

Nutritional management for fertility

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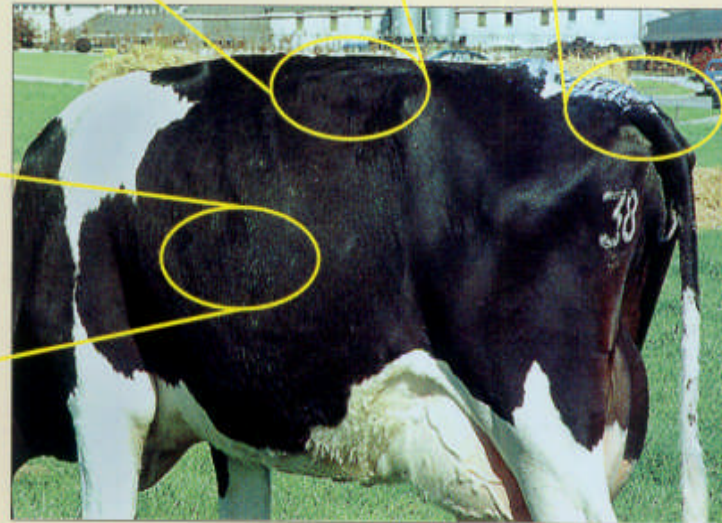
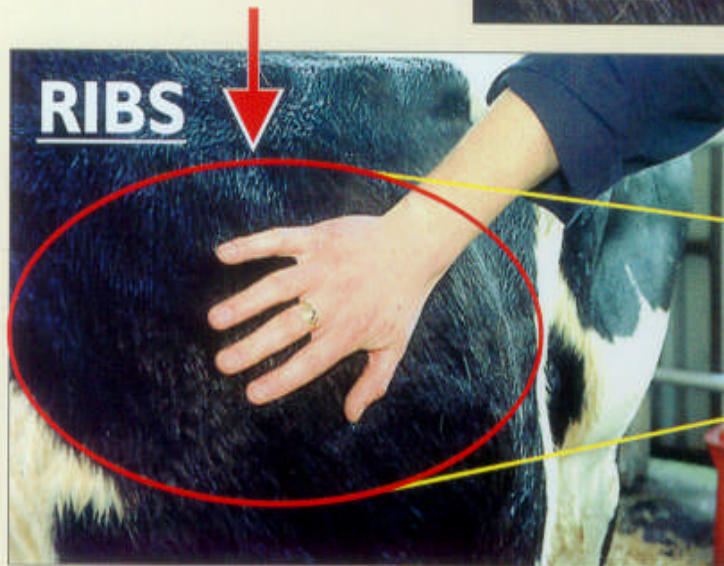
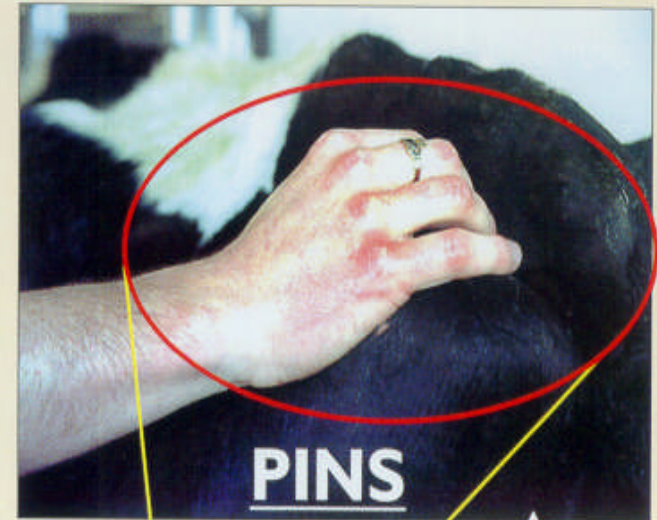
²Teagasc Kildalton, Piltown, Co. Kilkenny

Nutrition in grass-based systems

- ❑ Keep it simple – grass – budgeting
- ❑ Manage BCS
- ❑ Prevent deficiencies of essential nutrients

Run hand firmly over 3 primary reference points

The flat hand is used to assess the degree of fat cover or bone prominence on the loin and rib areas.



