)	6		
DF intake%	96	Supply		20.3	Supply	26.4	L.	
um DMI%	77	Deman	d	20.6	Demand	14.4		
% liveweight	1.8	Balance	е	-0.3	Balance	12.0)	
recommended levels		Magne	esium (g)	0	DCAD	0		
e O Four		Supply		10.7	Calculated	-		
o O Five		Demar	Live weigh	t (kg)	350	-		
ree Off	1	Balanc	Live weigh	t change (kg	/d) 🖬 0.40	-		
A			Days in mi	lk		6.5		
			Days preg	nant	30	1		
Feed effi			Number of	animals in h				
kg ECM/k g F+P/kg		Milk yield (1/d)	0.0	-1	155		
Feed % in			Milk fat (%	m/v)	0.00			
KES Milk/	ed	Milk true protein (%m/v)						

EA AP African nership

	Eile	Edit Animal Vi-	uu Llala				
	<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> ie	ew <u>H</u> elp		DM	As-fed	Da
	1.	Maize silage DM < 3	0%	~	1.90 🖨	7.25 ≑	N
	2.	Rhodes hay Low CP	(Chloris gayana) ~	0.00	0.00	S
	<mark>3</mark> .	Napier fresh mature	> 120 cm	~	0.00	0.00	D
	4.	Maize grain		~	0.00	0.00	D
	5.	Wheat bran		~	0.00	0.00	N
	6.	Rapeseed (Canola)	meal fat < 40 g/kg	, ~ [0.00	0.00 ≑	S
	7.	Soyabean meal fat <	: 40 g/kg	$\overline{}$	0.00	0.00 🖨	DB
	8.	Cottonseed meal dec	corticated	$\overline{}$	0.00	0.00	С
	9.	Maize bran		$\overline{}$	1.70 🖨	1.92 ≑	D
	10.	Sunflower seed mea	l dehulled	~	2.00 🖨	2.22 🖨	М
	11.	Limestone (CaC03)		~	0.03 🖨	<mark>0.03</mark> ‡	D
	12.			~	0.00 ‡	0.00 🜩	
La	ISE	e study	/ 6- /			0.00 ≑	
Ta	c	5:				0.00	
Ia	. 5 .	J.		~	0.00	0.00 🗘	
	Total	daily intake (kg/d)			5.6	11.4	
		Feed costs		м	lilk income		
		KES/t DM	33129	ĸ	ES/L raw mil	k	
		KES/MJ ME	3.0		ES/kg ECM		
		KES/kg CP	172		ES/kg F+P		
		KES/cow/d	187		ES/cow/d		
		and a figure and the second second					

airy Diet	Diet detail	Price	Feed	ost Co	mpare	Notes	Optimise			
Metabolisabl	e energy		NDF (%DM)	2	2.8	Starch ((%DM)	18.1	
Supply (MJ)		61	NDF (k	g)	2.	407	Sugar (%	DM)	3.2	í.
Demand (MJ)		61	peNDF	(%DM)	2	22.3	NFC (%E	OM)	28.3	t
Balance (MJ)		1	NDF fro	(%NDF) 3	88.4	Forage :	Conc	34:66	1
Density (MJ/kg	IDM)	10.9	NDF frg	g (%lw)	().37	Ash (%D	M)	6.0	
Metabolisabl	e protein		RDP/U	JDP pro	otein		Enteric	methane		
Supply (g)		471	RDP (%	6CP)	7	7.7	Total (g/c	:ow)	-	
Demand (g)		475	UDP (%	6CP)	2	22.3	Intensity	(g/L)	-	
Balance (g)		-4	Excess	protein (g)	274				
CP (%DM)		19.3	LWG lo	ss (kg/d)	(0.10	Fat (%DN	(N	3.6	
DM intake es	timate		Calciu	ım <mark>(g)</mark>			Phosph	orus <mark>(</mark> g)	0	
Max. NDF intal	ke%	96	Supply			26.6	Supply		30.4	
Maximum DMI	%	81	Deman	d		26.2	Demand		16.8	
DMI as % livew	veight	2.3	Balanc	e		0.3	Balance		13.5	
Active recomme	nded levels		Magne	esium (g	3)	\bigcirc	DCAD			
	○ Four ○ Five		Supply Demar	I to an end	eight (kg)	Odela	250 🜩	-	
	● Off		Balanc			inge (kg/c	i) 🖬			
	А				in milk				6.3	
				Days	pregnant			0 🌲		
	Feed effic	ciency		Numb	er o <mark>f an</mark> in	nals in he	rd	1		
0	kg ECM/kg	g DM		Milk y	ield (l/d)			0.0 🔹	-18	7
0	g F+P/kg [Milk fa	at (%m/v)	6		0.00		-
0 0	Feed % ind KES Milk/I		ed	Milk tr	ue protei	n (%m/v)		0.00	0.0)≑



