Calculate the cost per unit of energy, i.e. cost/MJ of ME.

Feed A

Step 1 – Calculate the price of the feed on a dry matter basis at 85% dry matter

In a tonne of this feed, there is 850 kg dry matter and the rest is water. To calculate the cost of a kilogram of dry matter, divide the cost/tonne of feed by the number of kilograms of dry matter.

$/ tonne as fed	x 10	÷	% DM	=	Cents/ kgDM
195	x 10	÷	85	=	23

Step 2 – Calculate the cost per MJ of energy

In each kilogram of dry matter there are 10 MJ of energy.

Cents/ kgDM	÷	MJ ME/ kgDM	=	Cents/ MJ ME
23	÷	10	=	2.3

Feed B

Step 1 – Calculate the price of the feed on a dry matter basis at 90% dry matter

In a tonne of this feed there is 900 kg dry matter and the rest is water. To calculate the cost of a kilogram of dry matter, divide the cost/tonne of feed by the number of kilograms of dry matter.

$/ tonne as fed	x 10	÷	% DM	=	Cents/ kgDM
230	x 10	÷	90	=	25.6

Step 2 – Calculate the cost per MJ of energy

In each kilogram of dry matter there are 13 MJ of energy.

Cents/ kgDM	÷	MJ ME/ kgDM	=	Cents/ MJ ME
25.6	÷	13	=	1.97

Unpacking the previous slide

- $ per tonne as fed
  = the cost per tonne when purchased

Step 1 – Calculate the price of the feed on a dry matter basis at 85% dry matter
In a tonne of this feed, there is 850 kg dry matter and the rest is water. To calculate the cost of a kilogram of dry matter, divide the cost/tonne of feed by the number of kilograms of dry matter.

$/ tonne as fed	x 10	÷	% DM	=	Cents/ kgDM
195	x 10	÷	85	=	23

Step 2 – Calculate the cost per MJ of energy
In each kilogram of dry matter there are 10 MJ of energy.

Cents/ kgDM	÷	MJ ME/ kgDM	=	Cents/ MJ ME
23	÷	10	=	2.3

Advertised on “as-fed” basis

- Sometimes sold per bale or per roll basis
- Larger volumes tend to be per tonne
- These adverts are from North East Farmer paper
- Ideally want a feed test prior to purchase to find out DM%, energy and protein (at minimum)

STOCKFEED

HAY FOR SALE

SMALL SQUARES

Oaten or Rye, $8 per bale. Lucerne $12 per bale inc. Oaten, $70 per roll. Ph Ken 04 87 192 862. Lancaster.

HAY - SMALL

SQUARE BALES

Lucerne, Lucerne and Rye, Rye Grass and Clover, Teff. 5x4 rolls Oaten and Rye, Lucerne or Rye grass. Good quality, discount for quantity. Shepp East. Phone 0400 292 522 or 0428 577 551.

LUCERNE

Oaten, Grass, Teff, small squares. Ph Michael Gaffy 0428 290 172.

LUCERNE HAY

SMALL SQUARES

$10 per bale. 14 bale modules. Phone 0417 327 103

OATEN HAY

300 round bales, located in Stanhope. Phone 0408 333 547.

RYE GRASS

ROLLS

5x4, off the paddock price. Invergordon. $49 inc GST. Phone 0419 329 868.

Information we have

- Price per tonne (metric tonne)
- Energy density MJ/kgDM ie. How much energy is there is each kilogram of the feed we are purchasing if we dried it out until there was no water left in it

Need to think about units we are using

Step 1 – Calculate the price of the feed on a dry matter basis at 85% dry matter
In a tonne of this feed, there is 850 kg dry matter and the rest is water. To calculate the cost of a kilogram of dry matter, divide the cost/tonne of feed by the number of kilograms of dry matter.

$/ tonne as fed	x 10	÷	% DM	=	Cents/ kgDM
195	x 10	÷	85	=	23

Step 2 – Calculate the cost per MJ of energy
In each kilogram of dry matter there are 10 MJ of energy.

Cents/ kgDM	÷	MJ ME/ kgDM	=	Cents/ MJ ME
23	÷	10	=	2.3

- Starting with a $/tonne & MJ/kgDM units
- Need to end up with c/MJ

- Step one
  - Convert $/tonne into cents/kg

  - There are 100 cents in a dollar and 1000 kilograms in a tonne (remember for those international students this is using the international metric system, NOT imperial)
  - E.g. if we started with $300/T (remembering this is still AS FED, not yet DM), then we end up with 30 c/kg
  - This is why in the example they use the multiplication factor of 10

Need to think about units we are using

Step 1 – Calculate the price of the feed on a dry matter basis at 85% dry matter
In a tonne of this feed, there is 850 kg dry matter and the rest is water. To calculate the cost of a kilogram of dry matter, divide the cost/tonne of feed by the number of kilograms of dry matter.

