



RUMEN8

Easy dairy & beef cattle diets



Dairy cattle nutrition in the tropics using Rumen8

PART 4: Rumen8 details




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

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- Information presented in parts ONE & TWO of this course is based in part on material developed by Dairy Australia
- 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 FOUR – Rumen8 details

- ‘Diet detail’ in detail
- Using the Feed Editor
- Dry cows & Transition cows
- Heifers (unmated & mated)
- Dual purpose cows (in Beef mode)
- Creating Reports
- Using Recommended levels



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.



Part 4A

Exercise 4-1



Using the tabs 1/3

1. Open Rumen8 in Standard Mode
2. Set up an average cow for a herd
 - Go to the 'Animal' menu & select 'Use Standard Animal'
 - Select Lactation 4000 litres & Early Lactation
 - LW 500 kg – breed Holstein
 - Click on the calculator icon next to live weight change
 - Set days in milk to 90 and click OK
 - What is the LW change predicted by Rumen8?
 - Cow not pregnant (0 days)
 - Set milk yield to 15 litres (4% fat, 3 %protein)
 - Set DMI estimation method to “NDF intake” (1.3% of LW; see Preferences)
 - Set farm terrain flat - distance walked 0 km

Using the tabs 2/3

1. Go to Price tab and check milk price

- KES 35 per litre

2. Load three feeds from the library & enter costs in Feed Cost tab

- Maize silage DM<>30-35% Cost: KES 6,000/t (KES 1.7/MJ ME)
- Napier fresh 60 cm Cost: KES 2,000/t (KES 1.1/MJ ME)
- Sunflower seed meal dehulled Cost: KES 40,000/t (KES 4.0/MJ ME)

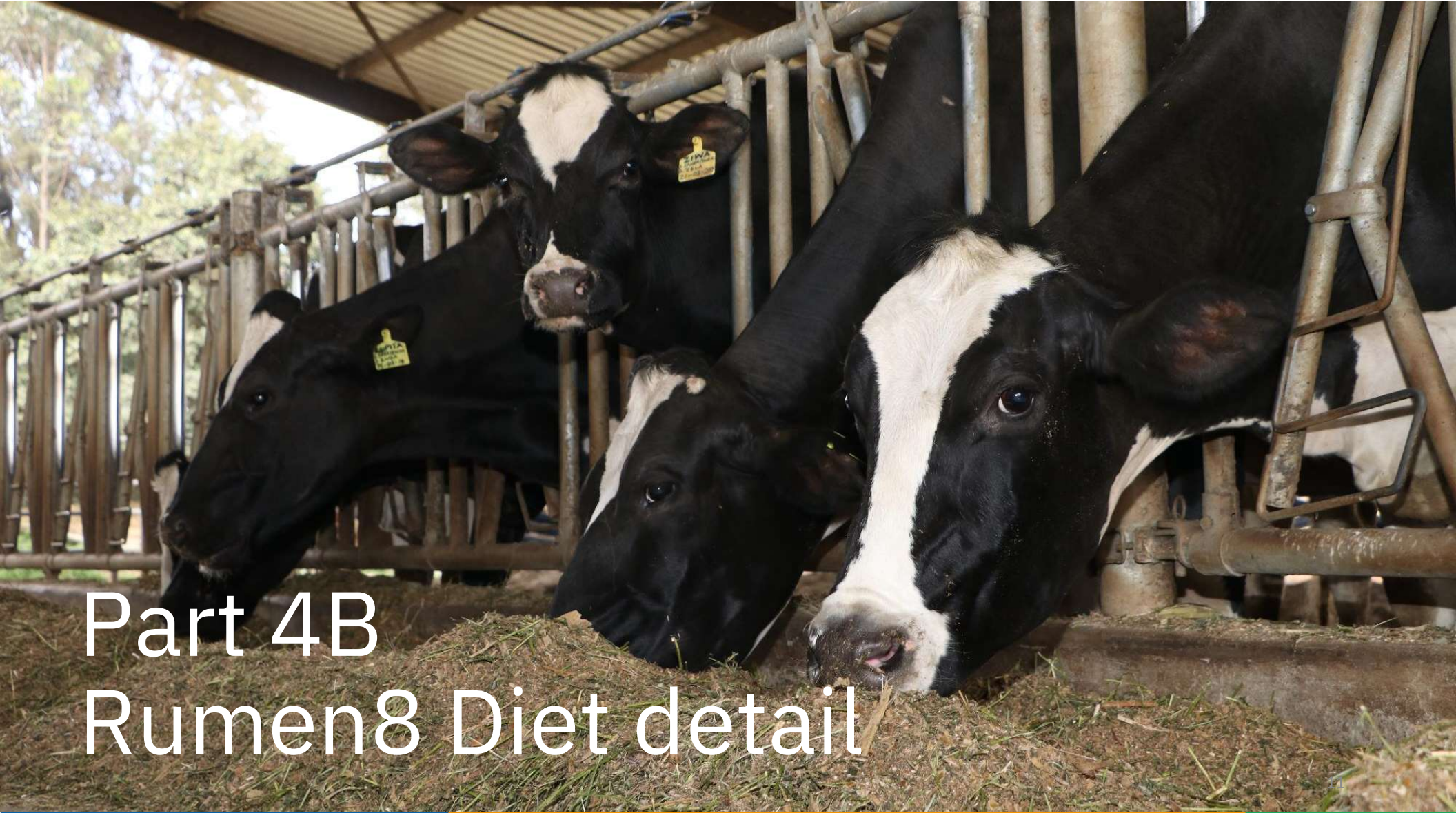
3. Save file as 'Rumen8Tutorial4-1.rm8'

Using the tabs 3/3

1. Start feeding your cows with various amounts of 3 feeds
2. Use the Diet tab to balance your diet for:
 - Dry matter intake
 - Metabolisable energy
 - Metabolisable protein
 - NDF & starch.
3. Group discussion on merits of various diets that trainees have formulated.
4. What is the Margin that you have been able to achieve?
5. Is there a best solution? What remains missing from this diet?
6. Save the file!



Q & A
Discussion



Part 4B
Rumen8 Diet detail

Diet detail tab

- Lots of detail!
- “Traffic lights”
- Let’s look at what it all means
- Additional information in tooltips

Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes
Metabolisable energy ●						
		Supply (MJ)	144			
		Demand (MJ)	145			
		Balance (MJ)	-2			
		Density (MJ/kg DM)	10.5			
NDF (%DM) ●						
		NDF (kg)		6.475		
		peNDF (%DM)		31.2		
		NDF frg (%NDF)		69.4		
		NDF frg (%lw)		0.90		
Starch (%DM) ●						
		Sugar (%DM)			5.0	
		NFC (%DM)			25.3	
		Forage : Conc			61:39	
		Ash (%DM)			6.3	
Metabolisable protein ●						
		Supply (g)	1344			
		Demand (g)	1158			
		Balance (g)	187			
		CP (%DM)	17.9			
RDP/UDP protein ●						
		RDP (%CP)		68.2		
		UDP (%CP)		31.8		
		Excess protein (g)		390		
		Milk loss (l)		0.59		
Enteric methane ●						
		Total (g/cow)			318	
		Intensity (g/L)			18.7	
		Fat (%DM)			3.2	
DM intake estimate ●						
		Max. NDF intake%	100			
		Maximum DMI%	90			
		DMI as % liveweight	2.7			
Calcium (g) ●						
		Supply		50.1		
		Demand		76.8		
		Balance		-26.7		
Phosphorus (g) ●						
		Supply		65.7		
		Demand		41.7		
		Balance		24.0		
Magnesium (g) ●						
		Supply		40.7		
		Demand		24.5		
		Balance		16.2		
DCAD ●						
		Calculated			-	
		Recommended			>250	

Active recommended levels

One Four
 Two Five
 Three Off

Diet detail tab

- Main summaries for ME, MP and DM intake
 - Supply vs demand with balance and nutrient density
 - DMI intake as % of potential: NDF & conventional methods & % of LW
 - Traffic light system
 - (green, red, yellow)
- Tool tips!

Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes
Metabolisable energy ●						
Supply (MJ)		144				
Demand (MJ)		145				
Balance (MJ)		-2				
Density (MJ/kg DM)		10.5				
Metabolisable protein ●						
Supply (g)		1344				
Demand (g)		1158				
Balance (g)		187				
CP (%DM)		17.9				
DM intake estimate ●						
Max. NDF intake%		100				
Maximum DMI%		90				
DMI as % liveweight		2.7				
Active recommended levels						
<input checked="" type="radio"/> One	<input type="radio"/> Four					
<input type="radio"/> Two	<input type="radio"/> Five					
<input type="radio"/> Three	<input type="radio"/> Off					
NDF (%DM) 47.4						
NDF (kg)		6.475				
peNDF (%DM)		31.2				
NDF frg (%NDF)		69.4				
NDF frg (%lw)		0.90				
RDP/UDP protein						
RDP (%CP)		68.2				
UDP (%CP)		31.8				
Excess protein (g)		390				
Milk loss (l)		0.59				
Calcium (g) ●						
Supply		50.1				
Demand		76.8				
Balance		-26.7				
Magnesium (g) ●						
Supply		40.7				
Demand		24.5				
Balance		16.2				
Starch (%DM) 13.8						
Sugar (%DM)		5.0				
NFC (%DM)		25.3				
Forage : Conc		61:39				
Ash (%DM)		6.3				
Enteric methane						
Total (g/cow)		318				
Intensity (g/L)		18.7				
Fat (%DM)		3.2				
Phosphorus (g) ●						
Supply		65.7				
Demand		41.7				
Balance		24.0				
DCAD ●						
Calculated		-				
Recommended		>250				

Diet detail tab

Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes	Optimise
-------	------	-------------	-------	-----------	---------	-------	----------

Metabolisable energy ●

Supply (MJ)	149
Demand (MJ)	150
Balance (MJ)	0
Density (MJ/kg DM)	10.5

Metabolisable protein ●

Supply (g)	1205
Demand (g)	1150
Balance (g)	55
CP (%DM)	14.0

DM intake estimate ●

Max. NDF intake%	100
Maximum DMI%	94
DMI as % liveweight	2.8

Active recommended levels

One Four
 Two Five
 Three Off

Early lactation (18-22 lt..

NDF (%DM) ●	45.8	Starch (%DM) ●	18.7
NDF (kg)	6.486	Sugar (%DM)	4.7
peNDF (%DM) ●	37.5	NFC (%DM) ●	29.7
NDF frg (%NDF) ●	89.0	Forage : Conc	74:26 ●
NDF frg (%lw) ●	1.15		

RDP/UDP protein ●

RDP (%CP)	
UDP (%CP)	
Excess protein (g)	
Milk loss (l)	

Enteric methane

Total non fibrous carbohydrate in the diet (% of dry matter intake)

Non-fibrous Carbohydrates (NFC) comprises:
 Organic acids
 Sugars, Starch
 Pectins, Beta-glucans
 $\% \text{ NFC} = 100 - (\text{CP} + \text{NDF} + \text{Fat} + \text{Ash})$

Calcium (g) ●

Supply	
Demand	
Balance	

Magnesium (g) ●

Supply	
Demand	
Balance	
Ash (%DM)	

Comparing NFC Fractions

	Sugar	Starch	Pectin	VFA
Alfalfa haylage	0	24	33	42
Grass hay	35	15	49	0
Corn silage	0	71	0	29
Corn grain	21	80	0	0
Beet pulp	34	2	64	0
Soy hulls	19	19	62	0
Soy meal	28	28	44	0

- Carbohydrates
 - NDF & peNDF
 - Starch, Sugar & **NFC**
 - Forage : Concentrate
- NFC: Non-Fibrous Carbohydrates
 - Sugar & Starch
 - Pectins & β-glucans
 - Organic acids (VFA)
 - See box for NFC examples in feeds

Warnings

Starch (%DM)	28.1
Sugar (%DM)	4.6
NFC (%DM)	37.6
Forage : Conc	25:75
Ash (%DM)	6.2



Warning - Starch content is too high. High risk of ruminal acidosis

This warning appears regardless of the recommended levels set in the preferences

Warning - Forage:Concentrate ratio is too low. High risk of ruminal acidosis

This warning appears regardless of the recommended levels set in the preferences

Diet detail tab

- Protein
 - RDP vs UDP in total CP
 - Excess protein
 - Milk loss due to excess protein
- Enteric methane output
- Dietary fat %

Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes
		Metabolisable energy		NDF (%DM)	47.4	Starch (%DM) 13.8
		Supply (MJ)	144	NDF (kg)	6.475	Sugar (%DM) 5.0
		Demand (MJ)	145	peNDF (%DM)	31.2	NFC (%DM) 25.3
		Balance (MJ)	-2	NDF frg (%NDF)	69.4	Forage : Conc 61:39
		Density (MJ/kg DM)	10.5	NDF frg (%lw)	0.90	Ash (%DM) 6.3
		Metabolisable protein		RDP/UDP protein		Enteric methane
		Supply (g)	1344	RDP (%CP)	68.2	Total (g/cow) 318
		Demand (g)	1158	UDP (%CP)	31.8	Intensity (g/L) 18.7
		Balance (g)	187	Excess protein (g)	390	Fat (%DM) 3.2
		CP (%DM)	17.9	Milk loss (l)	0.59	
		DM intake estimate		Calcium (g)		Phosphorus (g)
		Max. NDF intake%	100	Supply	50.1	Supply 65.7
		Maximum DMI%	90	Demand	76.8	Demand 41.7
		DMI as % liveweight	2.7	Balance	-26.7	Balance 24.0
		Active recommended levels		Magnesium (g)		DCAD
		<input checked="" type="radio"/> One	<input type="radio"/> Four	Supply	40.7	Calculated -
		<input type="radio"/> Two	<input type="radio"/> Five	Demand	24.5	Recommended >250
		<input type="radio"/> Three	<input type="radio"/> Off	Balance	16.2	

Diet detail tab

- Macro-minerals
 - Calcium
 - Phosphorus
 - Magnesium
- DCAD
 - Dietary Cation Anion Difference

Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes	
		Metabolisable energy	<input checked="" type="radio"/>	NDF (%DM)	47.4	Starch (%DM) 13.8	
		Supply (MJ)	144	NDF (kg)	6.475	Sugar (%DM) 5.0	
		Demand (MJ)	145	peNDF (%DM)	31.2	NFC (%DM) 25.3	
		Balance (MJ)	-2	NDF frg (%NDF)	69.4	Forage : Conc 61:39	
		Density (MJ/kg DM)	10.5	NDF frg (%lw)	0.90	Ash (%DM) 6.3	
		Metabolisable protein	<input type="radio"/>	RDP/UDP protein		Enteric methane	
		Supply (g)	1344	RDP (%CP)	68.2	Total (g/cow) 318	
		Demand (g)	1158	UDP (%CP)	31.8	Intensity (g/L) 18.7	
		Balance (g)	187	Excess protein (g)	390	Fat (%DM) 3.2	
		CP (%DM)	17.9	Milk loss (l)	0.59		
		DM intake estimate	<input checked="" type="radio"/>	Calcium (g)	<input type="radio"/>	Phosphorus (g) <input type="radio"/>	
		Max. NDF intake%	100	Supply	50.1	Supply	65.7
		Maximum DMI%	90	Demand	76.8	Demand	41.7
		DMI as % liveweight	2.7	Balance	-26.7	Balance	24.0
		Active recommended levels		Magnesium (g)	<input type="radio"/>	DCAD	<input type="radio"/>
		<input checked="" type="radio"/> One		Supply	40.7	Calculated	-
		<input type="radio"/> Two		Demand	24.5	Recommended	>250
		<input type="radio"/> Three		Balance	16.2		
		<input type="radio"/> Four					
		<input type="radio"/> Five					
		<input type="radio"/> Off					

Further technical details

- Right click on headings to open tooltips with detailed technical information

- ME
- MP
- Minerals

Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes
		Metabolisable energy				
		Supply (MJ)	144	NDF (kg)	6.475	Starch (%DM) 13.8
		Demand (MJ)	145	peNDF (%DM)	31.2	Sugar (%DM) 5.0
		Balance (MJ)	-2	NDF frg (%NDF)	69.4	NFC (%DM) 25.3
		Density (MJ/kg DM)	10.5	NDF frg (%lw)	0.90	Forage : Conc 61:39
						Ash (%DM) 6.3
		Metabolisable protein				
		Supply (g)	1344	RDP/UDP protein		Enteric methane
		Demand (g)	1158	RDP (%CP)	68.2	Total (g/cow) 318
		Balance (g)	187	UDP (%CP)	31.8	Intensity (g/L) 18.7
		CP (%DM)	17.9	Excess protein (g)	390	Fat (%DM) 3.2
				Milk loss (l)	0.59	
		DM intake estimate				
		Max. NDF intake%	100	Calcium (g)	50.1	Phosphorus (g)
				Supply		Supply 65.7

