2022 Milk Quality Farm Walk

The Maher Farm

Winners 2021 Dairygold Milk Quality Milk Award

Farm walk on November 9th 2022

Herd Profile

The herd is pure Friesian with the pure Friesian tradition having been on the farm in previous generations. These cows are very fertile and go back in calf very readily. They are very easy care cows with body condition management not a concern. They produce >6000litres each year and at 3.53% Protein and 4.24% Fat delivered 482kg of milk solids to Dairygold in 2021.

Animal Group	Num of Cows	Milk Kg / Fat / Prot	% / %	Sun% / Ci Days	Milk % Cont	Fertility % Cont	Calv % Cont	Beef % Cont	Maint % Cont	Mgmt % Cont	Health % Cont	EBI €
Cows with EBI	77	-115			€ 0	€ 115	€ 18	€ -13	€ 19	€ 0	€ 5	€ 153
Missing EBI*	0	-0.0	0.08	2.0	4.9%	64.3%	10.2%	-7.3%	10.6%	-0.1%	2.6%	
Total Cows	77	-0.3	0.07	-7.2								
1st Lactation	13	-40			€ 43	€ 103	€ 29	€ -14	€ 15	€ 1	€ 1	€ 177
		4.6	0.11	2.0	20.9%	50.5%	14%	-6.6%	7.2%	0.3%	0.4%	
		5.0	0.11	-6.3								
2nd Lactation	19	-63			€ 12	€ 100	€ 16	€ -14	€ 19	€ 1	€ 3	€ 137
		0.5	0.05	2.0	7.4%	60.7%	9.5%	-8.5%	11.5%	0.9%	1.5%	
		0.9	0.06	-5.9								
3rd Lactation	16	-51			€ 29	€ 109	€ 23	€ -10	€ 16	€ 1	€ 6	€ 174
		2.7	0.08	1.9	14.9%	56.1%	11.8%	-5.3%	8.1%	0.5%	3.2%	
		3.2	0.09	-6.8								
4th Lactation	8	-79			€ 20	€ 99	€ 28	€ -15	€ 21	€ -3	€ 3	€ 151
		4.1	0.13	2.4	10.6%	52.9%	14.7%	-7.8%	10.9%	-1.8%	1.4%	
		0.7	0.06	-5.5								
5th Lactation (+)	30	-209			€ -21	€ 133	€ 10	€ -14	€ 22	€ -1	€ 7	€ 136
		-4.7	0.06	2.0	-10%	64.3%	4.7%	-6.6%	10.6%	-0.4%	3.2%	
		-5.0	0.04	-8.6								
2. Dairy Youngstock												
2022 Calves	19	-30			€ 28	€ 100	€ 34	€ -13	€ 17	€ 3	€ 5	€ 173
Missing EBI*	0	3.2	0.08	2.0	14.1%	50.5%	16.8%	-6.5%	8.4%	1.3%	2.6%	
Total Calves	19	3.2	0.07	-6.0								
2021 Calves	35	-98			€ 10	€ 119	€ 17	€ -11	€ 18	€ 1	€ 4	€ 158
Missing EBI*	0	0.9	0.09	2.4	5.6%	66.4%	9.4%	-6.1%	9.7%	0.4%	2.5%	
Total Calves	35	-0.1	0.06	-7.1								

Figure1. EBI Report for the Maher Herd

Herd Health

The Mahers have a herd health plan completed in conjunction with their vets at Mulcair Veterinary Clinic. This process allows them to identify diseases that may pose a threat to their stock and allows them to be proactive rather than reactive to illnesses. Vaccination for clostridial diseases such as blackleg as well as vaccination for Salmonella, Leptosporosis and Infectious Bovine Rhinotracheitis (IBR) is done on the farm. This is also important from a human health point of view as both leptosporosis and salmonella can cause illness in humans.

The Mahers are also involved in the Johnes programme where they test all animals >2years old on the farm annually for Johnes. In conjunction with their vets, a Veterinary Risk Assessment and Management Plan (VRAMP) is in place on the farm to prevent any Johnes issues developing on the farm.

