



# Managing a High Producing Spring Calving Dairy Herd – The Learning from 2017

Dairygold Dairy Day 2018  
12<sup>th</sup> January 2018

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# UCD Lyons Project: Development of a Profitable High-Output Grass-Based Spring Milk Production System

## WHY Develop this System?

- Profitable for the dairy farmer
- Land availability/Farm fragmentation is a real issue for many dairy farmers
- Facilitates sustainable expansion
  - Farmer level sustainability
    - extra stock, land, facilities, labour, work life balance
  - National industry sustainability
    - animal numbers and the environment
  - Processing Sector
    - More milk available from equal number of cows



# Our Aim

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- To incorporate the most recent advances in grassland management for dairy farms
- Use a type of dairy cow that did not exist 15 years ago that has high milk output and fertility
- Employ the best practices from nutrition research and dairy cow husbandry



# Rationale for the System

- A high output grass based spring milk production system can be **profitable** when built on a foundation of good **grassland management and meeting performance targets** and has a place in a sustainable Irish dairy industry
- This system is not currently researched in Ireland or internationally



# Dairy Systems

## Low input

- Max utilisation of least cost feed
- Competitive resilience
- But may be suboptimal in periods of higher milk prices
- Farm expansion reliant on high animal numbers

## But what about the middle ground?

- High solids per ha
- Maintain grass focus
- Moderate use of purchased feed
- Fertility and output goals

## High input

- TMR, confinement
- High output
- Scalable
- Reliance on purchased feed
- Risky (ability to cope with volatility)?
- Complexity
- Cost control issues

For farmers that consider such systems what are the KPIs for success?





# The role of production systems and husbandry in dairy farm profitability (Teagasc 2015)

Table 1: Technical performance for manufacturing milk producing herds.

	Current <sup>1</sup>	2025	Research target
Milk delivered (kg/cow)	5,036	5,739	5,800
Milk solids (kg fat plus protein/cow)	372	448	475
Protein %	3.42	3.56	3.70
Fat %	3.97	4.25	4.50
Somatic cell count (SCC) ,000 cells/ml	215	180	<120
Calving interval (days) <sup>2</sup>	394	385	365
Median calving date (herd) <sup>2</sup>	March 3	March 1	February 14
Herd Economic Breeding Index (EBI) (€) <sup>2, 3</sup>	55	180	230
Replacements bred to dairy AI entering herd (%) <sup>2</sup>	52	75	100
Six-week calving rate (%) <sup>2</sup>	57	75	90
Replacement rate (%) <sup>2, 4</sup>	23	20	18
Labour input (hours/cow/year)	30	22	<16
Stocking rate (LU/ha)	1.96	2.15	2.94
Herbage utilised (t DM/ha)	7.36	10.0	12.7
Concentrate per cow (kg)	1,008	750	400
Greenhouse gas (GHG) (kg CO <sub>2e</sub> /kg MS)	1.10	0.97	0.83
Nitrogen efficiency (%)	25.2	26.4	33.2
Fertiliser nitrogen applied (kg/ha)	176	230	250
Net margin at 28c/l (€/kgMS) <sup>5</sup>	0.34	1.57	1.76
Net margin at 28c/l (€/ha) <sup>5</sup>	250	1,503	2,449

<sup>1</sup> Three-year average for years 2013, 2014 and 2015. The source for data in this column is Teagasc National Farm Survey (NFS) data, except for <sup>2</sup> which is from the Irish Cattle Breeding Federation (ICBF) Calving Statistics 2008-2015 [http://www.icbf.com/?page\\_id=313](http://www.icbf.com/?page_id=313).

<sup>3</sup> Current herd Economic Breeding Index (EBI) has been adjusted to reflect August 2016 EBI base change.

<sup>4</sup> First lactation animals as % of total herd, ICBF.

<sup>5</sup> Full labour costs included based on hours/cow/year in each column.