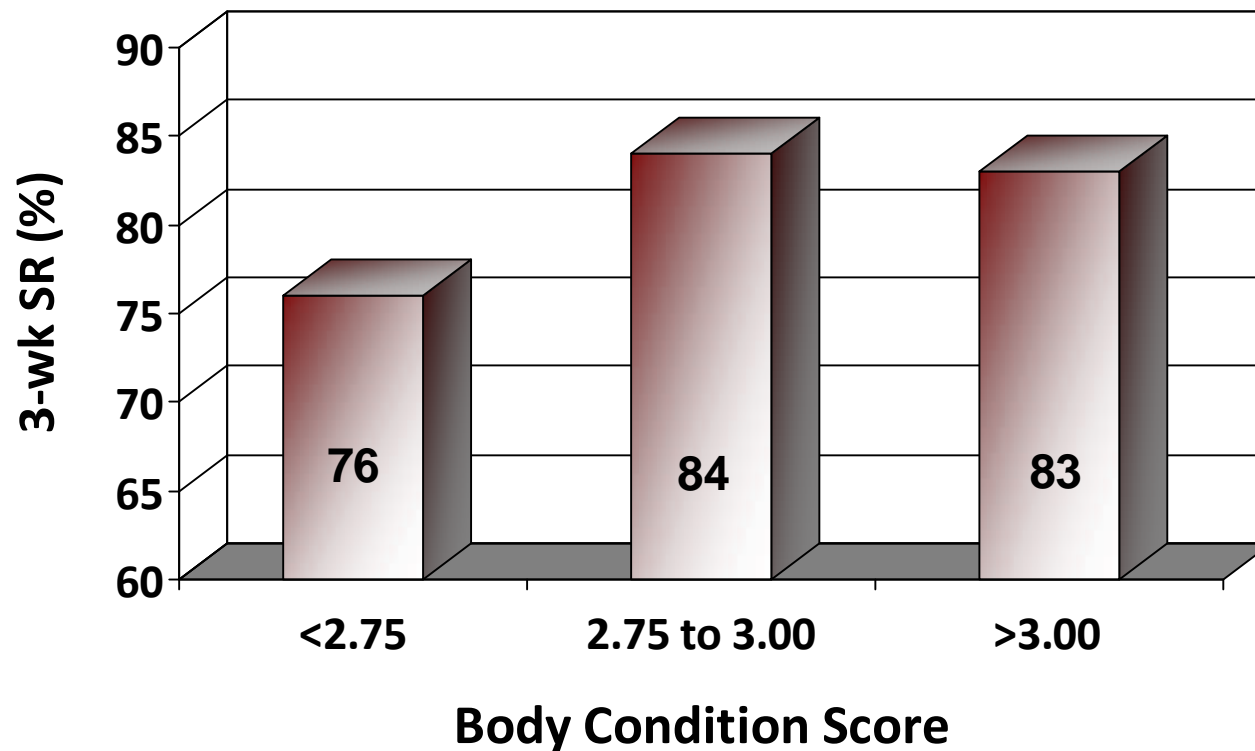
The fingers are used to assess the area around the tail head and pin bones.

Visual Scoring Alone is Not Recommended!

