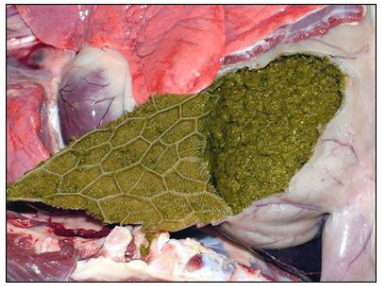
Nutrition

- Small ruminants have lower incisors and upper dental pad
- Reticulum (honeycomb), rumen(paunch), omasum (bible), abomasum

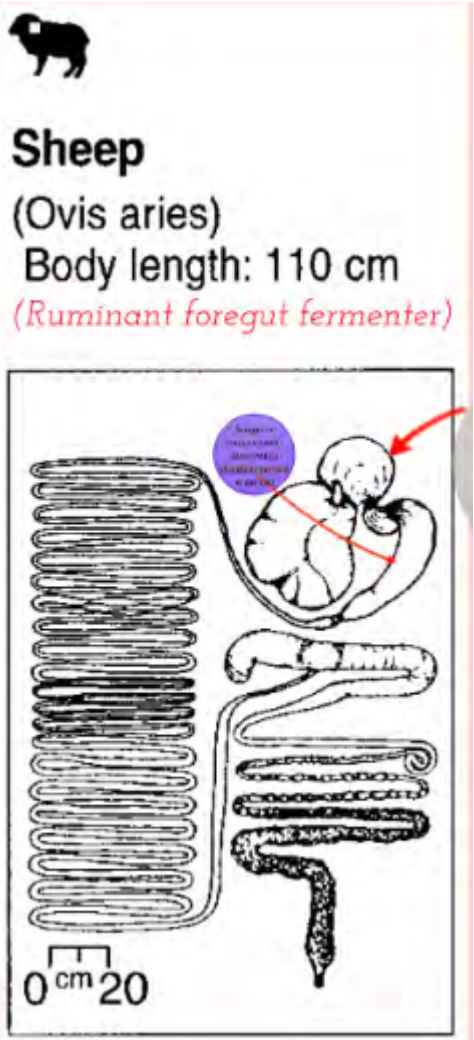
Omasum inner wall (Sheep)



Wall of the (Sheep)

https://en.wikivet.net/File:Reticulum_Anatomy_Sheep.jpg

https://d1c58x5kw725gb.cloudfront.net/wp-content/uploads/2017/06/ThinkstockPhotos-477728452.jpg



Small ruminant nutrition

- Ruminants in general able to take lower quality nutrition and produce fibre, milk, meat whereas monogastrics need higher quality feed eg grain
- Goats browsers
  - Can lead to issues with parasite pickup where goats grazed in same way as sheep (on high quality pasture)
- Sheep grazers

- Review previous nutrition (general/cattle) for types of pastures as same types are used e.g. some legume/grass