Case study 6-8



Case study 6-8 (1/2)

- A farmer has 10 cross-bred cows under zero-grazing*: Cow LW 450 kg, 150 days in milk and 75 days in calf
- Milk production 15 litres/cow/day (milk fat 3.6%; milk protein 3.0%); milk price KES 40/litre.
- The following forages are available Oats forage fresh KES 3,000/tonne • Maize silage <30% Dry Matter KES 6,000/tonne Lucerne fresh KES 10.000/tonne Limit 8 kg/cow/d Rhodes hay low CP KES 23,000/tonne • Create a concentrate using the following ingredients (% in mix as shown) Bone meal KES 37,560/tonne inclusion 2% Copra (fat <40 g/kg) KES 40,000/tonne inclusion 4% ٠ Cotton seed meal partly decorticated KES 63,000/tonne inclusion 7% Fish meal CP 535 g/kg KES 136,000/tonne inclusion 5% KES 15,000/tonne Limestone inclusion 3% • Maize germ meal fat (<40 g/kg) KES 38,000/tonne inclusion 50% Soya bean meal (fat<40 g/kg) KES 130,000/tonne inclusion 2% Sunflower meal partly dehulled KES 40,000/tonne inclusion 7% KES 29,000/tonne Wheat bran inclusion 10% • KES 40,000/tonne Wheat Pollard inclusion 10% TOTAL COST of MIX KES50,000/tonne



* Zero grazing - walking 0.5 km/cow/day



Case study 6-8 (2/2)

- At the farm visit the farmer is using the following ration
 - Maize silage 18.5 kg
 - Lucerne 8 kg
 Oats fresh 2 kg
 - Compound feed 7 kg
- Task 1: Create the concentrate mix outlined above and assess the above diet
- Task 2: If the farmer can grow any of the above forages and buy all ingredients of the compound feed separately what could be a diet giving the farmer the best milk production for the highest margin above feed cost?
- Task 3: The quality of the maize silage is low and can be improved with better practices. What would be the effect of a better-quality maize silage on milk production and margin above feed costs?



				KES/t DM	KES/t as-fed
	Deire ann	and an and	Maize silage DM < 30%	22901 ≑	6000 ≑
	Dairy cow V Hols	stein ~	Lucerne fresh	40816	10000 🖨
	Live weight (kg)	450 🖨 🥃	Oats forage fresh	11583 🜩	3000 🖨
	Live weight change (kg/d)	0.07 🖨 😑	ConcentrateCaseStudy6-8	55824 🜩	50000 ≑
		0.07	Bone Meal	40000 ≑	37560 ≑
	Days in milk	150 🖨 🥌	Copra (coconut cake) fat < 40 gr/kg	44793 🜩	40000 🖨
	Days pregnant	75 🖨 😑 🗕	. Cottonseed meal partly decorticated	69155 🜩	63000 🖨
	Number of animals in herd		Fish meal CP < 535 g/kg	149780 🗘	136000 ≑
	Number of animals in herd	10 🖨 🝚 🖓	Limestone (CaC03)	15000 🜩	15000 🜩
	Milk yield (I/d)	15.0 🗧 🤤	Maize germ meal fat < 40 g/kg	42889 🖨	38000 🖨
	Milk fat (%m/v)	3.60 🗧 😑	. Soyabean meal fat<40 g/kg	145089 🜩	130000 🖨
	Milk true protein (%m/v)	3.00 🜩 😑	Sunflower seed meal partly dehulled	44004 🜩	40000 ≑
	wink true protein (2011/4)	3.00	Wheat bran	32843 🗘	29000 🗘
	Fat:Protein ratio	1.20	Wheat pollard	44793 🜩	40000 🖨
	Fat, Protein, F+P (kg/d)	0.54 0.45	Maize silage DM > 35%	15831 ≑	6000 ≑
	DMI estimation method	○ Conventional	 NDF intake 		
	Farm terrain	Dista	nce walked (km/d)	0.5	8
RU	● Flat ○ Undulating ○ Steep	9-0)i		
Easy	daily a deer catue diets				



