

Nutrition and management for a successful breeding season



Irish Holstein Friesian Association and MSD

March 14th 2024

Nutrition and management for a successful breeding season!

- Why is good fertility so important!



- **Good fertility is key for farmer profitability!**



Why is fertility so important

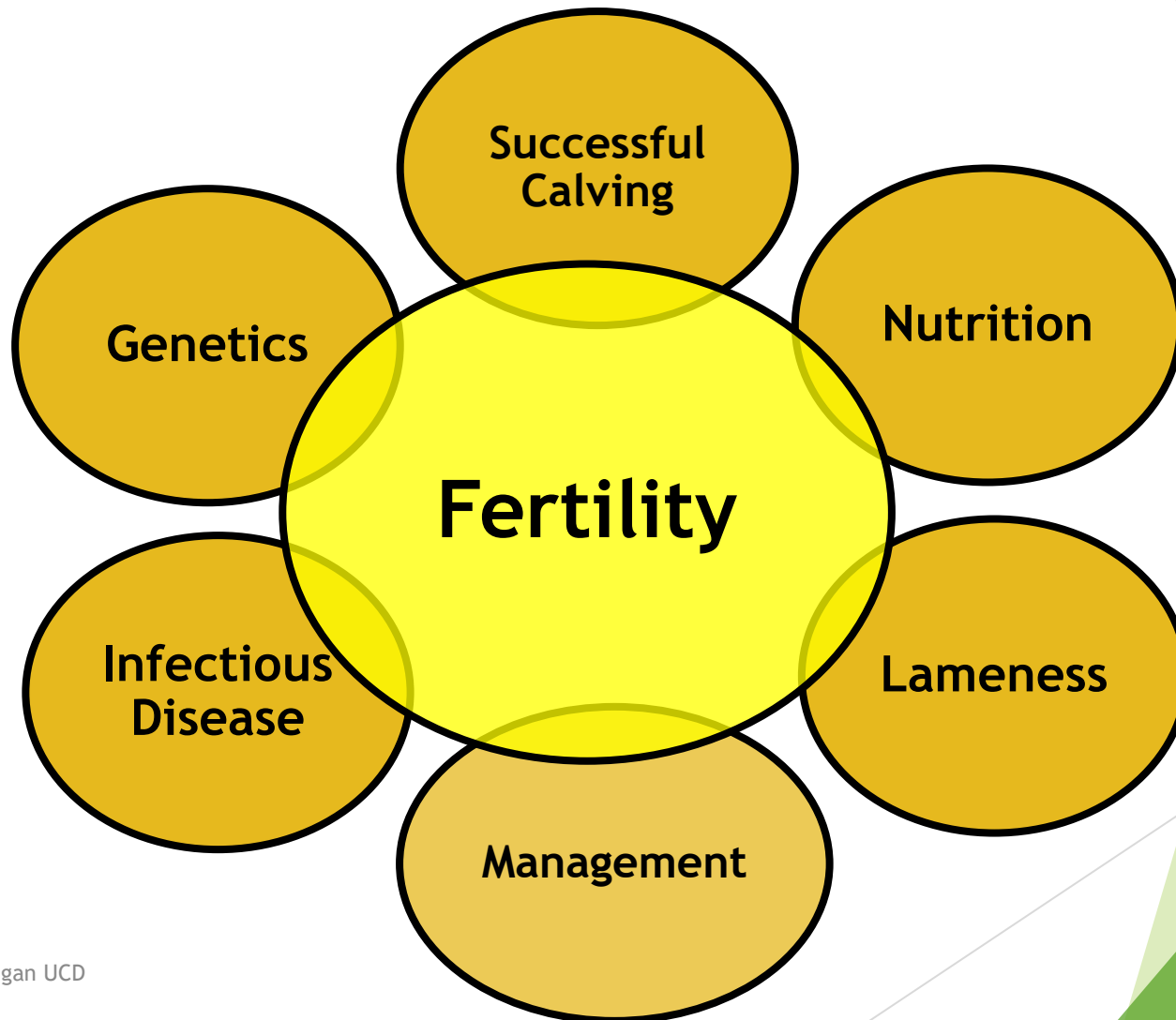
- Target 6-week calving down rate is 90%
- It costs €8.22 per cow for every % below that Target (Teagasc, 2014)
- ICBF Data
- National average
- 6-week calving down rate is 66% (ICBF, 2024)
- **Cost is €19,728 per 100 cows**

What is Successful Breeding?

Spring Calving Dairy Herd Fertility Targets

Submission rate	≥90%
Conception rate	≥60%??
6-week in-calf rate	≥75%
Empty rate	<10%
6-week calving down rate	90%
Calving interval	365 days

Many arrows need to point in the right direction!



A Successful Breeding season!