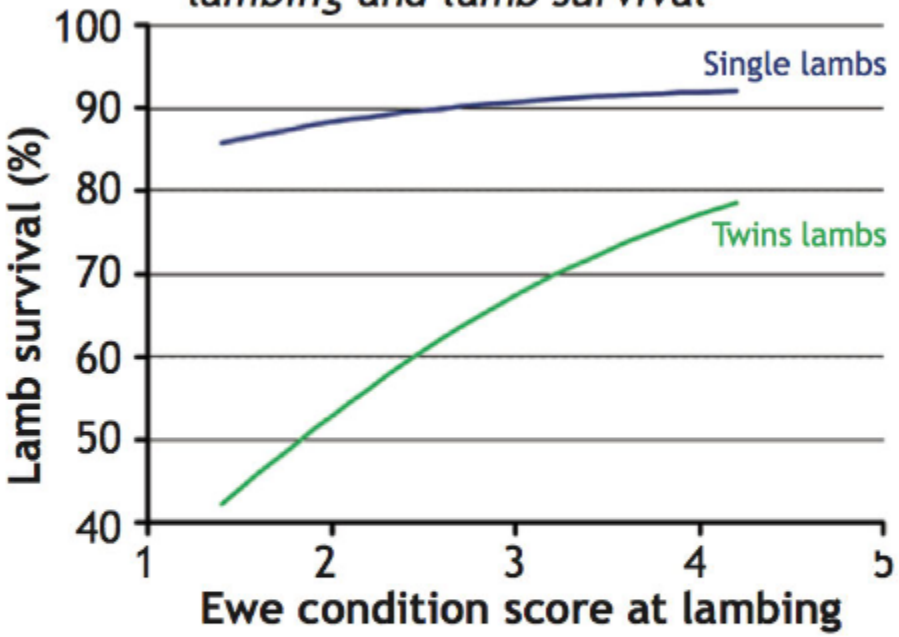
Regional growth rates

- In HRZ and parts of Sheep/wheat perennial grasses such as ryegrass and phalaris grow compared to predominantly annual in wheat/sheep or pastoral areas
- Means that more responsive to rainfall as have root reserves to start growth faster than seed
- Longer growing season in HRZ compared to WSZ compared to pastoral country – impacts options for what sorts of small ruminant enteprises best fit and stocking rates

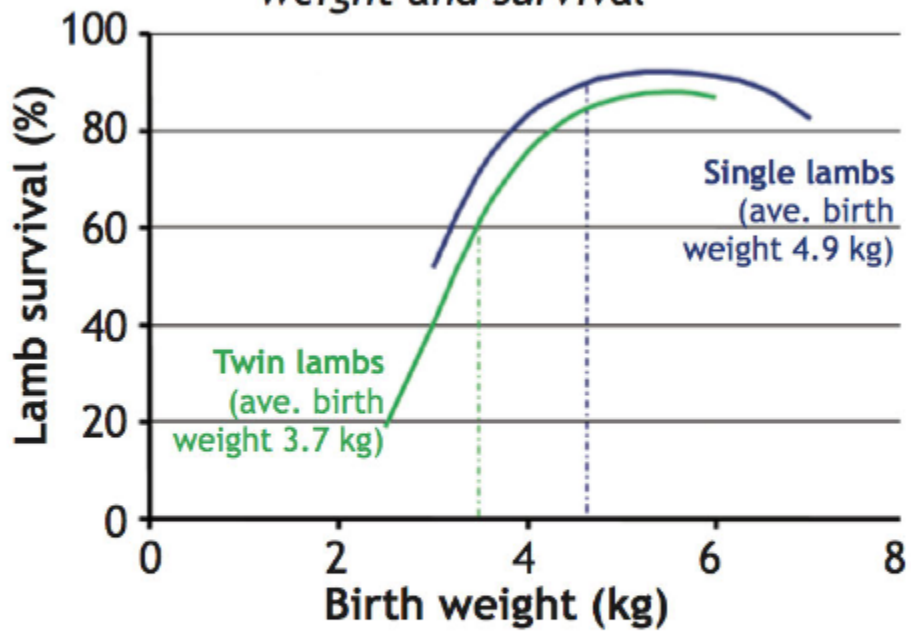
Summer/Autumn

- As pasture dries off it reduces in quality and quantity
- Supplementary feeds required or fodder crops

The relationship between ewe condition at lambing and lamb survival



The relationship between lamb birth weight and survival



Feed Budget for small ruminants

Intake (supply)

Pasture
Supplements

−

Requirement (demand)

Basal maintenance
Milk
Growth
Pregnancy
Work

=

Surplus ↑ Or Deficit ↓

Requirements (from 4.3.3)

How Do We Express Requirements?