NEA NEA
DAP
Netherlands East African

Percent	Feed
2.0	Bone Meal
4.0	Copra (coconut cake) fat < 40 g
7.0	Cottonseed meal decorticated
5.0	Fish meal CP < 535 g/kg
3.0	Limestone (CaC03)
50.0	Maize germ meal fat < 40 g/kg
2.0	Soyabean meal fat < 40 g/kg
7.0	Sunflower seed meal partly deh
10.0	Wheat bran
10.0	Wheat pollard

Case study 6-8 Task 1: Concentrate mix

RUMEN8 Easy dairy & beef cattle diets

	non-forage entrate	Comment			
Particle size Conce Source	-				
Source	entrate				
DM (a/ka)					
Divi (g/kg)	896	Calcium (g/kg DM)	18.7	NDF (g/kg DM)	316
ME (MJ/kg DM)	11. <mark>2</mark>	Calcium absorption	0.60	peNDF (g/kg DM)	10 <mark>4</mark>
Cost (KES/MJ ME)	3.9	Phosphorus (g/kg DM)	12.8	Starch (g/kg DM)	256
CP (g/kg DM)	206	Phosphorus absorption	0.68	Sugar (g/kg DM)	32
Cost (KES/kg DM CP)	265	Magnesium (g/kg DM)	3.6		
Fat (g/kg DM)	42	Magnesium absorption	0.15	Max feeding rate (g/kg DM)	-
aN	1.7			Wet density (m3)	
bN	-	Potassium (g/kg DM)	11.0	Cost (KES/t DM)	55824
cN	-	Sulphur (g/kg DM)	2.0	Cost (KES/t as-fed)	50000
		Sodium (g/kg DM)	1.9	Losses (%)	-
ADIN (g/kg DM)	1.4	Chloride (g/kg DM)	0.8	Cost -losses (KES/t DM)	55824
Ash (g/kg DM)	109	DCAD (mEq/kg DM)	33	Cost -losses (KES/t as-fed)	50000

<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew <u>H</u> elp			
			DM	As-fed
1.	Maize silage DM < 30%	~	4.85 🜩	18.51 🜩
2.	Lucerne fresh	~ [1.96 🜩	8.00 🜩
3.	Oats forage fresh	~	0.52 🜩	2.01 ≑
4.	ConcentrateCaseStudy6-8	~	6.27 ≑	7.00 ≑
5.	Bone Meal	~	0.00	0.00 ≑
6.	Copra (coconut cake) fat < 40 gr/kg	~	0.00 🔹	0.00 ≑
7.	Cottonseed meal partly decorticated	~	0.00 🜩	0.00
8.	Fish meal CP < 535 g/kg	~	0.00 🜩	0.00 ≑
9.	Limestone (CaC03)	~	0.00	0.00 ≑
10.	Maize germ meal fat < 40 g/kg	~ [0.00	0.00 ≑
11.	Soyabean meal fat < 40 g/kg	~	0.00	0.00 ≑
12.	Sunflower seed meal partly dehulled	~	0.00	0.00 ≑
13.	Wheat bran	~	0.00 🜩	0.00 ≑
<mark>14</mark> .	Wheat pollard	~	0.00 🜩	0.00 🜩
<mark>15</mark> .	Rhodes hay Low CP (Chloris gayana)	~	0.00	0.00 ≑
Total	daily intake (kg/d)		13.6	35.5
	Feed costs	Mi	lk income	

Dairy Diet Diet det	ail Price	Feed cost Compa	re Notes	Optimise	
Metabolisable energy		NDF (%DM)	39.8 😑	Starch (%DM)	18.9 👄
Supply (MJ)	141	NDF (kg)	5.409	Sugar (%DM)	2.6 😑
Demand (MJ)	140	peNDF (%DM)	24.6 😑	NFC (%DM)	33.2 😑
Balance (MJ)	0	NDF frg (%NDF)	63.3 😐	Forage : Conc	55:45 😑
Density (MJ/kg DM)	10.3	NDF frg (%lw)	0.76 😑	Ash (%DM)	8.6
Metabolisable protein	0	RDP/UDP protein		Enteric methane	
Supply (g)	1243	RDP (%CP)	68.2 😑	Total (g/cow)	285
Demand (g)	1122	UDP (%CP)	31.8 😑	Intensity (g/L)	19.0
Balance (g)	121	Excess protein (g)	170		
CP (%DM)	15.2	Milk loss (I)	0.28	Fat (%DM)	3.3 😑
DM intake estimate		Calcium (g)	0	Phosphorus (g)	0
Max. NDF intake%	92	Supply	163.7	Supply	96.3
Maximum DMI%	92	Demand	76.3	Demand	43.9
DMI as % liveweight	3.0	Balance	87.4	Balance	52.4
Active recommended levels		Magnesium (g)	0	DCAD	
One O Four		Supply	35.8	Calculated	1 -
● Two ○ Five		Demand	23.5	Recommended	>250
O Three O Off		Balance	12.3		
Mid Lactation (14-18 Its)	A			Rumen8 pH	6.1