The present day Maher farmyard layout

Quality milk

Milk Quality is excellent. The somatic cell count (SCC) for the farm for 2021 and 2022 to date is presented in Table 1 while total bacteria count (TBC), Thermoduric Count (THD), Chlorate, trichloromethane (TCM) and average lactose results are shown in Table 2

Month	2021	2022	Month	2021	2022
Jan	-	98	Jul	129	100
Feb	103	136	Aug	151	99
Mar	83	60	Sep	183	107
Apr	81	71	Oct	156	120
May	89	71	Nov	153	
Jun	121	81	Dec	124	
			Average	118	

Table 1. Somatic Cell Count on the Maher farm for 2021 and 2022 (ytd).

Key Steps to Successful Dry Off

- Clip tails and clean udders prior to dry off
- Small groups of cows dried off (Max of 6 in parlour at a time)
- Take your time – this has to be done right!
- Stand for 30 mins post tubing
- Wash down between groups
- Clean housing and clean cubicles

thus reducing herdlevel SCC. Milk recording also allows farmers to identify cows suitable for teat sealing, without the need for antibiotics. The majority (92%) of farms in the study used some level of teat sealing.

Table 1. Milk hygiene and milk composition of nominated farms

	Average	National Average (2020)
SCC cells/ml	103,085 ± 40,745	178,000
Butterfat %	4.35 ± 0.27	4.20
Protein %	3.63 ± 0.18	3.55
Total milk solids/cow	491 ± 70	425

Mastitis control and prevention was prominent on these farms with farmers paying great attention to mastitis identification, prevention of cross transfer by cluster disinfection between infected cows on 62% of farms and with all farms implementing some pre-milking teat preparation procedure (Table 2). Milking equipment cleaning practices carried out by farmers in this study included implementing at least 4—5 hot washes per week and an acid descale wash at least once a week. Each farm exercised 'chlorine-free' wash routines which reduces the risk of chlorine related residues.

The Economic Breeding Index (EBI) is a tool to help identify profitable animals. The National average animal EBI in 2019 was 106. In this study, the average animal EBI was 143, putting this group of farmers into the top 25% nationally. The benefit of a high EBI is improved profitability and a reduced environmental footprint per unit of milk produced through a combination of improvements in milk solids output and reproductive performance/ survival.

Table 2. Milking procedures and cleaning practices on nominated farms

Mastitis Control and Prevention	% Farms
Stripping daily	54
Pre-milking teat preparation	100
Cluster dipping/cluster flush	62
Equipment Cleaning Procedure	
Hot Water ≥ 4/5 per week	100
Descale twice/week	77
Water Temp ≥ 70°C	92

Conclusion

Top quality milk is being produced on Irish dairy farms. These farms maintain high standards of cleanliness and attention to detail. Milking practices such as milk recording are beneficial for maintaining high levels of milk quality and mastitis control.

^{0}/0) contained in these products. It is advised that liquid based products have a minimum sodium hydroxide content of 21%. Powder based products are most suitable where manual washing is normally used and for small to medium sized plants, and are less suitable for automatic cleaning, whereas, liquid sodium hydroxide and acid based products (acid descale or milk-stone removal) are ideally suited for automatic cleaning. All of the new chlorine-free protocols require more regular use of acid products for the removal of mineral deposits from milking equipment surfaces. A number of new acid based 'all for one' products are now available, which can descale, sterilize and clean and are chlorate-free.

Peracetic acid: a replacement for chlorine

Cleaning protocols can include the use of peracetic acid in an additional rinse and can be used twice daily. It is advised that the caustic detergent solution be rinsed thoroughly from the plant before the additional rinse containing the peracetic acid. This is important because of (i) safety concerns and (ii) the caustic alkaline solution would neutralize the acid solution making it less effective. Further rinsing of the plant after the rinse containing the peracetic acid is not required provided that (i) the manufacturer recommended usage rate is adhered to (generally 60 ml/45 L) and (ii) the routine is completed at least one hour prior to the next milking occasion.