Production class	Metabolisable energy			
	MJ/d	DSE	MJ/d	DSE
	Sheep		Cattle	
Weaners/yearlings	8	1	40-60	6-8
Steers			60-80	8-11
Dry or early pregnant	7.7	1*	60	8-9
Late pregnant	9–12	1.5	70	10
Lactating (Merino/beef)	18	2.5	84-130	12-17
Milking dairy cow (20 L/d)			170	23
Rams / bulls	15	2	100	15

•DSE = 'dry sheep equivalents'
• different DSE 'standards' exist, depending on the reference sheep's weight!
•A 45 kg wether requires ~7.2 MJ ME/d for maintenance; 1 DSE = 7.7 MJ/d is now also frequently quoted
^ higher protein levels required for weight gain

Example: What is requirement of 65 kg lactating ewe with 3-week old twin lambs? What is her DSE rating?

Table 1. ME Requirements (MJ/day)

Pregnancy		
Day	Single	Twins
Dry	7.7	7.7
10	7.7	7.7
20	7.8	7.8
30	7.8	7.8
40	7.9	7.8
50	8	7.9
60	8.1	8.1
70	8.3	8.4
80	8.6	8.6
90	8.8	9.1
100	8.8	9.7
110	9.3	10.4
120	9.8	11.2
130	10.4	12.1
140	11.1	13
150	11.8	13.7

Lactation		
Day	Single	Twins
1	11.6	13.3
10	17.3	21.7
20	19.2	24.6
30	18.7	23.9
40	17.2	21.7
50	15.5	19.1
60	13.8	16.8
70	13.1	14.6
80	12.4	12.9
90	10.2	11.5
100	9.4	10.4

Table 2. Requirements Multiplier for Different Liveweight Ewes

LW @ CS 3	40	45	50	55	60	65	70
Multiply by	0.92	1.00	1.08	1.16	1.24	1.32	1.39

(Standard 'dry' ewe needs 7.7 MJ/d)

45 kg ewe 21 days into lactation needs:

24.6 MJ/d

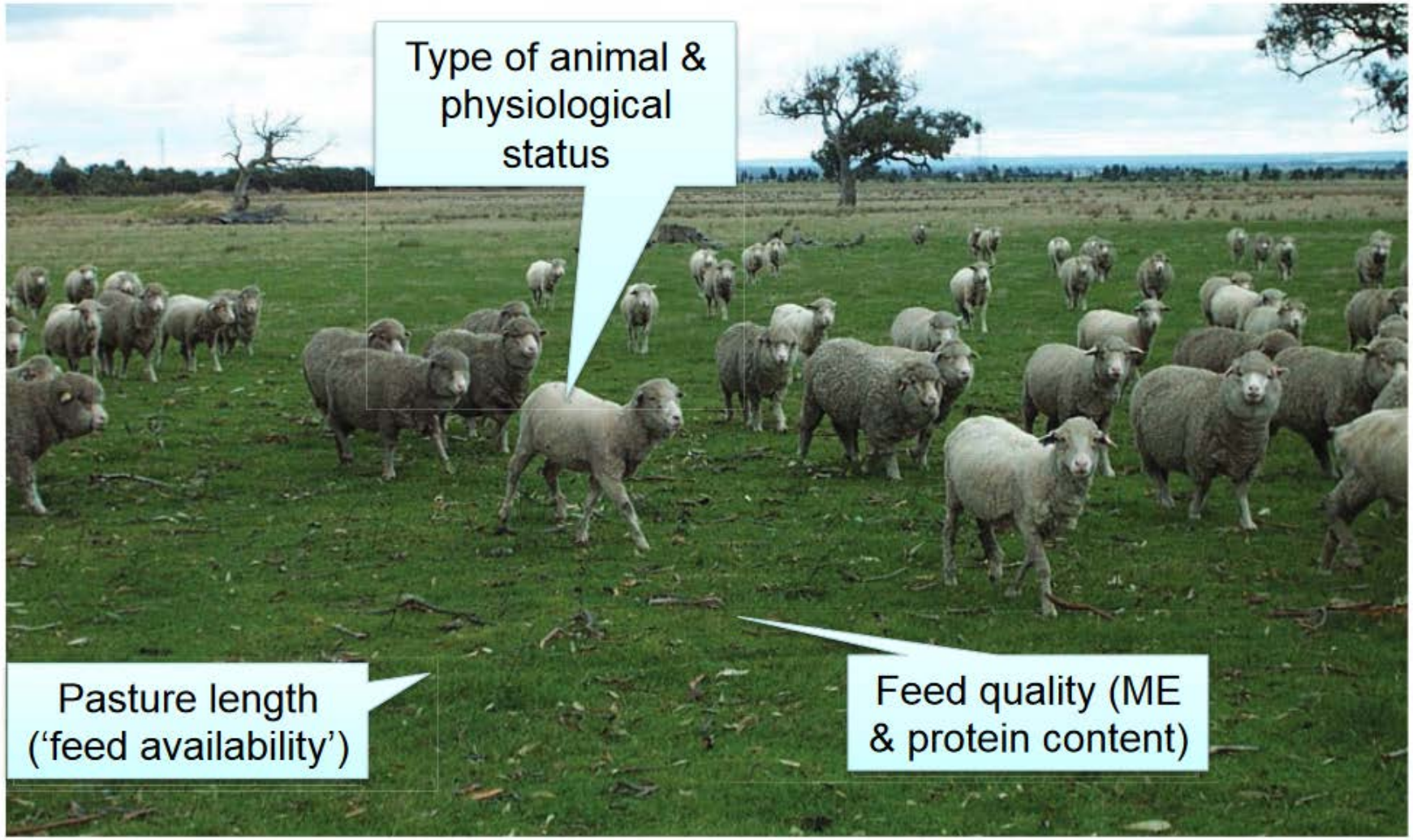
x 1.32 for *65 kg* ewe

= 32.5 MJ/d

How many DSEs?

32.5 ÷ 7.7 ≡ 4.2 DSE

What About ME Intake?