Feed costs		Milk income
KES/t DM	40228	KES/L raw milk
KES/MJ ME	3.9	KES/kg ECM
KES/kg CP	265	KES/kg F+P
KES/cow/d	547	KES/cow/d

R

Feed efficiency	
Case study 6-8	1.0
case slugy 0 0	
Task 1: Current	farm
TUSK I. CUITCILL	ICIIII

KKESF

Margin	
KES/cow/d	<mark>5</mark> 3
KES/herd/d	529
Milk yield (l/d)	15.0 🗘

<u>F</u> ile	<u>E</u> dit <u>A</u> nimal <u>V</u> iew <u>H</u> elp			
			DM	As-fed
1.	Maize silage DM < 30%	<u> </u>	0.00	0.00 🕈
2.	Lucerne fresh	~	0.00	0.00 ≑
3.	Oats forage fresh	~ [7.50 🜩	28.96 ≑
<mark>4</mark> .	ConcentrateCaseStudy6-8	~	0.00 🜩	0.00 🜩
5.	Bone Meal	~	0.00 🜩	0.00
6.	Copra (coconut cake) fat < 40 gr/kg	~	0.00 🜩	0.00 🔹
7.	Cottonseed meal partly decorticated	~	0.00 🜩	0.00 🜩
8.	Fish meal CP < 535 g/kg	~	0.00	0.00 🜩
9.	Limestone (CaC03)	~	0.14 ≑	0.14 ≑
10.	Maize germ meal fat < 40 g/kg	~	4.20 🜩	4.74 🜩
11.	Soyabean meal fat < 40 g/kg	~	0.00	0.00 🜩
12.	Sunflower seed meal partly dehulled	~	0.00 🜩	0.00 🜩
13.	Wheat bran	~	0.00	0.00 🗢
14.	Wheat pollard	~	1.30 🜩	1.46 🜩
15.	Rhodes hay Low CP (Chloris gayana)	~ [0.00	0.00 🗢
Total	daily intake (kg/d)		13.1	35.3
	Feed costs	Mil	k income	

Feed costs		Milk income	
KES/t DM	24912	KES/L raw milk	
KES/MJ ME	2.4	KES/kg ECM	
KES/kg CP	188	KES/kg F+P	
KES/cow/d	327	KES/cow/d	

airy Diet Diet deta	I Price	Feed cost	Compare	Notes	Optimise	
Metabolisable energy		NDF (%D	/I) 4	14.5 😑	Starch (%DM)	19.0 🗢
Supply (MJ) 139		NDF (kg)	5.	844	Sugar (%DM)	6.6 😑
Demand (MJ)	139	peNDF (%D	OM) 3	33.9 😐	NFC (%DM)	30.1 😑
Balance (MJ)	0	NDF frg (%NDF)		69.9 😑	Forage : Conc	58:42 😑
Density (MJ/kg DM) 10.6		NDF frg (%lw)		0.91 😑	Ash (%DM)	9.0
Aetabolisable protein		RDP/UDP	protein		Enteric methane	
Supply (g)	1123	RDP (%CP)) 6	65.7 😐	Total (g/cow)	291
Demand (g)	1122	UDP (%CP)) 3	34.3 😑	Intensity (g/L)	19.4
Balance (g) 0		Excess protein (g)		0		
CP (%DM)	%DM) 13.3		<(0.01	Fat (%DM)	3.1 😑
OM intake estimate		Calcium (3)		Phosphorus (g)	0
Max. NDF intake%	100	Supply		79.6	Supply	50.9
Maximum DMI% 89 Dem		Demand	Demand		Demand	43.1
OMI as % liveweight	2.9	Balance		1.5	Balance	7.8
Active recommended levels		Magnesiu	m (g)	0	DCAD	
One O Four		Supply		26.8	Calculated	-
Two Five		Demand		23.4	Recommended	>250
◯ Three ◯ Off		Balance		3.5		
Mid Lactation (14-18 Its)	4				Rumen8 pH	6.3
40 Case study 6-8				Margin		
40 UdSt	っしし	uuy	10 - 0)	KES/cow/d	273
43 g F+P/k	g DM				KES/herd/d	2727
606 ASK	income					
600 KES Mil	k/KES Fe				Milk yield (I/d)	15.0 🜩