Hot Water for daily cleaning

Hot water is a key component of chlorine-free cleaning. A minimum of seven hot washes per week are required with liquid chlorine-free cleaning and the cleaning protocols are designed to target the hot washes after AM milking, using night rate electricity which is approximately 50% cheaper than day rate. The recommended temperature of the detergent solution at the start of circulation is 75/80^{0}C and at the end of circulation is >45^{0}C. The inclusion of a warm water post milking rinse (25^{0}C) would help to maintain the required temperature for the wash cycle. Furthermore, allowing the first 20 L of the hot wash solution to run to waste before the remainder of the solution is circulated would also assist in maintaining the detergent solution temperature. The length of the hot wash cycle should not be greater than 8/10 minutes.

Conclusions

Successful chlorine-free cleaning requires increased use of hot water, acid based products and re-calibration of automated detergent dosing equipment. While choosing a good quality detergent product is important, following the steps of one of the recommended wash protocols is critical.

non-productive stock. Improving efficiency through grassland management and genetics reduced the GHG intensity per kg milk. However, due to the increase in production minor reduction was reported per ha. Further development and implementation of low emission technologies is necessary to reduce the GHG intensity and total GHG emissions of dairy systems.

Table 1: Performance indicators for current average and future dairy systems.

	Current old model	Current new model	Target
Stocking rate (LU/ha)	2.1	2.1	2.7
Fat plus protein (kg/ha)	866	866	1,222
Replacement rate (%)	26	26	18
Calving rate (% calved in 6 weeks)	65	65	90
Fertiliser N (kg N/ha)	186	186	150
Grass utilized (t DM/ha)	7.3	7.3	12.1
Concentrate intake (kg DM/cow)	1,025	1,025	450
LESS spreading (% slurry applied)	10	10	100
Protected urea (% N applied)	-	-	100
GHG intensity (kg CO_2-eq/kg FPCM)	1.12 (0.95)[1]	0.99 (0.82)	0.74 (0.62)
GHG intensity (kg CO_2-eq per ha)	10,714 (9,111)	9,465 (7,862)	10,498(8,832)

[1]500 kg carbon sequestered per ha

Conclusion

Updates to the models and emission factors has resulted in the GHG intensity of Irish milk being reduced by over 10%. Technologies available for take up at farm can reduce GHG intensity by a further 26%. To reduce footprints further will require investment in new research strategies around methane, nitrogen and carbon sequestration.

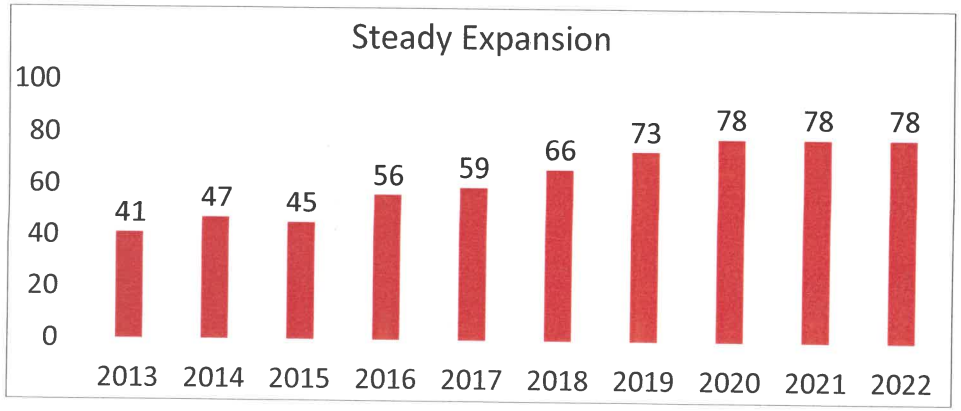
	number of non-milking animals, reduced mortality	and increase profitability		Implement good stock importing practices
Low emissions slurry spreading equipment	Less nitrogen (N) volatilisation Increases the N fertilizer value of slurry Reduces the total chemical N inputs	Retains an extra 3 units of N/1,000 gallons of cattle slurry. Worth €3.30/cow	Reduces ammonia emissions from slurry by up to 30% and nitrous oxide emissions through reduced chemical N use. Reduces footprint & total emissions	Switch to using LESS equipment for all slurry spreading
Reducing chemical N fertiliser use	Reduces nitrous oxide emissions	Reduction in farm profitability unless soil fertility is optimised, spread lime, use clover and LESS	Reduce nitrous oxide emissions and nitrate losses to water. Reduces footprint & total emissions	Get lime right first. Soil sample your farm, identify fields that need lime, P & k, make a plan
Incorporating white clover	Nitrous oxide emission reduction is achieved from lower chemical N fertiliser use (up to 100 kg N/ha)	Increased milk solids production 20-48 kg/cow per year Increased net farm profit by €108-€305/ha	Can reduce nitrous oxide emissions by up to 40% due to reduced chemical N fertiliser use. Reduces footprint & total emissions	Over a 5 year period aim to have white clover in at least 30% of your paddocks (at a minimum average annual sward clover content of 20%)