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# Dairy eprofit monitor analysis 2015

	Grass Rich		Grass Poor	
	<10%	10-20%	20-30%	>30%
Proportion of purchased feed in the diet				
No. of farms	244	831	261	56
<b>Physical</b>				
Stocking rate (LU/ha)	2.2	2.2	2.2	2.3
Grass used (t DM/ha)	10.2	9.3	8.5	7.7
Grass in diet (% total DM consumed)	92%	85%	76%	64%
Milk yield (litres/cow)	5,142	5,477	5,681	6,267
Milk solids (kg/ha)	949	955	978	1,086
<b>Financial (€/ha)</b>				
Gross Output	3,795	3,865	3,954	4,495
Variable Costs	1,173	1,358	1,599	1,990
Gross Margin	2,622	2,507	2,355	2,505
Fixed Costs	1,053	1,033	1,061	1,217
Net Profit excl. premia	1,569	1,474	1,293	1,288



# UCD Lyons Herd Targets

Parameter	Target
Stocking rate (milking platform)	3.4 LU per ha
Stocking rate (whole farm)	2.4 LU per ha
Milk yield per cow	7,500-8,000 kgs
Milk solids per cow	625 kgs
6 week in calf rate	75%
Concentrate (kg/cow/yr)	1,500 kgs
% diet as grazed grass	51
% diet as grazed grass and grass silage	75

60 cows on 17.65 ha MP



# Genetics of the UCD Systems Research Herd – September 2017

EBI	Milk	Fert	Calv	Beef	Maint	Health	Mgt
124	40.36	47.58	37.74	-8.89	5.19	0.77	1.25