- ▶ **Topics for discussion!**
- ▶ **1. Successful calving**
- ▶ **2. Nutrition: energy status early-lactation**
- ▶ **3. Minerals and trace elements**



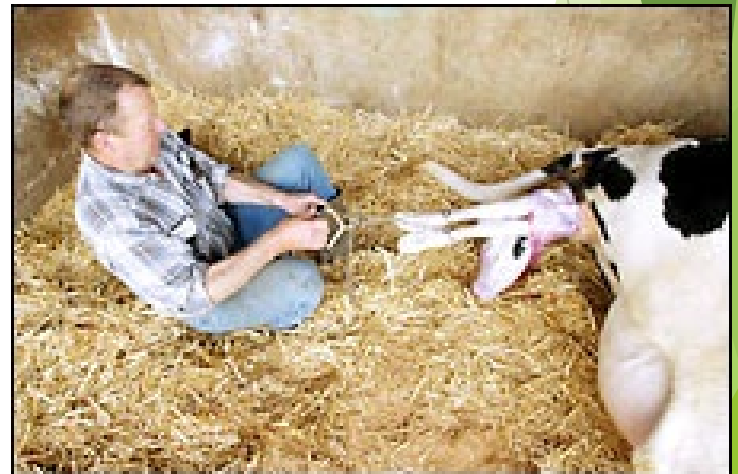
A successful breeding Season

Most disease conditions of dairy cows have their origin in the periparturient period

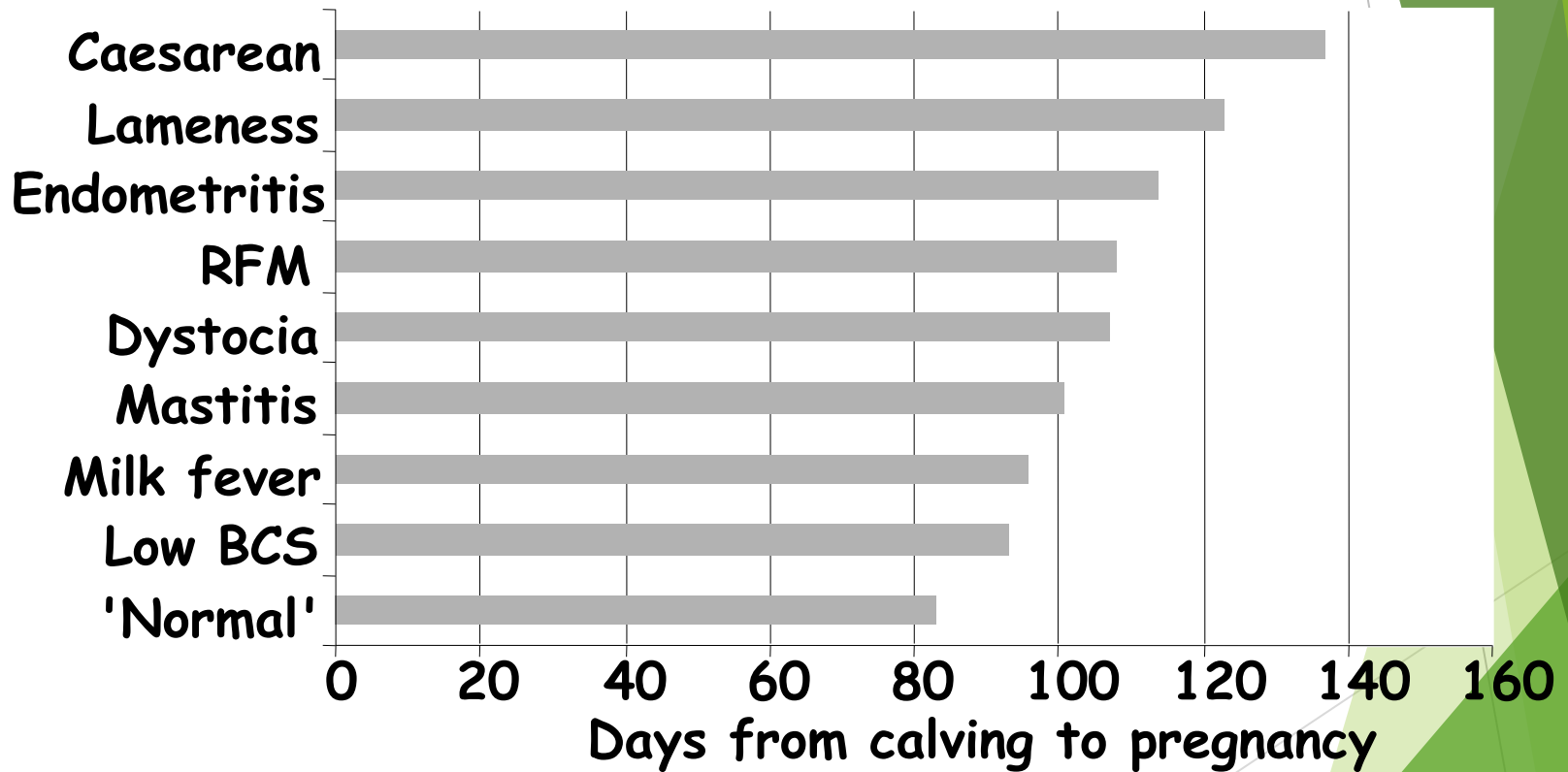
- Difficult calving
- Retained placenta
- Metritis / Endometritis
- Laminitis
- Acidosis
- Ketosis
- Fatty liver
- Milk fever
- Displaced abomasum
- Mastitis



Finbar Mulligan



The Role of Dairy Cow Nutrition in Reproductive Performance



A successful breeding season

▶ A good calving season!