[1] Reduces footprint = reduces the GHG emissions per kg of fat and protein corrected milk
[2] Total emissions = reduces total GHG emissions from the farm

Maher Farm Details

Farm History

- 4th Generation in Killuragh
- Farm leased out for a period up to 2011
- 2013 - New entrant quota & started milk production
- 2018 – Fulltime farming
- Near derelict farmyard to what you see today



Farm Details

- Milking Platform 32ha
- Total Area Farmed 88ha
- Stocking Rate 1.3 LU/ha
- MP SR 2.5 LU/ha

Stock Numbers

- Cows 76
- R2s 35
- R1s 19

Current Performance

- Milk Yield (litres) 14.07
- Protein % 4.09
- Fat % 5.18
- Milk Solids (kg/cow) 1.34
- Meal (kg/cow) 3
- SCC 131

Herd Performance 2021

- Milk Solids - 482kg/cow
- Milk Yield - 6026l/cow
- Protein - 3.53%
- Fat - 4.24%

Maher Farm Milk Quality

SCC

Month	2021	2022	Month	2021	2022
Jan	-	98	Jul	129	100
Feb	103	136	Aug	151	99
Mar	83	60	Sep	183	107
Apr	81	71	Oct	156	
May	89	71	Nov	153	
Jun	121	81	Dec	124	

TBC	
2021	9
2022 (YtD)	11

Lactose	
2021	4.8
2022 (YtD)	4.8

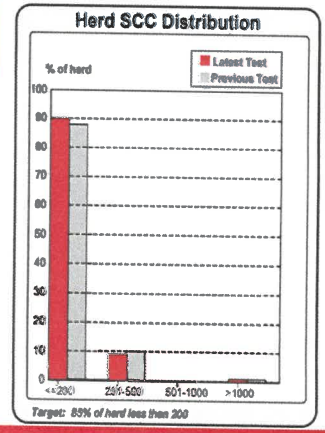
Thermoduric	
2021	82
2022 (YtD)	49

Chlorate (≤0.00375mg/kg)	
2021	0.001
2022	0.001

TCM (≤0.00124mg/kg)	
2021	0.0003
2022	0.0002

Maher Milk Quality

- Gloves at milking
- Post Milking Teat Spraying
- Milk Record early and often
- Liner change every 2,000 milkings



Maher Washing Routine

- Fresh detergent every milking
- Hot Wash every 2nd day
- Unlimited Hot Water @75°C available
- Descale x 2 per week

Milk Quality at the farm gate is as good as it gets – it cannot be improved!

Herd Health & Fertility

Herd Health

- Herd Health Plan
- Herd Screened annually for Johnes
- Vaccination Programme
  - Black Leg, Salmonella, Lepto, IBR