## September 2017

Top 1% = €127

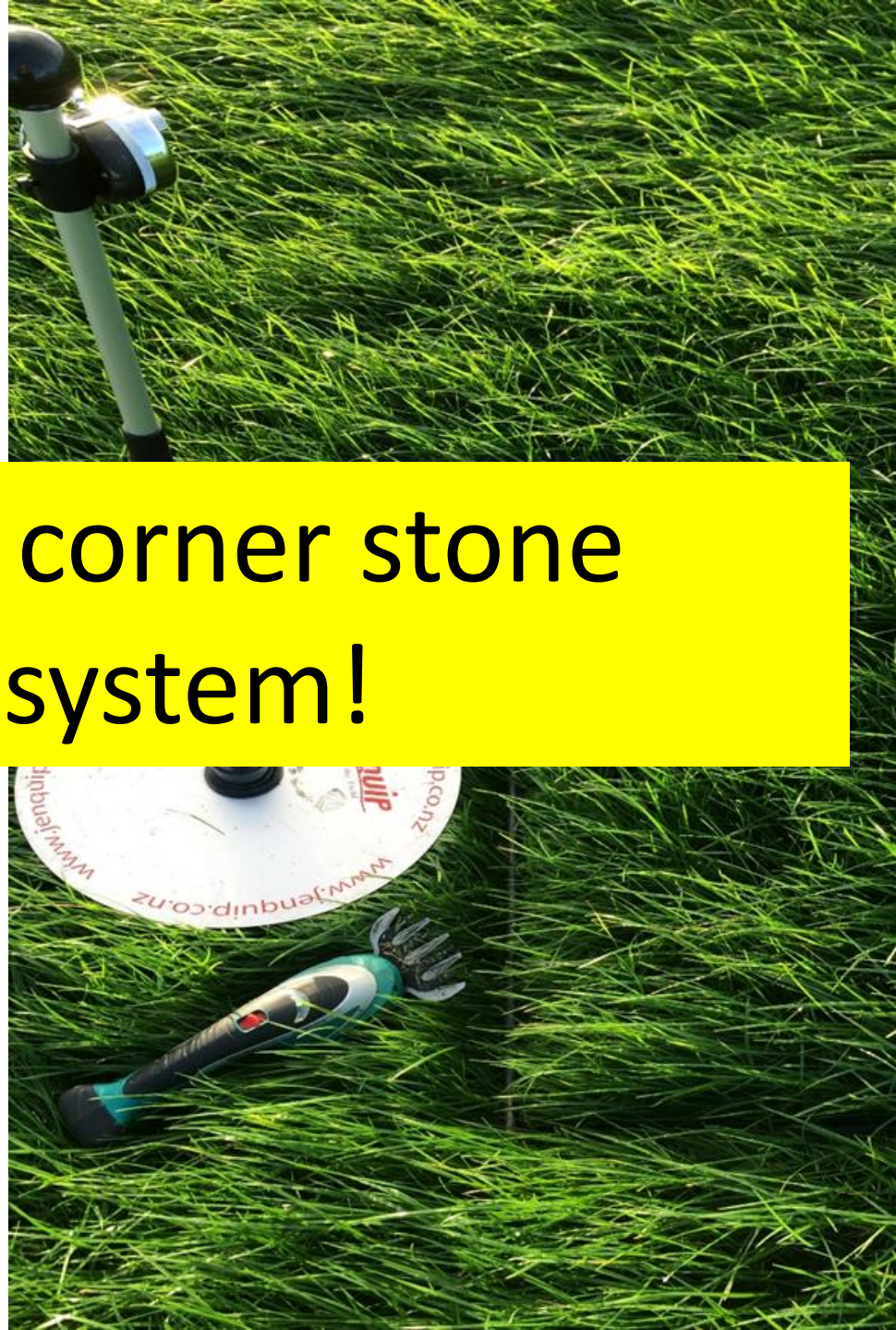
National average: €72



# Grassland management throughout the grazing season

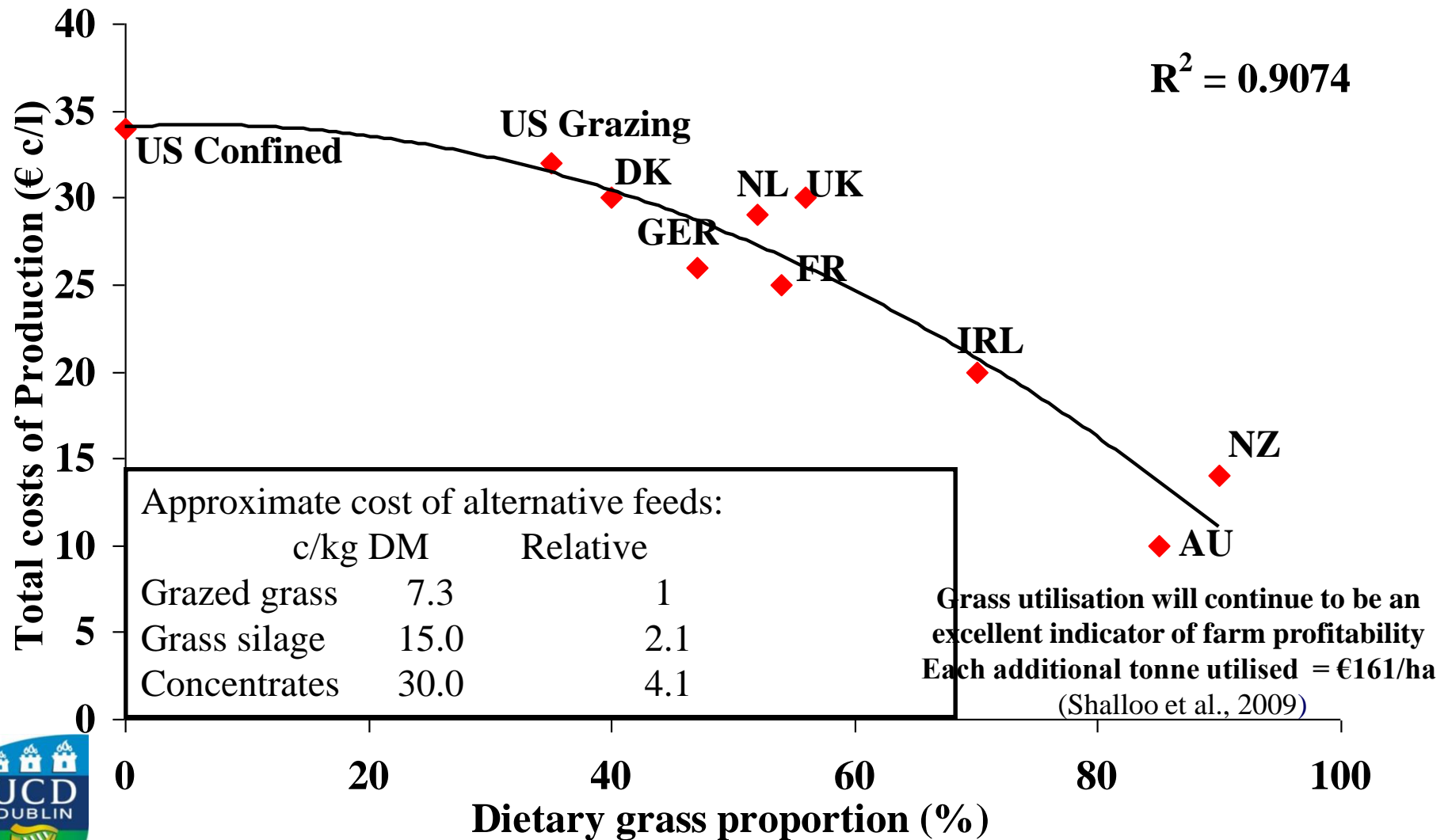
- Grazed grass is the corner stone of this system
- Grass is measured in every paddock on a Monday morning with a platometer and covers are entered
- Spring rotation planner;
- Grass wedge
- Baled silage used to manage surplus/quality
- Topping where necessary