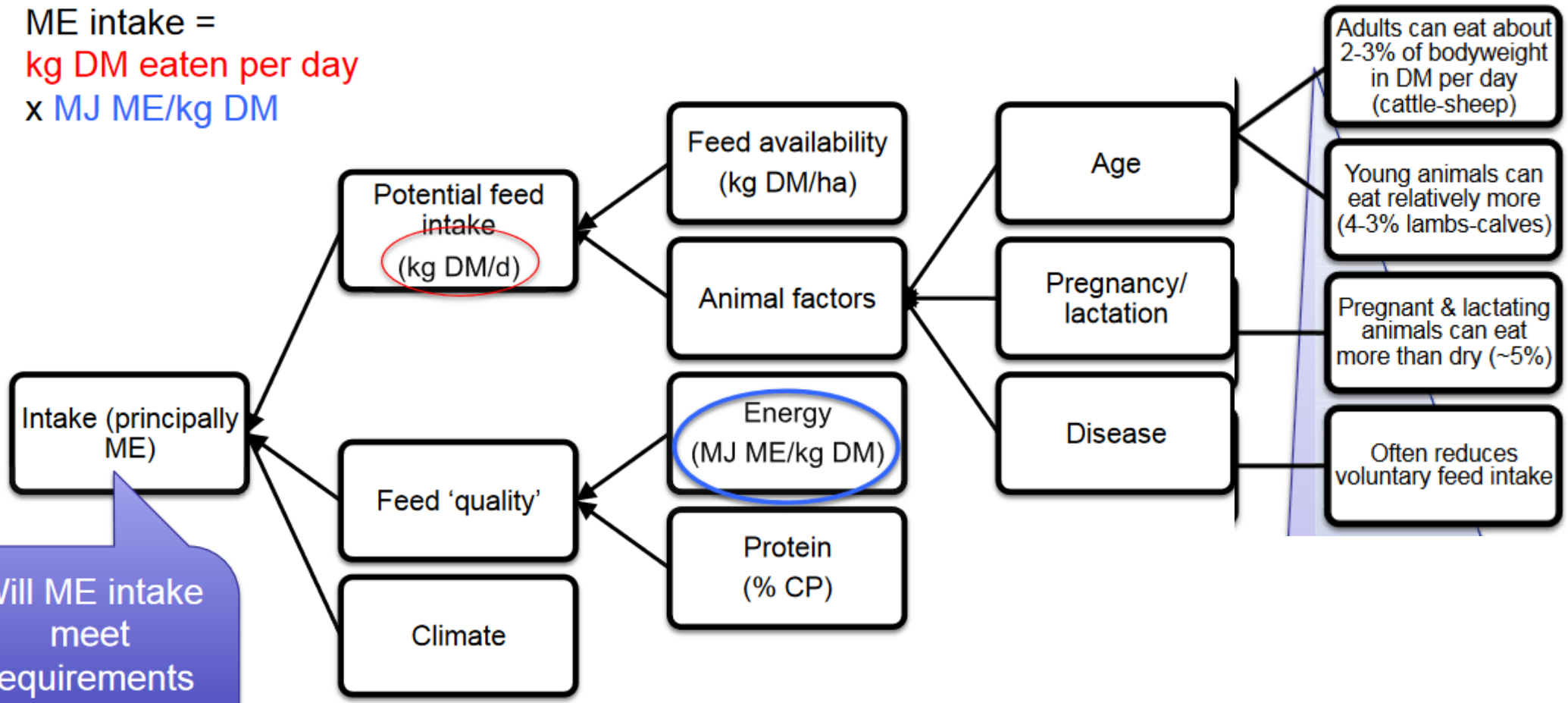
Merino ewes: western Victoria in June

Pasture: mixed improved/native, 4 cm average height, 75% digestibility

Sheep: day 50 of gestation, slowly gaining weight

What Affects ME Intake?

ME intake =
kg DM eaten per day
x MJ ME/kg DM



Will ME intake meet requirements for maintenance & production?

Intake & Disease

Sick sheep eat (& produce) less

Well-fed sheep have less disease

Pasture Factors: Quantity & Quality

Quantity = 'feed availability'

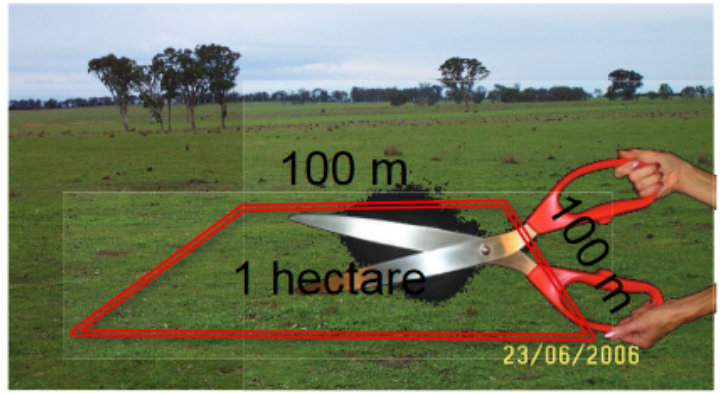
Quality = ME, % CP

Quantity: How do we measure feed availability?

