UCD Lyons Systems Herd Annual Report 2024

Development of a Sustainable High-Output Grass-Based Spring Milk Production System

Summary of 2024 Findings and Research Plan 2025

- Average herd production was 6748kg milk and 563 kgs MS. Production was significantly lower than the target of 625kg MS/cow and this is attributed to a difficult spring lowering peak milk production and to frequent drought conditions over the summer months with lower grass intake and high silage intakes as a result.
- Grass growth was extremely poor in 2024. 9.3t grass DM was grown on the milking platform. The reduction in grass growth over that in 2023 is in line with that recorded in many parts of the country. The lower grass production in the last 3 years is of concern and may be related to lower nitrogen application rates to facilitate clover establishment, low soil P and in particular, prolonged periods of soil moisture deficit.
- Fertility performance was poorer than in previous years. Submission rate (24-day) was on target at 89%, 6-week in calf rate was 71% and the empty rate was 16% after 10 weeks of breeding.
- Cows were fed a 14% protein native ingredient concentrate for the entire year as has been the case in Lyons for several years now.
- Research in 2025 will focus on reducing the crude protein content of the concentrate to 12% for half of the cows and looking at the impact on the system (performance, profitability etc.) of achieving a concentrate crude protein percentage of 13% throughout the year, resulting in an increase in allowable stocking rate under the Nitrates Derogation rules. The performance of this group will be compared to the performance of a group fed a 15% protein concentrate throughout the year, necessitating a lower stocking rate based on higher organic nitrogen excretion per cow.

Overall Project Objectives

- To develop a profitable high-output grass-based spring milk production system.
- To incorporate the most recent advances in grassland management for dairy farms into a high-output system.
- Use a type of dairy cow that has good genetic indices for both milk production and fertility.
- Employ the best practices from nutrition research and dairy cow husbandry.
- Incorporate nutritional studies into a high-output system.
- To incorporate management technologies and system attributes that enhance the sustainability of dairy production.

System Targets and Genetics

The system targets are presented in Table 1. The average genetic merit of the herd in January 2024 is presented in Table 2. In the January 2024 evaluation, the overall herd EBI was within the top 5% nationally, with milk sub-index (SI) in the top 1% and herd fertility SI in the top 10%. The feed budget (target and actual) is presented on a days in milk (DIM) basis and is shown in Table 3.

Table 1: System Targets

Parameter	Target
Stocking rate on milking platform	3.27 LU/ha
Stocking rate whole farm	2.07 LU/ha
Milk yield kg/cow	7,500-8,000
Milk solids kg/cow	625
6-Week in calf rate	75%
Concentrate (kg/cow/year)	1,500
% diet as grazed grass	>51
% diet as grazed grass and grass silage	>75*

*The annual feed budget contains >90% grazed grass + grass silage on an as-fed basis

Table 2: Herd EBI (January 2024 evaluations)

EBI	Milk	Fertility	Carbon	Calving	Beef	Maint.	Health	Mgt
248 (Top 5%)	79 (Top 1%)	106 (Top 10%)	1	47	-7.1	10	10	3
	Milk kg	**Fat kg**	**Prot. Kg**	**Fat %**	**Prot. %**	**Calv int.**	**Surv %**	
	174	14	11	0.12	0.09	-5.18	2.93	

Table 3: Feed budget for 2024 (target allowances and actual feed budget)

Days in milk	0-20	21-60	61-90	91-120	121-180	181-240	241-270	271-305	306-343	344-365	Target annual amount	Actual annual amount
Silage kg DM/cow/day	5	0	0	0	0	0	5	15	10.7	8.5	1.3t DM	2.6 t DM
Grass kg DM/cow/day	10	15	15	15	15	14	7.5	0	0	0	3.5t DM	2.25 t DM
Concentrate kg/cow/day	8	8	7.5	6	3.5	3	3	3	0	0	1.5t as fed	1.52 t As fed

Production Performance 2016-2024

Table 4: Herd Milk Production Performance 2016 -2024

Parameter	Target	2016	2017	2018	2019	2020	2021	2022	2023	2024	9-year avg
Cow Numbers		58	60	59	58	57	57	57	56.21	57	57.69
MP ha		17.58	17.65	17.65	17.52	17.43	17.43	17.43	17.43	17.43	17.50
Silage ha		9	7	7	7	7	7	7	7	7	7.22
Whole Farm ha		26.58	24.65	24.65	24.52	24.43	24.43	24.43	24.43	24.43	24.72
SR on MP	3.27	3.3	3.4	3.34	3.31	3.27	3.27	3.27	3.22	3.27	3.29
SR Whole Farm	2.33	2.18	2.4	2.4	2.34	2.33	2.33	2.33	2.30	2.33	2.33
% Heifers	18-22	22.4	23.3	28	21	23	23	17.5	17.5	17.5	21.47
Average Lact Days	305	301	305	305	304	305	298	293	294	291	300
Average Protein %	3.6	3.56	3.66	3.62	3.6	3.59	3.64	3.62	3.56	3.6	3.60
Average Fat %	4.5	4.51	4.48	4.54	4.53	4.56	4.46	4.50	4.59	4.77	4.55
Average SCC	<120,000	111,000	91,500	154,000	56,000	58,000	50,000	73,000	42,000	61,000	77,389
Yield/cow kg (305d)	7750	7441	7548	6680	7541	7771	7744	7234	7145	7095	7355
MS/cow kg (305d)	625	592	602	558	597	621	630	580	580	579	593
Yield/cow kg (Actual)	7750	7407	7466	6790	7381	7503	7733	7010	7108	6748	7238