**Grass is the corner stone  
of the system!**



# Grassland Systems Will Predominate

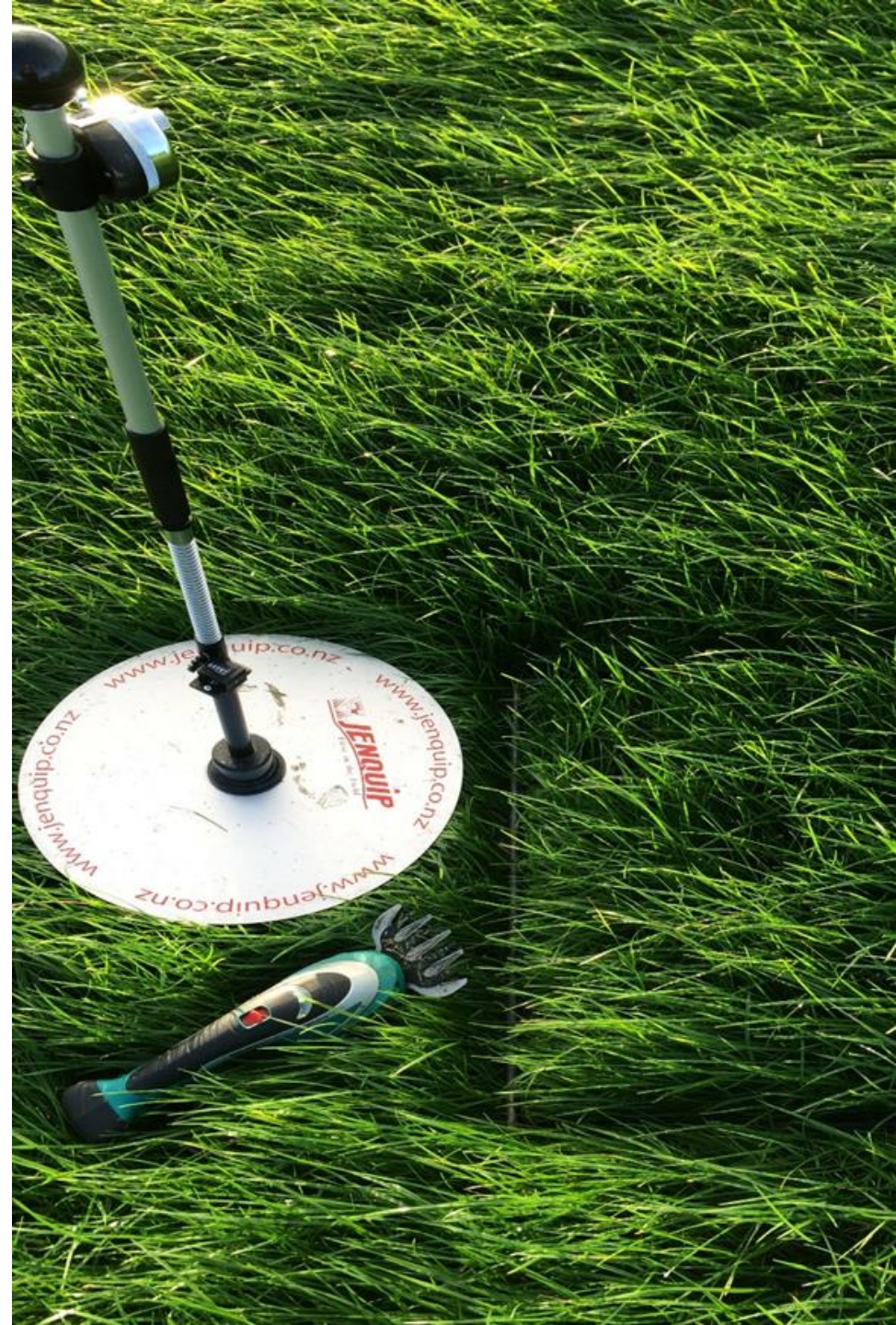
Increased grazed grass proportion in the animal diet decreases milk production costs - reducing feed, labour and capital investment costs