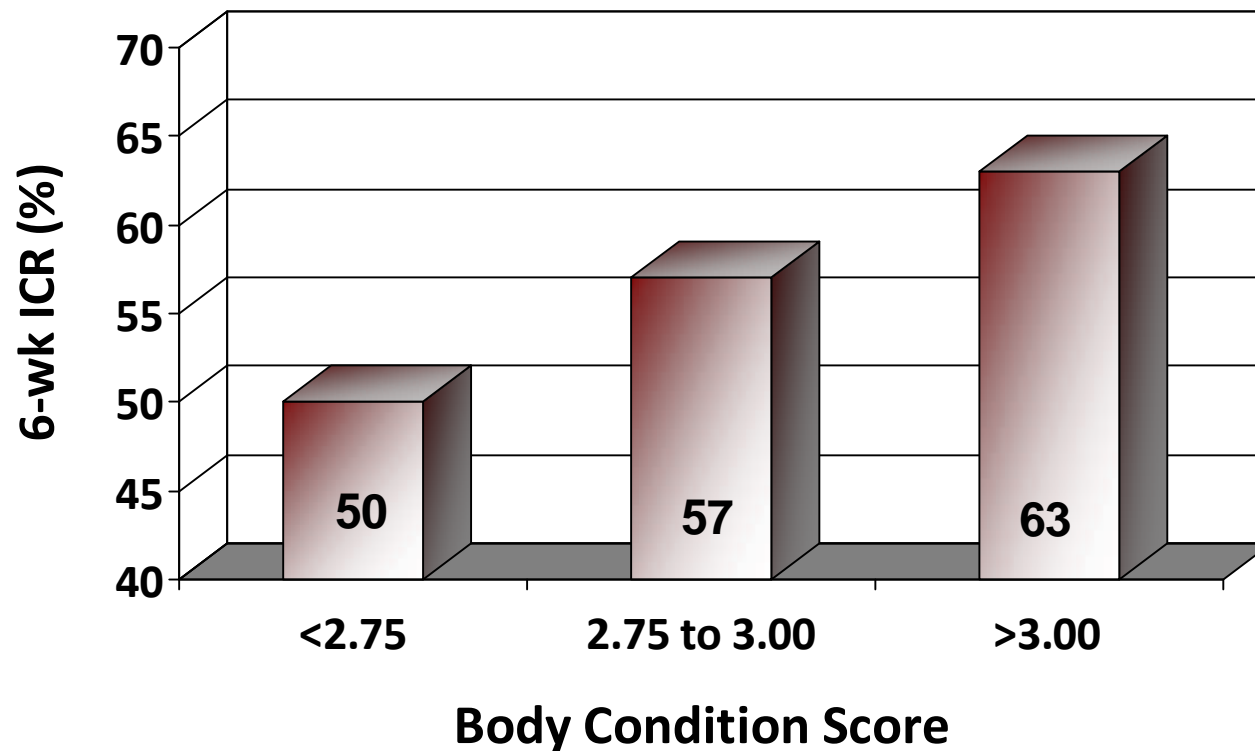
BCS 2.0



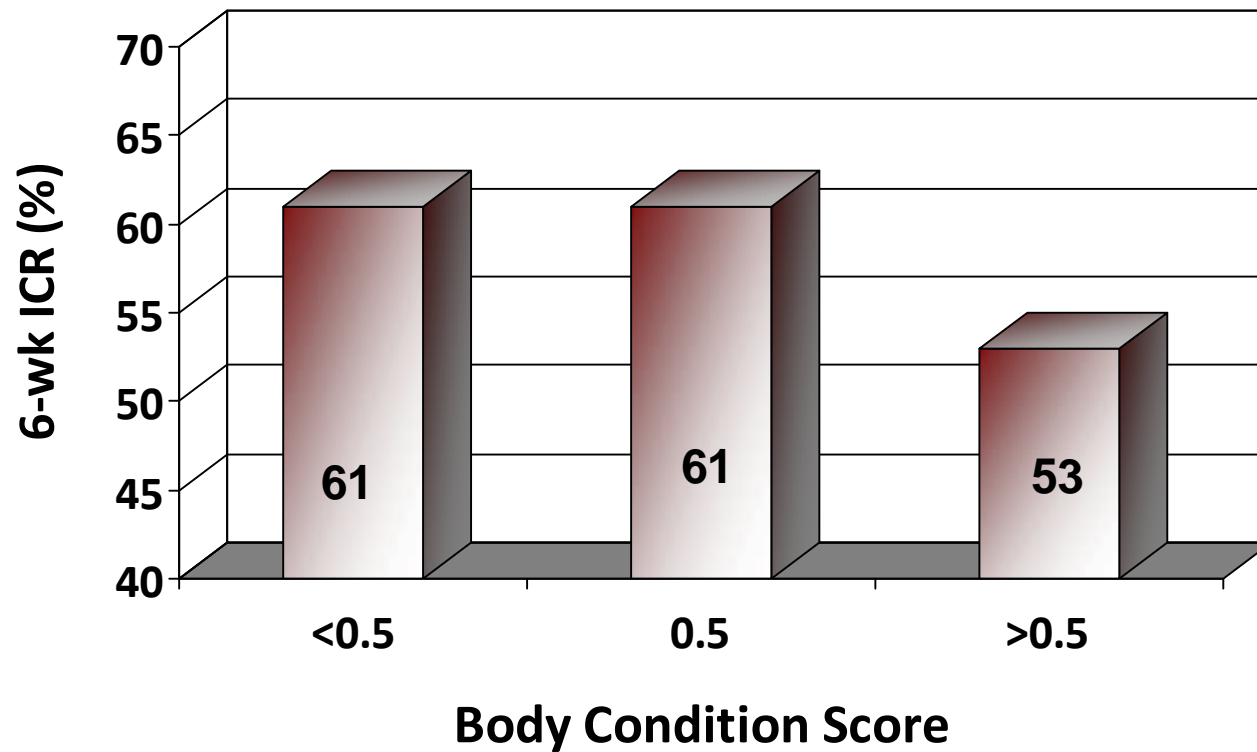
BCS and 3-wk Submission Rate



BCS and 6-wk In-calf Rate



BCS loss and 6-wk In-calf Rate



BCS recommendations

	Herd average	Cow - Range
Drying off	3.00	2.75 to 3.25
Pre-calving	3.25	3.00 to 3.50
Start of breeding	2.90	2.75 to 3.25