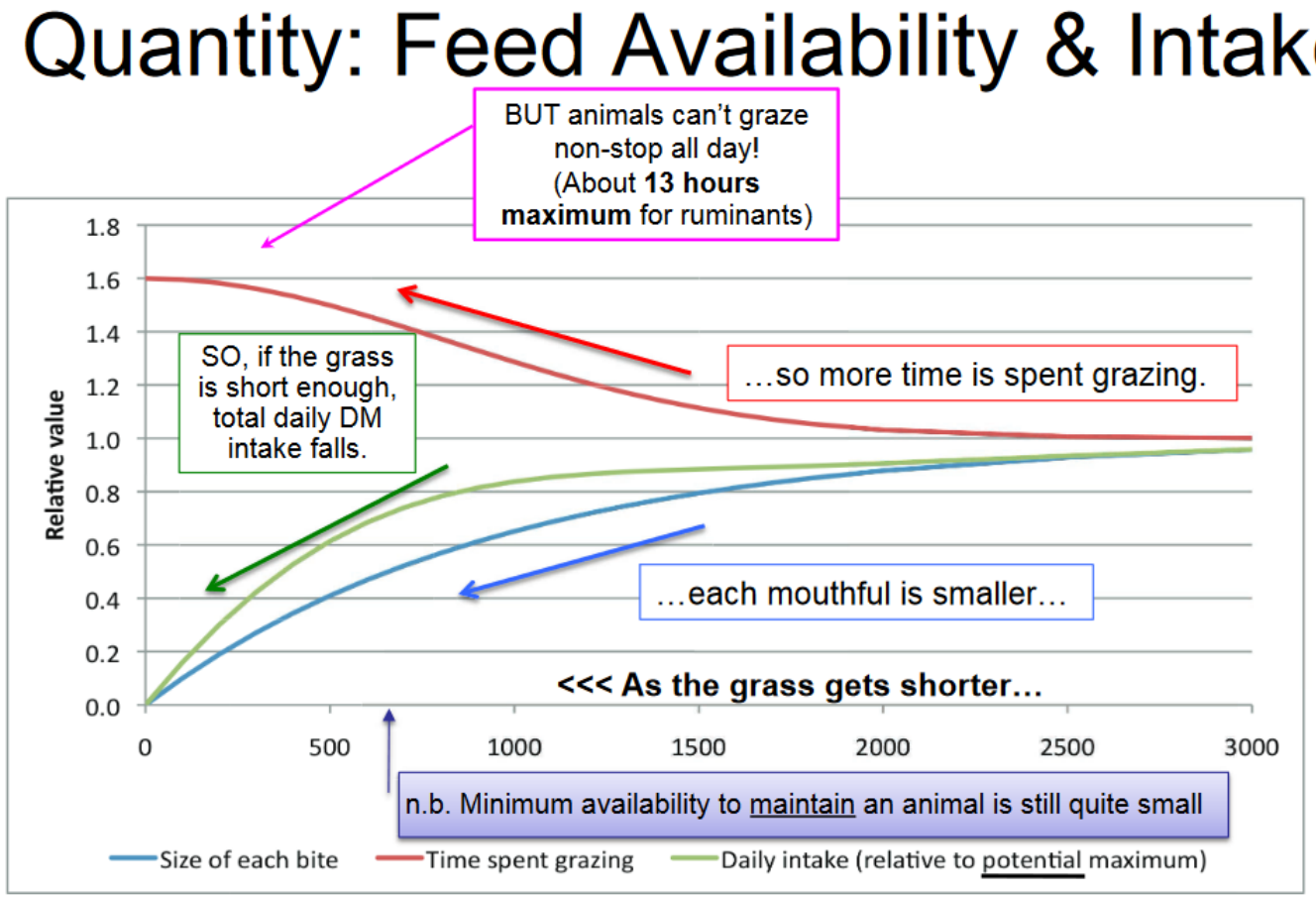
Or "How many kg of dry matter are in each hectare (kg DM/ha)"?

Green improved pasture: Average height (cm)	Availability (kg DM/ha)
1	400
2	700
3	1000
4	1200
5	1400
6	1600
7	1700
8	1900
10	2200
12	2500
14	3000+

MUST KNOW THESE!

