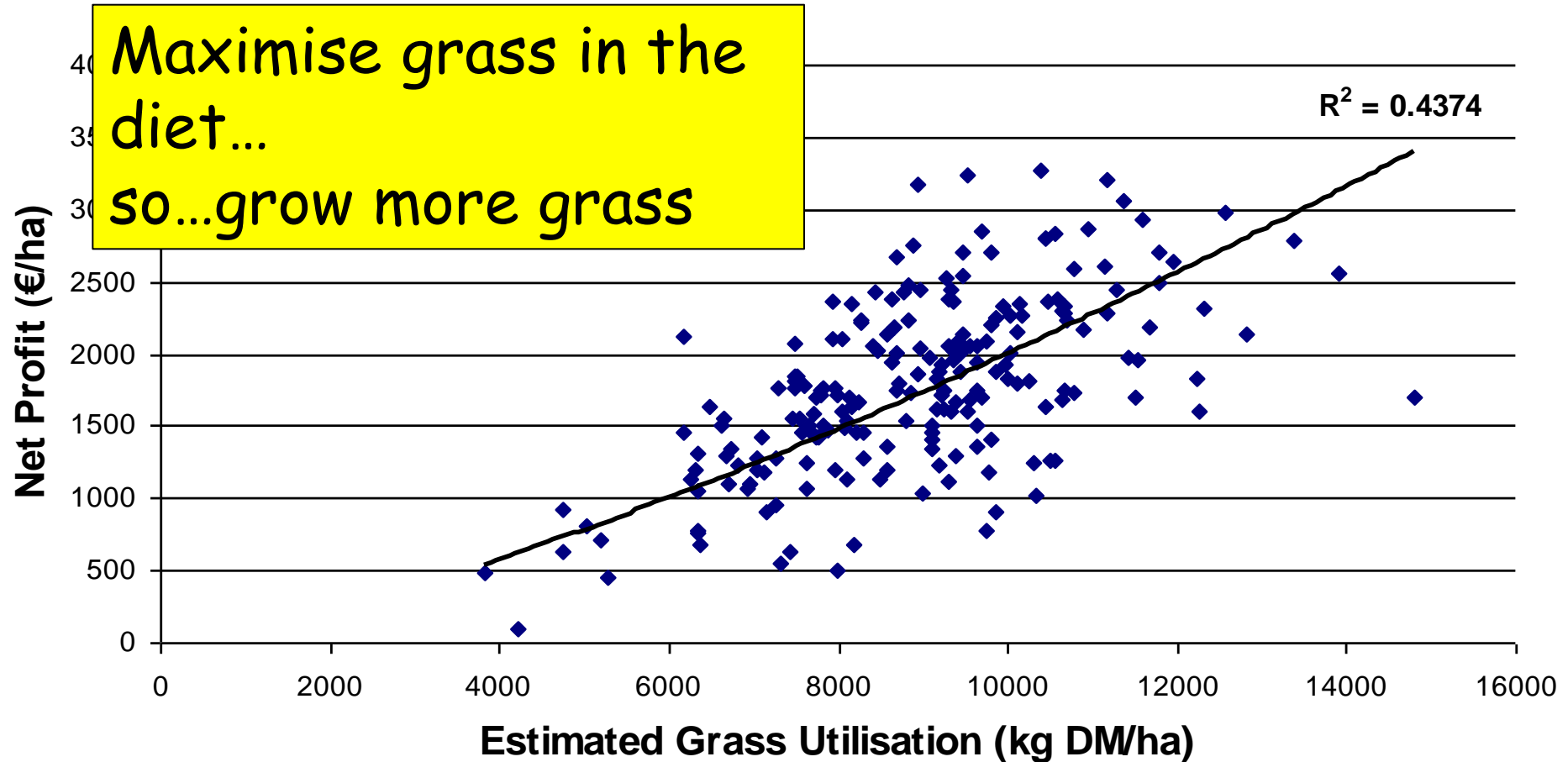


Getting the balance right between grass quantity and quality - what the research says

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Teagasc, AGRIC, Moorepark

Introduction: why focus on grass-based systems



Introduction: grass quality

- ❑ Organic Matter Digestibility (OMD) is common measurement of grass quality
- ❑ Grass OMD is used to calculate the grass energy content, called the UFL value (Feed Unit for Lactation)
- ❑ High OMD
 - high UFL value = high energy content
 - lower fibre = less filling → so more can be eaten
- ❑ Low OMD
 - low UFL value = low energy content
 - higher fibre = more filling → so less can be eaten