Minerals detail

Calcium (g)		Phosphorus (g)		Magnesium (g)	
Maintenance	15.5	Maintenance	14.7	Maintenance	1.5
Lactation	21.4	Lactation	15.8	Lactation	2.6
Pregnancy	0.0	Pregnancy	0.0	Pregnancy	0.0
Growth	-4.8	Growth	-2.8	Growth	-0.2
Net demand	32.1	Net demand	27.6	Net demand	3.9
Absorption	0.42	Absorption	0.66	Absorption	0.16
Dietary demand	76.8	Dietary demand	41.7	Dietary demand	24.5
Dietary supply	50.1	Dietary supply	65.7	Dietary supply	40.7
Balance	-26.7	Balance	24.0	Balance	16.2

Active recommended levels

Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes
		Metabolisable energy	<input checked="" type="radio"/>	NDF (%DM)	47.4	Starch (%DM) 13.8
		Supply (MJ)	144	NDF (kg)	6.475	Sugar (%DM) 5.0
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		Balance (MJ)	-2	NDF frg (%NDF)	69.4	Forage : Conc 61:39
		Density (MJ/kg DM)	10.5	NDF frg (%lw)	0.90	Ash (%DM) 6.3
		Metabolisable protein	<input type="radio"/>	RDP/UDP protein		Enteric methane
		Supply (g)	1344	RDP (%CP)	68.2	Total (g/cow) 318
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		Balance (g)	187	Excess protein (g)	390	Fat (%DM) 3.2
		CP (%DM)	17.9	Milk loss (l)	0.59	
		DM intake estimate	<input checked="" type="radio"/>	Calcium (g)	<input type="radio"/>	Phosphorus (g) <input type="radio"/>
		Max. NDF intake%	100	Supply	50.1	Supply 65.7
		Maximum DMI%	90	Demand	76.8	Demand 41.7
		DMI as % liveweight	2.7	Balance	-26.7	Balance 24.0
				Magnesium (g)	<input type="radio"/>	DCAD <input type="radio"/>
				Supply	40.7	Calculated -
				Demand	24.5	Recommended >250
				Balance	16.2	

Active recommended levels

One Four
 Two Five
 Three Off



Q & A
Discussion

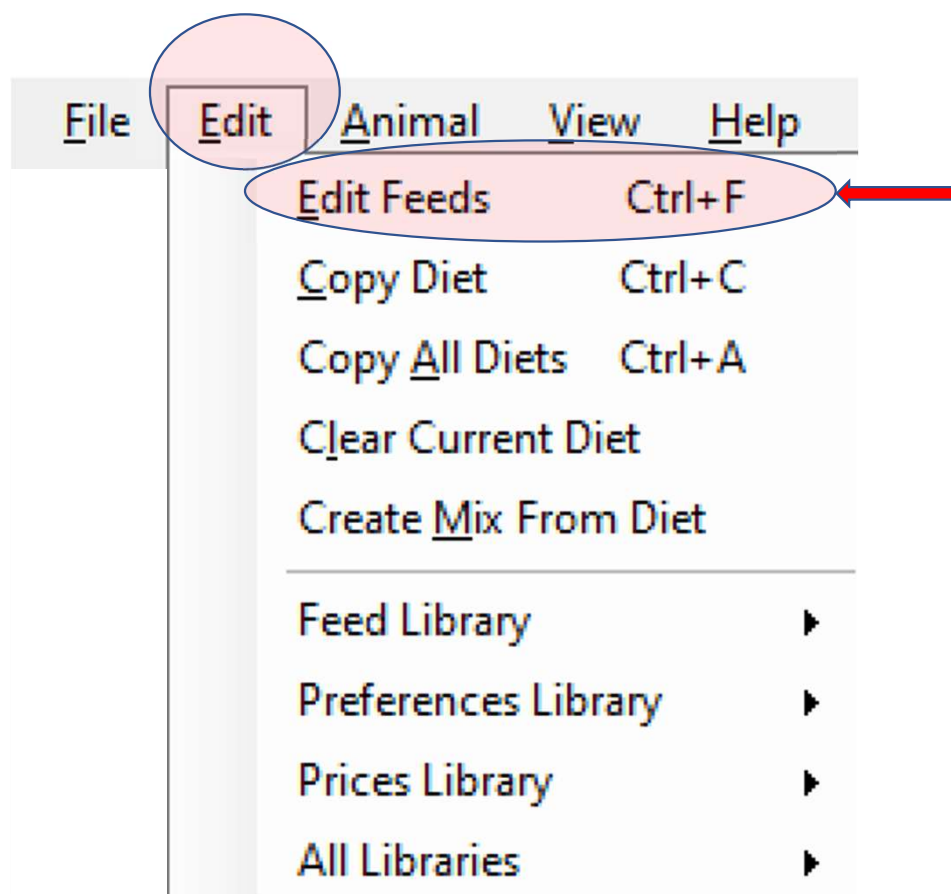


Part 4C
Feed Editor

Using the Edit menu

File	Edit	Animal	View	Help
	Edit Feeds		Ctrl+F	← To access the "Feed Editor"
	Copy Diet		Ctrl+C	} ← Copy one or all diets & all Rumen8 data for pasting into MS Excel
	Copy All Diets		Ctrl+A	
	Clear Current Diet			← To clear Current Diet
	Create Mix From Diet			← To create a Mix from Diet
	Feed Library		▶	} ← To switch between libraries (Feed, Preferences, Prices, All)
	Preferences Library		▶	
	Prices Library		▶	
	All Libraries		▶	

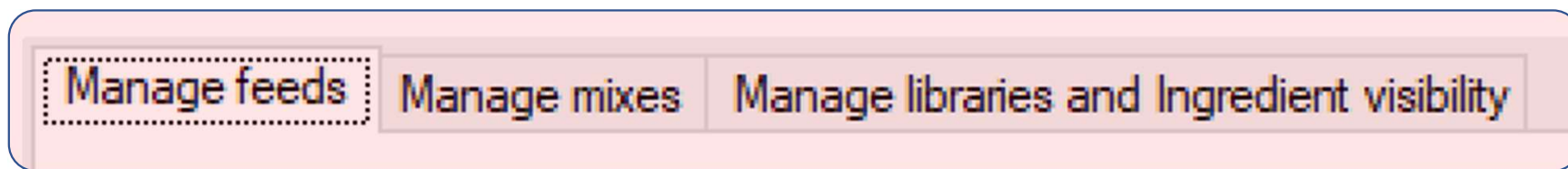
Let's look at Edit Feeds



This opens the
"Feed Editor"

Feed Editor tabs

Feed Editor



- Three Feed Editor tabs
 - Manage feeds: to edit individual feeds & create new feeds
 - Manage mixes: to create and edit feed mixes
 - Manage libraries and ingredient visibility

Manage feeds tab 1/3

- Lists all feeds in the feed library
- Can be sorted by Name or by Category

Feed Editor

Manage feeds | Manage mixes | Manage libraries and Ingredient visibility

Category	Name
GPas	African foxtail grass fresh < 90 g/kg CP
GPas	African foxtail grass fresh <= 90-150 g/kg CP
GPas	African foxtail grass fresh >150 g/kg CP
Hay	African foxtail grass hay
Bypr	Avocado seed fresh fat < 100 g/kg
Bypr	Avocado seed fresh fat > 100 g/kg
Conc	Avocado seed meal fat < 100 g/kg
Conc	Avocado seed meal fat >100 g/kg
GFRg	Bamboo (Giant thorny) leaves fresh
GFRg	Bamboo leaves fresh
GFRg	Bana grass fresh
GFRg	Banana combs fresh
GFRg	Banana leaves fresh
Bypr	Banana leaves meal
GFRg	Banana mature pseudostems
GFRg	Banana peels
GFRg	Banana peels immature fresh
GFRg	Banana whole plant fresh
Sil	Banana whole plant silage
GFRg	Banana young pseudostems
Bypr	Barley bran
Conc	Barley grain
Bypr	Barley straw
Hay	Bean hay
Bypr	Bean mature WP fresh (without seeds)
Bypr	Bean straw
GFRg	Bean young fresh leaves
Bypr	Blood Fresh
Conc	Bone Meal
GPas	Brachiana (Signal Grass) AVERAGE
GPas	Brachiana (Signal Grass) GOOD
GFRg	Brachiana (Signal Grass) GOOD hiCP
GPas	Brachiana (Signal Grass) POOR

Edit
Add Copy
Delete

Edit

Name: African foxtail grass hay

1. Feed management category

Grazed pasture Grazed other Hay Silage

Concentrate Additive Byproduct

2. Feed protein type

Grass silage Other non-forage

OtherSilage Other forage Distillery byproduct

3. Feed particle size classification

Concentrate Forage Other

DM (g/kg)	900	aN	0.24	NDF (g/kg)	691
ME (MJ/kg)	8.1	bN	0.64	peNDF (g/kg)	684
CP (g/kg)	90	cN	0.08	Starch (g/kg)	0
Fat (g/kg)	19	ADIN (g/kg)	1.2	Sugar (g/kg)	0
Ca (g/kg)	0.0	Ca abs	0.30	Ash (g/kg)	118
P (g/kg)	0.0	P abs	0.64	Cost (KES/t DM)	0
Mg (g/kg)	0.0	Mg abs	0.16	Cost (KES/t fed)	0
K (g/kg)	0.0	Max feeding rate (g/kg)		Losses (%)	0
Na (g/kg)	0.0	Wet density (kg/m3)		Cost +loss	0
Cl (g/kg)	0.0			Cost +loss. fr	0
S (g/kg)	0.0	Source	Kenyan Rumens8 Team		
DCAD		Comment			

Required feed parameter names are in bold
Units are on a DM basis unless shown otherwise

Okay Cancel

- Provides detailed composition data for each feed

Manage feeds tab 2/3

Manage feeds | Manage mixes | Manage libraries and Ingredient visibility

Category	Name
GPas	African foxtail grass fresh < 90 g/kg CP
GPas	African foxtail grass fresh <= 90-150 g/kg CP
GPas	African foxtail grass fresh >150 g/kg CP
Hay	African foxtail grass hay
Bypr	Avocado seed fresh fat < 100 g/kg
Bypr	Avocado seed fresh fat > 100 g/kg
Conc	Avocado seed meal fat < 100 g/kg
Conc	Avocado seed meal fat >100 g/kg
GFrg	Bamboo (Giant thorny) leaves fresh
GFrg	Bamboo leaves fresh
GFrg	Bana grass fresh
GFrg	Banana coms fresh
GFrg	Banana leaves fresh
Bypr	Banana leaves meal
GFrg	Banana mature pseudostems
GFrg	Banana peels
GFrg	Banana peels immature fresh
GFrg	Banana whole plant fresh
Sil	Banana whole plant silage
GFrg	Banana young pseudostems
Bypr	Barley bran
Conc	Barley grain
Bypr	Barley straw
Hay	Bean hay
Bypr	Bean mature WP fresh (without seeds)
Bypr	Bean straw
GFrg	Bean young fresh leaves

Edit
Add Copy
Delete

Edit

Name

1. Feed management category

Grazed pasture
 Grazed other
 Hay
 Silage
 Concentrate
 Additive
 Byproduct

2. Feed protein type

Grass silage
 Other non-forage
 OtherSilage
 Other forage
 Distillery byproduct

3. Feed particle size classification

Concentrate
 Forage
 Other

DM (g/kg)	<input type="text" value="900"/>	aN	<input type="text" value="0.24"/>	NDF (g/kg)	<input type="text" value="691"/>
ME (MJ/kg)	<input type="text" value="8.1"/>	bN	<input type="text" value="0.64"/>	peNDF (g/kg)	<input type="text" value="684"/>
CP (g/kg)	<input type="text" value="90"/>	cN	<input type="text" value="0.08"/>	Starch (g/kg)	<input type="text" value="0"/>
Fat (g/kg)	<input type="text" value="19"/>	ADIN (g/kg)	<input type="text" value="1.2"/>	Sugar (g/kg)	<input type="text" value="0"/>
Ca (g/kg)	<input type="text" value="0.0"/>	Ca abs	<input type="text" value="0.30"/>	Ash (g/kg)	<input type="text" value="118"/>
P (g/kg)	<input type="text" value="0.0"/>	P abs	<input type="text" value="0.64"/>	Cost (KES/t DM)	<input type="text" value="0"/>
Mg (g/kg)	<input type="text" value="0.0"/>	Mg abs	<input type="text" value="0.16"/>	Cost (KES/t fed)	<input type="text" value="0"/>
K (g/kg)	<input type="text" value="0.0"/>	Max feeding rate (g/kg)	<input type="text" value=""/>	Losses (%)	<input type="text" value="0"/>
Na (g/kg)	<input type="text" value="0.0"/>	Wet density (kg/m3)	<input type="text" value=""/>	Cost +loss	<input type="text" value="0"/>
Cl (g/kg)	<input type="text" value="0.0"/>			Cost +loss. fr	<input type="text" value="0"/>

Manage feeds tab 3/3

Manage feeds | Manage mixes | Manage libraries and Ingredient visibility

Category	Name
GPas	African foxtail grass fresh < 90 g/kg CP
GPas	African foxtail grass fresh <= 90-150 g/kg CP
GPas	African foxtail grass fresh >150 g/kg CP
Hay	African foxtail grass hay
Bypr	Avocado seed fresh fat < 100 g/kg
Bypr	Avocado seed fresh fat > 100 g/kg
Conc	Avocado seed meal fat < 100 g/kg
Conc	Avocado seed meal fat >100 g/kg
GFrg	Bamboo (Giant thorny) leaves fresh
GFrg	Bamboo leaves fresh
GFrg	Bana grass fresh
GFrg	Banana coms fresh
GFrg	Banana leaves fresh
Bypr	Banana leaves meal
GFrg	Banana mature pseudostems
GFrg	Banana peels
GFrg	Banana peels immature fresh
GFrg	Banana whole plant fresh
Sil	Banana whole plant silage
GFrg	Banana young pseudostems
Bypr	Barley bran
Conc	Barley grain
Bypr	Barley straw
Hay	Bean hay
Bypr	Bean mature WP fresh (without seeds)
Bypr	Bean straw
GFrg	Bean young fresh leaves

Edit

Add Copy

Delete

Edit

Name

1. Feed management category

Grazed pasture
 Grazed other
 Hay
 Silage

Concentrate
 Additive
 Byproduct

2. Feed protein type

Grass silage
 Other non-forage

OtherSilage
 Other forage
 Distillery byproduct

3. Feed particle size classification

Concentrate
 Forage
 Other

DM (g/kg)	<input type="text" value="900"/>	aN	<input type="text" value="0.24"/>	NDF (g/kg)	<input type="text" value="691"/>
ME (MJ/kg)	<input type="text" value="8.1"/>	bN	<input type="text" value="0.64"/>	peNDF (g/kg)	<input type="text" value="684"/>
CP (g/kg)	<input type="text" value="90"/>	cN	<input type="text" value="0.08"/>	Starch (g/kg)	<input type="text" value="0"/>
Fat (g/kg)	<input type="text" value="19"/>	ADIN (g/kg)	<input type="text" value="1.2"/>	Sugar (g/kg)	<input type="text" value="0"/>
Ca (g/kg)	<input type="text" value="0.0"/>	Ca abs	<input type="text" value="0.30"/>	Ash (g/kg)	<input type="text" value="118"/>
P (g/kg)	<input type="text" value="0.0"/>	P abs	<input type="text" value="0.64"/>	Cost (KES/t DM)	<input type="text" value="0"/>
Mg (g/kg)	<input type="text" value="0.0"/>	Mg abs	<input type="text" value="0.16"/>	Cost (KES/t fed)	<input type="text" value="0"/>
K (g/kg)	<input type="text" value="0.0"/>	Max feeding rate (g/kg)	<input type="text" value=""/>	Losses (%)	<input type="text" value="0"/>
Na (g/kg)	<input type="text" value="0.0"/>	Wet density (kg/m3)	<input type="text" value=""/>	Cost +loss	<input type="text" value="0"/>
Cl (g/kg)	<input type="text" value="0.0"/>			Cost +loss. fr	<input type="text" value="0"/>



Creating your own feed in the feed library

Manage feeds | Manage mixes | Manage libraries and Ingredient visibility

Category	Name
GFrg	Banana peels
GFrg	Banana peels immature fresh
GFrg	Banana whole plant fresh
Sil	Banana whole plant silage
GFra	Banana young pseudostems

~~Edit~~

Add Copy

~~Delete~~



IMPORTANT!!!!

NEVER Edit or Delete original feeds in the default Rumen8 Feed Libraries

To create your own feeds follow these important steps!!