# Grassland management throughout the grazing season

- Grazed grass is the corner stone of this system
- Grass is measured in every paddock on a Monday morning with a platometer and covers are entered into Agrinet
- Three conventional grassland management tools are used throughout the grazing season (1<sup>st</sup> February – 21<sup>st</sup> November) to manage grass demand and supply:
  - 60:40 Autumn planner;
  - Spring rotation planner;
  - Grass wedge
- Baled silage used to manage surplus/quality
- Topping minimal but used when necessary



# 2017 Target Feed Budget

Days in Milk	0- 20	20- 60	60- 120	120- 180	180- 240	240- 270	270- 305	306- 365 (dry)	Total Annual DMI (t DM)
Milk yield	31	34	32	27	22	19	15	-	7500kgs
Silage DM	12	0	0	0	0	5.5	10	11	1.5
Grass DM	0	13.5	14.5	14.5	14	5.5	0	-	3.2
Concentrate	8	8	6	3.5	2.5	4	6	-	1.3

**Provisional tonnes DM 2017:** Grass silage 1.5; Grazed grass 3.0; Concentrate 1.3  
 Total DMI: 5.8 tns  
 52% of diet from grazed grass  
 78% of diet from grazed grass + silage  
 Approx. 4400kgs from forage



# 2018 Target Feed Budget

In order to achieve and sustain high milk and milk solids output along with good fertility, high energy intakes are essential

Days in Milk	0-20	20-60	60-120	120-180	180-240	240-270	270-305	306-365 (dry)	Total Annual DMI (t DM)
Milk yield	31	34	32	27	22	19	15	-	7500kgs
Silage DM	12	0	0	0	0	5.5	10	11	1.5
Grass DM	0	13.5	14.5	14.5	14	5.5	0	-	3.2
Concentrate	8	8	6	3.5	4	4	3	-	1.3