Introduction: importance of grass quality

550 kg mature cow, mid-lactation, 3.8% fat, 3.4% protein

Milk yield (litres) [Milk solids (kg)]	24 [1.73]
Energy required (UFL/d)	15.8
High quality grass	
Intake required (kg DM/d)	
Potential intake (kg DM/d)	
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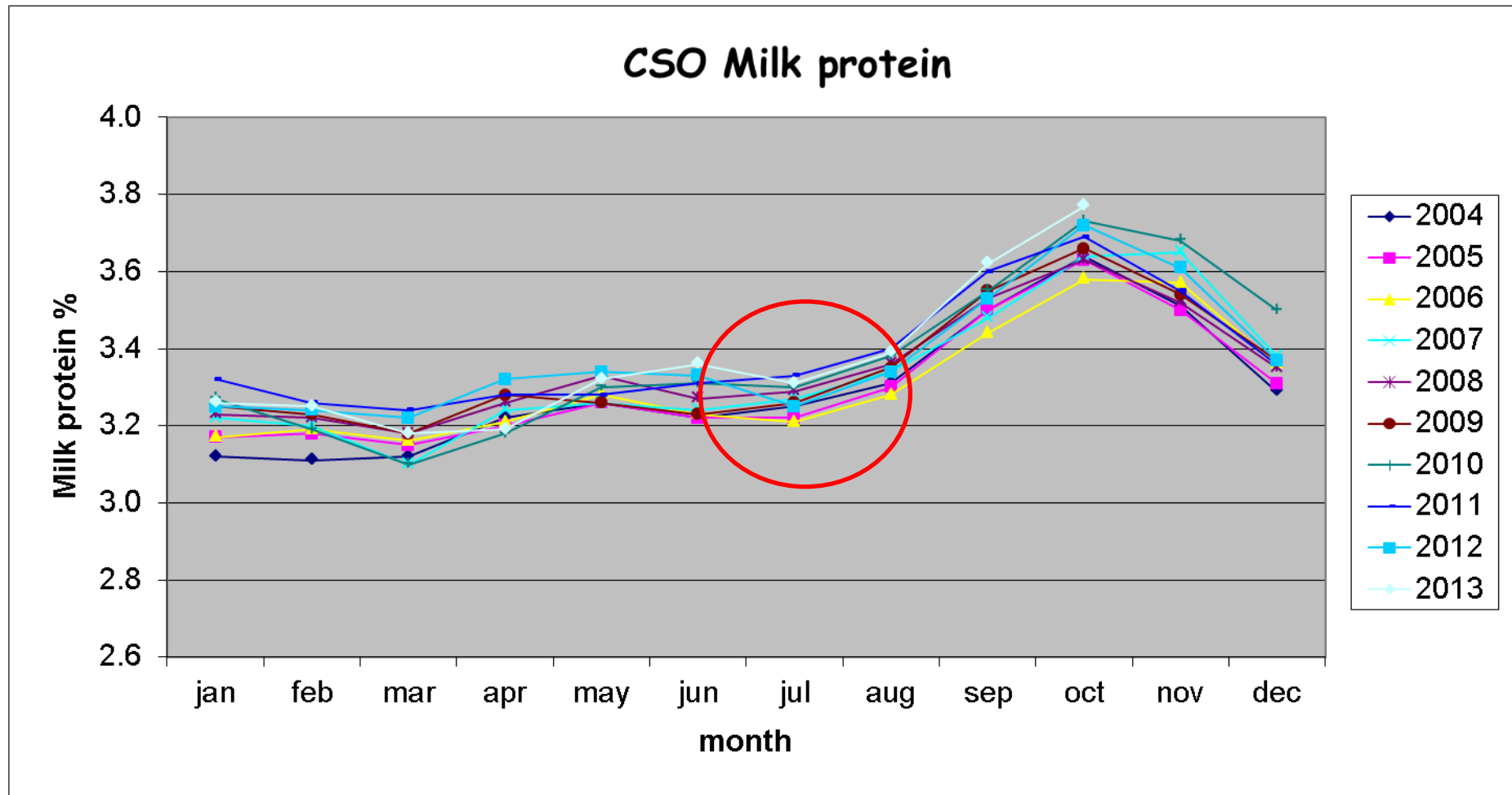
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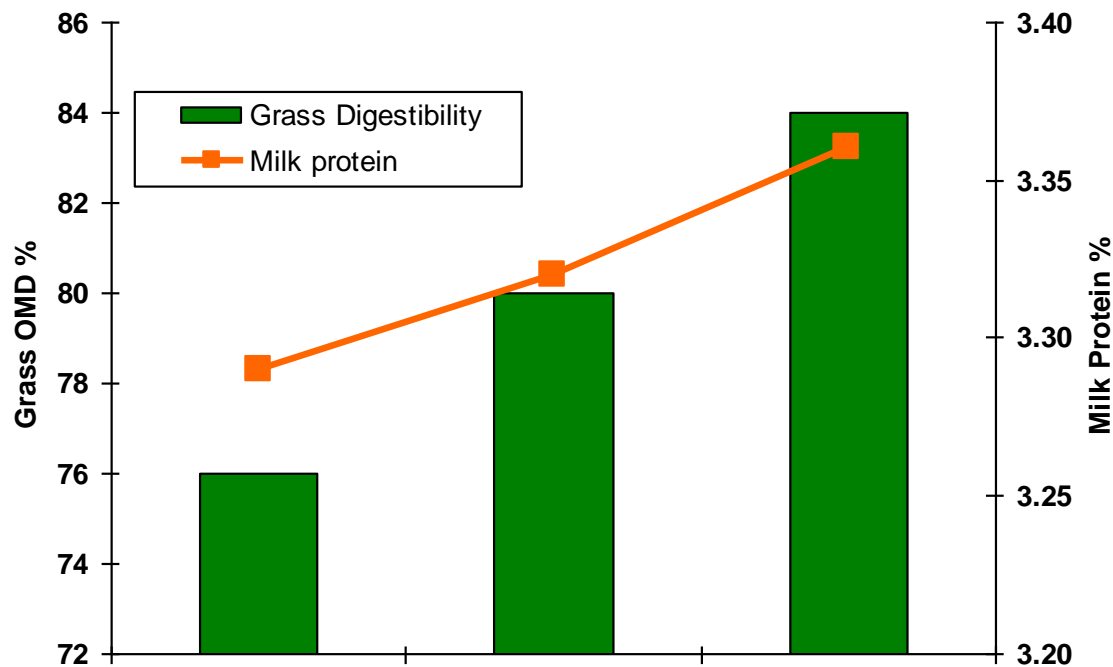