▶ Excellent

- ▶ Retained placenta < 5%
- ▶ Milk fever < 3%
- ▶ Displacements = 0%

▶ Review controls

- ▶ Retained placenta 5 to 10%
- ▶ Milk fever 3 to 5%
- ▶ Displacements 0 to 3%

▶ Action Needed

- ▶ Retained placenta > 10%
- ▶ Milk fever > 5%
- ▶ Displacements > 3%

Most disease conditions of dairy cows have their origin in the periparturient period

- Difficult calving
- Retained placenta
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Fisher Mulligan

- ▶ A good calving season!
- ▶ **Things to check on:**
- ▶ Body condition score
- ▶ Was energy allowance correct
- ▶ Mineral feeding plan, was it appropriate
- ▶ Mineral feeding, was it effective?
- ▶ Feed space
- ▶ Did the silage change
- ▶ Risks with silage (High K, Low Mg, High P)
- ▶ Husbandry at calving
- ▶ Husbandry in calving pen

Most disease conditions of dairy cows have their origin in the periparturient period

- Difficult calving
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Finbar Mulligan

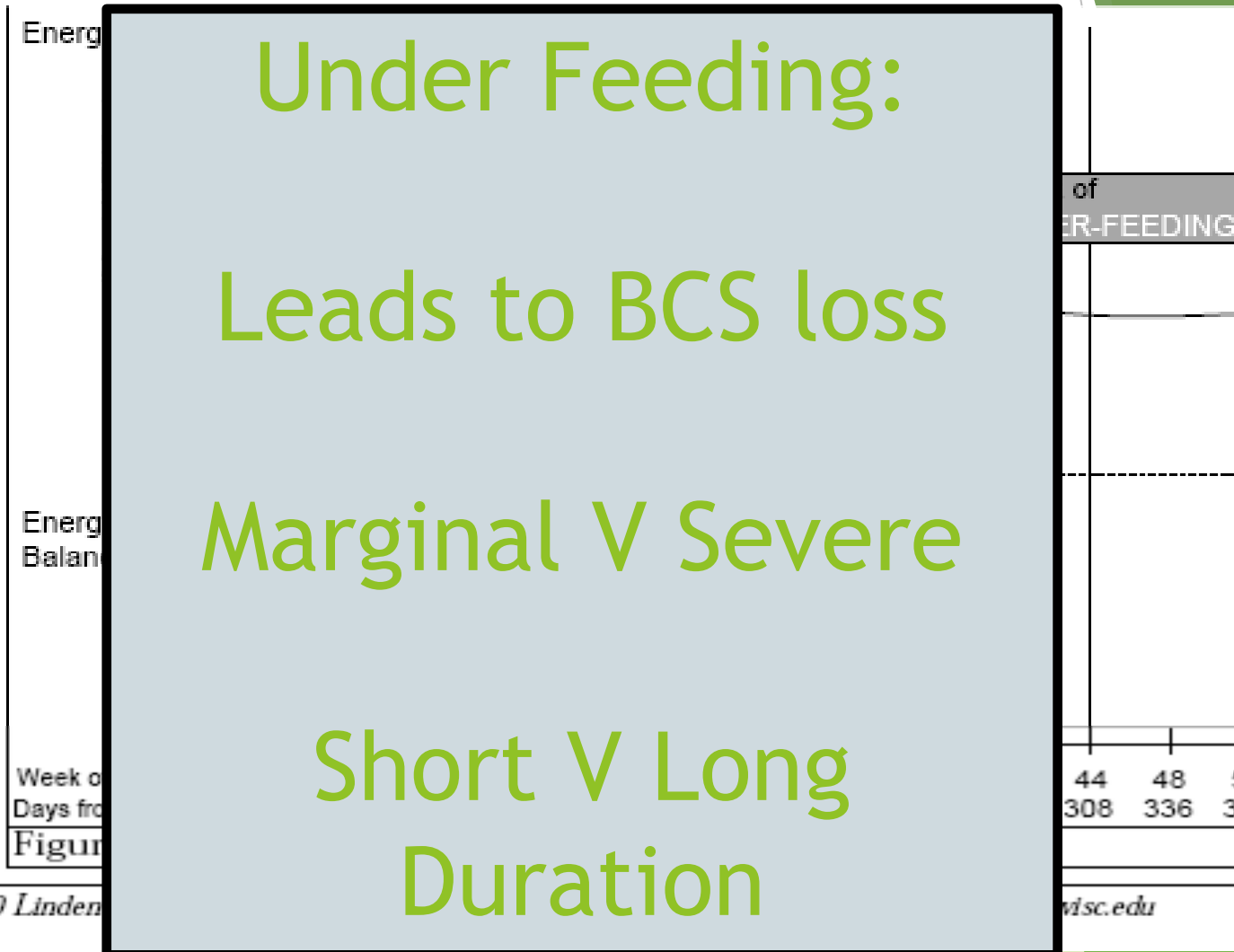
▶ Early lactation



- ▶ Focus on energy status of the cow
- ▶ Feed them a sufficient allowance of energy
 - ▶ Calculate / estimate the amount of energy they need
 - ▶ Supplement accordingly
 - ▶ Make good quality grass silage