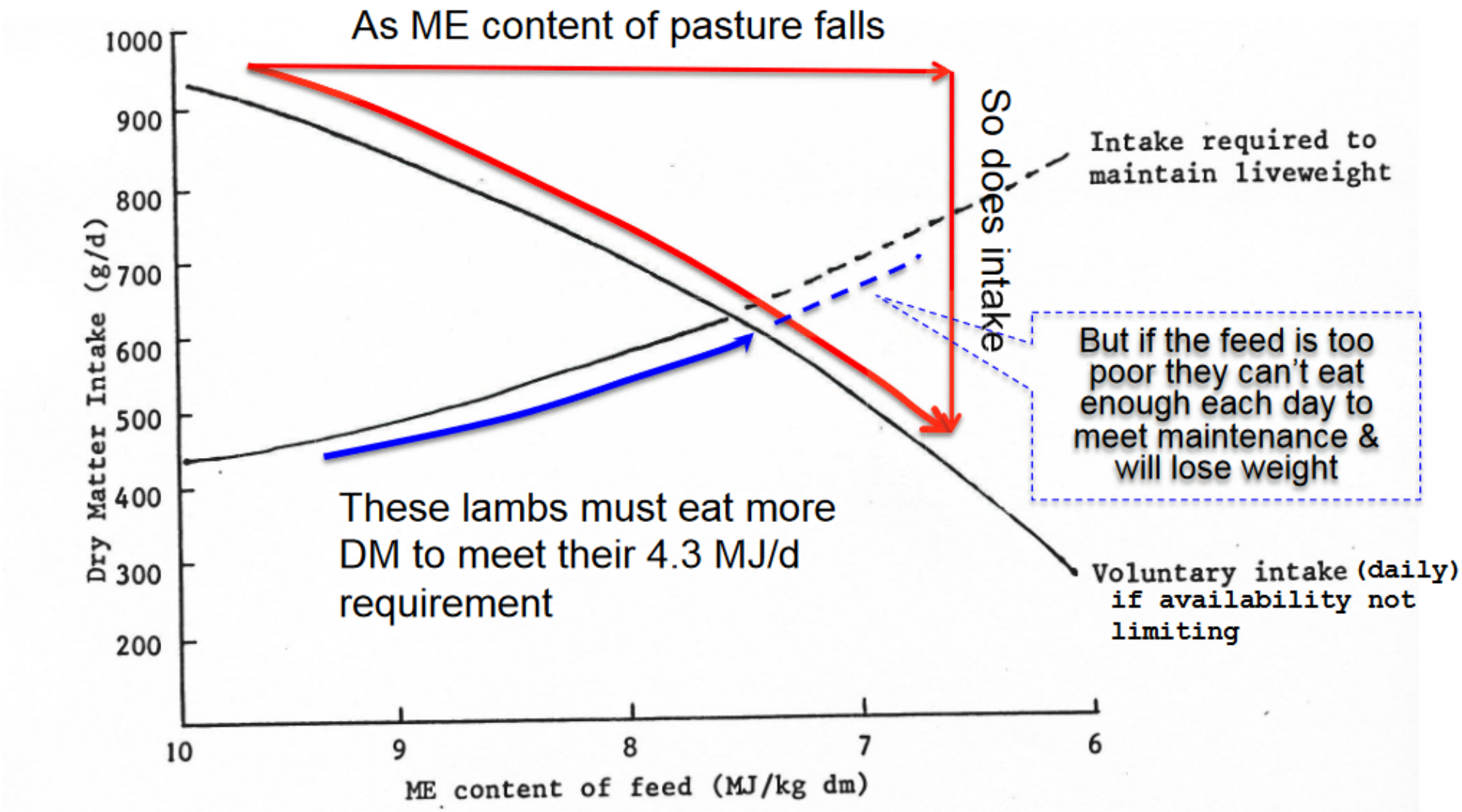


Remember this graph from 4.3.3



Relative availability (i.e., intake) = eating rate X grazing time

Lower ME = Lower Intake



Example: Intake of 25 kg lambs

Type of stock	Pasture digestibility		
	75% (11.2 MJ/kg DM)	68% (10.1 MJ/kg DM)	60% (9 MJ/kg DM
Dry sheep	400	600	1200
Pregnant ewes:			
mid pregnancy	500	700	1700
last month	700	1200	NP
Lactating ewes			
single	1000	1700	NP
twins	1500	NP	NP
Growing sheep			
4 months, 32 kg, growing:			
125 g/d	600	1000	NP
175 g/d	800	1700	NP
225 g/d	1600	NP	NP

NP: Not Possible to maintain weight for that kind to animal at given pasture quality