- Find a feed **SIMILAR** to the one that you want to create (**very important!!**)
- Click on “Add Copy”
- Give the Feed a new name with farm name and date
 - “Rhodes grass Otieno 20221201” (for Rhodes grass at Otieno farm date 01 Dec 2022)
- Edit the Feed parameters as appropriate and save

Add Copy



 (crossed out)

 (crossed out)

Edit

Name:

1. Feed management category

Grazed pasture Grazed other Hay Silage
 Concentrate Additive Byproduct

2. Feed protein type

Grass silage Other non-forage
 OtherSilage Other forage Distillery byproduct

3. Feed particle size classification

Concentrate Forage Other

DM (g/kg)	<input type="text" value="252"/>	aN	<input type="text" value="0.52"/>	NDF (g/kg)	<input type="text" value="634"/>
ME (MJ/kg)	<input type="text" value="9.1"/>	bN	<input type="text" value="0.21"/>	peNDF (g/kg)	<input type="text" value="507"/>
CP (g/kg)	<input type="text" value="129"/>	cN	<input type="text" value="0.04"/>	Starch (g/kg)	<input type="text" value="14"/>
Fat (g/kg)	<input type="text" value="28"/>	ADIN (g/kg)	<input type="text" value="2.0"/>	Sugar (g/kg)	<input type="text" value="63"/>
Ca (g/kg)	<input type="text" value="3.8"/>	Ca abs	<input type="text" value="0.30"/>	Ash (g/kg)	<input type="text" value="86"/>
P (g/kg)	<input type="text" value="2.7"/>	P abs	<input type="text" value="0.64"/>	Cost (KES/t DM)	<input type="text" value="7937"/>
Mg (g/kg)	<input type="text" value="2.4"/>	Mg abs	<input type="text" value="0.16"/>	Cost (KES/t fed)	<input type="text" value="2000"/>
K (g/kg)	<input type="text" value="25.7"/>	Max feeding rate (g/kg)	<input type="text"/>	Losses (%)	<input type="text" value="0"/>
Na (g/kg)	<input type="text" value="0.3"/>	Wet density (kg/m3)	<input type="text"/>	Cost + loss	<input type="text" value="7937"/>
Cl (g/kg)	<input type="text" value="6.3"/>	Source	<input type="text" value="Kenyan Rumen8 Team"/>	Cost + loss. fr	<input type="text" value="2000"/>
S (g/kg)	<input type="text" value="1.8"/>	Comment	<input type="text" value="Brachiaria decumbens"/>		
DCAD	<input type="text" value="380"/>				

Required feed parameter names are in bold
Units are on a DM basis unless shown otherwise

1. Find a feed as similar as possible to your own feed
2. ADD COPY & give feed new name
3. Do NOT change info/ numbers in Green boxes
4. EDIT numbers in Red boxes as appropriate – see details in next slide

A note on essential feed values

Edit

Name: Brachiaria (Signal Grass) fresh FARM ABC

1. Feed management category

Grazed pasture
 Grazed other
 Hay
 Silage
 Concentrate
 Additive
 Byproduct

2. Feed protein type

Grass silage
 Other non-forage
 OtherSilage
 Other forage
 Distillery byproduct

3. Feed particle size classification

Concentrate
 Forage
 Other

DM (g/kg)	252	aN	0.52	NDF (g/kg)	634
ME (MJ/kg)	9.1	bN	0.21	peNDF (g/kg)	507
CP (g/kg)	129	cN	0.04	Starch (g/kg)	14
Fat (g/kg)	28	ADIN (g/kg)	2.0	Sugar (g/kg)	63
Ca (g/kg)	3.8	Ca abs	0.30	Ash (g/kg)	86
P (g/kg)	2.7	P abs	0.64	Cost (KES/t DM)	7937
Mg (g/kg)	2.4	Mg abs	0.16	Cost (KES/t fed)	2000
		Max feeding			

- Items shown in **Bold** font are **essential**. Rumen8 cannot calculate a diet without these values:
 - Feed management category,**
 - Feed protein type**
 - Feed particle size classification**
 - DM, ME, CP, Fat**
 - aN, bN, cN** (=protein degradability)
- All other values are 'optional' but missing inputs produce incomplete output (i.e. missing values for any feed parameter that is not available for all feeds)
- Especially important for NDF, starch, Ca, P & Mg

Details on feed values (1/3)

- Dry matter
- ME
- Crude protein
- Fat (Ether extract)
- Calcium
- Phosphorus
- Magnesium
- Potassium
- Sodium
- Chloride
- Sulphur
- DCAD

DM (g/kg)	<input type="text" value="237"/>	aN	<input type="text" value="0.47"/>	NDF (g/kg)	<input type="text" value="672"/>
ME (MJ/kg)	<input type="text" value="7.9"/>	bN	<input type="text" value="0.33"/>	peNDF (g/kg)	<input type="text" value="518"/>
CP (g/kg)	<input type="text" value="77"/>	cN	<input type="text" value="0.08"/>	Starch (g/kg)	<input type="text" value="51"/>
Fat (g/kg)	<input type="text" value="33"/>	ADIN (g/kg)	<input type="text" value="1.2"/>	Sugar (g/kg)	<input type="text" value="37"/>
Ca (g/kg)	<input type="text" value="4.6"/>	Ca abs	<input type="text" value="0.30"/>	Ash (g/kg)	<input type="text" value="139"/>
P (g/kg)	<input type="text" value="2.6"/>	P abs	<input type="text" value="0.64"/>	Cost (KES/t DM)	<input type="text" value="3555"/>
Mg (g/kg)	<input type="text" value="2.8"/>	Mg abs	<input type="text" value="0.16"/>	Cost (KES/t fed)	<input type="text" value="15000"/>
K (g/kg)	<input type="text" value="24.6"/>	Max feeding rate (g/kg)	<input type="text"/>	Losses (%)	<input type="text" value="20"/>
Na (g/kg)	<input type="text" value="9.5"/>	Wet density (kg/m3)	<input type="text"/>	Cost +loss	18750
Cl (g/kg)	<input type="text" value="22.0"/>	Source	<input type="text" value="Kenyan Rumen8 Team"/>		
S (g/kg)	<input type="text" value="3.1"/>	Comment	<input type="text" value="Potential residue risk (insecticides, herbicides, f"/>		
DCAD	<input type="text"/>	Required feed parameter names are in bold Units are on a DM basis unless shown otherwise			
		<input type="button" value="Okay"/>		<input type="button" value="Cancel"/>	



Required feed parameter names are in bold
Units are on a DM basis unless shown otherwise

Okay

Cancel

Details on feed values (2/3)

- aN protein degradability
- bN protein degradability
- cN protein degradability
- ADIN
- Ca absorption
- P absorption
- Mg absorption
- Maximum feeding rate
- Wet density
- Source
- Comment

DM (g/kg)	<input type="text" value="237"/>	aN	<input type="text" value="0.47"/>	NDF (g/kg)	<input type="text" value="672"/>
ME (MJ/kg)	<input type="text" value="7.9"/>	bN	<input type="text" value="0.33"/>	peNDF (g/kg)	<input type="text" value="518"/>
CP (g/kg)	<input type="text" value="77"/>	cN	<input type="text" value="0.08"/>	Starch (g/kg)	<input type="text" value="51"/>
Fat (g/kg)	<input type="text" value="33"/>	ADIN (g/kg)	<input type="text" value="1.2"/>	Sugar (g/kg)	<input type="text" value="37"/>
Ca (g/kg)	<input type="text" value="4.6"/>	Ca abs	<input type="text" value="0.30"/>	Ash (g/kg)	<input type="text" value="139"/>
P (g/kg)	<input type="text" value="2.6"/>	P abs	<input type="text" value="0.64"/>	Cost (KES/t DM)	<input type="text" value="3555"/>
Mg (g/kg)	<input type="text" value="2.8"/>	Mg abs	<input type="text" value="0.16"/>	Cost (KES/t fed)	<input type="text" value="15000"/>
K (g/kg)	<input type="text" value="24.6"/>	Max feeding rate (g/kg)	<input type="text"/>	Losses (%)	<input type="text" value="20"/>
Na (g/kg)	<input type="text" value="9.5"/>	Wet density (kg/m ³)	<input type="text"/>	Cost +loss	18750
Cl (g/kg)	<input type="text" value="22.0"/>	Source	<input type="text" value="Kenyan Rumen8 Team"/>		
S (g/kg)	<input type="text" value="3.1"/>	Comment	<input type="text" value="Potential residue risk (insecticides, herbicides, f"/>		
DCAD	<input type="text"/>	Required feed parameter names are in bold			
		Units are on a DM basis unless shown otherwise			
		<input type="button" value="Okay"/>		<input type="button" value="Cancel"/>	

Details on feed values (3/3)

- Neutral detergent fibre
- Physically effective NDF (peNDF)
- Starch
- Sugar
- Ash (total minerals)
- Cost per tonne DM
- Cost per tonne as fed
- Losses (%)
- Cost after losses on DM basis
- Cost after losses on as-fed basis

DM (g/kg)	<input type="text" value="237"/>	aN	<input type="text" value="0.47"/>	NDF (g/kg)	<input type="text" value="672"/>
ME (MJ/kg)	<input type="text" value="7.9"/>	bN	<input type="text" value="0.33"/>	peNDF (g/kg)	<input type="text" value="518"/>
CP (g/kg)	<input type="text" value="77"/>	cN	<input type="text" value="0.08"/>	Starch (g/kg)	<input type="text" value="51"/>
Fat (g/kg)	<input type="text" value="33"/>	ADIN (g/kg)	<input type="text" value="1.2"/>	Sugar (g/kg)	<input type="text" value="37"/>
Ca (g/kg)	<input type="text" value="4.6"/>	Ca abs	<input type="text" value="0.30"/>	Ash (g/kg)	<input type="text" value="139"/>
P (g/kg)	<input type="text" value="2.6"/>	P abs	<input type="text" value="0.64"/>	Cost (KES/t DM)	<input type="text" value="3555"/>
Mg (g/kg)	<input type="text" value="2.8"/>	Mg abs	<input type="text" value="0.16"/>	Cost (KES/t fed)	<input type="text" value="15000"/>
K (g/kg)	<input type="text" value="24.6"/>	Max feeding rate (g/kg)	<input type="text"/>	Losses (%)	<input type="text" value="20"/>
Na (g/kg)	<input type="text" value="9.5"/>	Wet density (kg/m3)	<input type="text"/>	Cost +loss	<input type="text" value="18750"/>
Cl (g/kg)	<input type="text" value="22.0"/>	Source	<input type="text" value="Kenyan Rumen8 Team"/>	Cost +loss. fr	<input type="text" value="4444"/>
S (g/kg)	<input type="text" value="3.1"/>	Comment	<input type="text" value="Potential residue risk (insecticides, herbicides, f"/>		
DCAD	<input type="text"/>				

Required feed parameter names are in bold
Units are on a DM basis unless shown otherwise

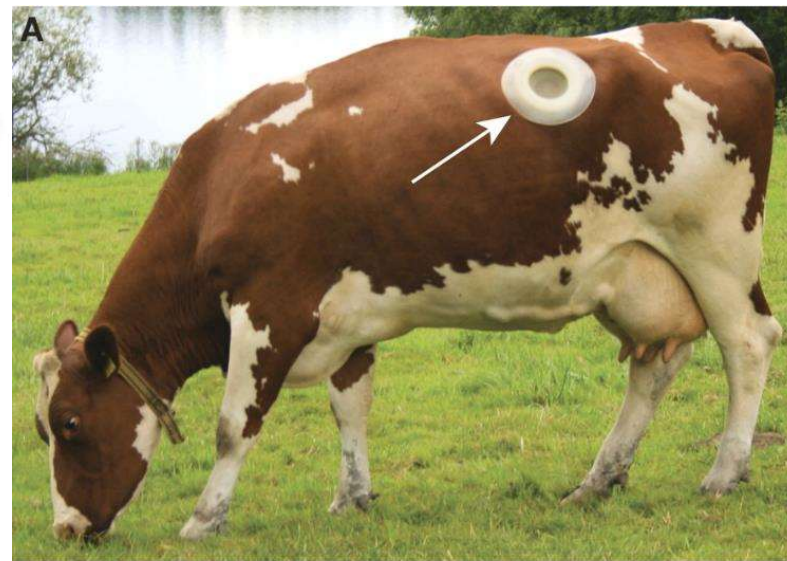
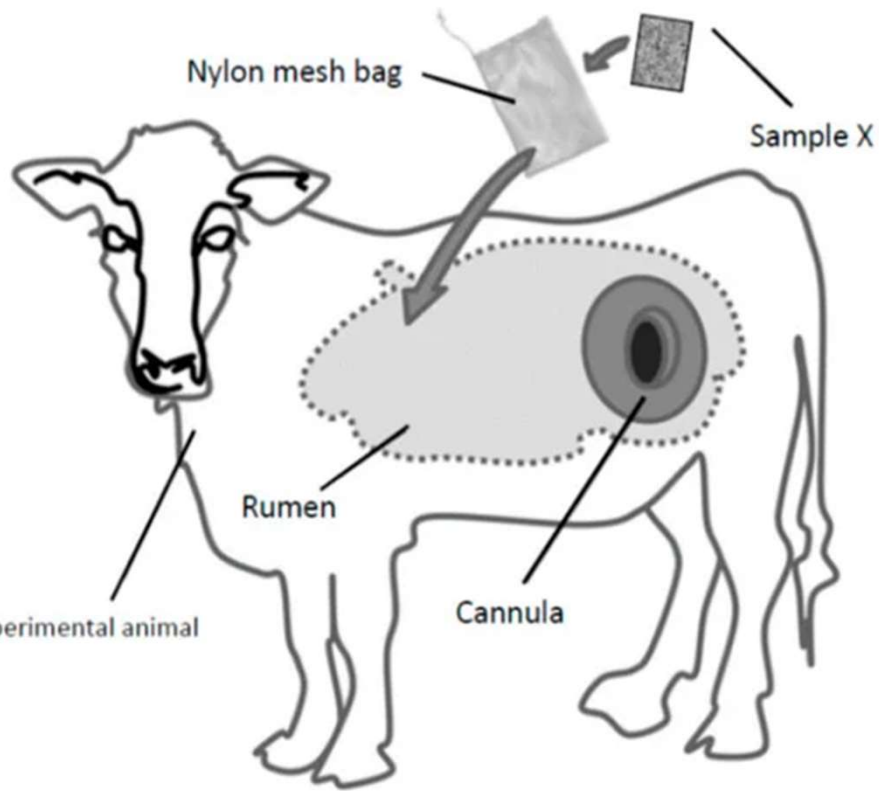
More on aN, bN, cN: rumen degradability of protein

DM (g/kg)	<input type="text" value="250"/>	aN	<input type="text" value="0.28"/>	NDF (g/kg)	<input type="text" value="580"/>
ME (MJ/kg)	<input type="text" value="9.3"/>	bN	<input type="text" value="0.59"/>	peNDF (g/kg)	<input type="text" value="520"/>
CP (g/kg)	<input type="text" value="180"/>	cN	<input type="text" value="0.15"/>	Starch (g/kg)	<input type="text" value="15"/>
Fat (g/kg)	<input type="text" value="30"/>	ADIN (g/kg)	<input type="text" value="2.0"/>	Sugar (g/kg)	<input type="text" value="70"/>
Ca (g/kg)	<input type="text" value="3.8"/>	Ca abs	<input type="text" value="0.30"/>	Ash (g/kg)	<input type="text" value="110"/>

aN	<input type="text" value="0.28"/>
bN	<input type="text" value="0.59"/>
cN	<input type="text" value="0.15"/>

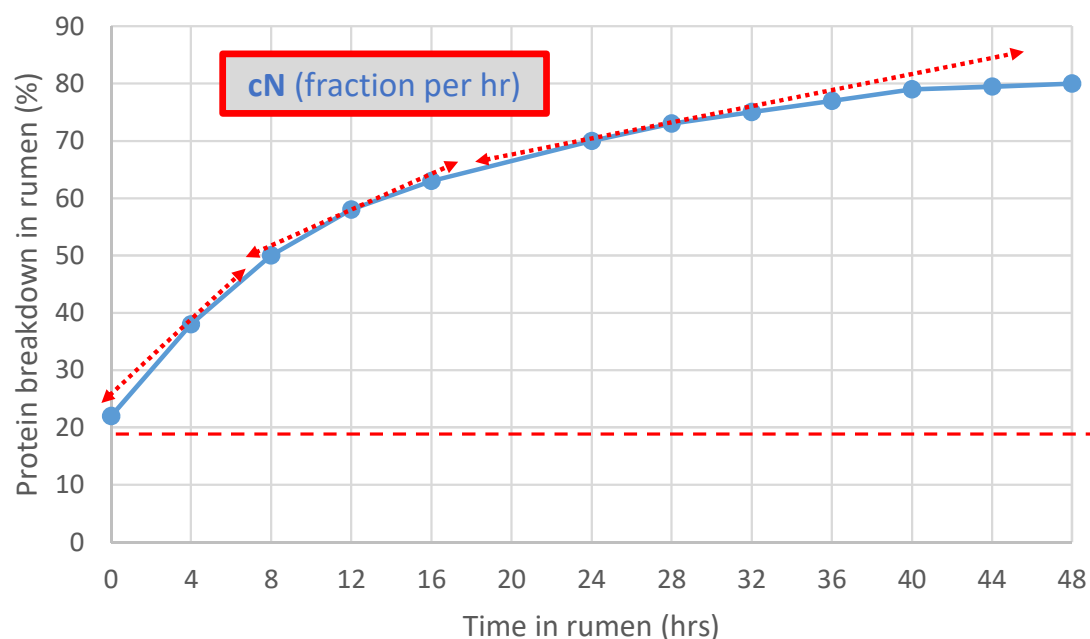
Cancel

What about aN, bN, cN? Rumen degradability of protein



aN, bN and cN

What do they mean?