Introduction: importance of grass quality



Introduction: importance of grass quality

- ❑ Survey of 45 spring-calving dairy farms to examine on-farm factors affecting mid-season milk protein %
- ❑ Higher milk protein % in mid-season was associated with higher quality grass



(Murphy et al., 2008)

Pre-grazing herbage mass (PGHM)

- ❑ A range of factors affect grass quality and grass quantity
 - Soil fertility
 - Proportion of perennial ryegrass in sward
 - Perennial ryegrass cultivar
 - Fertiliser usage
 - Pre grazing herbage mass (PGHM)

Comparison of three PGHM

- ❑ April to September
- ❑ Three target PGHM
 - Low - 900 kg DM/ha
 - Medium - 1500 kg DM/ha
 - High - 2000 kg DM/ha
- ❑ Swards were grazed to 4 cm

Very large
area required

Mass and rotation length

	Low	Medium	High
Pre grazing herbage mass (kg DM/ha)	978	1521	2330
Rotation length (days)	14.5	20.3	29.0
Total herbage production Apr - Sept (t DM/ha)	11.1	13.0	14.2
Leaf proportion	70	67	62
Stem proportion	15	19	26
Dead proportion	14	15	13

Quantity
3 leaf stage is ideal for
grazing = 21 days

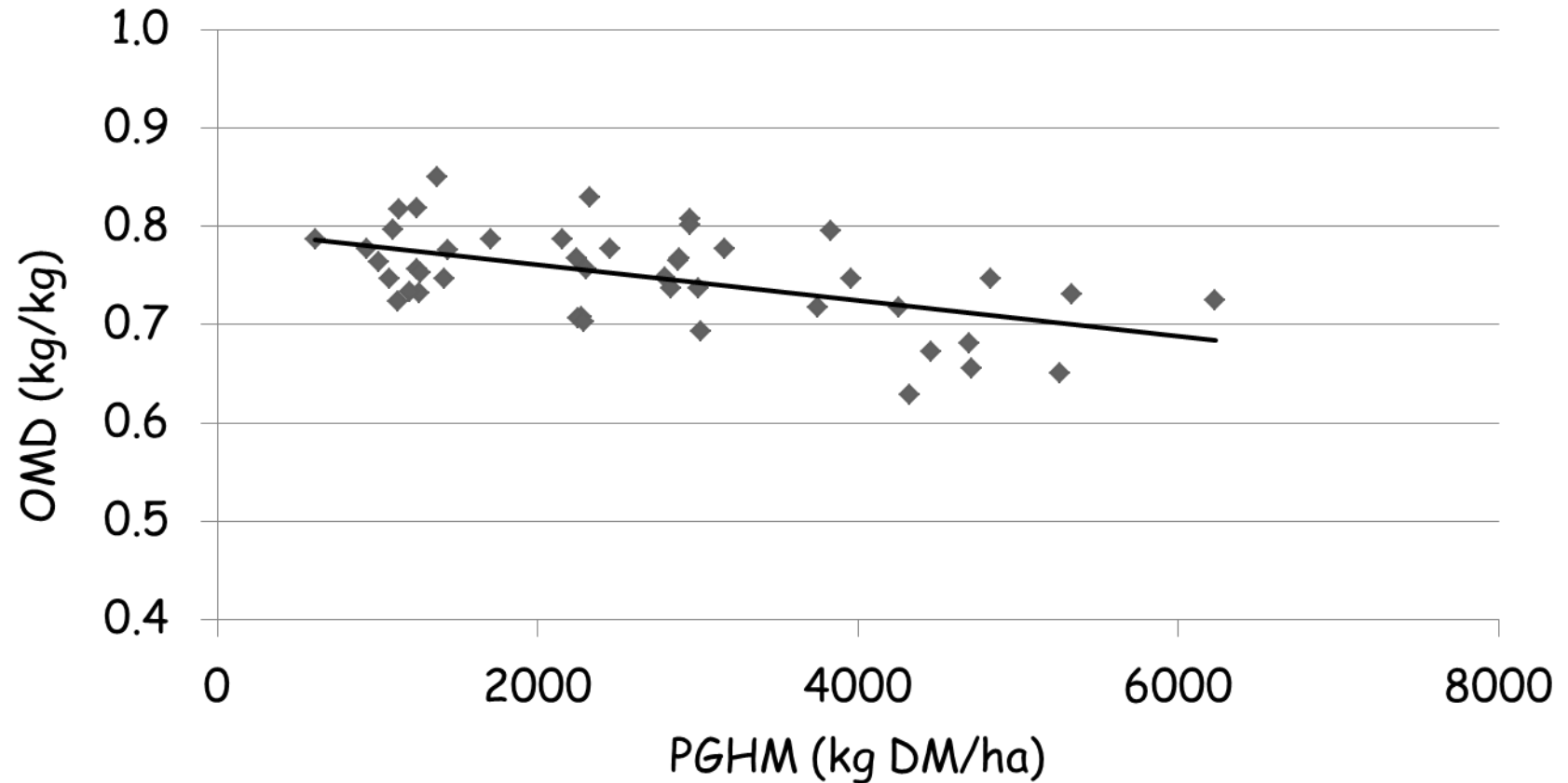
Quality
Directly; And via achieving
post grazing height

Effect of PGHM on intake and grazing time

	Low	Medium	High	Level of significance
Grazing time (h/day)	10.8 ^a	9.3 ^b	9.3 ^b	**
Rumination time (h/day)	8.4 ^a	9.0 ^b	9.9 ^c	*
DM intake (kg/cow/day)	15.2	16.5	15.7	†
MS yield (kg/cow/day)	1.42	1.43	1.31	NS