**Silage Quality for spring 2018:** 81% DMD, 35% DM, 0.90 UFL (12.2 UFL), 16.6% CP



High quality baled silage for buffer feeding when required

# Financial Assumptions

<b>System Comparison</b>			
	<b>Low Input</b>	<b>Moderate Input</b>	
SR Cows/ha milking platform	3.50	3.40	
Overall SR (LU/ha)	2.50	2.40	
Milk Solids (kg/cow)	450	600	
Milk Solids (kg/ha)	1,530	1,442	
Concentrates (t DM/cow)	0.30	1.30	
Grazed Grass (t DM/cow)	4.10	3.20	
Grass Silage (t DM/cow)	1.10	1.50	
Milk output (€/cow)	1,679	2,205	
Milk output (€/ha)	4,193	5,299	
Gross Margin (€/cow)	1,083	1,158	
Gross Margin (€/ha)	2,694	2,784	
Fixed Costs (€/cow)	500	583	
Fixed Costs (€/ha)	1,243	1,401	
Net Margin (€/cow)	583	575	
Net Margin (€/ha)	1,450	1,383	
Breakeven milk price (€/kg MS)	2.96	3.21	
	22.47	25.39	cent/L
* Milk price approx 30 c/L; Conc Price €310/t DM			

\*Assuming excellent technical performance from 'low input' system – 450kg MS from 400kg meal



# UCD Lyons Herd Performance – 2016 and 2017 (Provisional)

Parameter	Target	2016 Actual	2017 Provisional
Cow numbers	60	58	60
Milking Platform ha	17.64	17.58	17.65
Silage ha	9.02	9.02	7
Whole farm ha	26.6	26	24.65
Stocking rate on milking platform	3.4	3.3	3.4
Stocking rate whole farm	2.25	2.18	2.4
% heifers in herd	22	22.4	23.3

# UCD Lyons Herd Performance – 2016 and 2017 (Provisional)

Parameter	Target	2016 Actual	2017 Provisional
Average lactation days	305	301	305
Yield/cow (305d)	7750	7441	7548
Milk solids/cow (305d)	625	592	602
Yield/cow (actual)	7750	7407	TBC
Milk solids/cow (actual)	625	588	TBC (590 approx.)
Milk solids/ha MP (305d)	2125	1953	2,040
Milk solids/ha Whole Farm (305d)	1521	1291	1,440

# 2016/17 Grassland Performance

<b>Parameter</b>	<b>2016 Actual</b>	<b>2017 Provisional</b>
Grass grown kg/ha	13,060	14,000
Silage on MP (kg/ha)	1,710	2,000
Herbage utilized kg/ha	11,417	12,200
Grazed Grass utilized/ha	9,707	10,200
Grazed Grass utilized/cow	2,942	3,000
Milk from forage (kgs)	4,400	4,400 approx.
Silage ground required	9.02	7
Nitrogen MP kg/ha	235	260
P MP kg/ha	9.3	8.6
K MP kg/ha	31.7	44
Nitrogen Silage kg/ha	263	232

# 2017 Paddock Growth Comparison

Show Period    
 24/01/2017 To 20/11/2017 (300 Days)