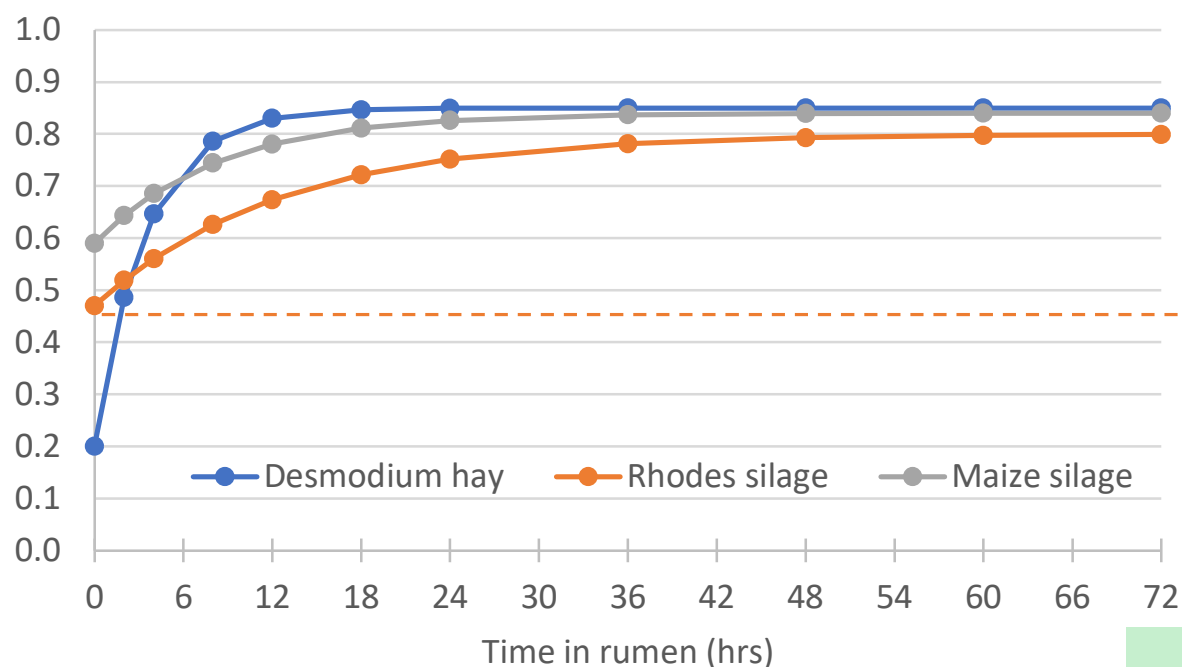
cN: the rate at which the bN fraction is broken down in the rumen (fraction per hour)

bN: potentially rumen degradable CP (excluding aN). The actual amount that will be degraded depends on length of residence time in the rumen

aN: water soluble CP which is instantly rumen degradable

aN, bN and cN values

How to read protein degradation curves



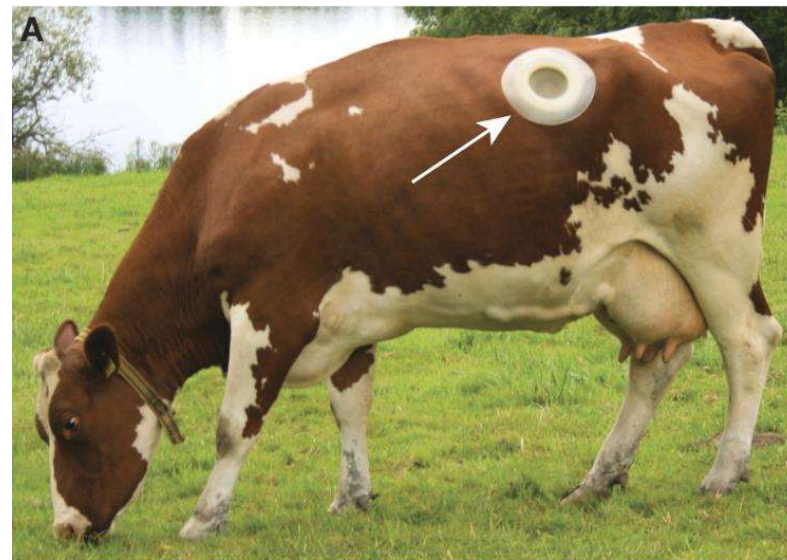
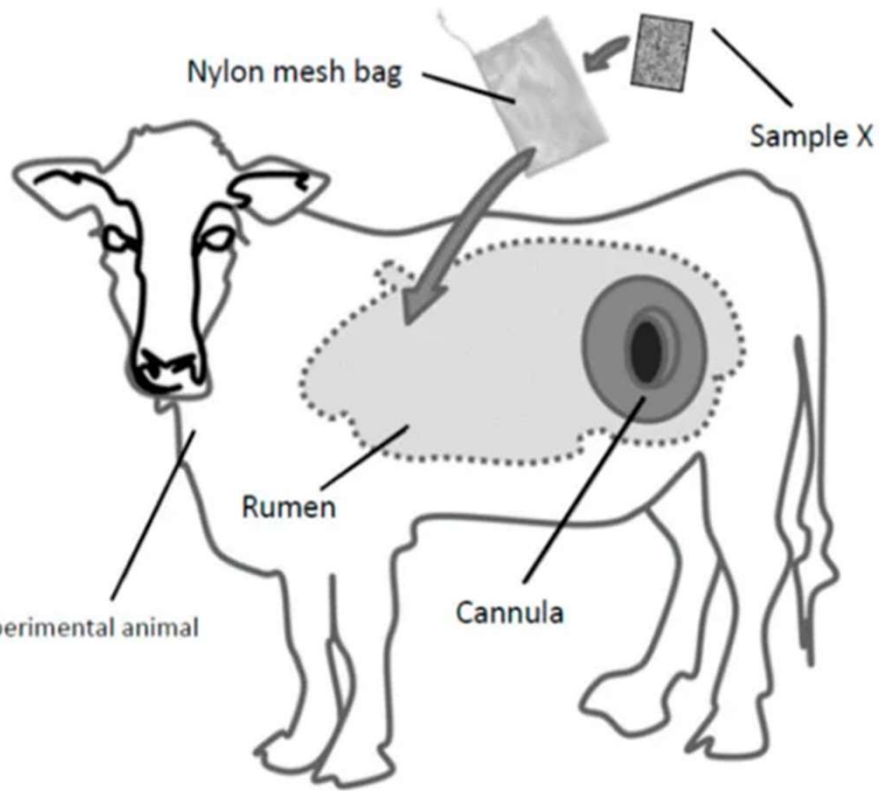
cN: the rate at which the bN fraction is broken down in the rumen (fraction per hour)

bN: potentially rumen degradable CP (excluding aN). The actual amount that will be degraded depends on length of residence time in the rumen

aN: water soluble CP which is instantly rumen degradable

Feed	aN	bN	cN
Desmodium hay	0.20	0.65	0.29
Rhodes silage	0.47	0.33	0.08
Maize silage	0.59	0.25	0.12

Where do we find aN, bN, cN values?



How to get aN, bN cN values?

- aN, bN, cN **cannot** be measured easily/cheaply
- In practice we rely on the Rumen8 library or published data
- Feedipedia lists aN, bN, cN for various tropical feeds
- Also other data sources incl. individual scientific papers



Guinea grass (*Megathyrsus maximus*)

Description Nutritional aspects **Nutritional tables** References

Ruminant nutritive values	Unit	Avg	SD	Min	Max	Nb
a (N)	%	25.3	16.7	1.2	40.3	6
b (N)	%	43.0	18.6	6.8	55.0	6
c (N)	h-1	0.038	0.021	0.007	0.058	6

 Feedipedia

<https://www.feedipedia.org/>

Typical protein degradability values

From Rumen8 User Guide

Feed class	aN	bN	cN
Fresh forages	0.24	0.67	0.12
Roots	0.25	0.65	0.41
Grass and legume silages	0.59	0.31	0.13
Cereal silage incl maize	0.69	0.20	0.10
Grass hays	0.22	0.60	0.08
Legume hays	0.20	0.65	0.29
Cereal straws	0.30	0.50	0.12
Cereals	0.47	0.48	0.27
Legume seeds	0.41	0.57	0.16
Cereal byproducts	0.36	0.55	0.09
Beet and citrus pulps	0.39	0.57	0.05
Oils meals, high fibre	0.24	0.69	0.11
Oil meals, low fibre	0.14	0.79	0.09

aN value 0.24

24% of CP is water-soluble and therefore instantly degradable in the rumen

bN value 0.67

67% of CP (other than aN) is potentially degradable, depending on length of time in the rumen

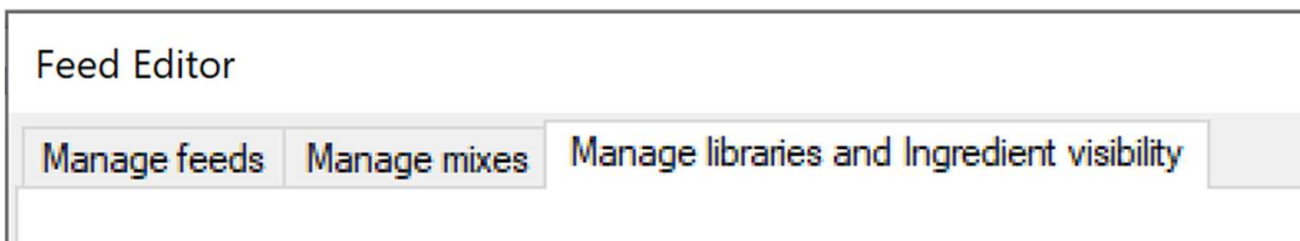
cN value 0.12

indicates that 12% of the b-fraction can be degraded every hour in the rumen



More options in the Feed Editor

- Manage libraries & Ingredient visibility
- Manage mixes



Know your feeds and their nutritive values



Manage libraries & ingredient visibility

Manage feeds Manage mixes **Manage libraries and Ingredient visibility**

Ingredients visible during diet creation

Category	Name
<input checked="" type="checkbox"/> GPas	African foxtail grass fresh < 90 g/kg CP
<input checked="" type="checkbox"/> GPas	African foxtail grass fresh <= 90-150 g/kg CP
<input checked="" type="checkbox"/> GPas	African foxtail grass fresh >150 g/kg CP
<input checked="" type="checkbox"/> Hay	African foxtail grass hay
<input checked="" type="checkbox"/> Bypr	Avocado seed fresh fat < 100 g/kg
<input checked="" type="checkbox"/> Bypr	Avocado seed fresh fat > 100 g/kg
<input checked="" type="checkbox"/> Conc	Avocado seed meal fat < 100 g/kg
<input checked="" type="checkbox"/> Conc	Avocado seed meal fat >100 g/kg
<input checked="" type="checkbox"/> GFrg	Bamboo (Giant thorny) leaves fresh
<input checked="" type="checkbox"/> GFrg	Bamboo leaves fresh
<input checked="" type="checkbox"/> GFrg	Bana grass fresh
<input checked="" type="checkbox"/> GFrg	Banana coms fresh
<input checked="" type="checkbox"/> GFrg	Banana leaves fresh
<input checked="" type="checkbox"/> Bypr	Banana leaves meal
<input checked="" type="checkbox"/> GFrg	Banana mature pseudostems
<input checked="" type="checkbox"/> GFrg	Banana peels
<input checked="" type="checkbox"/> GFrg	Banana peels immature fresh
<input checked="" type="checkbox"/> GFrg	Banana whole plant fresh
<input checked="" type="checkbox"/> Sil	Banana whole plant silage
<input checked="" type="checkbox"/> GFrg	Banana young pseudostems
<input checked="" type="checkbox"/> Bypr	Barley bran
<input checked="" type="checkbox"/> Conc	Barley grain
<input checked="" type="checkbox"/> Bypr	Barley straw
<input checked="" type="checkbox"/> Hay	Bean hay
<input checked="" type="checkbox"/> Bypr	Bean mature WP fresh (without seeds)
<input checked="" type="checkbox"/> Bypr	Bean straw
<input checked="" type="checkbox"/> GFrg	Bean young fresh leaves
<input checked="" type="checkbox"/> Bypr	Blood Fresh
<input checked="" type="checkbox"/> Conc	Bone Meal
<input checked="" type="checkbox"/> GFrg	Brachiarina (Signal Grass) fresh
<input checked="" type="checkbox"/> Rvnr	Brewers crain drv

Library management

Selected (ticked) diet ingredients (feeds and mixes) are available in the diet ingredient drop down lists

Diet ingredients available 240

Diet ingredients selected 240

Feed library in use Tropical feed library ▼

Select	Sort	Library
<input type="button" value="All"/>	<input type="button" value="Name"/>	<input type="button" value="Add Copy"/>
<input type="button" value="None"/>	<input type="button" value="Category"/>	<input type="button" value="Rename"/>
<input type="button" value="Invert"/>	<input type="button" value="Selection"/>	<input type="button" value="Delete"/>
<input type="button" value="All feeds"/>	<input type="button" value="Shared"/>	<input type="button" value="Add New"/>
<input type="button" value="No feeds"/>		<input type="button" value="Import"/>
<input type="button" value="All mixes"/>		
<input type="button" value="No mixes"/>	<input type="button" value="Print"/>	
<input type="button" value="Shared feed library"/>	<input type="button" value="Share"/>	
<input type="button" value="Open"/>	<input type="button" value="Import"/>	
<input type="button" value="Close"/>	<input type="button" value="Export"/>	

Manage libraries & ingredient visibility

Manage feeds Manage mixes **Manage libraries and Ingredient visibility**

Ingredients visible during diet creation

Category	Name
<input checked="" type="checkbox"/>	GPas African foxtail grass fresh < 90 g/kg CP
<input checked="" type="checkbox"/>	GPas African foxtail grass fresh <= 90-150 g/kg CP
<input checked="" type="checkbox"/>	GPas African foxtail grass fresh >150 g/kg CP
<input checked="" type="checkbox"/>	Hay African foxtail grass hay
<input checked="" type="checkbox"/>	Bypr Avocado seed fresh fat < 100 g/kg
<input checked="" type="checkbox"/>	Bypr Avocado seed fresh fat > 100 g/kg
<input checked="" type="checkbox"/>	Conc Avocado seed meal fat < 100 g/kg
<input checked="" type="checkbox"/>	Conc Avocado seed meal fat >100 g/kg
<input checked="" type="checkbox"/>	Gfrg Bamboo (Giant thorny) leaves fresh
<input checked="" type="checkbox"/>	Gfrg Bamboo leaves fresh
<input checked="" type="checkbox"/>	Gfrg Bana grass fresh
<input checked="" type="checkbox"/>	Gfrg Banana coms fresh
<input checked="" type="checkbox"/>	Gfrg Banana leaves fresh
<input checked="" type="checkbox"/>	Gfrg Banana leaves meal
<input checked="" type="checkbox"/>	Bmpr Banana mature pseudostems
<input checked="" type="checkbox"/>	Gfrg Banana peels
<input checked="" type="checkbox"/>	Gfrg Banana peels immature fresh
<input checked="" type="checkbox"/>	Gfrg Banana whole plant fresh
<input checked="" type="checkbox"/>	Sl Banana whole plant silage
<input checked="" type="checkbox"/>	Gfrg Banana young pseudostems
<input checked="" type="checkbox"/>	Bypr Barley bran
<input checked="" type="checkbox"/>	Conc Barley grain
<input checked="" type="checkbox"/>	Bypr Barley straw
<input checked="" type="checkbox"/>	Hay Bean hay
<input checked="" type="checkbox"/>	Bypr Bean mature WP fresh (without seeds)
<input checked="" type="checkbox"/>	Bypr Bean straw
<input checked="" type="checkbox"/>	Gfrg Bean young fresh leaves
<input checked="" type="checkbox"/>	Bypr Blood Fresh
<input checked="" type="checkbox"/>	Conc Bone Meal
<input checked="" type="checkbox"/>	Gfrg Brachiaria (Signal Grass) fresh
<input checked="" type="checkbox"/>	Rvnr Brewers grain drv