Negative energy balance in early lactation

Source: Wattiaux Babcock Institute



A successful breeding season

- ▶ Early lactation
- ▶ Focus on energy status of the cow
- ▶ In comparison to other confined dairy production systems, grazing cows often have low energy allowance offered by circumstance or design:
 - ▶ Low grass growth in spring
 - ▶ Use of spring rotation planner
 - ▶ Medium or poor grass silage quality
 - ▶ Advice to offer only low levels of concentrate feeding
 - ▶ Grass silage shortage (Spring 2024)

Focus on energy status in Early Lactation

- ▶ Energy allowance for the early lactation cow
- ▶ Supply 100% of UFL (energy) requirements where possible (week 4 to 5 on)
- ▶ The goal is to prevent BCS loss



Focus on energy status in Early Lactation

Source Teagasc

BCS at 1st service

Pregnant at d 42 (%)

<2.5

50

2.75

57

≥3.0

66

Focus on energy status in Early Lactation

-
- ▶ Energy allowance for the early lactation cow
 - ▶ UFL requirement early lactation simple guide!!
 - ▶ 6 UFL for the cow
 - ▶ High solids herd: 0.47 UFL/kg milk
 - ▶ Crossbred herd: 0.50 UFL/kg milk (high fat milk needs more UFL, use equation)
 - ▶ Grass 0.95 to 1.0 UFL /kg of DM
 - ▶ Concentrate ask the mill for UFL /kg
 - ▶ Grass silage UFL should be on analysis (ask before sending to lab)

Focus on energy status in early lactation!

- ▶ **Lowest feed intake is in weeks 1 and 2 after calving**
- ▶ (McNamara et al., 2003)

- ▶ **Intake reduction due to:**
 - Calving /health problems

 - Poor quality silage
 - Not enough feed space
 - Not enough silage
 - Not enough feed provided (grass / meal)
 - Issues with access to water (indoors)



Forage Analysis Report

Alltech Ireland
 Farm UCD
 Material Type First Cut Silage
 Variety
 Lab Report No. L325838

Contact Emma Swan
 UCD Lyons
 Additive
 Received Date 02/10/23



Analysis (Dry Matter)	Unit	Result	Low	High
Dry Matter	%	24.9		
Protein	%	15.1		
DMD	%	68.9		
ME	MJ/kg	10.4		
Sugars	%	0.2		
Ash	%	10.6		
NDF	%	48.7		
Digestible NDF	%	62.7		
ADF	%	29.6		
Lignin	g/kg	38.0		
Oil B	%	2.5		
Intake	g/kg	100.8		
Crude Fibre	%	24.0		

Protein: s= 0.58; a= 0.68; b= 0.23; c=0.079

Dry Matter: s= 0.22; a= 0.32; b= 0.51; c=0.036

Fermentation Characteristics

pH		4.1		
Ammonia N as % Total N	%	4.6		
VFA's	g/kg	45.9		
Lactic Acid	g/kg	125.1		

PDI and Energy Values

PDIA	g/kg	27.5		
PDIN	g/kg	89.3		
PDIE	g/kg	71.0		
UFL		0.77		
UFV	kg	0.72		

Comments: Pit 1 & 2

Silage harvested 08.05.2023
 Paddocks harvested 20, 22, 25, 30, 59, 69, 70, 71

Early Lactation Cow Nutrition

- ▶ Nutrition in early-lactation:
Typical Irish Scenario
- ▶ Indoors on grass silage
(January, 1st half February,
and March 2024)
- ▶ Grass silage and grazed
grass in the diet (out by day,
in by night)
- ▶ Grazing full time
- ▶ Calving month and weather
will often dictate nutrition
in early-lactation!!

Early Lactation Cow Nutrition

- ▶ During the indoor grass silage feeding period (Jan/Feb)
- ▶ Typical Irish dairy cows often underfed when consuming grass silage in the shed
- ▶ Feed space may also be a problem
- ▶ Requirement for supplementation will depend on silage quality and milk energy yield

Early Lactation Cow Nutrition

- Concentrate requirement can be high if milking indoors
- All diets assume 12kg of grass silage DM intake, milk fat is 3.8%
- Required concentrate allowances grass silage only diet

		<u>Milk Yield kg/day</u>							
		20	22	24	26	28	30	32	34
<u>Silage DMD</u>	64	6.3	7.3	8.3	9.3	10.3	11.3	12.3	13.3
	70	5.2	6.2	7.2	8.2	9.2	10.2	11.2	12.2
	74	4.6	5.6	6.6	7.6	8.6	9.6	10.6	11.6
	76	4.3	5.3	6.3	7.3	8.3	9.3	10.3	11.3
	78	3.9	4.9	5.9	6.9	7.9	8.9	9.9	10.9

With a 70 DMD Grass Silage as
the sole forage

Typical Irish Dairy Cows
Need 7 to 8 kg of concentrate
supplement per day in early
lactation

Early Lactation Cow Nutrition

Typical Irish dairy cows often underfed when consuming grass silage in the shed



If the silage feeding period is prolonged then underfeeding is prolonged



These figures assume 12 kg of silage DM intake!!