- **Minimise loss to no more than 0.5**
- **Key Condition score timepoints**
 - **Early October**
 - **Mid-December (All cows dry)**
 - **At calving: OAD, supplementation?**
 - **Pre-breeding: OAD, supplementation?**

Nutrition of dry cows

Silage DMD	BCS <2.5 10-12 weeks dry	BCS 2.75 8-10 weeks dry	BCS >3.00 8 weeks dry
>72 DMD	Silage + 1 kg conc	Silage ad lib	Silage restricted
68-72 DMD	Silage + 2 kg conc	Silage + 1 kg conc	Silage ad lib
64-68 DMD	Silage + 3 kg conc	Silage + 2 kg conc	Silage + 1 kg conc

Grass silage	0.25	} vs. Grass silage
Maize silage	0.25	
Straw	0.40	
Soyabean meal	0.10	

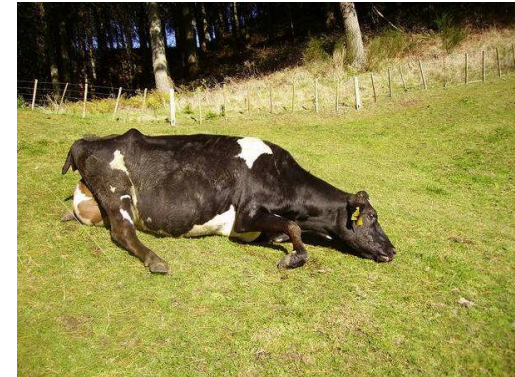
	HF TMR	Silage	P-value
BCS	3.1	3.5	0.04
BCS loss	-0.3	-0.5	0.4
SCM	28.5	30.7	0.03

Major Element Status of Grass Silage

	Mineral Status		Dry Cow Requirements g/kg DM
	2009 g/kg DM	1990-1993 g/kg DM	
Calcium	5.3	6.5	4.5-5.0
Phosphorus	2.5	3.1	2.3-3.5
Magnesium	1.6	1.8	4.0
Sodium	2.9	3.6	2.0-2.2
Potassium	18.1	24	-
Sulphur	1.5	3.1	2.0-2.2