Library management

Selected (ticked) diet ingredients (feeds and mixes) are available in the diet ingredient drop down lists

Diet ingredients available 240

Diet ingredients selected 240

Feed library in use: Tropical feed library

Select

All

None

Invert

All feeds

No feeds

All mixes

No mixes

Sort

Name

Category

Selection

Shared

Print

Library

Add Copy

Rename

Delete

Add New

Import

Shared feed library

Open

Close

Share

Import

Export

- Only feeds that are ticked are visible in the feed library
- Options for selecting and sorting feeds
- Use Print to create a feed composition report

Manage libraries & ingredient visibility

Manage feeds | Manage mixes | **Manage libraries and Ingredient visibility**

Ingredients visible during diet creation

Category	Name
<input checked="" type="checkbox"/> GPas	African foxtail grass fresh < 90 g/kg CP
<input checked="" type="checkbox"/> GPas	African foxtail grass fresh <= 90-150 g/kg CP
<input checked="" type="checkbox"/> GPas	African foxtail grass fresh >150 g/kg CP
<input checked="" type="checkbox"/> Hay	African foxtail grass hay
<input checked="" type="checkbox"/> Bypr	Avocado seed fresh fat < 100 g/kg
<input checked="" type="checkbox"/> Bypr	Avocado seed fresh fat > 100 g/kg
<input checked="" type="checkbox"/> Conc	Avocado seed meal fat < 100 g/kg
<input checked="" type="checkbox"/> Conc	Avocado seed meal fat >100 g/kg
<input checked="" type="checkbox"/> GFrg	Bamboo (Giant thorny) leaves fresh
<input checked="" type="checkbox"/> GFrg	Bamboo leaves fresh
<input checked="" type="checkbox"/> GFrg	Bana grass fresh
<input checked="" type="checkbox"/> GFrg	Banana coms fresh
<input checked="" type="checkbox"/> GFrg	Banana leaves fresh
<input checked="" type="checkbox"/> Bypr	Banana leaves meal
<input checked="" type="checkbox"/> GFrg	Banana mature pseudostems
<input checked="" type="checkbox"/> GFrg	Banana peels
<input checked="" type="checkbox"/> GFrg	Banana peels immature fresh
<input checked="" type="checkbox"/> GFrg	Banana whole plant fresh
<input checked="" type="checkbox"/> Sil	Banana whole plant silage
<input checked="" type="checkbox"/> GFrg	Banana young pseudostems
<input checked="" type="checkbox"/> Bypr	Barley bran
<input checked="" type="checkbox"/> Conc	Barley grain
<input checked="" type="checkbox"/> Bypr	Barley straw
<input checked="" type="checkbox"/> Hay	Bean hay
<input checked="" type="checkbox"/> Bypr	Bean mature WP fresh (without seeds)
<input checked="" type="checkbox"/> Bypr	Bean straw
<input checked="" type="checkbox"/> GFrg	Bean young fresh leaves
<input checked="" type="checkbox"/> Bypr	Blood Fresh
<input checked="" type="checkbox"/> Conc	Bone Meal
<input checked="" type="checkbox"/> GFrg	Brachiaria (Signal Grass) fresh
<input checked="" type="checkbox"/> Rvnr	Brewers grain drv

Library management

Selected (ticked) diet ingredients (feeds and mixes) are available in the diet ingredient drop down lists

Diet ingredients available 240
Diet ingredients selected 240

Feed library in use: Tropical feed library ←

Select

All

None

Invert

All feeds

No feeds

All mixes

No mixes

Sort

Name

Category

Selection

Shared

Print

Library

Add Copy

Rename

Delete

Add New

Import

Shared feed library

Open

Close

Share

Import

Export

Select your library here

Creating your own feed mixes

Manage feeds **Manage mixes** Manage libraries and Ingredient visibility

Edit Add New
Add Copy Delete

Name
Kikuyu maize grain mix 10 ME
Kikuyu maize grain mix 11 ME

- Edit, Add New, Add Copy, Delete
- Mix on as-fed basis or DM basis
- Mix cost vs ingredient cost
- Can be used to create any mix
 - Concentrate mixes
 - Mineral mixes
 - TMR mixes

Edit
Mix percentages Dry matter As-fed Okay Cancel

Percent	Feed
20.0	Dairy Meal High Yield
60.0	Maize silage DM <> 30-35%

Total: 100.0 Mix DM: 44.5%

Name: Test mix

Category	Name
GPas	African foxtail grass fresh < 90 ...
GPas	African foxtail grass fresh <> 90...
GPas	African foxtail grass fresh >100 ...
Hay	African foxtail grass hay
Bypr	Avocado seed fresh fat <100 ...
Bypr	Avocado seed fresh fat >100 ...
Conc	Avocado seed meal fat <100 g ...
Conc	Avocado seed meal fat >100 g ...
GFrg	Banana (Corm thorny) leaves f...
GFrg	Banana leaves fresh
GFrg	Bana grass fresh
GFrg	Banana corms fresh
GFrg	Banana leaves fresh
Bypr	Banana leaves meal
GFrg	Banana mature pseudostems
GFrg	Banana peels
GFrg	Banana peels immature fresh
GFrg	Banana whole plant fresh
Sl	Banana whole plant - sago
GFrg	Banana young pseudostems 46 ...

Creating your own mixes

Manage feeds | Manage mixes | Manage libraries and Ingredient visibility

Edit Add New
Add Copy Delete

Name
Example TMR mix East Africa
Kenya demo concentrate mix
Kikuyu maize grain mix 10 MF

Edit

Mix percentages Dry matter As-fed

Percent	Feed
20.0	Cottonseed meal partly decortic...
1.0	Limestone (CaCO3)
25.0	Maize bran
40.0	Maize grain
2.0	Minerals Maziwa (Vital)
2.0	Molasses (cane)
10.0	Soyabean meal fat < 40 g/kg

Total: 100.0 Mix DM: 89.3%

Name Kenya demo concentrate mix

Max feeding rate (g/kg) Mix cost (KES/t) 73932 **As-fed** 66000

Wet density Ingredients cost (KES/t) 72084 64350

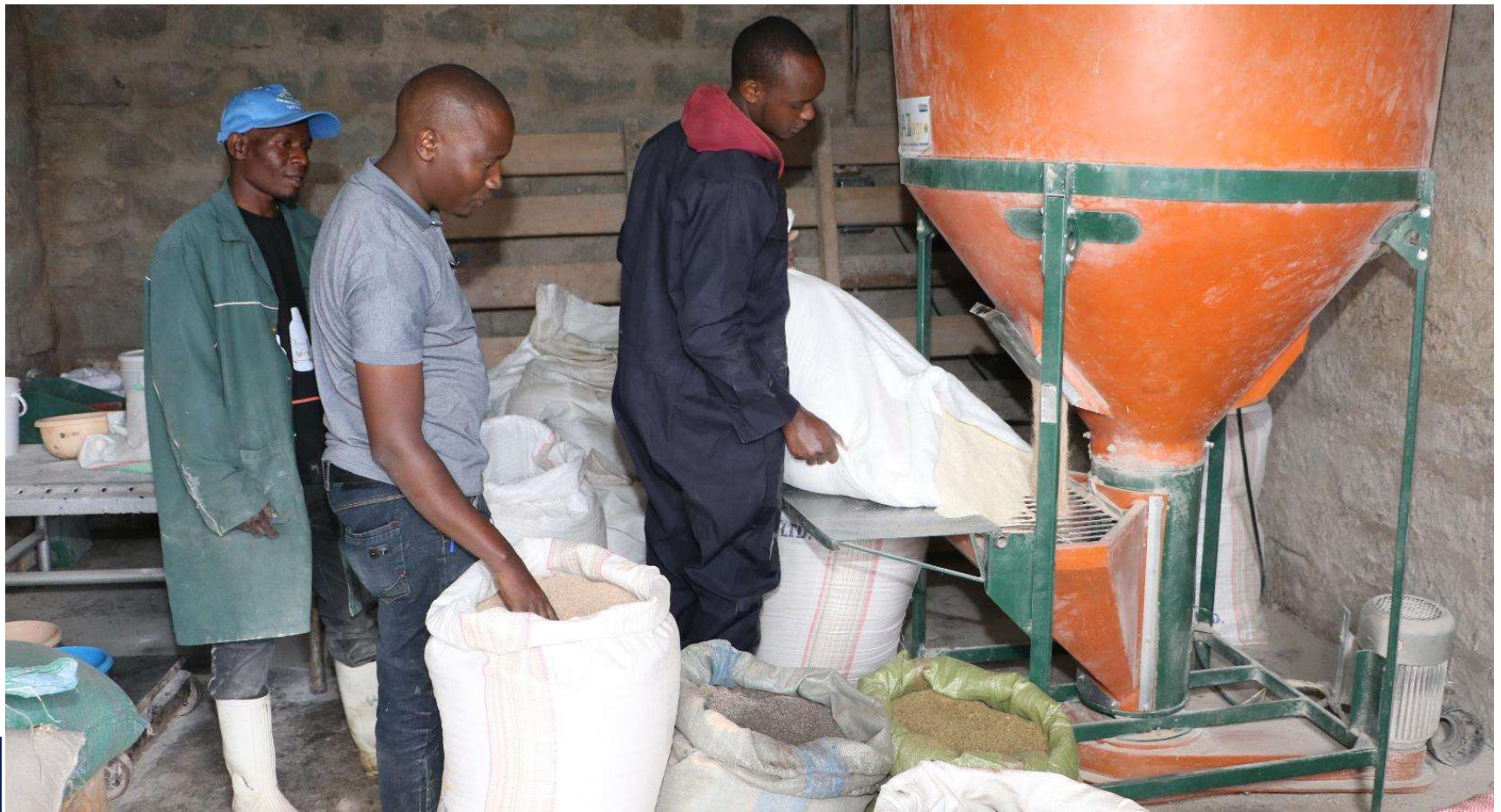
Losses (%) 0

Category Name

Conc	Cassava tuber/root meal (Tapi...
GFrG	Centrosema fresh
Sil	Citrus peels silage
Bypr	Citrus pulp dry
Bypr	Citrus pulp fresh
Add	Columbus grass fresh
GPas	Copper sulphate
Bypr	Copra (coconut cake) fat < 40 ...
Bypr	Copra (coconut cake) fat > 40 ...
Bypr	Cottonseed cake expeller extra...
Bypr	Cottonseed meal decorticated
Bypr	Cottonseed meal undecorticated
GPas	Couch (African) Grass (Digitaria...
Conc	Dairy Meal High Yield
Conc	Dairy Meal Standard
GPas	Desho/Nigeria grass fresh (Pen...
Hay	Desho/Nigeria hay (Pennisetu...
Sil	Desho/Nigeria silage (Penniset...
GFrG	Desmodium (green leaf) fresh
Hay	Desmodium (green leaf) hay
GFrG	Desmodium (silver leaf) fresh
Hay	Desmodium (silver leaf) hay
Add	Dicalcium phosphate
Bypr	Duckweed meal
Conc	Faba Bean (Vicia Faba)
GPas	Feed A
Sil	Feed B
Conc	Feed C
Bypr	Feed D

- Click on “Add New”
- Select feeds from the library and click to add them to your custom mix
- Enter % for each feed (must total 100%)
- Give your mix a unique name and save
- Mix % can be on DM basis or as-fed basis
- Total cost of mix includes ingredient cost & mixing cost (so > than ingredient cost)

Preparing a feed mix



Creating a mix from any existing diet

File **Edit** Animal View Help

Edit Feeds Ctrl+F

Copy Diet Ctrl+C

Copy All Diets Ctrl+A

Clear Current Diet

Create Mix From Diet

Feed Library ▶

Preferences Library ▶

Prices Library ▶

All Libraries ▶

Create a mix from the current diet

Include ingredient	DM	As-Fed	Mix (%)	Mix parameters
1. <input type="checkbox"/> Maize silage DM <> 30-35%	6.7	20.0	-	Mix percentages <input type="radio"/> Dry matter <input checked="" type="radio"/> As-fed
2. <input checked="" type="checkbox"/> Maize bran	1.9	2.2	35.9	Dry matter content: 89.9%
3. <input checked="" type="checkbox"/> Sunflower seed meal non dehulled	2.5	2.8	45.8	Number of ingredients: 3
4. <input checked="" type="checkbox"/> Rapeseed (Canola) meal fat < 40 g/kg	1.0	1.1	18.3	
5. <input type="checkbox"/> Brachiaria (Signal Grass) GOOD hiCP	1.1	4.3	-	Name: Example grain mix Kenya
6. <input type="checkbox"/> None	-	-	-	Max feeding rate (g/kg) <input type="text"/> Mix cost (KES/t) DM: 50081 as-fed: 45000
7. <input type="checkbox"/> None	-	-	-	Wet density (kg/m3) <input type="text"/> Ingredients cost (KES/t) 47869 43012
8. <input type="checkbox"/> None	-	-	-	Losses (%) <input type="text"/>
9. <input type="checkbox"/> None	-	-	-	Source <input type="text"/>
10. <input type="checkbox"/> None	-	-	-	Comment <input type="text"/>
11. <input type="checkbox"/> None	-	-	-	
12. <input type="checkbox"/> None	-	-	-	
13. <input type="checkbox"/> None	-	-	-	
14. <input type="checkbox"/> None	-	-	-	
15. <input type="checkbox"/> None	-	-	-	
Total (kg)	5.5	6.1	100.0	Okay Cancel

IMPORTANT POINTS about Feed Editor

Garbage in = Garbage out

- Assess all the feeds available on the farm visually/smell/taste/touch
- **Have feeds analysed where possible**
 - Especially important for fresh and conserved forages
 - Concentrates can differ quite widely in nutrient content also
- Key measures for feed analysis: ME, CP, NDF, fat, starch, Ca/P/Mg
- For aN, bN, cN values use Rumen8 library or published research
- Make new feed entries for Rumen8 with analysis results

Last resort for feed libraries

- If you accidentally corrupt your feed library you can always just delete it
 - Rumens8 will restore the Default (Australian) library when it starts up again
 - The Tropical Feed Library will have to be downloaded from Rumens8 website again





Q & A
Discussion



Part 4D
Exercise 4-2

Feed Editor & Diet detail 1/2

1. Open the Rumen8 Feed Editor
2. Create 3 new feeds available at our case-study farm with these feed test results (courtesy - ILRI)
Remember the correct procedure!