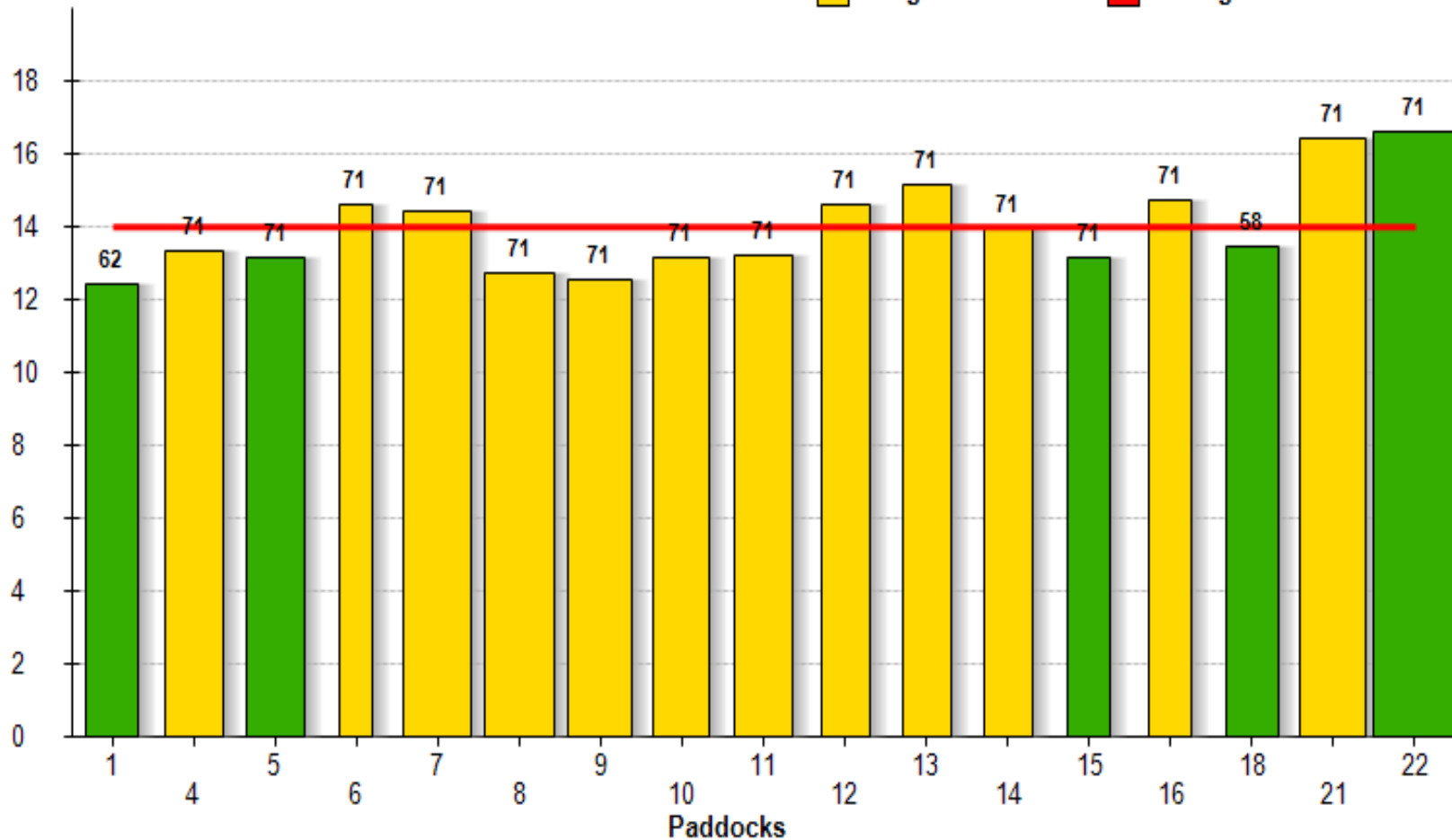
Exclude If Measured Less Than

Sorted By: Code - Ascending

Silage Cut

Average 14 Tonne/Ha

Tonne/Ha





# 2016 and 2017 Reproductive performance

	2016	2017
Number of Cows	58	59
Submission Rate %	91	90
First Service Conception Rate %	43	50
6-week Pregnancy Rate %	59	54
Empty Rate %	9 (12 weeks)	15 (13 weeks)

- Breeding started 24/25<sup>th</sup> April in both years
- 12 weeks of A.I (once/day)
- Bulls: FR2226, FR4020, FR2298, SEW, FR4019, FR4118



## Key Learnings to date:

- Cows resilient in tough grazing conditions
- Good grass utilisation possible in high output systems
- High level of milk output possible in high EBI cows
- Demonstration of high levels of milk production and fertility remains an issue





# Challenges for the system

- Cows with too much milk?
- Grazing swards to an acceptable residual and still feeding the cow?
- Achieving desirable dry matter intakes in a grazing system
- Grazing in poor soil conditions



A black and white cow is shown from the chest up, eating green grass. The cow's face is the central focus, with its large ears and dark patches on its white fur. The background is a clear blue sky with some light clouds. The grass is vibrant green and appears to be a mix of different types, including some taller stalks.