These figures have no energy added for BCS correction in thin cows!!

A photograph of a herd of black and white cows grazing in a lush green field. The cows are in the foreground and middle ground, with some looking towards the camera. The background is a blurred green field with a fence line. The image is partially obscured by a white and green geometric overlay on the right side of the slide.

Early Lactation Cow Nutrition

- ▶ Grazing full time
- ▶ Requirement for concentrate depends on grass intake and milk production
- ▶ Check for energy allowance during spring rotation planner (Until Apr 10th)

Required feed allowance: grazing cows in early lactation

(Milk is 3.8% Fat; 3.2% Protein; BCS on Target)

Milk Yield kg/day

	20	22	24	26	28	30	32	34
10	5.2	6.2	7.2	8.2	9.2	10.2	11.2	12.2
11	4.1	5.1	6.1	7.1	8.1	9.1	10.1	11.1
12	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
13	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9
14	0.8	1.8	2.8	3.8	4.8	5.8	6.8	7.8
15	0.0	0.7	1.7	2.7	3.7	4.7	5.7	6.7
16	0.0	0.0	0.6	1.6	2.6	3.6	4.6	5.6

Early Lactation Cow Nutrition

Requirement for feed is high when grass intake is low

At low grass allowances no problem in offering 2-3 kg of silage DM after morning milking