Feed name	MJ ME/kg DM	CP g/kg DM	NDF g/kg DM	Starch g/kg DM	Cost KES/t as-fed
X4 Good quality grass (fresh)	9.0	120	650	20	2,750
X4 Maize silage	10.5	70	440	275	6,000
X4 Protein meal	12.0	400	270	30	75,000

Feed Editor & Diet detail 2/2

1. Load the three new feeds from your feed library
2. Also open these additional feeds
 - Napier fresh 120 cm KES 2,000/t as-fed
 - Maize grain KES 70,000/t as-fed
 - Limestone (CaCO₃) KES 15,000/t as-fed
3. Load a Standard Animal 5000 litres mid lactation – stall-fed
4. Formulate a diet that meets all nutrient requirements within intake limits
5. Examine the Diet detail screen. Find the following values
 - ME and CP content of the total diet (MJ/kg DM and % CP in DM)
 - DMI as % of LW
 - NDF intake (kg/cow/day)
 - Starch & sugar content (% in DM)
6. Save the file as “Rumen8Tutorial4-2.rm8”

Part 4E
Dry & Transition cows
Young stock
Dual purpose cows

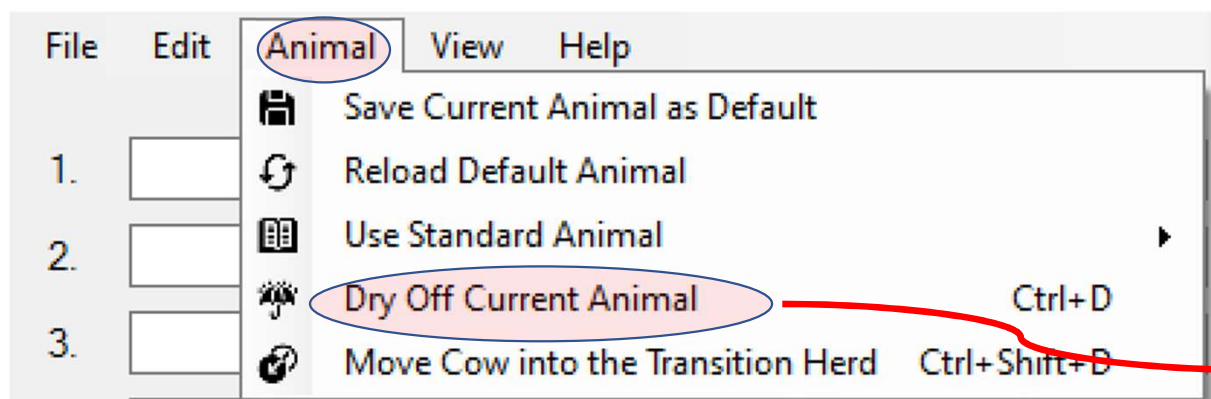


Dry cows & Transition cows

- Assumed gestation length 282 days
- Target is for dairy cows to be dry (i.e. **not lactating**) for 60 days immediately before calving
- Two distinct phases after dry-off
 - **‘Dry cow’**
 - Days 222 to 260 of pregnancy
 - **‘Transition cow’**
 - Last 21 days before calving
 - Days 261 to 282 of pregnancy

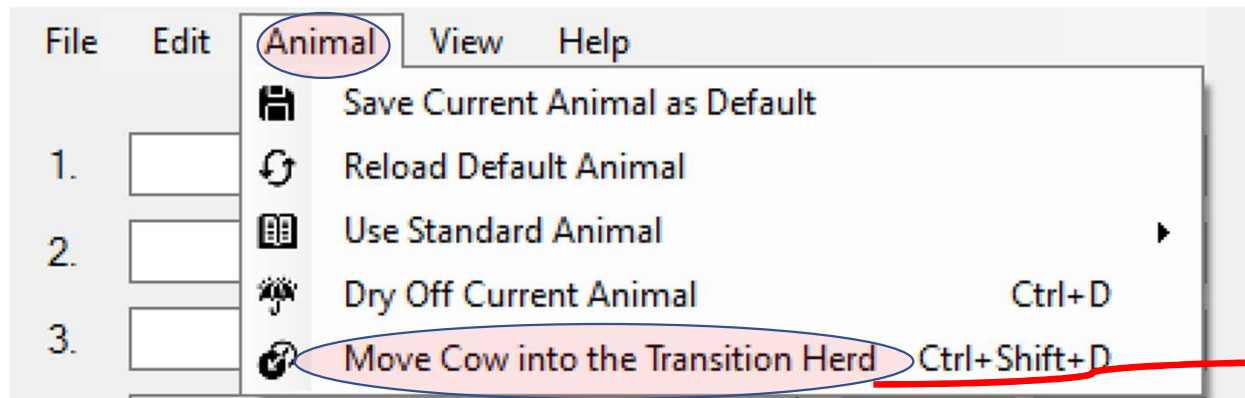


Drying off a lactating cow




Dairy	Diet	Diet detail	Price	Feed cost
Dairy cow		Holstein		
Live weight (kg)		500		
Live weight change (kg/d)		0.00		
Days in milk		0		
Days pregnant		250		
Number of animals in herd		1		
Milk yield (l/d)		0.0		
Milk fat (%m/v)		0.00		
Milk true protein (%m/v)		0.00		

Transition cows (last 3 weeks pregnant)



Dairy	Diet	Diet detail	Price	Feed cost
Dairy cow		Holstein		
Live weight (kg)				500
Live weight change (kg/d)				0.00
Days in milk				0
Days pregnant				270
Number of animals in herd				1
Milk yield (l/d)				0.0
Milk fat (%m/v)				0.00
Milk true protein (%m/v)				0.00

DM intake in Dry cows & Transition cows

 Dairy preferences ? ×

General **Advanced** Recommended levels Standard cows

Milk yield units
 Litres Kilograms

Milk component units
 Mass/mass Mass/volume

Feed concentration units
 g/kg Percentage

Feed proportion units
 Proportion Percentage

Fat to protein ratio
 Fat:Protein Protein:Fat

Tool tips detail
 Standard Extended

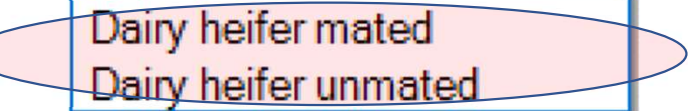

Dry matter intake estimate

	Cow	Dry	Close-up	Heifer
Conventional method: kg DM/d	NRC eqn.	11.0	10.0	AFRC eqn.
NDF intake: % of liveweight	1.3	1.0	0.8	1.0


Diet formulation for young stock




Dairy Diet Diet detail Pri

Dairy cow	▼
Dairy cow	
Dairy heifer mated	
Dairy heifer unmated	



Diet formulation for heifers

Dairy	Diet	Diet detail	Price	Feed cost
Dairy heifer unmated		Holstein		
Live weight (kg)		250		
Live weight change (kg/d)		0.75		
Days in milk		0		
Days pregnant		0		
Number of animals in herd		1		
Milk yield (l/d)		0.0		

Dairy	Diet	Diet detail	Price	Feed cost
Dairy heifer mated		Holstein		
Live weight (kg)		490		
Live weight change (kg/d)		0.75		
Days in milk		0		
Days pregnant		150		
Number of animals in herd		1		
Milk yield (l/d)		0.0		

Diet formulation for East African heifers

Dairy	Diet	Diet detail	Price	Feed cost
	Dairy heifer unmated	Holstein		
Live weight (kg)		200		
Live weight change (kg/d)		0.55		
Days in milk		0		
Days pregnant		0		
Number of animals in herd		1		
Milk yield (l/d)		0.0		

Dairy	Diet	Diet detail	Price	Feed cost
	Dairy heifer mated	Holstein		
Live weight (kg)		350		
Live weight change (kg/d)		0.55		
Days in milk		0		
Days pregnant		150		
Number of animals in herd		1		
Milk yield (l/d)		0.0		


Heifer target growth rate calculator

Dairy Diet **Diet detail** Price Feed cost

Dairy heifer mated Holstein

Live weight (kg) 350

Live weight change (kg/d)  0.55

Days in milk  0

Days pregnant  150

Number of animals in herd 1

Milk yield (l/d) 0.0

Heifer target growth rate calculator

Heifers must achieve 55% mature weight at mating or 94% mature weight at calving. The calculator estimates the average daily gain required to reach these targets from a recent weigh date.

Herd's mature cow weight (kg) 500

Heifer birth date Thursday , 1 July 2021

Heifer weight date Monday , 3 October 2022

Weight (kg) 310

Age: 15.0 months, Mature cow weight: 62% (Target 61%)

Heifer due calving date Saturday , 1 July 2023

Days to calving 270

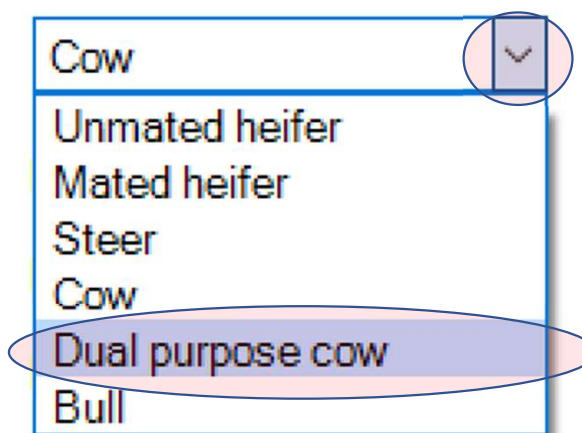
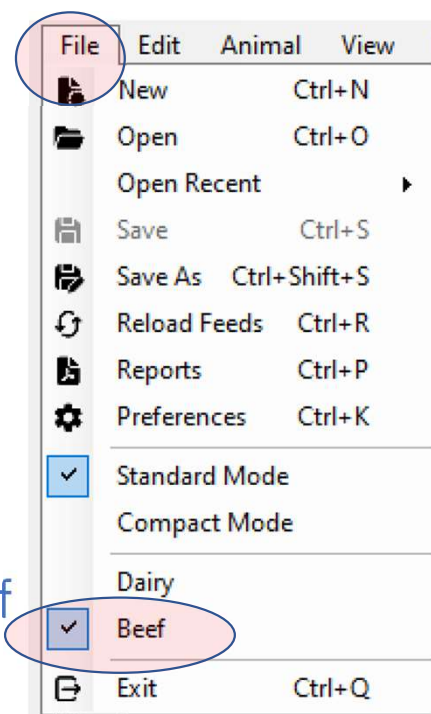
Target weight at calving (kg) 470 (94%)

Required average daily gain (kg/d) 0.59

Okay Cancel

Dual purpose cows

- Rumen8 has the option to formulate diets for Dual purpose cows
- This is in **Rumen8 Beef**
- Go to the File Menu and tick Beef rather than Dairy
- Go to the Beef tab and select 'Dual purpose cow' from the list of animal classes available



Dual purpose cow

		DM	As-fed
1.	Brachiaria (Signal Grass) GOOD	8.00	32.00
2.	Dairy Meal Standard	2.43	2.70

- Select Breed Type
 - Pure breeds or crosses
- Enter LW, LW change, days since calving, age, etc.
- Select DMI estimation method
- Provide animal with a ration
- Adjust milk yield
- Check Diet and Diet Detail as usual
- Adjust diet

Beef | Diet | Diet detail | Price | Feed cost | Compare | Notes | Optimise

Dual purpose cow

Live weight (kg) 500

Live weight change (kg/d) 0.00

Days since calving 90

Days in calf 0

Number of animals in herd 1

Age (years) 4.0

Carcase dressing (%) 55

Live weight at sale (kg) 500

Penned

Hormone growth promotant

Breed

Holstein 50.0

Boran 50.0 + -

Milk

Automatic Entered None

Yield (l/d)	Fat (%m/v)	True protein (%m/v)
8.1	4.00	3.00

DMI estimation method

Young stock Feedlot General AFRC

General NRC Cow NDF intake

Farm terrain Distance walked (km/d) 0.5

Flat Undulating Steep



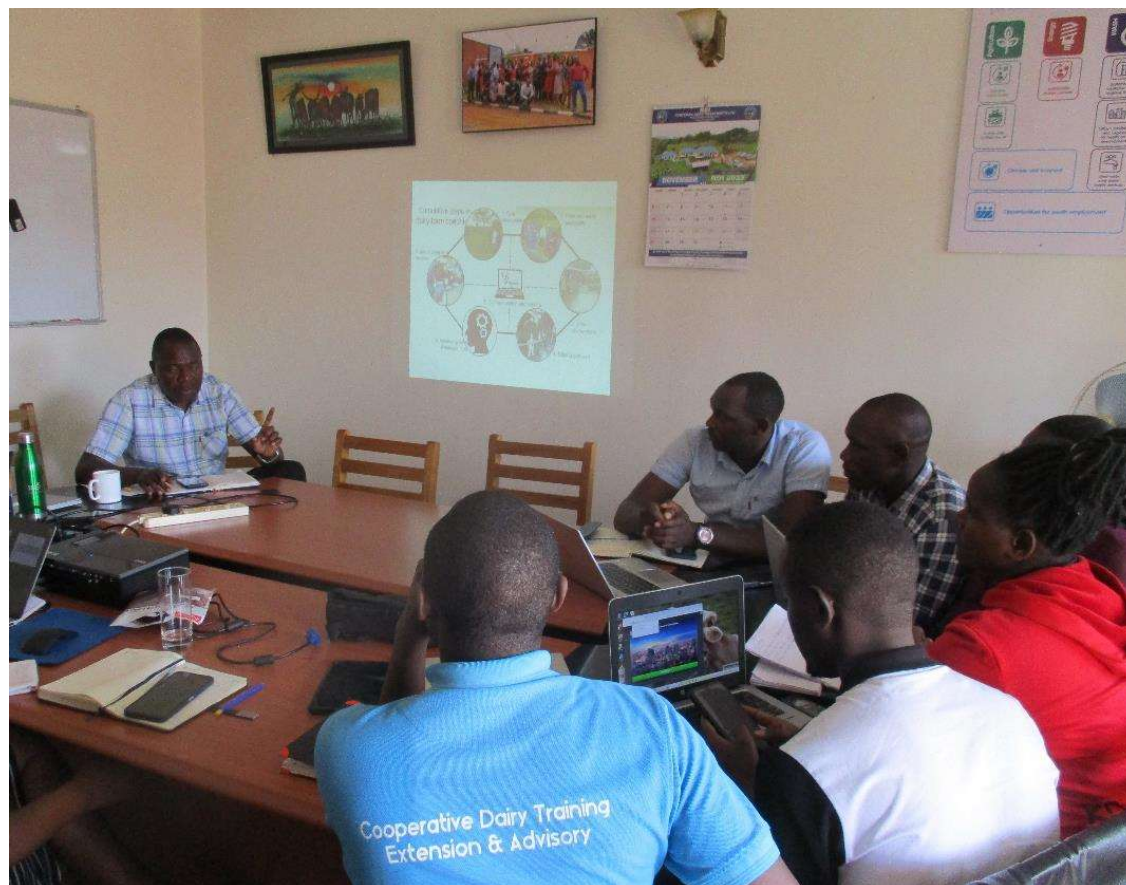
Q & A
Discussion

A group of four SNV staff members, three women and one man, are gathered in a rural setting, possibly a community center or a field office. They are all wearing dark blue uniforms with the SNV logo. The man in the center is wearing a white cap. They are focused on reviewing various documents and a book. One document prominently displays the text 'ethand' and 'tebook A5'. Another document has 'WWW.CWVSOKO.COM' visible. The background shows a simple structure with wooden beams and a black tarp.

Part 4F Miscellaneous

Additional features in Rumen8

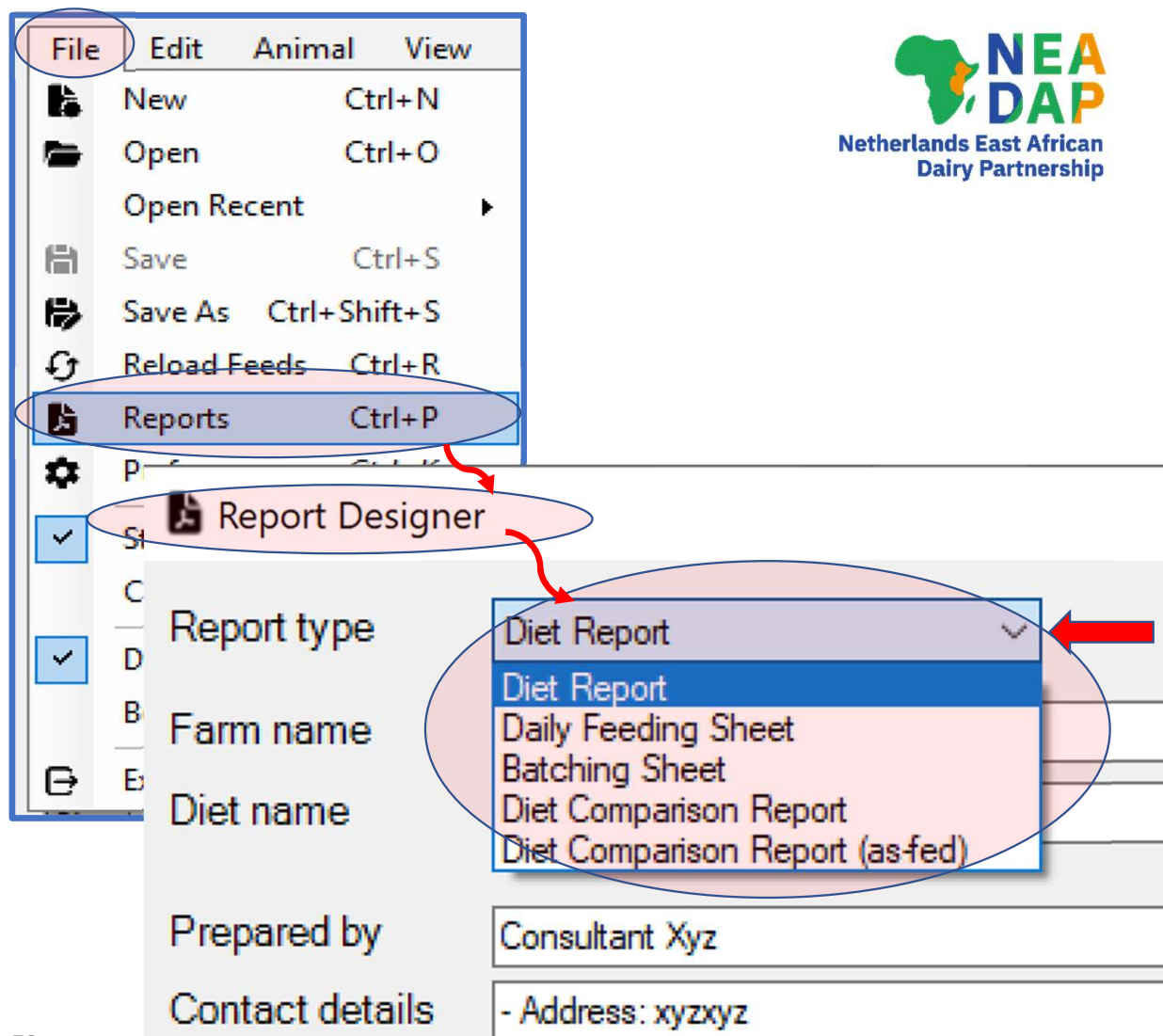
- Creating reports
- Using 'Recommended levels'



Creating reports

- Option of 5 report types
 - Diet Report
 - Daily Feeding Sheet
 - Batching Sheet (when using TMR)
 - Diet Comparison Report (in DM)
 - Diet Comparison Report (as-fed)

- Can also create custom report
 - Click on Edit menu
 - Copy diet or Copy all diets
 - Paste in Excel to produce your own report



The screenshot shows the RUMEN8 software interface. The 'File' menu is open, and the 'Reports' option (Ctrl+P) is highlighted. Below the menu, the 'Report Designer' dialog box is visible. The 'Report type' dropdown menu is open, showing the following options: Diet Report (selected), Diet Report, Daily Feeding Sheet, Batching Sheet, Diet Comparison Report, and Diet Comparison Report (as-fed). The 'Farm name' field is empty, and the 'Diet name' field is empty. The 'Prepared by' field contains 'Consultant Xyz', and the 'Contact details' field contains '- Address: xyzxyz'.