$/ tonne as fed	x 10	÷	% DM	=	Cents/ kgDM
195	x 10	÷	85	=	23

Step 2 – Calculate the cost per MJ of energy
In each kilogram of dry matter there are 10 MJ of energy.

Cents/ kgDM	÷	MJ ME/ kgDM	=	Cents/ MJ ME
23	÷	10	=	2.3

- Now we have our units in c/kg however it is still in units of a DM so must convert to kg of DM
- Our cost per unit of DM will ALWAYS be more as we are removing water so the cost per unit of remaining DM INCREASES
- So if the feed type is 90% DM (0.9 units per total are DM and 0.1 water)
- To get our c/kgDM we divide our c/kg by 0.9
- E.g. 30 c/kg (As fed) = 30/0.9 c/kgDM = 300/9 c/kg DM = 33.33 c/kgDM

Need to think about units we are using

Step 1 – Calculate the price of the feed on a dry matter basis at 85% dry matter
In a tonne of this feed, there is 850 kg dry matter and the rest is water. To calculate the cost of a kilogram of dry matter, divide the cost/tonne of feed by the number of kilograms of dry matter.

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Step 2 – Calculate the cost per MJ of energy
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Cents/ kgDM	÷	MJ ME/ kgDM	=	Cents/ MJ ME
23	÷	10	=	2.3

- Resuming from last slide ……..33.33 c/kgDM
- The units we now have are c/kgDM but we need to end up with c/MJ (ie cost per MJ, in this case using cents as working in Australian currency)
- If we have a feed test result this is expressed in MJ/kgDM, so if we divide the cost (c/kgDM) by energy (MJ/kgDM) we end up with cents/MJ (as you can see by the units cancelling out.
- Many grains are somewhere between 10-12 MJ/kgDM – so lets use 11 MJ/kgDM
- If we put that into our equation we get = 33.3/11 c/MJ = 3.03 c/MJ
- Similar number to what you can see above

General “rules of thumb”

- Most feed cost will be less than 10c/MJ (see the next page for the sorts of common range)
- Often higher moisture feeds look cheaper on a cost “as-fed” but when you factor in moisture and energy density they can end up being more expensive to purchase, particularly when cartage (cost to transport) is added as moving lots of water in the feed
- Grain relatively simple to transport
- Hay tends to be 80-90% DM, grain about 90%, silage highly variable

“Normal” price range

Table 3.3: Cents per megajoule of energy calculated from $/tonne and MJ/kg DM.

		$/tonne														
Fodder	**MJ/kg DM**	**125**	**150**	**175**	**200**	**225**	**250**	**275**	**300**	**325**	**350**	**375**	**400**	**425**	**450**	**475**	**500**
Grain/ pellets (assuming 90% DM)	14.0	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0
	12.0	1.2	1.4	1.6	1.9	2.1	2.3	2.5	2.8	3.0	3.2	3.5	3.7	3.9	4.2	4.4	4.6
	10.0	1.4	1.7	1.9	2.2	2.5	2.8	3.1	3.3	3.6	3.9	4.2	4.4	4.7	5.0	5.3	5.6
	8.0	1.7	2.1	2.4	2.8	3.1	3.5	3.8	4.2	4.5	4.9	5.2	5.6	5.9	6.3	6.6	6.9
Hay (assuming 85% DM)	10.0	1.5	1.8	2.1	2.4	2.6	2.9	3.2	3.5	3.8	4.1	4.4	4.7	5.0	5.3	5.6	5.9
	8.0	1.8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	5.1	5.5	5.9	6.3	6.6	7.0	7.4
	6.0	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.9	6.4	6.9	7.4	7.8	8.3	8.8	9.3	9.8
Silage (assuming 40% DM)	14.0	2.2	2.7	3.1	3.6	4.0	4.5	4.9	5.4	5.8	6.3	6.7	7.1	7.6	8.0	8.5	8.9
	12.0	2.6	3.1	3.7	4.2	4.7	5.2	5.7	6.3	6.8	7.3	7.8	8.3	8.9	9.4	9.9	10.4
	10.0	3.1	3.8	4.4	5.0	5.6	6.3	6.9	7.5	8.1	8.8	9.4	10.0	10.6	11.3	11.9	12.5
	8.0	3.9	4.7	5.5	6.3	7.0	7.8	8.6	9.4	10.2	10.9	11.7	12.5	13.3	14.1	14.8	15.6
Straw (assuming 90% DM)	6.0	2.3	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	6.5	6.9	7.4	7.9	8.3	8.8	9.3
	4.0	3.5	4.2	4.9	5.6	6.3	6.9	7.6	8.3	9.0	9.7	10.4	11.1	11.8	12.5	13.2	13.9
	2.0	6.9	8.3	9.7	11.1	12.5	13.9	15.3	16.7	18.1	19.4	20.8	22.2	23.6	25.0	26.4	27.8