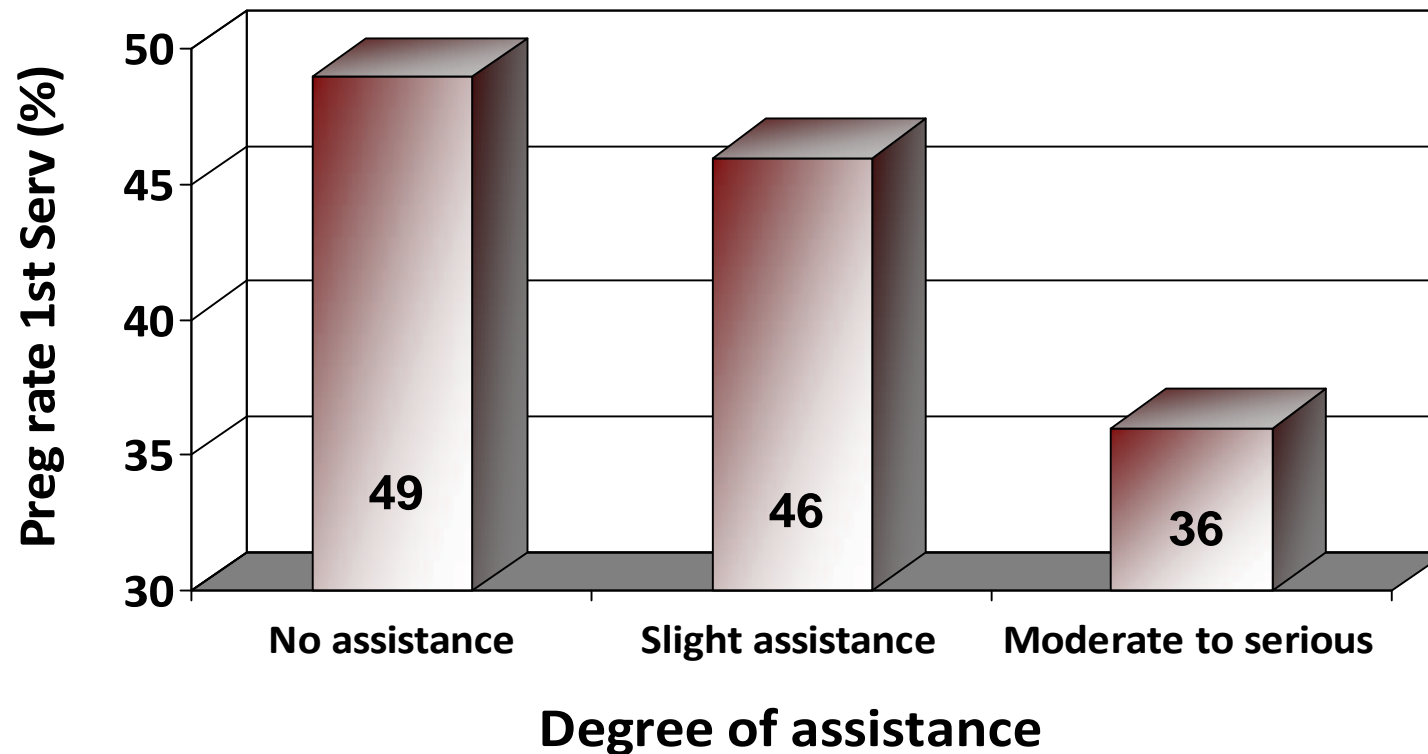
Milk Fever, Ketosis, Retained placenta

- ❑ Not a major problem in well managed herds
- ❑ Meet BCS targets
- ❑ Nutrition during dry period and early lactation
 - Energy, minerals