Replace 2 kgs of grass DM with 3 kg of silage DM

Don't be wasting money if grass intake is good and feed not needed

High output cows need more feed to prevent BCS loss

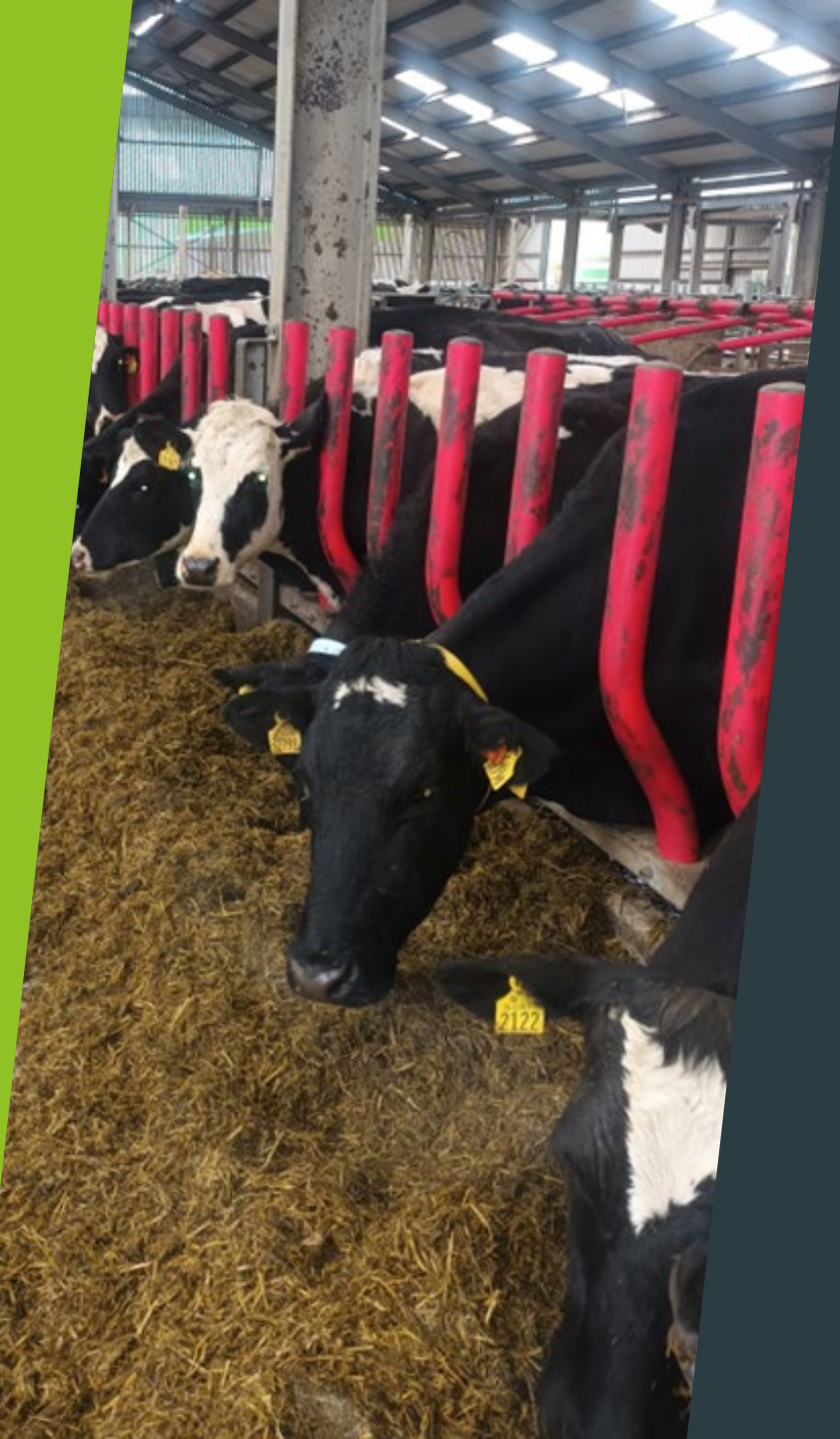
Early Lactation Cow Nutrition

- An extra month in the shed will under-feed many Irish cows!!
- If grass unavailable or restricted continue to feed for 100% of UFL
- If you don't bridge the UFL gap : cows will loose BCS



Early Lactation Cow Nutrition

- ▶ Grazing full time
- ▶ Lyons Farm Late March 19
- ▶ Daily Feed budget includes 18 kg of grass DM allocated
- ▶ 8 kg of concentrate
- ▶ Estimated intake is 23 kg DM per day (16.3 grass and 7 feed)
- ▶ This is 23 UFL per day (Maintenance plus 36 kg milk)



- ▶ March 20th 2023
- ▶ Daily Feed budget includes
 - ▶ 14 kg grass silage DM (11.62 UFL)
 - ▶ 8 kg of concentrate
- ▶ This is 19 UFL per day (Maintenance plus 28 kg milk)

Grass silage quality for late springs

► Grass Silage Quality Must be Excellent

► High Energy

► High Intake

Grass Silage Analysis Report for Dairy Cattle

Adviser's name & address		Farmer's name & address	
Edward Jordan Drummonds Ltd o/o Drummonds Ltd Alexander Reid Navan Co.Meath Tel:- e-mail:- rose.miggin@drummonds.ie-edward.jon FAX:-		Estate UCD Lyons Newcastle Co.Dublin FAX:- Mob:- Tel:-	

Sample & analysis details		Sample type	Feeding reports requested	
Sample no.	17-10-1830	Grass Silage	Dairy cows	Yes
Date received	23/10/17	Additive	Sucker cows	
Date reported	31/11/17	Cut date	Breeding ewes	Yes
HFIS no.	122,266	Cut no.	Growing lambs	
Farmer acc.		Cut system	Growing cattle	Yes
Farmer site id.	PIT 2	Comments		

Practical Feeding Information	Comments	First cut av. 2015	Range
Dry matter (%) ^{1 2}	34.7	Good	29.0 15 to 55
pH ^{1 2}	3.9	Good	4.2 3.5 to 5.0
Ammonia (% total N)	7.0	Good	9.3 7 to 15
Protein (% DM) ^{1 2}	16.6	Good	11.6 7 to 16
ME (MJ/kg DM) ^{1 2}	12.2	Excellent	11.0 9 to 12
DMD (% DM) ²	81	Excellent	71 55 to 82
FIM intake (g/kgW ^{0.75}) ³	115	Excellent	95 70 to 115



The comments above are for general guidance on silage quality only and are not covered by any accreditation system

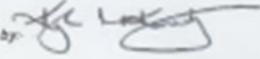
Additional Feeding information		French System parameters				
Lactic acid (% DM) ^{1 2}	8.8	PDIA	PDIE	PDIN	UFL	UFV
Lactic acid (% total acids) ²	90	30	89	90	0.92	0.89
Volatile fatty acids (% DM) ^{1 2}	1.0					
PAL (meq/kg DM) ¹	700					
Neutral detergent fibre (% DM) ^{1 2}	36					
Soluble sugars (% DM) ¹	5.3					
FME (MJ/kg DM)	9.9					
FMENE ratio	0.81					
Oil (% DM) ²	3.3					

¹ Values validated by FAA Group

² Values covered by UKAS Accreditation

17-10-1830

Approved by: 

Vive Mulcahy - HPLC Service Manager
Lorraine Mulcahy - Assistant HPLC Service Manager

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Problems with grass silage availability

- ▶ Use of Straights
- ▶ Palm kernel expeller €240/t (25c /UFL)
- ▶ Soya hulls €248/t (25c /UFL)
- ▶ Rolled Barley €265/t (23c /UFL)

- ▶ ‘Fodder stretcher’ 14% €340/t

- ▶ Source: Quinns of Baltinglass March 2024

Nutrition in early lactation

- ▶ Potential Solutions for Low BCS Cows
- ▶ Once A Day Milking
- ▶ Feed them twice a day