Herd EBI November 2022

Animal Group	Num of Cows	Milk Kg	Fat %	Prot %	Surv%	Cl Days	Milk % Cont	Fertility % Cont	Calv % Cont	Beef % Cont	Maint % Cont	Mgmt % Cont	Health % Cont	EBI €
Cows with EBI	76	-113					€ 9	€ 116	€ 19	€ -13	€ 19	€ 0	€ 5	€ 154
Missing EBI*	0	0.1	0.08		2.0		5.2%	64.2%	10.3%	-7.3%	10.4%	-0.1%	2.5%	
Total Cows	76	-0.2	0.07		-7.2									
1st Lactation	13	-40					€ 43	€ 103	€ 29	€ -14	€ 15	€ 1	€ 1	€ 177
		4.6	0.11		2.0		20.9%	50.5%	14%	-6.6%	7.2%	0.3%	0.4%	
		5.0	0.11		-6.3									
2. Dairy Youngstock														
2022 Calves	19	-30					€ 28	€ 100	€ 34	€ -13	€ 17	€ 3	€ 5	€ 173
Missing EBI*	0	3.2	0.08		2.0		14.1%	50.5%	16.8%	-6.5%	8.4%	1.3%	2.4%	
Total Calves	19	3.2	0.07		-6.0									
2021 Calves	35	-98					€ 10	€ 119	€ 17	€ -11	€ 18	€ 1	€ 4	€ 158
Missing EBI*	0	0.9	0.09		2.4		5.6%	66.4%	9.4%	-6.1%	9.7%	0.4%	2.5%	
Total Calves	35	-0.1	0.06		-7.1									

Fertility Performance 2022

Herd EBI	€151
Calving Interval (days)	377
6 week calving 2022	72%
Median Calving Date 2022	15th Feb
Days to calve 50% of herd	26
3 weeks submission rate 2022	85%
Empty Rate 2022	8.9%

Healthy, fertile cows will have longer lactations, be more productive and are more carbon efficient

Selective Dry Cow Therapy

What is it and Why?

- Selective Dry Cow Therapy – (SDCT) – Antibiotics given to only cows that need them
- Rest of Herd – Internal Teat Sealant
- Why? Increasing risk of Antimicrobial Resistance (AMR) so prophylactic use of Antibiotics needs to change to use where necessary

Maher Experience

- 2015 – 1st attempt – not a success
  - Dried too many cows at one time
- 2016 – tried again but still not a success
  - Used no sealer, problem at time of springing
- 2017 – AHI TASAH Consult with Vet
  - Following advice and directions = SUCCESS
- Now using antibiotic on individual ¼s at dry off

Steps to Success

- Clip tails and clean udders prior to dry off
- Small groups of cows dried off (Max of 6 in parlour at a time)
- Take your time – this has to be done right!
- Stand for 30 mins post tubing
- Wash down between groups
- Clean housing and clean cubicles

Hygiene, Hygiene, Hygiene!

This is a surgical procedure being done in a non-surgical environment

Clean Cow, Clean Parlour, Clean Person

Sustainability

Maximising Slurry Nitrogen

- Adequate slurry storage – spread when suitable
- LESS – maximise N value of the slurry
- No/Reduced chemical N where slurry spread
- Buffer Zones for water quality

Reducing Chemical Fertiliser N

- 70% Protected Urea in 2022 – ↓ Emissions & €€€s
- Reduced usage through better use of slurry
- Reduced usage through clover incorporation
- GPS for more accurate spreading

Nitrogen Use Efficiency (NUE) = 30%

Biodiversity

- 20 acres of forestry on farm
- Further 720 tress planted since 2018
- Hedgecutting no longer done routinely
- Herbicide only used for reseeding
- Bird boxes and sand for bees
- Watercourses fenced 1.5m from the bank
- Farming for Nature Ambassador 2021

Further Sustainability Actions

- Natural light in parlour to reduce electricity usage
- Changing lighting on the farm to LED
- Has reduced concentrate usage from 1000kg to ≤700kg/cow
- Using Reduced Protein % in dairy concentrate

PREVENTING PRODUCTION & METABOLIC DISEASE NEXT SPRING

BCS Target 3-3.25 at Calving
Fat Cows ⬆ Metabolic Disease
Thin cows ⬆ Risk of Infections

Milk Fever - BCS, Low risk silage (K)