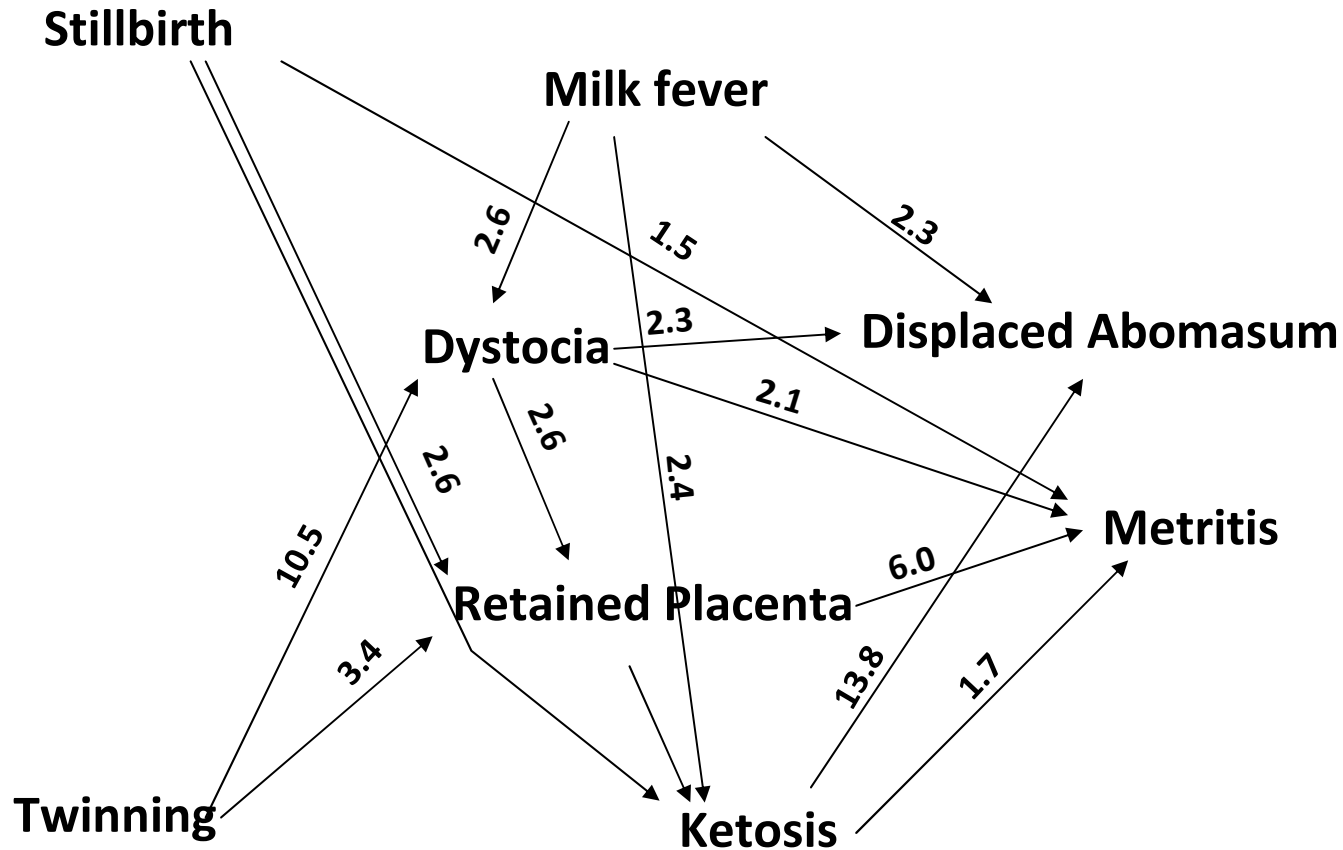


	Preg rate 1 st serv (%)	6 wk in-calf rate (%)	Empty rate (%)
No RP	48	57	14
RP	38	47	21

Calving assistance and pregnancy rate



Links between periparturum problems



Adapted from Correa et al. (1993)

Lactating cows

❑ Meeting animal energy requirements (dry matter intake)

- maintenance
- milk
- growth

❑ Deficit in “Energy in”

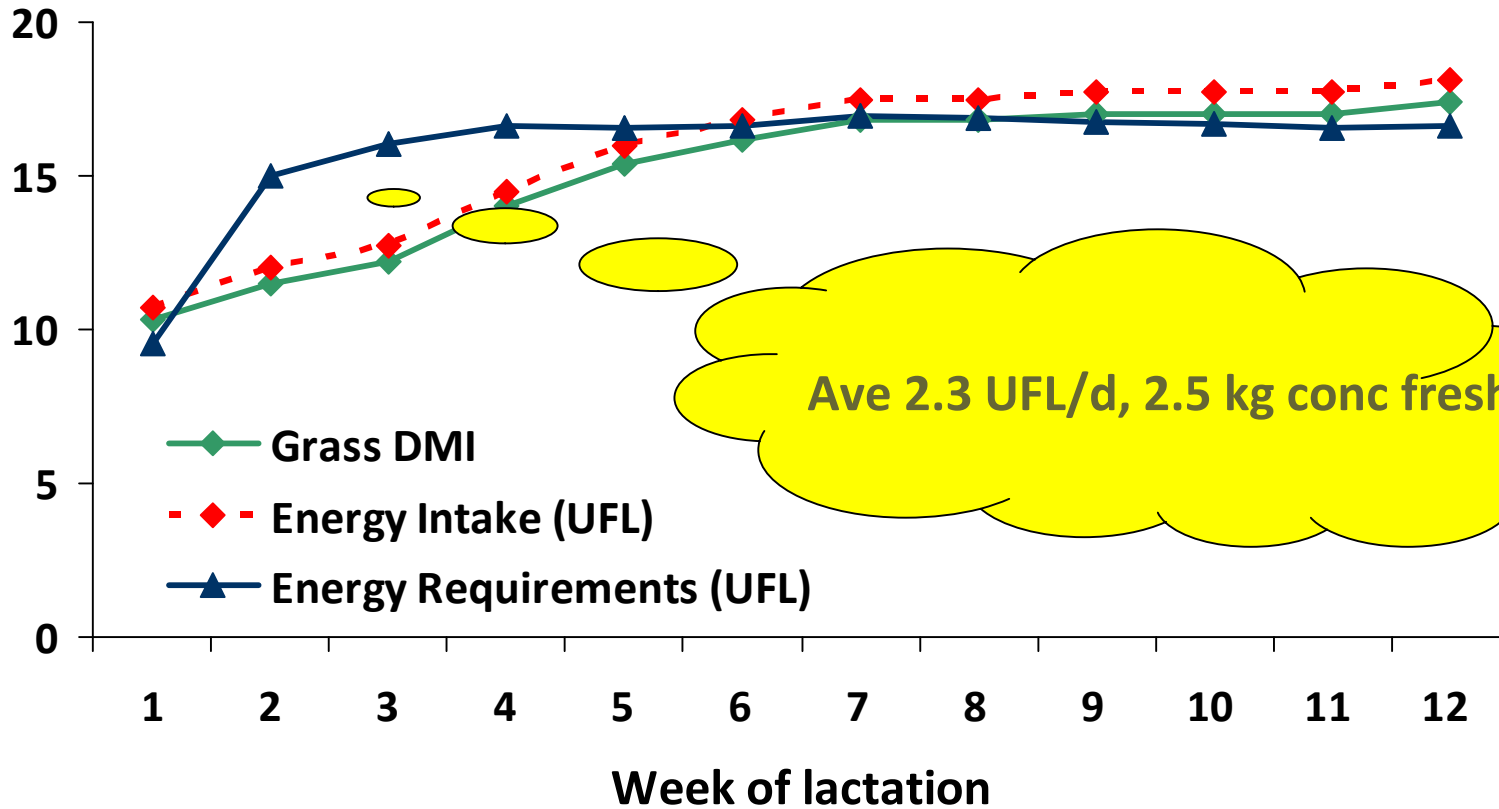
- reduced performance
and/or
- excessive BW/BCS loss