Milking frequency and production

J Murphy Teagasc End of project reports

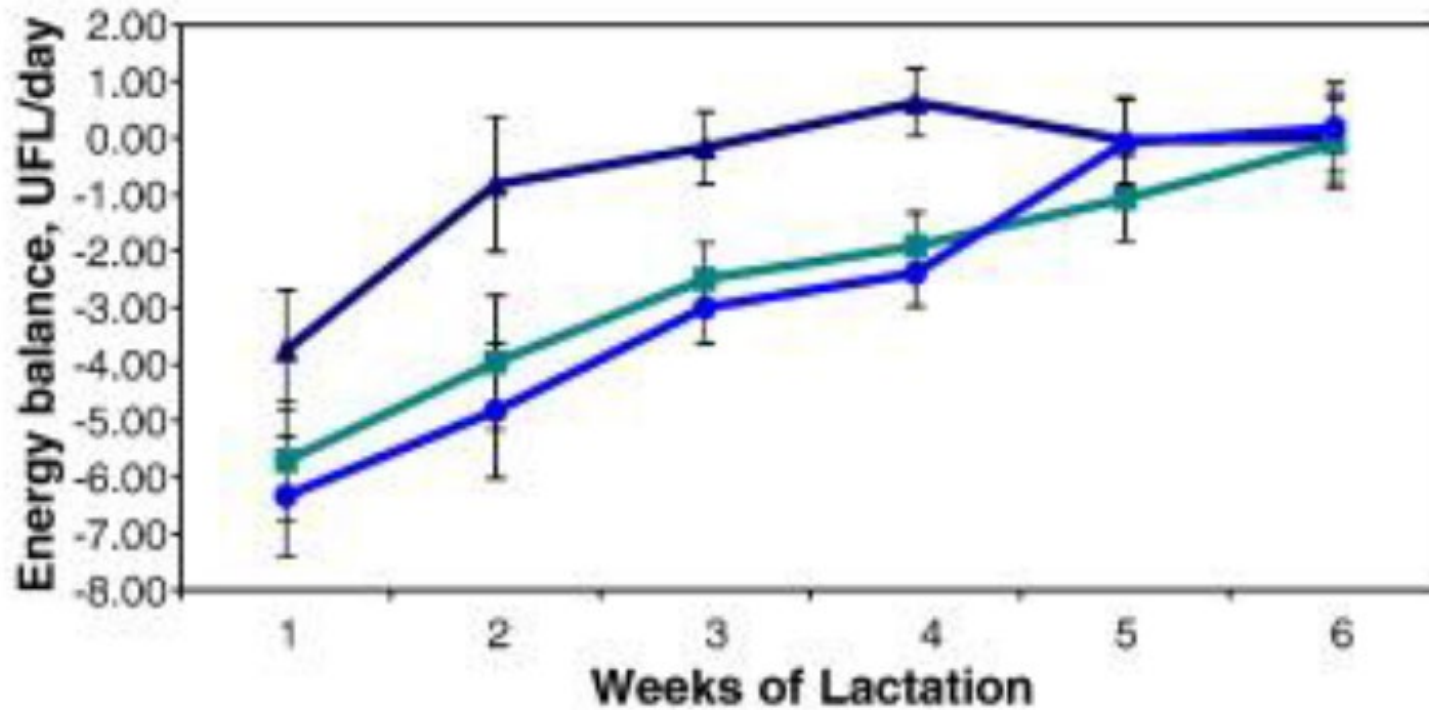
Effect of milking frequency in weeks 1-4

Milking frequency	1X	2X
Dry matter intake kg/hd/d	15.7	17.1*
Milk yield kg/hd/d	24.1	31.9*
Milk fat kg/hd/d	1.18	1.51*
Milk protein kg/hd/d	0.87	1.09
Milk fat%	4.70	4.74
Milk prot%	3.49	3.35

Generally no effects on cell count if well managed!!

Influence of milking frequency on energy balance

McNamara et al 2008



Once (▲ X1) twice (■ X2) or thrice (● X3) daily.

EARLY LACTATION NUTRITION

- ▶ Low BCS cows
- ▶ Lyons Farm 2017
- ▶ OAD for 13 high output cows (40 litres plus)
- ▶ 4 weeks pre and 1st 6 weeks of breeding season
- ▶ BCS improved 0.4 units in 10 weeks (2.40 to 2.80)
- ▶ OAD also used in Lyons 2019 and 2021
- ▶ Early lactation yield was 2.9 kg of Milk Solids per day early March 2021!
- ▶ Expect 20 to 25% reduction in daily milk and MS output with OAD!