Report Designer

Report Designer
?
X

Report type:

Farm name:

Diet name:

Prepared by:

Contact details:

Notes:

Save report as PDF

Main Report

DIET REPORT

Abcdeee
Dairy cows Oct22

Diet created by Consultant X
xyzxyz

Animal					
Liveweight (kg)	500	Milk yield (l)	17.0	Fat (kg)	
LW change (kg/d)	-0.5	Milk fat (%)	4.1	Protein (kg)	
Days pregnant	0	Milk protein (%)	3.1	Fat + Protein (kg)	
Days in milk	60	Fat:Protein ratio	1.32	Energy corrected milk	

Diet/cow/day						
# Ingredient	kg DM	kg As Fed	ME (MJ)	CP (g)	Ca (g)	P (g)
1 Maize silage DM <> 30-35%	6.87	20.50	73.5	467	18.5	13
2 Maize bran	1.77	2.00	21.1	177	3.4	6
3 Sunflower seed meal dehulled CF < 2	3.60	4.00	40.0	1,426	14.8	37
5 Brachiaria (Signal Grass) fresh	0.86	3.40	7.8	111	3.3	2

Ingredients listed in order

- 1 Maize silage DM ...
- 2 Maize bran
- 3 Sunflower seed m...
- 5 Brachiaria (Signal ...

Disclaimer:

Diet Report

DIET REPORT

Abcdeee

Dairy cows Oct22

Diet created by ConsultantXyz

-Address: xyzxyz

Animal

Liveweight (kg)	450	Milk yield (l)	13.6	Fat (kg)	0.60
LW change (kg/d)	0.0	Milk fat (%)	4.2	Protein (kg)	0.43
Days pregnant	70	Milk protein (%)	3.2	Fat + Protein (kg)	0.99
Days in milk	150	Fat:Protein ratio	1.32	Energy corrected milk (kg)	13.8

Diet/cow/day

# Ingredient	kg DM	kg As Fed	ME (MJ)	CP (g)	Ca (g)	P (g)	Mg (g)
1 Maize silage DM <> 30-35%	6.71	20.03	71.8	456	18.1	13.4	7.4
2 Maize bran	1.93	2.18	23.0	193	3.7	6.8	4.2
3 Sunflower seed meal non dehulled	2.52	2.78	25.5	741	13.6	26.2	14.1
4 Rapeseed (Canola) meal fat < 40 g/kg	1.00	1.11	11.8	405	7.7	12.2	5.4
5 Brachiaria (Signal Grass) GOOD hiCF	1.07	4.28	10.0	193	4.1	2.9	2.6

Total/cow/day

	kg DM	kg As Fed	ME (MJ)	MP (g)	Ca (g)	P (g)	Mg (g)
Supply	13.2	30.4	142	1,066	47.2	61.5	33.7
Demand			142	1,066	73.3	40.2	21.6
Balance			0	0	-26.1	21.2	12.1
% Requirement			100.0	100.0	64.4	152.8	156.3

Total Diet

Total Diet			Feed Efficiency		Margin (KES/cow/d)		
Diet DM (%)	43.5	ME density (MJ/kg DM)	10.7	kg ECM/kg DM	1.0	Milk income	476
% of DMI limit	100	CP (%DM)	15.0	g F+P/kg DM	75	Feed cost	392
NDF (%DM)	44.2	RDP (%CP)	73.0	KES Milk/KES Feed	1	MAFC	84
Starch (%DM)	20.0	UDP (%CP)	27.0				
Forage:Conc ratio	59:41	DCAD (mEq/kg)	0				

Notes

Rumen8 diet summary report printed 17/10/2022 11:25AM

Daily Feeding Sheet

Daily Feeding Sheet

Abcdeee

Dairy cows Oct22

Diet created by Consultant Xyz

-Address: xyzxyz

Number of animals to be fed: 10

PMR/TMR dry matter content: 44% (Target DM: 52%)

Diet

# Ingredient	kg DM		kg as Fed	
	/cow/day	Total/day	/cow/day	Total/day
Fed in TMR/PMR:				
1 Maize silage DM <> 30-35%	6.71	67	20.03	200
2 Maize bran	1.93	19	2.18	22
3 Sunflower seed meal non dehulled	2.52	25	2.78	28
4 Rapeseed (Canola) meal fat < 40 g/kg	1.00	10	1.11	11
5 Brachiaria (Signal Grass) GOOD hiCP	1.07	11	4.28	43
Sub-Total	13.23	132	30.38	304
Total	13.23	132	30.38	304

Notes

Rumen8 daily feeding sheet printed 17/10/2022 11:27AM

Batching Sheet

Batching Sheet

Abcdeee

Dairy cows Oct22

Diet created by Consultant Xyz

- Address: xyzxyz

Mix

Name

Batch size 1.0 tonnes as-fed (0.436 tonnes DM)

Batch dry matter content 44% (Target DM: 52%)

Ingredients

Name

Maize silage DM <> 30-35%

Maize bran

Sunflower seed meal non dehulled

Rapeseed (Canola) meal fat < 40 g/kg

Brachiaria (Signal Grass) GOOD hiCP

Mixing Order	kg As fed	Cumulative	% As Fed	kg DM
1	659.3	659	65.9	220.9
2	71.8	731	7.2	63.6
3	91.5	823	9.2	83.0
4	36.5	859	3.7	32.9
5	140.9	1,000	14.1	35.2

Total

1,000.0 1,000 100.0 435.6

Notes

Rumen8 batching sheet printed 17/10/2022 11:28AM

Diet Comparison Report

Abcdeee
Dairy cows Oct22

Cow details

Cow liveweight (kg)	450	450	600
Cow liveweight change (kg/d)	0.00	0.00	0.00
Days in milk	150	150	150
Days pregnant	70	70	70

Milk production

Milk yield (l/d)	13.6	13.6	25.0
Milk fat (%m/v)	4.15	4.15	4.00
Milk protein (%m/v)	3.15	3.15	3.00

Diet ingredients (kg as-fed)

Maize silage DM <=> 30-35%	24.9	20.0	41.3
Maize bran	0.9	2.2	0.0
Rapeseed (Canola) meal fat < 40 g/kg	2.2	1.1	6.5
Brachiaria (Signal Grass) GOOD hiCP	8.7	4.3	0.4
Sunflowerseed meal non dehulled	0.0	2.8	0.0

Feed intake

Dry matter intake (kg)	13.3	13.2	19.8
Dry matter intake (kg as-fed)	36.7	30.4	48.2
Dry matter intake (%max. NDF)	100	100	100
Dry matter intake (%max. NRC)*	91	91	94
Feed efficiency (kg ECM/kg DM)	1.0	1.0	1.2
Feed efficiency (g F+P/kg DM)	75	75	89

Energy

ME supply (MJ)	142	142	218
ME required (MJ)	142	142	218
ME density (MJ/kg DM)	10.7	10.7	11.0

Protein

MP supply (g)	1,071	1,066	1,979
MP required (g)	1,071	1,066	1,706
CP supply (%)	13.8	15.0	16.8
CP supply (g)	1,837	1,988	3,316
RDP CP (%)	67.9	73.0	64.7
UDP CP (%)	32.1	27.0	35.3

Fibre

NDF (% DM)	44.1	44.2	39.5
------------	------	------	------

Enter a disclaimer if required

NDF (kg)	5.850	5.850	7.800
peNDF (% DM)	32.8	28.0	27.5
NDF from forage (%)	84.7	61.4	79.3
NDF from forage (%LW)	1.10	0.80	1.03

Starch/sugar etc

Starch supply (% DM)	20.0	20.0	20.0
Sugar supply (% DM)	4.1	3.8	4.5
NFC (% DM)	33.5	31.6	35.9
Forage concentrate ratio (F/C)	3.79	1.43	2.39
Fat supply (%)	3.1	4.1	2.9

Minerals

Calcium supply (g)	47.5	47.2	82.5
Calcium demand (g)	85.6	73.3	128.8
Phosphorus supply (g)	49.4	61.5	98.9
Phosphorus demand (g)	41.1	40.2	67.1
Magnesium supply (g)	26.8	33.7	46.9
Magnesium demand (g)	21.6	21.6	35.4
Potassium supply (g)	174.5	161.3	224.2
Sulphur supply (g)	15.5	14.4	34.5
Sodium supply (g)	3.7	4.1	6.3
Chloride supply (g)	14.9	11.4	4.1
DCAD (mEq/kg)	0	0	0

Feed costs

Feed cost (KES/t DM)	27,964	29,617	38,787
Feed cost (KES/MJ ME)	3	3	4
Feed cost (KES/kg CP)	202	197	231
Feed cost (KES/cow/d)	371	392	766

Income

Milk income (KES/l)	35	35	35
Milk income (KES/kg ECM)	35	35	36
Milk income (KES/kg F+P)	479	479	500
Milk income (KES/cow/d)	476	476	875

Margin above feed cost

Margin (KES/cow/d)	105	84	109
Feed as % of income	78	82	88

Notes

Rumen8 diet comparison report printed 17/10/2022 11:30AM

This is an example of a Diet Comparison Report that can be generated in Rumen8

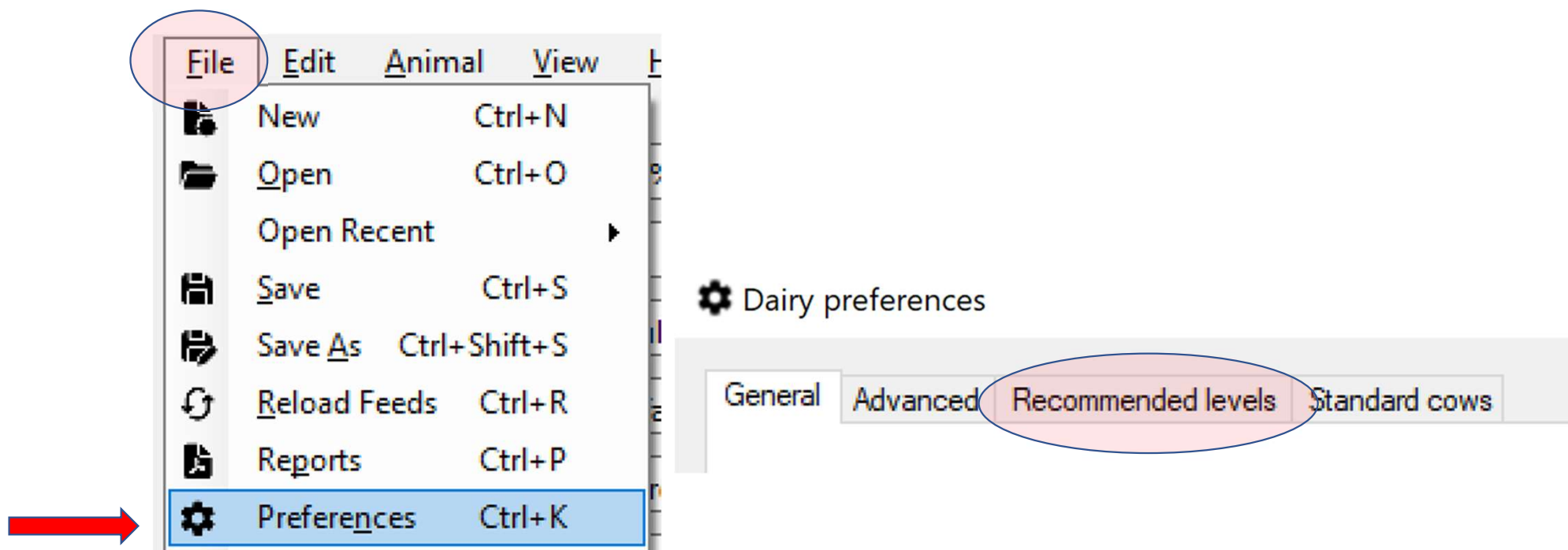
Diet Comparison Report



Use of Recommended levels



Use of Recommended levels



The image shows a screenshot of the RUMEN8 software interface. The 'File' menu is open, displaying various options. A red arrow points to the 'Preferences' option at the bottom of the menu. The 'Dairy preferences' dialog is also visible, with the 'Recommended levels' tab selected and circled in pink.

File	Edit	Animal	View
New			Ctrl+N
Open			Ctrl+O
Open Recent			
Save			Ctrl+S
Save As			Ctrl+Shift+S
Reload Feeds			Ctrl+R
Reports			Ctrl+P
Preferences			Ctrl+K

Dairy preferences

General Advanced Recommended levels Standard cows

Use of Recommended levels

- Sets nutritional targets for up to 5 groups/classes of cows
- Groups can be defined by user. For example:
 - Early lactation, mid lactation, late lactation, dry cow, transition cow
 - Days in milk and days pregnant for each group can be defined by user

General Advanced **Recommended levels** Standard cows

Recommended levels set ?

One Two Three Four Five

Description

Auto Day of lactation - Days pregnant -

Recommended levels

- Sets boundaries around various nutritional parameters
 - NDF, peNDF, NDF forage etc.
 - Starch, sugar, NFC
 - Fat
 - Protein: RDP & UDP
 - Forage % in DM
 - Feed efficiency
 - Feed cost as % of milk income
- Can be varied by stage of lactation/pregnancy
 - Sets 1 to 5

General Advanced Recommended levels Standard cows

Recommended levels set
 One Two Three Four Five

Description Early lactation












Auto Day of lactation 1 - 100 Days pregnant 0 - 30

Parameter	Value	Slider
<input checked="" type="checkbox"/> NDF (%DM)	35 - 45	[Slider]
<input checked="" type="checkbox"/> peNDF (%DM)	21 - 34	[Slider]
<input checked="" type="checkbox"/> NDF forage (%DM)	60 - 70	[Slider]
<input checked="" type="checkbox"/> NDF forage (%LW)	0.7 - 1.0	[Slider]
<input checked="" type="checkbox"/> Sugar (%DM)	3 - 8	[Slider]
<input checked="" type="checkbox"/> Starch (%DM)	10 - 24	[Slider]
<input checked="" type="checkbox"/> Fat (%DM)	2 - 5	[Slider]
<input checked="" type="checkbox"/> NFC (%DM)	30 - 35	[Slider]
<input checked="" type="checkbox"/> RDP (%CP)	65 - 70	[Slider]
<input checked="" type="checkbox"/> UDP (%CP)	30 - 35	[Slider]
<input checked="" type="checkbox"/> Forage % in F:C	40 - 70	[Slider]
<input type="checkbox"/> FE kg ECM/ kg DMI	0.0 - 4.0	[Slider]
<input type="checkbox"/> FE g FP/ kg DMI	0 - 400	[Slider]
<input checked="" type="checkbox"/> Feed % income	40 - 60	[Slider]

Close

Use of Recommended levels

- Recommended levels are linked to ‘mini-traffic lights’ in the Diet & Diet detail tabs, which help users see which nutrients are on-target or off-target

Dairy	Diet	Diet detail	Price	Feed cost	Compare	Notes
		Metabolisable energy		NDF (%DM)	43.5	
		Supply (MJ)	142	NDF (kg)	5.692	
		Demand (MJ)	142	peNDF (%DM)	27.5	
		Balance (MJ)	1	NDF frg (%NDF)	63.0	
		Density (MJ/kg DM)	10.9	NDF frg (%lw)	0.72	
				Starch (%DM)	20.1	
				Sugar (%DM)	3.5	
				NFC (%DM)	31.6	
				Forage : Conc	59:41	
				Ash (%DM)	5.1	