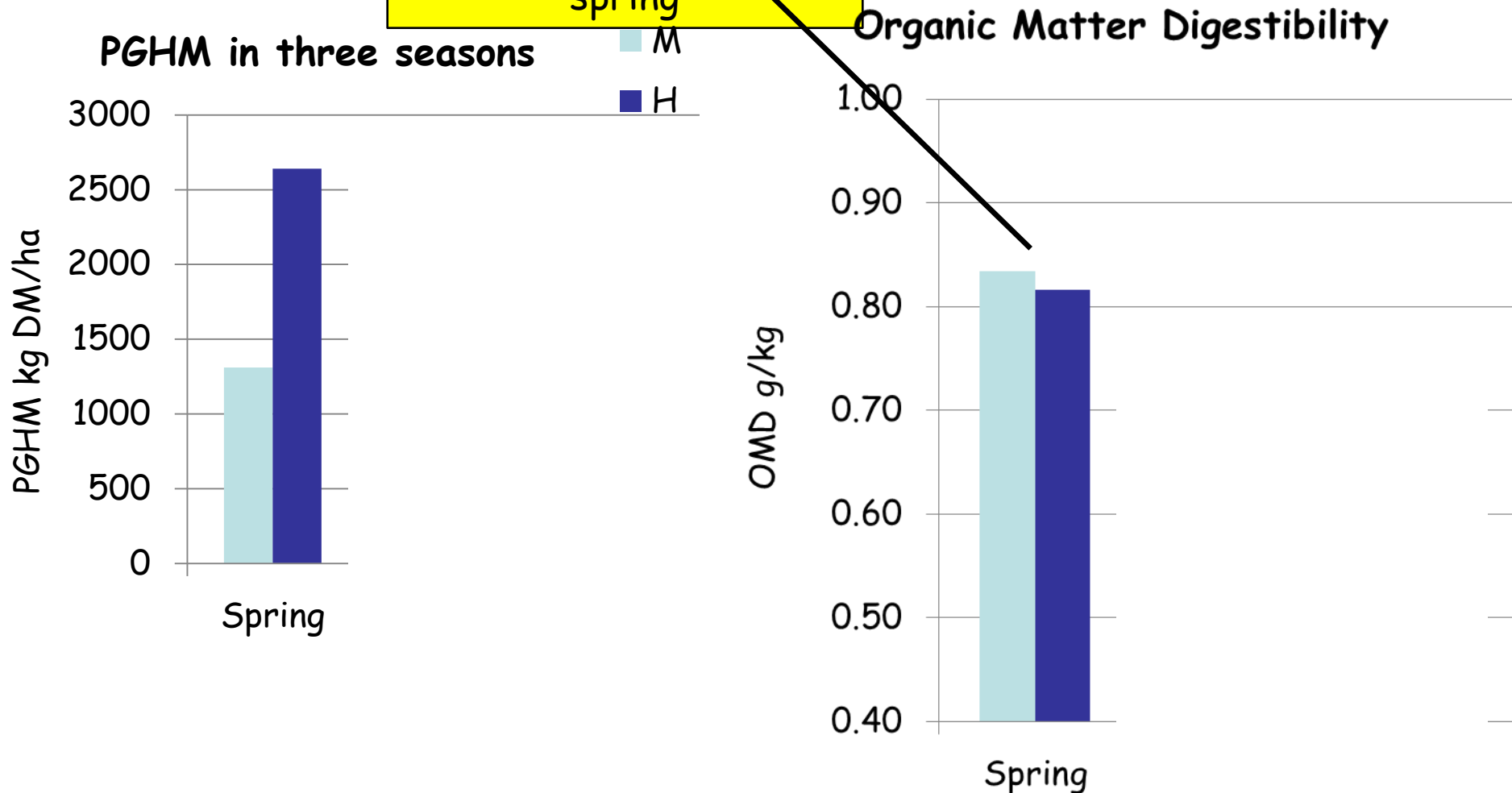
Effect of PGHM on grass quality

PGHM and Organic Matter Digestibility



Effects of PGHM on quality - by season

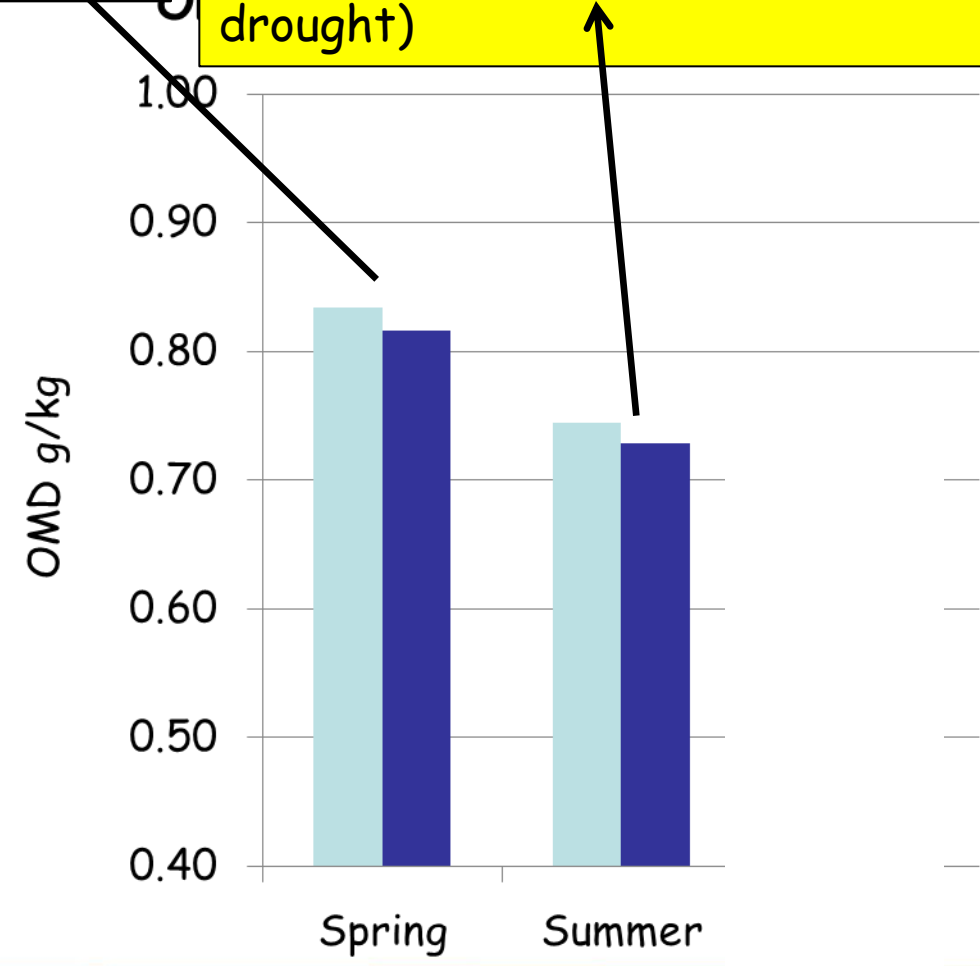
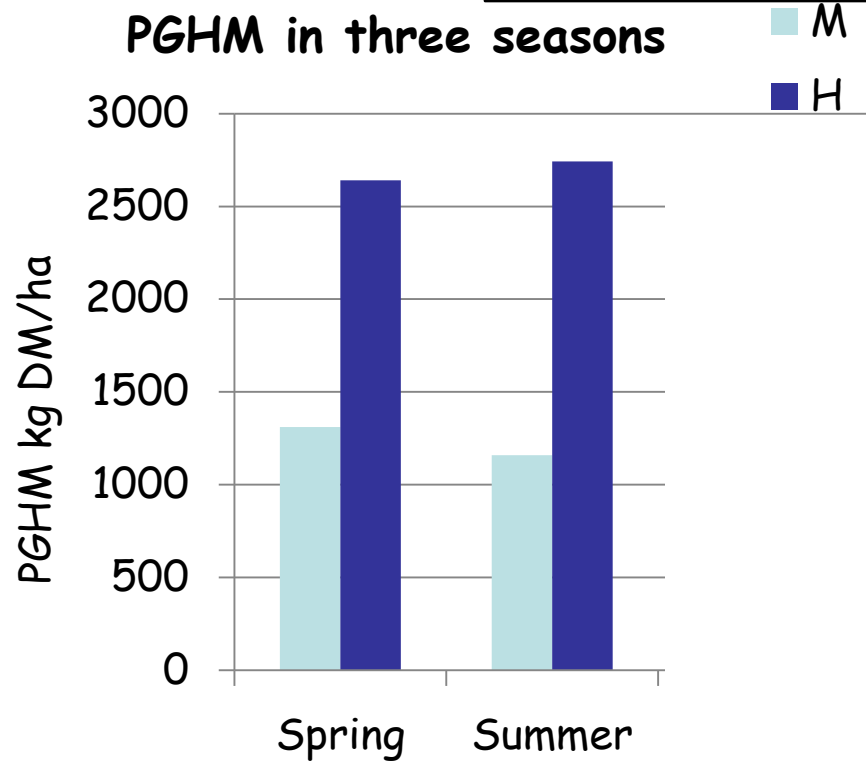
generally high quality in spring



Effects of PGHM on quality

generally high quality in spring

Grass heading causes digestibility to decrease, due to presence of stem - particularly in higher PGHM swards (plus 2013 drought)