## Focus for 2018

- Increase grass grown (14.5 tonnes)
- Increase grass consumed in feed budget (3.2 t/cow)
- Improve per cow performance (625 kg of Milk solids)
- Better match grass and concentrate input
- Improve fertility performance

# UCD Team

- Prof Karina Pierce
- Prof Finbar Mulligan
- Dr Bridget Lynch
- Luke O'Grady BVMS
- Prof Alan Fahey
- Joris Somers BVMS
- Dr Michael Wallace
- Ciaran Hearn
- Dr Faisal Zahoor
- Farm staff and students at Lyons





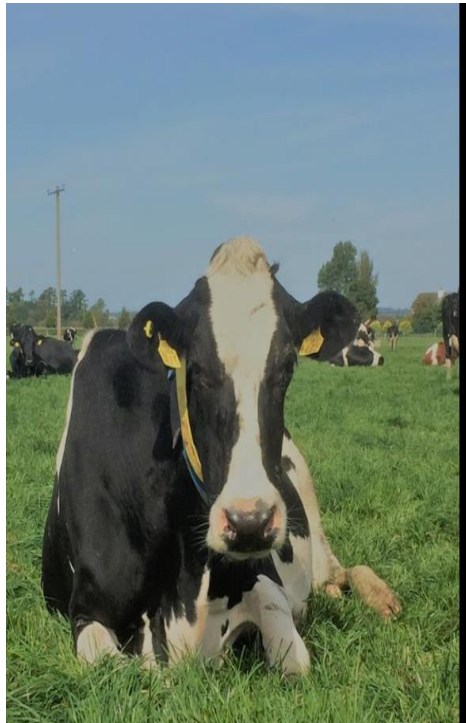
# Systems Research Herd Updates:

☐ Live since March 2017 every week

✓ UCD website

✓ Twitter

✓ Facebook



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This week's UCD Lyons Systems Research Herd Notes are online now <http://www.ucd.ie/agfood/about/lyonsresearchfarm/lyonsystemsresearchherdnotes/>

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Lyons Systems Research Herd Notes

**Background:** The main aim of the **Systems Research Herd** at UCD Lyons Farm is to evaluate the feasibility (including profitability) of a higher input/output grazing system within a limited land holding scenario. The focus is on maximising milk solids output from the existing land holding which involves high output from individual cows and high stocking rates on the MP. This will occur most efficiently through maximising the use of grazed grass/home grown forage in the system and the strategic use of supplementation thereafter. Such a system might facilitate the successful expansion of the farm business without the need to buy or rent extra land, to buy stock, to acquire extra labour or to provide extra cow facilities. For the study purpose, stocking rate and concentrate inputs are fixed. For more details on the Systems Research Herd visit <http://www.ucd.ie/agfood/welcomemessage/systemsresearchherd/>.

**Lyons Systems Research Herd Notes Week 23-10-2017**

**Farm Details:**

Area available: 17.65  
Current Stocking Rate (MP): 3.4  
Farm Cover: 699 kg DM/ha (206 kg DM/cow)  
Growth Rate: 28 kg DM/ha/day  
Demand: 40.8 kg DM/ha/day  
Supplement: Concentrate 3.4 kg/cow/day  
Average DIM: 245 (range 183-276)



**Grass Supply:** AFC on 23<sup>rd</sup> of October was

699kg DM/ha (range 217 to 1628 kg DM/ha). Cows are cleaning out paddocks very well considering the high rainfall here last week. Ground conditions are beginning to deteriorate here on the heavier parts of the milking platform but, on most paddocks, little damage is being done.

Buffer feeding of one bale/day (~4kg DM/cow) of silage began on Monday morning (23<sup>rd</sup>) to reduce the demand on the platform. Cows are given access to the silage for ~1 hour after morning milking and continue to graze outside otherwise.

Current silage quality is as follows: 33%DM, 78 DMD, 13.7% Protein, 0.89 UFL.

We began closing paddocks on the MP on the 8<sup>th</sup> October with a target to have 70% of the MP closed by 1<sup>st</sup> November. After 2 weeks we have grazed 46% of the block, which is slightly ahead of the autumn planner target of 41%.



Thank You