<u>File</u>	<u>E</u> dit <u>A</u> nimal <u>V</u> iew <u>H</u> elp			
			DM	As-fed
1.	Maize silage DM < 30%	~	0.00 🜩	0.00 🜩
2.	Lucerne fresh	~	0.00	0.00 ≑
3.	Oats forage fresh	~	5.20 🜩	20.08 ≑
4.	ConcentrateCaseStudy6-8	~	0.00 ÷	0.00
5.	Bone Meal	~	0.00	0.00 🜩
6.	Copra (coconut cake) fat < 40 gr/kg	, ~	0.00 🜩	0.00 🜩
7.	Cottonseed meal partly decorticate	ed ~	0.00	0.00 🜩
8.	Fish meal CP < 535 g/kg	~	0.00	0.00 ≑
9.	Limestone (CaC03)	~	0.00	0.00
10.	Maize germ meal fat < 40 g/kg	~	0.00	0.00
11.	Soyabean meal fat < 40 g/kg	~	0.00	0.00 ≑
12.	Sunflower seed meal partly dehull	e <mark>d</mark> ~	1.70 🖨	1.87 ≑
13.	Wheat bran	~	0.00	0.00 ≑
14.	Wheat pollard	~	2.70 🖨	3.02 ≑
15.	Maize silage DM > 35%	~	3.70 🜩	9.76 🜩
Total	daily intake (kg/d)		13.3	34.7
	Feed costs		Milk income	
	KES/t DM 23651		KES/L raw mil	k
	KES/MJ ME 2.2		KES/kg ECM	

315

KES/kg F+P

KES/cow/d

KES/kg CP

KES/cow/d

airy Diet	Diet detail	Price	Feed cost Comp	are Notes	Optimise	
Metabolisat	le energy		NDF (%DM)	44.1 👄	Starch (%DM)	17.9 😑
upply (MJ) 140 NDF (kg)		5.863	Sugar (%DM)	6.7 😐		
Demand (MJ)		139	peNDF (%DM)	33.5 😑	NFC (%DM)	31.4 😑
Balance (MJ)		0	NDF frg (%NDF)	75.9 😑	Forage : Conc	67:33 🔵
Density (MJ/k	g DM)	10.5	NDF frg (%lw)	0.99 😑	Ash (%DM)	6.9
Metabolisat	le protein		RDP/UDP protein	1	Enteric methane	
Supply (g)	(g) 1112 RDP (%CP)		75.4 😑	Total (g/cow)	291	
		1109	UDP (%CP)	24.6 🔵	Intensity (g/L)	19.4
Balance (g) 3		3	Excess protein (g)	17		
CP (%DM)	P (%DM) 14.3 M		Milk loss (I)	0.03	Fat (%DM)	3.3 😑
DM intake e	stimate		Calcium (g)		Phosphorus (g)	0
Max. NDF inte	Max. NDF intake% 100 Supply		38.8	Supply	49.3	
Maximum DN	1%	90	Demand	84.1	Demand	43.3
DMI as % live	weight	3.0	Balance	-45.3	Balance	6.0
Active recomm	ended levels		Magnesium (g)	0	DCAD	
One	◯ Four		Supply	33.1	Calculated	-
● Two ○ Five		Demand	23.1	Recommended	>250	
() Three	OOff		Balance	10.0		
Mid Lactation	(14-18 lts) A				Rumen8 pH	6.3
					1	
C	Feed effi	ciency	tudy 6	0	Margin	
40	d St	DD	tudy 6	O-Q	KES/cow/d	285
43	g F+P/kg	DM	74		KES/herd/d	2854
606	ASK	come				
600	KESMIL	KES Fee	ed 1.9		Milk yield (I/d)	15.0 ≑

NEA DAP ast African Partnership



Ready to Rumen8!



Course Goal

- To improve knowledge and skills of trainees so that they can confidently use the Rumen8 software application to make informed on-farm nutrition decisions to improve farm profit.
- Rumen8 is our tool to help in our decision making
- Let's go and do it!







Practice makes Perfect!

- It will take time to master the skills needed for a successful Farm Walk
- It will take time and perseverance to master the use of Rumen8
- Work with an experienced 'Rumen8 coach' to learn the 'Art of Feeding'
- This course is only a first step in that process





This brings to an end this 6-part course. We wish you good luck with 'Dairy cattle nutrition in the tropics using Rumen8'