Recommended levels



Netherlands East African
Dairy Partnership

Variable	Early lactation	Mid lactation	Late lactation	Dry	Transition
Levels set	N _o 1	N _o 2	N _o 3	N _o 4	N _o 5
Days in Milk	1-100	101-200	201-end lact.	dry	> 260 d.i.c
NDF % in DM	35-45	40-50	45-55	50-60	45-55
peNDF % of DM	21-34	26-40	32-44	35-48	32-44
NDF forage (%DM)	60-70	65-70	70-75	90-100	85-90
NDF forage (%LW)	0.7-1	0.6 to 1	0.6 to 1	0.5-1	0.5-1
Sugar % in DM	3-8	2-8	2-6	2-4	2-5
Starch % in DM	10-24	10-22	10-20	0-15	10-20
Fat % in DM	2-5	2-5	2-5	2-5	2-5
NFC % in DM	30-35	27-32	25-30	15-20	20-25
RDP %CP	65-70	68-72	70-74	75-80	75-80
UDP %CP	30-35	28-32	26-30	20-25	20-25
Forage % in F:C	40-70	45-70	50-80	80-100	75-85
Feed % income	40-60	50-60	50-60	-	-
ME per kg DM	11-12	10-11	10-11	9-10	10-11
CP % (as proxy for MP)	14-16	13-15	12-13	≈ 12	≈ 14
Body wt change, kg/d	-0.6	0	0.6	-	-
Typical milk yield (litres)	18-22	14-18	10-12	-	-

Automatic implementation

- Once Recommended levels are activated they can be automatically linked to lactation stage

- Click on  to toggle between

Automatic or Manual activation of Recommended levels by 'lactation stage'

Dairy Diet Diet detail

Metabolisable energy

Supply (MJ)
Demand (MJ)
Balance (MJ)
Density (MJ/kg DM)

Metabolisable protein

Supply (g)
Demand (g)
Balance (g)
CP (%DM)

DM intake estimate

Max. NDF intake%
Maximum DMI%
DMI as % liveweight

Active recommended levels

<input checked="" type="radio"/> One	<input type="radio"/> Four
<input type="radio"/> Two	<input type="radio"/> Five
<input type="radio"/> Three	<input type="radio"/> Off

Early lactation 





Q & A
Discussion



Part 4G
Exercise 4-3

Young stock 1/3

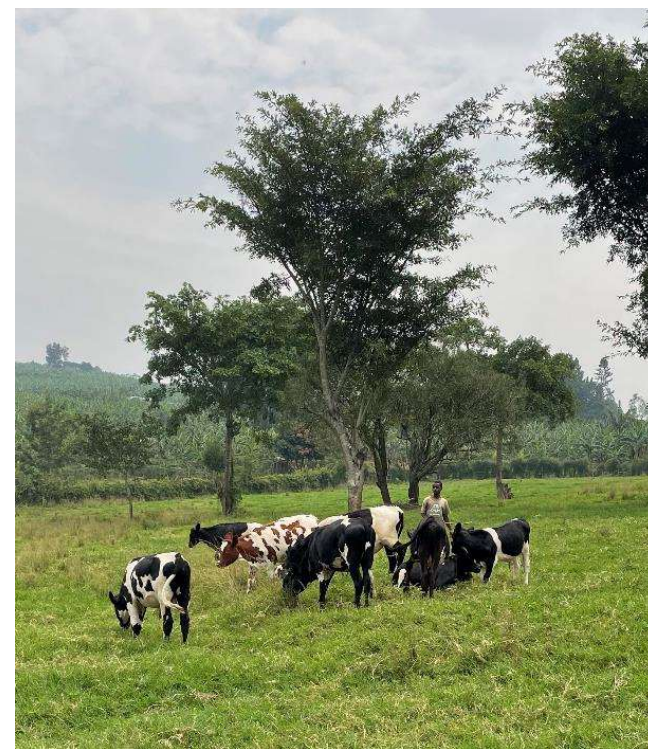
1. Heifer rearing targets:

- Mature cow weight 500 kg
- Target weight for mating at 15 months = $(500 \times 55\%) = 275$ kg
- Target weight for calving at 24 months = $(500 \times 85\%) = 425$ kg
- Our heifers are 10 months of age and weigh 200 kg

2. Open Rumen8

3. Select Dairy heifer unmated as the type of animal on the Dairy tab

4. Enter LW 200 kg



Young stock 2/3

1. Open calculator next to LW change
 - Enter mature weight as shown
 - Enter heifer birth date & weigh date as shown
 - Enter weight as shown
 - Enter heifer mating start date as shown
2. Rumen8 calculates Required average daily gain (kg/d) to meet these targets
3. There are 4 animals in this group of heifers

? ×

Heifers must achieve 55% mature weight at mating or 94% mature weight at calving. The calculator estimates the average daily gain required to reach these targets from a recent weigh date.

Herd's mature cow weight (kg)	<input type="text" value="500"/>
Heifer birth date	<input type="text" value="Tuesday, 14 December 2021"/>
Heifer weight date	<input type="text" value="Friday, 14 October 2022"/>
Weight (kg)	<input type="text" value="200"/>

Age: 10.0 months, Mature cow weight: 40% (Target 42%)

Heifer mating start date	<input type="text" value="Wednesday, 15 March 2023"/>
Days to mating	151
Target weight at mating (kg)	275 (55%)
Required average daily gain (kg/d)	0.50

Young stock 3/3

1. Load 5 feeds from the library and check feed prices are set as follows:

- Maize silage DM <>30-35% KES 6,000 as fed
- Cottonseed meal decorticated KES 63,000 as fed
- Wheat bran KES 29,000 as fed
- Brachiaria spp LateVegetative KES 1,000 as fed
- Brachiaria spp EarlyVegetative KES 2,500 as fed

2. Formulate a diet to meet animal requirements within intake limits

3. Present what you have found incl. margin (income minus feed cost)

4. Create a Diet Report for this group of animals

5. Save the file as “Rumen8Tutorial4-3.rm8”



Q & A
Discussion

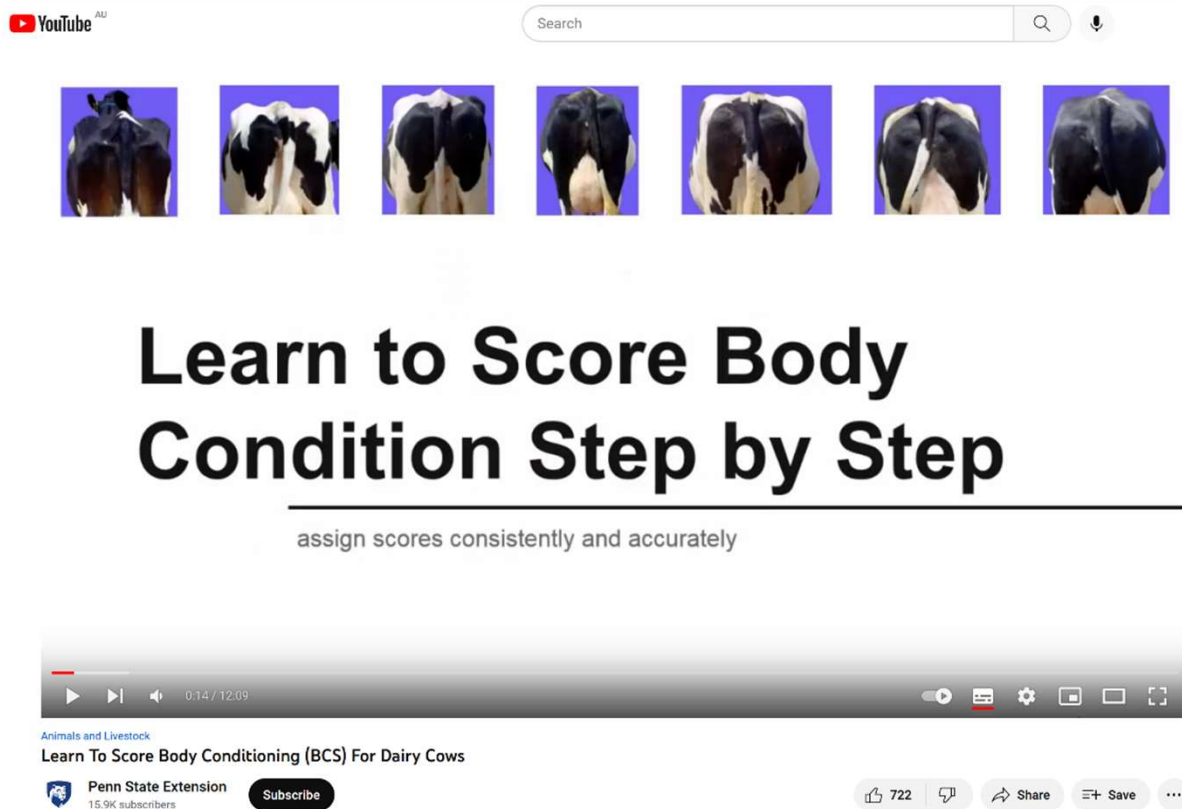
PARTS 5 & 6: Practical use of Rumen8 on dairy farms

- A farm walk is an **ESSENTIAL** part of using Rumen8
- Face to face meeting with farmer/manager on farm
- Become a Rumen8 Detective: ‘Nutrition in Practice’ & ‘Body of Evidence’
- Collect management info & data on feeding & animal production
- Set up the farm in Rumen8 & assess opportunities for improvements
- Discuss options & agree on plan with the farmer
- Remember the ‘Art of Feeding’ – opportunities to do better?
- Follow-up is **essential**
- ‘Practice makes Perfect’

Part FIVE - Farm walk details


- Location of the farm
- Mode of transport
- Place and time of departure – **be punctual please as this will be a long day**
- Lunch & refreshments
- Requirement for clothing: overalls, gumboots, hat, water (presenters to provide rubber gloves for handling of manure etc.)
- Laptop: carry in backpack so you have hands free
- Expected return time
- Home work (see next slides)

HOME WORK - Body condition scoring



YouTube AU

Search



Learn to Score Body Condition Step by Step

assign scores consistently and accurately

0:14 / 12:09

Animals and Livestock

Learn To Score Body Conditioning (BCS) For Dairy Cows

Penn State Extension
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https://m.youtube.com/watch?v=wASXNn_CTCU

HOME WORK - Identifying lame cows



<https://youtu.be/pa88nfVq6pE>

<https://www.dairynz.co.nz/animal/cow-health/lameness/identifying-lame-cows/>

Home work - Rumen fill

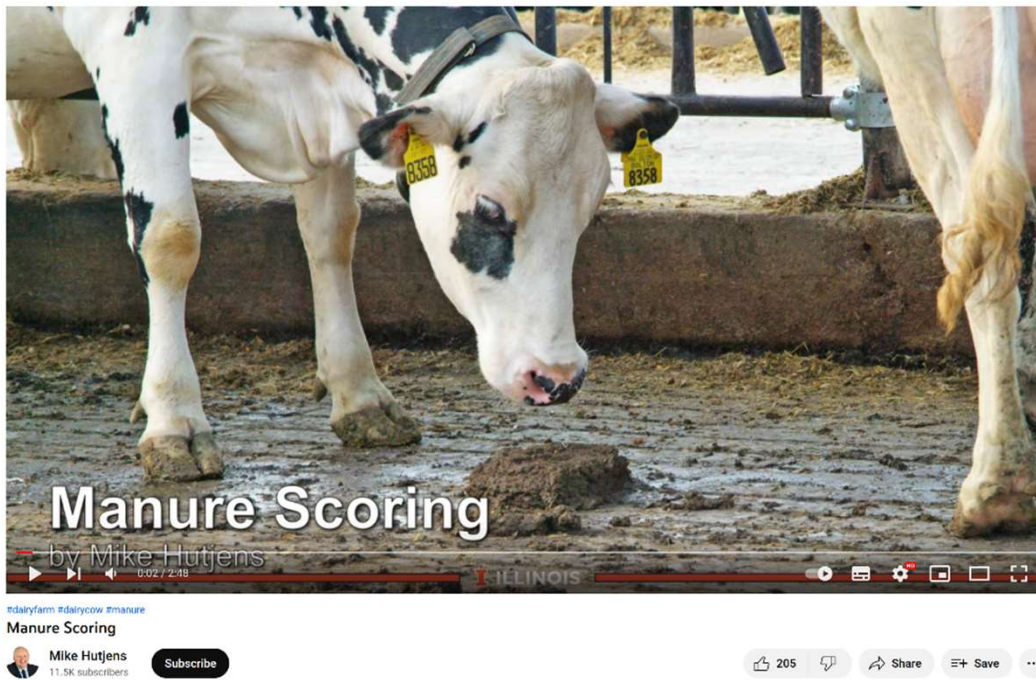
Rumen Scoring Dairy Cows

YouTube · NS Perennia · 3 Jan 2013



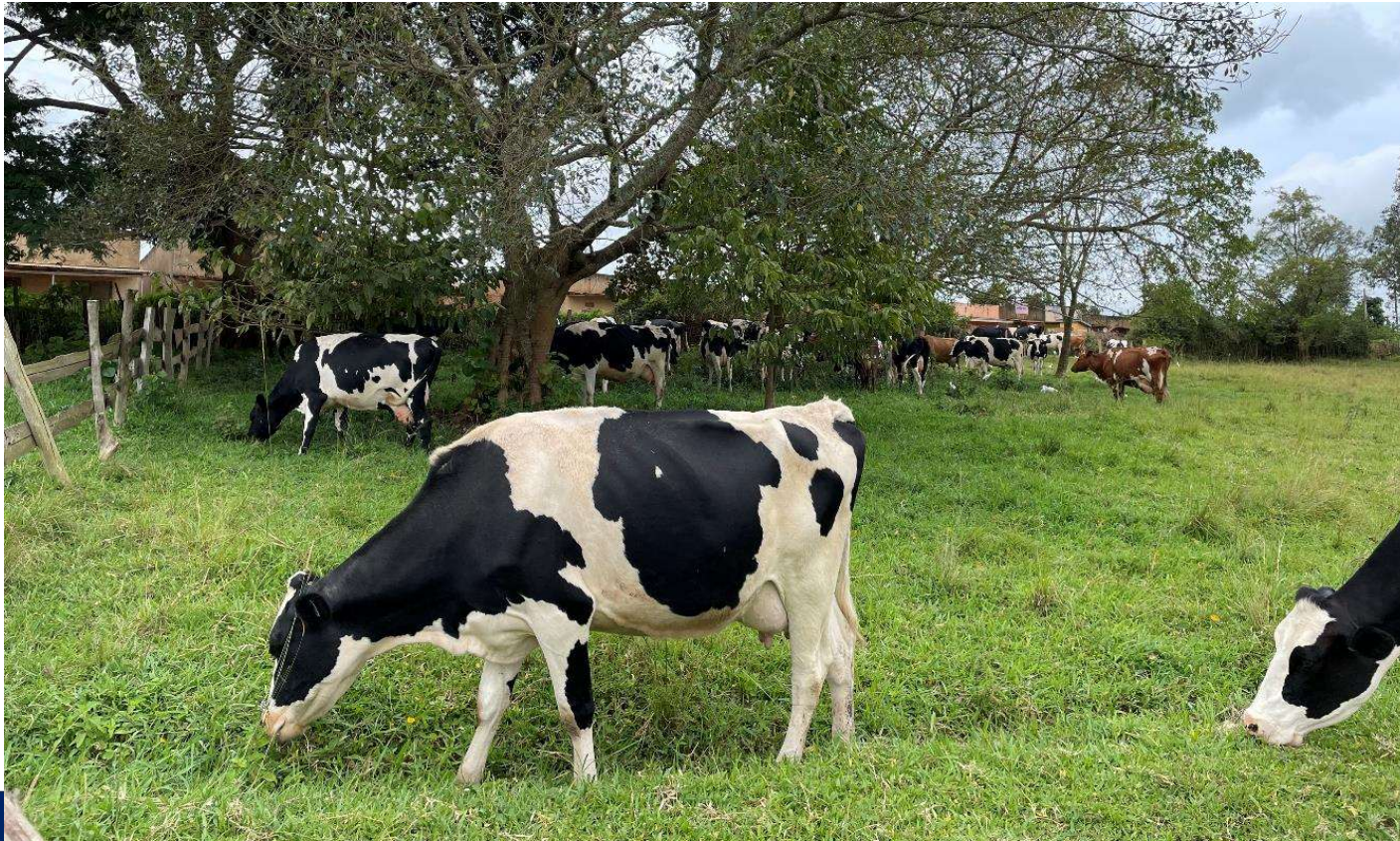
<https://youtu.be/MWo03iteLA8>

Home work – Manure scoring



https://youtu.be/NA_pJh77wmk

Dairy cattle nutrition in the tropics using Rumen8



Part FOUR
finished