MS/cow kg (Actual)	625	588	595	544	586	606	629	562	577	563	583
MS/ha kg MP	2043	1953	2023	1850	1940	1980	2057	1838	1884	1730	1917
MS/ha kg WF	1456	1291	1428	1306	1371	1413	1468	1311	1368	1234	1354

Table 5: 2024 Grassland Management

Grass Production Parameter	
Opening cover on 8th Jan 2024 (kg DM/ha)	720
Total grass grown (t/ha)	9,275
Total number of grazings	7.2
Closing cover on 1st December 2024 (kg DM/ha)	772
Stocking rate on MP	3.27
Nitrogen (kg N/ha MP)	222
Phosphorus (kg P/ha MP)	45
Sulphur (kg S/ha MP)	25
Potassium (kg K/ha MP)	112
Turnout by day	12th February
Turnout full time	26th February
Housed by night	10th October
Full time housing	10th November
Total days at grass	233
Silage (bales) on MP (t/ha)	0.96
Herbage utilized t/ha	8,320
Grazed grass utilized t/cow	2,249
Grazed grass utilized t/ha	7,357
Milk from forage (kg)	3,718
Average concentrates consumed (kg/cow as fed)	1515
Average silage consumed (kg/cow DM)	2601

Table 6: Grassland Production Performance 2016-2024

	2016	2017	2018	2019	2020	2021	2022	2023	2024	9-Yr Average
Grass grown kg/ha	13060	14000	11700	14535	13633	13807	12102	10956	9275	12,563
Silage on MP (kg/ha)	1710	2000	1410	1979	1428	1421	2854	814	963	1,620
Herbage utilized kg/ha	11417	12200	10030	13528	12122	11598	10977	10496	8320	11,187
Grazed Grass utilized/ha	9,707	10200	8620	11549	10713	10177	8123	9682	7357	9,570
Grazed Grass utilized/cow	2,942	3000	2535	3489	3243	3112	2484	2684	2249	2,860
Milk from forage (kgs)	4400	4400	3548	4381	4612	4829	3860	4009	3718	4,195
Nitrogen MP kg/ha	235	260	265	250	235	210	182	179	222	226
Nitrogen whole farm kg/ha	219	237	229	231	195	188	159	155.7	177	199
P MP kg/ha	9.3	8.6	8.9	10	14.6	25.3	0	0	45	13.5
K MP kg/ha	31.7	44	112	120	84.7	95.3	29	47	112	75

Breeding 2024

Table 7: Fertility performance of the herd 2016-2024

	2016	2017	2018	2019	2020	2021	2022	2023	2024
Number of cows bred	58 (of 58)	59 (of 60)	55 (of 60)	58 (56 sub)	57 (54 sub)	57 (55 sub)	57 (56 sub)	57 (56 sub)	56
Submission rate 21 d%	91	90	96	95	91	95	87.5	89	89
First service conception rate %	43	49	69	60	74	72	79	70	56
6-week pregnancy rate %	59	54	83	79	87	87	84	84	71
Empty rate of total cows %*	9 (5/58)	15 (9/59)	13 (7/55)	12 (7/58)	9 (5/54)	7 (4/57)	10.5 (6/57)	8.8(5/57)	16 (9/56)

Breeding was all by A.I and was done twice daily. Bulls used were:

FR9316	DUNGRANGE DAN
FR7929	TANKARDSROCK TEAK
FR7755	CLONLAHY BOY
FR7956	WET LEGACY MUFASA
FR7923	TOBERMARTIN FRANCIS

Table 8. The weighted EBI averages of these bulls used were as follows:

EBI	Milk	Fert	Carbon	Calv	Beef	Maint	Mnmgt.	Health	Milk	Fat	Prot	F+P	F	P
€	SI	SI	SI	€	€	€	€	€	kg	kg	kg	kg	%	%
287	118	116	-5.2	49	-16.6	6.2	2	19	210	22.8	15.2	38	.25	0.14

These bulls were selected for high milk fat and protein milk PTA to ensure the milk fat and protein % stay positive in addition to selecting for good health and high fertility sub-index values. Ten bulls were selected to increase bull team reliability. From the 22nd of April, selected beef bulls were used for the remainder of the breeding season. The beef bulls being used are LM2010 (Raffertys Immanuel), AA9849 (Gabriel Vinny), and AA6682 (HW Lord Horatio).

Dissemination in 2024

- Weekly notes and annual report published on the UCD Lyons Farm website (https://www.ucd.ie/lyonsfarm/research/dairyresearch/lyonssystemsresearchherdnotes/)
- Twitter: @UCD_SystemsHerd
- Industry and farmer groups were hosted throughout the year

Research Team

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