❑ Optimum - adequate nutrition to meet requirements

Lactating cow peak 2kg MS

Grass DMI (kg/cow/d), Energy intake from grass (UFL/cow/d) and Energy requirement (UFL/cow/d)



Ave 2.3 UFL/d, 2.5 kg conc fresh

Early lactation: recommendations

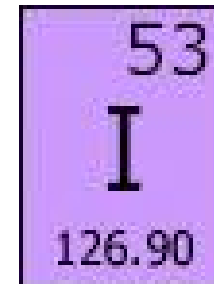
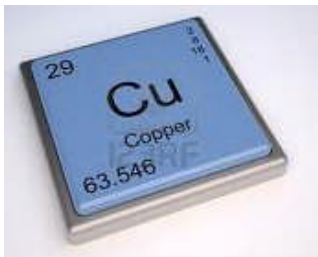
- ❑ Adequate grass intake
- ❑ Supplementation to maintain production (2kg MS, 20kg BW loss)
- ❑ Match supplement quality and quantity to grass deficit for appropriate time period
 - Quality: high energy, low protein concentrate
 - Quantity: up to 3.5 kg
 - Time: first 6 weeks of lactation

Main trace mineral deficiency symptoms

Copper	<ul style="list-style-type: none">-Poor fertility-Retained placenta-Hair depigmentation, esp. around eyes-Compromised immune system
Selenium	<ul style="list-style-type: none">-Retained placenta, metritis, cystic ovaries, anoestrous, foetal abortions, weak stillborn calves-Low sperm mobility-White muscle disease in newborns
Iodine	<ul style="list-style-type: none">-Retained placenta, irregular or weak oestrus, early embryonic death, abortion, stillbirths.-Poor appetite; reduced growth and milk yield-Blind, hairless, weak or dead calves-Goitre; more likely in newborn than adult

Trace mineral deficiencies

- ❑ Deficiencies in grass
 - region
 - fertilization strategy
 - Pasture growth rate
- ❑ Deficiencies in cattle
 - pasture deficient or imbalanced in one or more TM
 - concentrate supplementation reduced



Trace Mineral bolus study

- ❑ 1,381 cows on 5 farms (low conc. input)
 - 1,311 retained for data analysis
 - 2 Teagasc research farms
 - 3 commercial farms
- ❑ 4 treatments
 - **CONTROL:** No trace mineral bolus
 - **DRY:** Bolus at dry-off only
 - **BREED:** Bolus 6 weeks before MSD only
 - **DRY & BREED:** Bolus at dry-off & 6 weeks before MSD
- ❑ All treatments received similar nutrition management
 - Dry cow minerals
 - Concentrate in early lactation