Minerals and Trace Elements In Irish Grass

- ▶ Rogers and Murphy 2000 (1700-1800 samples)
- ▶ 32% grass low or very low in P (<0.36% of DM)
- ▶ 65.4% of Irish grass low or very low in Cu (< 5 and < 10 mg/kg DM)
- ▶ 11.1% grass high or very high in Mo (> 5 mg/kg DM)
- ▶ 46.6% of grass very low in I (< 0.2 mg/kg DM)
- ▶ 71.9% of grass very low in Se (<0.08 mg/kg DM)
- ▶ 11.1% of grass low in Co (<0.1 mg/kg DM)
- ▶ 21.4% of Irish grass low in Zn (<25 mg/kg DM)

EARLY LACTATION NUTRITION FOR DAIRY COWS

- ▶ Far too few farms sample grass for mineral and trace element analysis
- ▶ At least
- ▶ Phosphorous
- ▶ Copper (Copper, molybdenum, sulphur)
- ▶ Iodine
- ▶ Implications for fertility

- ▶ All Island Disease Survey 2015 (Eire and NI)
- ▶ Trace Element Deficiencies in submitted samples

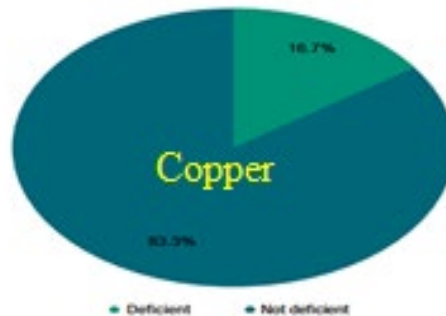


Figure 79: The number of bovine blood samples submitted to AFBI and DAFM laboratories during 2015 which were analysed for copper status and were identified as deficient or not deficient (n=11,275).

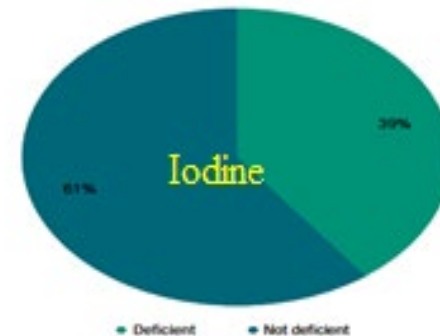


Figure 81: The number of bovine blood samples submitted to AFBI laboratories during 2015 which were analysed for inorganic iodine status and were identified as deficient or not deficient (n=3001).

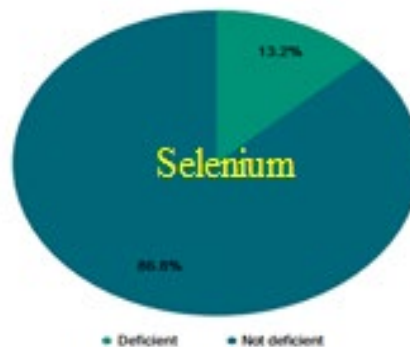


Figure 80: The number of bovine blood samples submitted to AFBI and DAFM laboratories during 2015 which were analysed for selenium status (either by blood selenium analysis or measurement of glutathione peroxidase activity) and were identified as deficient or not deficient (n=9100).

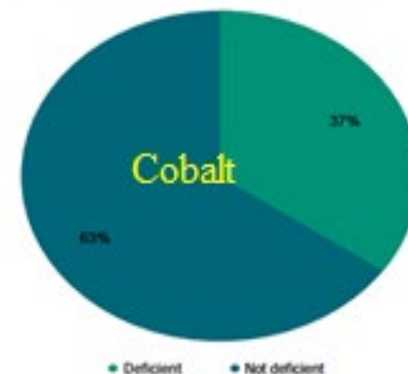


Figure 82: The total number of bovine liver samples submitted to DAFM laboratories during 2015 which were analysed for cobalt status and which were identified as deficient or not deficient (n=246).

Nutrition in Early Lactation

Example Nuts from Lyons Farm

Trace elements to be allowance in 8 kg of feed until June 1st

250 mg of Cu per day (40% from chelated or bioplex source)

Selenium to be 1.6 mg per day (as organic selenium supplement)

Iodine to be 16 mg per day

Cobalt 10 mg per day

Mn 400 mg per day

Zn 750 mg per day (150 mg from chelated or bioplex source)

Vitamins must be added:

Vitamins A, D and E to be added by the feed mill at rates equivalent to the following daily supplemental amounts in 8 kg of feed until June 1st

50,000 IU Vit A, 10,000 IU Vit D, 250 IU Vit E

Product must provide 80 g of acid buff per cow per day in 8 kg of feed until June 1st

Product must provide Live Yeast at a recommended rate of feeding in 8 kg of feed until June 1st

Biotin must be added at 20 mg per cow per day in 8 kg of feed until June 1st

Product must provide 60g Calcined Magnesite in 8 kg of feed (as fed) until June 1st

From June 1st CalMag, Trace element, biotin, and vitamin allowances to be supplied from 3 kg of fee

From June 1st acid buff and live yeast to be removed

Nutrition and management for a successful breeding season

- ▶ Nutrition and husbandry must be optimal to prevent calving problems
- ▶ Early lactation indoors with low to medium DMD silage and feed spaces issues is a risk for under-feeding
- ▶ Make sure silage is analysed
- ▶ Feed correct amounts of concentrate with grass silage
- ▶ Check feed space is adequate

Early Lactation Cow Nutrition

- ▶ Supplement to support cow energy status at grass
- ▶ Once a day milking may be useful for thin cows (chat with the vet about mastitis)
- ▶ If grass deficits arise plug the gap for example with silage / straights after morning milking or increase feed rates
- ▶ Consider mineral and trace element issues: test grass on farms with fertility problems

Thank you for listening!!