RFM - Impaired Immunity at Calving

NEB - Quantity, Quality, Dry Matter Intake

Displaced Stomachs - Reduced DMI

Mastitis - Environment, Immunity & Dry Period

PARASITES

Diagnostic Tests
- Bulk Milk & FECs

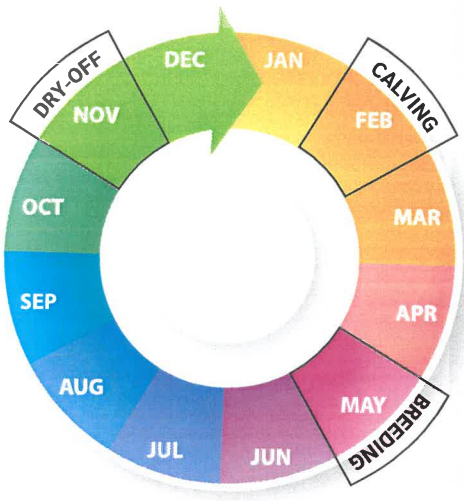
Factory Results

Farm History

Animals
- BCS, Clinical Signs

Weather
- Fluke Forecast

Consult with Vet

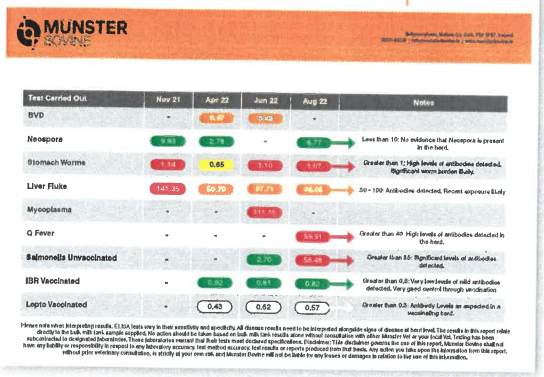


VACCINATIONS

Vaccination Planner Example:

	0-1 yr Calves	1-2 yr Breeding Heifers & Bulls	2yr+ Cows, In-calf heifers & Bulls
January		Leptospirosis	CalfScour_colostrum
February		Leptospirosis	
March			
April	ClostridialBlackleg		
May	ClostridialBlackleg		
June			
July	IBRLive	IBRLive	IBRLive
August		Salmonella	
September		Salmonella	Salmonella
October			
November			
December	IBRLive	IBRLive	Leptospirosis IBRLive

Disease Results Example:


MUNSTER BOVINE

Test Carried Out	Nov 21	Apr 22	Jun 22	Aug 22	Notes
BVD	-	[illegible]	[illegible]	-	
Neospora	0.93	2.78	-	4.77	Less than 10: No evidence that Neospora is present in the herd.
Stomach Worms	1.14	0.65	1.10	1.07	Greater than 1; High levels of antibodies detected. Significant worm burden likely.
Liver Fluke	141.35	60.70	87.75	46.68	50 - 100: Antibodies detected. Recent exposure likely
Mycoplasma	-	-	[illegible]	-	
Q Fever	-	-	-	54.91	Greater than 40: High levels of antibodies detected in the herd.
Salmonella Unvaccinated	-	-	0.70	56.48	Greater than 55: Significant levels of antibodies detected.
IBR Vaccinated	-	0.92	0.81	0.82	Greater than 0.8: Very low levels of wild antibodies detected. Very good control through vaccination
Lepto Vaccinated	-	0.43	0.62	0.57	Greater than 0.5: Antibody Levels as expected in a vaccinating herd.

Please note when interpreting results, ELISA tests vary in their sensitivity and specificity. All disease results need to be interpreted alongside signs of disease at herd level. The results in this report relate directly to the bulk milk/ tank sample supplied. No action should be taken based on bulk milk tank results alone without consultation with either Munster Vet or your local Vet. Testing has been subcontracted to designated laboratories. Those laboratories warrant that their tests meet declared specifications. Disclaimer: Title disclaimer governs the use of this report. Munster Genus shall not have any liability or responsibility in respect to any laboratory accuracy, test method accuracy, test results or reports produced from that tests. Any action you take upon the information from this report, without prior veterinary consultation, is strictly at your own risk and Munster Genus will not be liable for any losses or damages in relation to the use of this information.