Animax AllSure Bolus composition

- Cows <550 kg → 1 bolus
- Cows ≥550 kg → 2 boluses

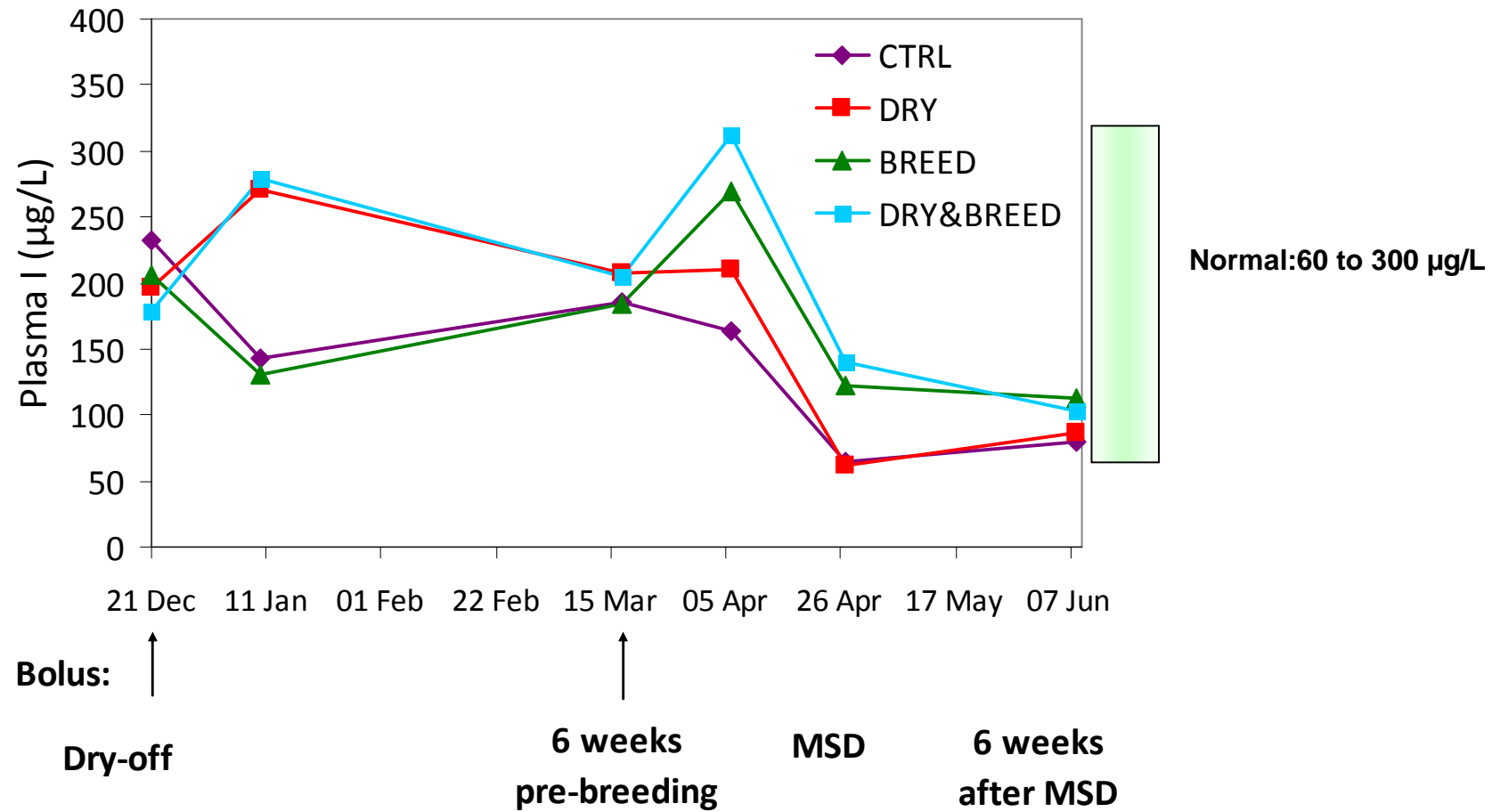
	mg/bolus	mg/day (180 days)	Approx req (lact. cow, 18 kg DM/day)
Cu*	23970	133	283
Se	500	2.8	5.4
I	3400	19	9.0
Co	525	2.9	2.0

*79.9% Cu in 30 g Cu oxide needles

River Blackwater, December 2010



Iodine



Effects of TM bolus on reproduction variables.

	CTRL	DRY	BREED	DRY & BREED	P-value
No. of cows	352	340	335	339	-
21 d submission rate (%)	80.4	82.0	78.5	79.3	0.7
Preg rate to 1st AI (%)	51.0	52.4	53.3	53.7	0.9
6-week ICR (%)	66.1	65.9	64.2	70.7	0.3
Final pregnancy rate (%)	86.3	87.0	88.0	87.9	0.9

Ryegrass Trace Mineral Profile

	Co mg/kg	Cu mg/kg	I mg/kg	Se mg/kg
North Cork	0.09	9.1	0.26	0.08
North Cork	0.11	8.7	0.22	0.06
West Cork	0.08	8.5	0.19	0.08
West Waterford	0.15	10.6	0.23	0.13
South Tipperary	0.06	9.2	0.20	0.05
Requirements* (% from grass)	0.11 (~90%)	15.7 (~60%)	0.5 (~45%)	0.3 (~27%)

*Requirements from NRC (2001)

Summary and Conclusions

- ❑ BCS major driver
 - Target BCS at calving
 - Supplement with concentrate in early lactation
 - Grass only diet during breeding season
 - Adequate for energy requirements and milk output

- ❑ Minerals
 - Supplement with dry cow minerals
 - Trace mineral deficiencies on grass only diet

- ❑ Minimize incidence of peripartum disorders

Questions?