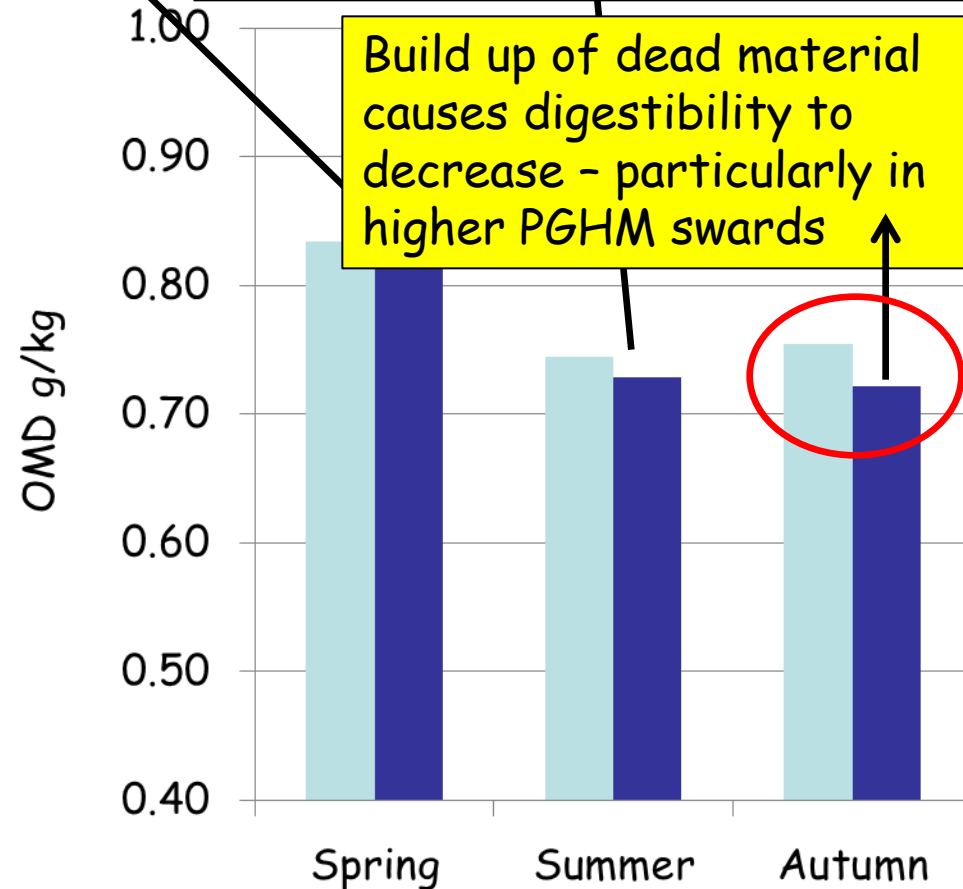
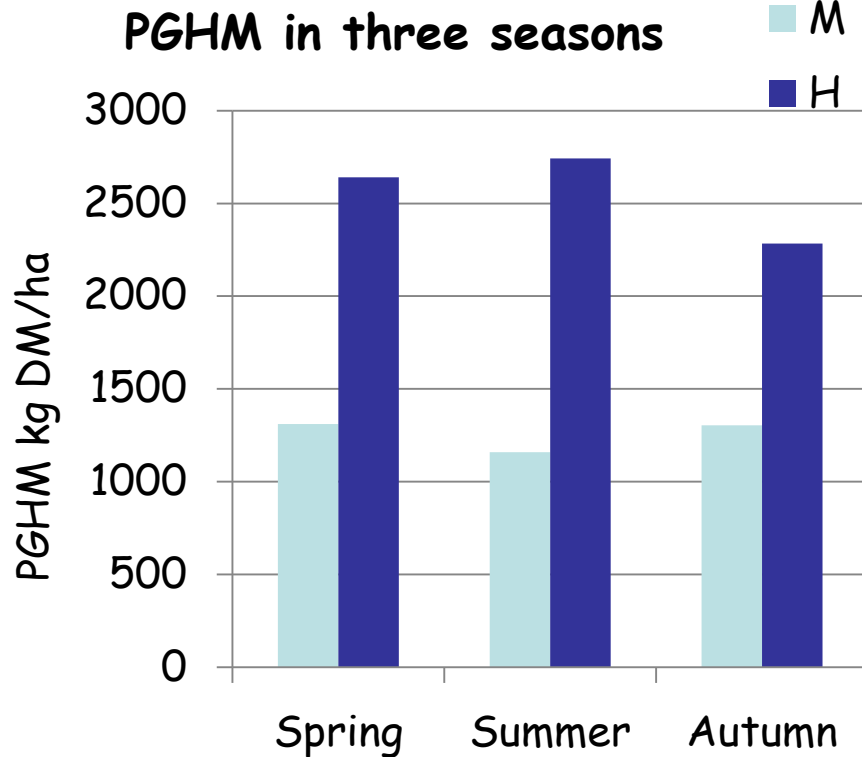


Effects of PGHM on quality

generally high quality in spring

Grass heading causes digestibility to decrease, due to presence of stem - particularly in higher PGHM swards (plus 2013 drought)

Build up of dead material causes digestibility to decrease - particularly in higher PGHM swards



Effect of PGHM on grass nutritive value

	PGHM	CP %	ADF %	UFL /kg DM	Fill value /kg DM	Potential UFL intake/day
Spring	M 1100	26.0	23.9	1.04	0.94	18.8

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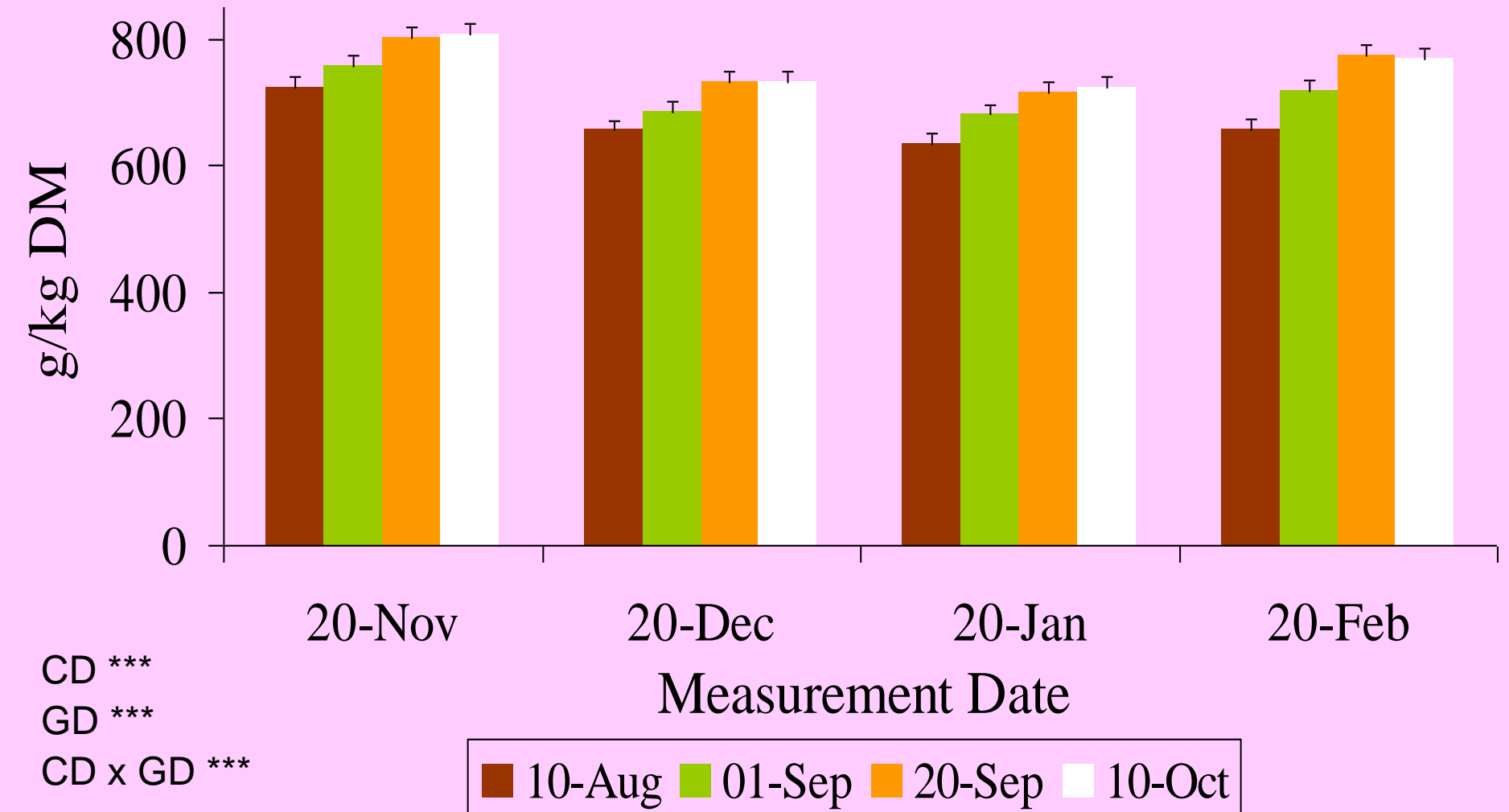
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	H 2500	17.7	25.3	0.97	1.00	16.5
Autumn	M 1100	23.0	26.2	0.99	0.96	17.5
	H 2500	20.0	27.7	0.95	1.00	16.2

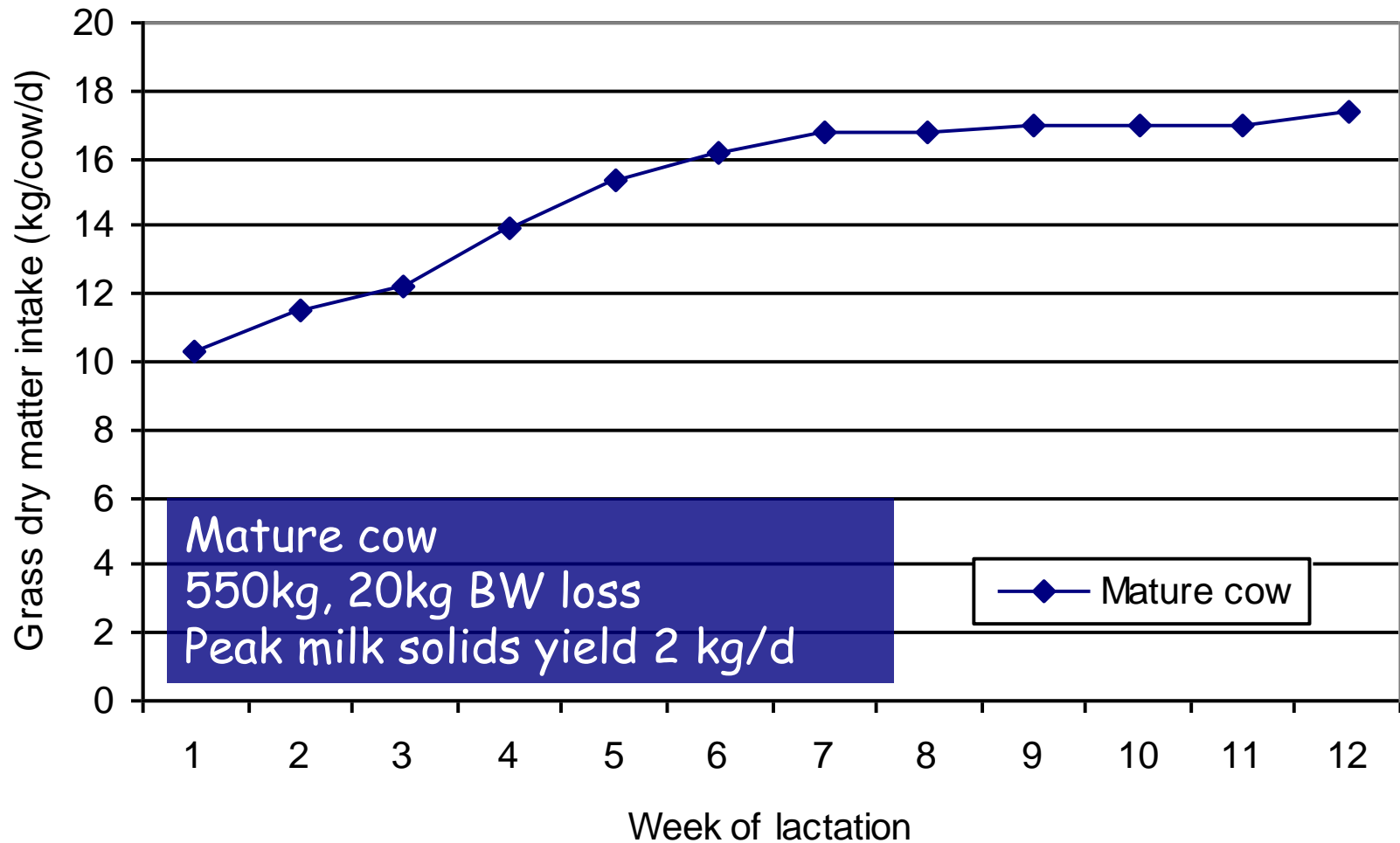
Summary

- ❑ In grass based milk production systems crucial to achieve **balance** between grass quality and quantity
 - Quality: DMI and MS yield (via fill value and energy content)
 - Quantity: grazing management and total annual herbage production
- ❑ Low PGHM swards
 - produce excellent quality grass
 - **but** consistently grazing low PGHM ↓ total herbage production
- ❑ High PGHM
 - Produce high total annual herbage production
 - **but** increased stem, and sometimes dead material, in sward
 - ↓ sward quality and hence MS yield
 - difficult for cows to graze down to 4 cm (further ↓ quality)
- ❑ May - Sept: 1500 kg DM/ha from 18-24d rotations

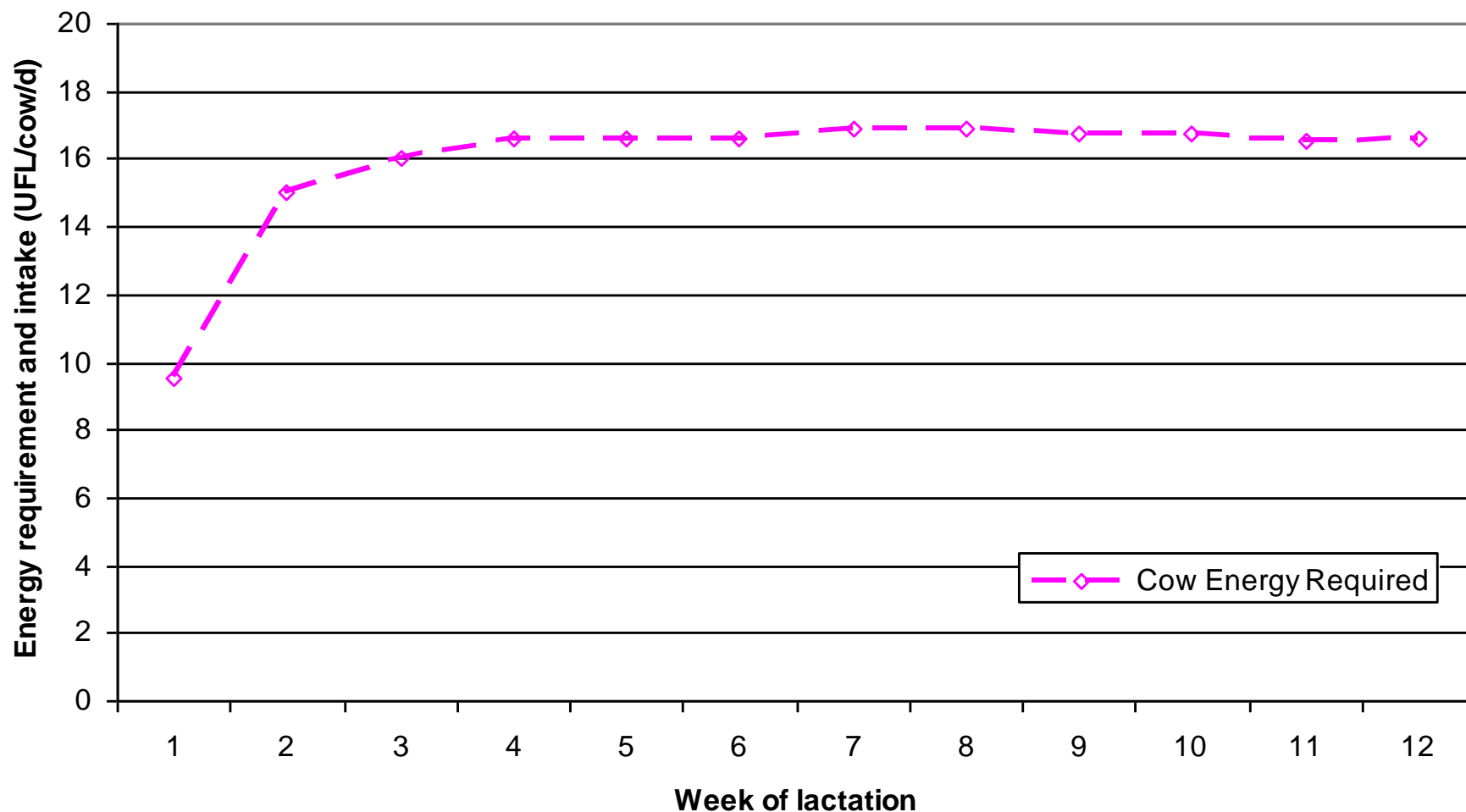
DMD values at Moorepark for four autumn closing dates on four winter grazing occasions



Grass Dry Matter Intake in early lactation



Energy requirements



Energy: requirements vs intake (grass)

