



# Milk Quality Farm Walk

Friday, 17<sup>th</sup> June 2016

O'Sullivan Family Farm,  
Dunmanus, Goleen, Co. Cork



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# Welcome

## Zoe Kavanagh NDC and Billy Kelleher Teagasc

*Chief Executive National Dairy Council and Billy Kelleher, Teagasc Regional Manager Cork West*

The NDC and Kerrygold Quality Milk Awards are an important acknowledgment of the unique knowledge base and excellent husbandry skills of Irish milk producers. They recognise the hard work and commitment of our producers to the standards necessary to produce top quality milk. The combination of our natural grassland, sustainable farming practices and the dedication of our farmers and their families means we can bring quality products to markets around the world.

This award programme allows us to show consumers the excellent standards of pasture-based dairy farming practiced by Irish dairy farmers. The winners and finalists in these annual awards are reaching the top standards in terms of not just milk quality but also quality in a complete context, taking on board all of the components which drive best practice for Irish dairy farmers; they act as role models for the industry. It is not easy to get to the stage where they are today, but they have set a very high standard which farmers can aspire to.

Fifteen dairy farmers were shortlisted for inspection by an expert judging panel and prizes were awarded in a number of categories at an Awards Ceremony in October 2015. The O'Sullivan family were awarded the top prize in the NDC and Kerrygold Quality Milk Awards.

Both Teagasc and NDC would like to thank the O'Sullivan family for hosting today's event. The performance of the O'Sullivan farm is of the highest order and this event offers all dairy farmers the opportunity to learn the 'secrets to their success'. Visitors will not see any extraordinary activities or fancy ideas, just common sense and efficient sustainable dairy farming. They should be encouraged by the performance levels which can be achieved by an efficient family dairy farm.

## **Fáilte from the O'Sullivan Family**

Kieran, Catherine, Cathal, Donal and Mary O'Sullivan would like to welcome you all to our farm. It is a great honour to host this farm walk and we sincerely hope that your visit is both enjoyable and worthwhile.

When we were awarded the overall 'National Dairy Council Milk Award' for 2015, it came as a huge surprise to us and I must say it is an unbelievable honour to get this award and without doubt the biggest honour that has been given to us as a farming family.

We take great pride in being part of the great success story that is Carbery, here in West Cork. We would like to thank Dan MacSweeney and Paddy Barrett and all the team at Carbery Group, for the great work they are doing here in West Cork and beyond for the farming community. This work benefits the whole area in general and if we the dairy farmers of West Cork continue to supply them with top quality milk I'm sure Carbery will grow from strength to strength.

We would also like to thank our co-op - Drinagh, which we are proud to be both a shareholder of and a milk supplier to. Thanks to Joe O Sullivan CEO and his team and especially, Seamus Daly, Martin O'Mahony, Tim O'Regan and David Shields. We thank the co-op for putting us forward as their entrant for the NDC national awards.

We would also like to thank Teagasc; Billy Kelleher, John McNamara, and my local adviser, Pauline O'Driscoll for the work they have put in organising this walk today and the lengths they have gone to get everything as right as possible.

We would like to thank everyone who helped us prepare for this walk.

We hope you all have an enjoyable experience.



Drinagh would like to congratulate Kieran and the O'Sullivan family on their wonderful achievement.

Quality Milk is the foundation of sustainable milk production in West Cork. Farms like the O'Sullivans' are setting an example for others to follow, irrespective of scale.

Progressing sustainability of farming through Quality Milk Awards, NDC, Carbery, Teagasc and all stakeholders in the dairy industry, has always been our priority. We must continue to work together to ensure a long term enterprise for all involved.

With milk quotas gone, Drinagh see the continuous improvement of milk quality, increased volume and the implementation of Herd Health Programmes as key drivers of our industry. By focusing on strengths such as our grass based and environmentally friendly production system, there is a more secure future.

We endeavour to continue to promote profitable and environmentally sustainable dairy farming to take advantage of all opportunities.

## Farm Details

### Pauline O'Driscoll and John McNamara

Teagasc West Cork

We are farming 102 ha in total; of this 80 ha is owned and 22 ha is rented. The home farm is 54 ha including the rented land and this is available for grazing cows. There is a distance of 1.9 km from the parlour to the furthest piece of land the cows graze. Included in the total area farmed there are 30 ha of rough hill ground. A further 14 ha of land is 'wet ground'.

#### Dairy Herd Details 2016

The herd is spring calving. In 2016 there are 150 cows milking, of which 27 (18%) are heifers and 25 (17%) are second calvers. The EBI of the herd is €146. The EBI of the herd is weighted towards fertility at €114 and milk solids contributing €6. (See full details later)

#### Dairy Herd Performance 2015 (Teagasc Profit Monitor)

Total Area farmed	102 hectares (252 acres)
Average number of cows	133
Heifers in herd	20 %
Stocking rate	1.82 LU/ha (overall farm)
Stocking rate	2.44 cows/ha (milking area)
Milk Yield / cow	4,584 litres
Co-op Butterfat	4.02 % - 190 kg / cow
Co-op Protein	3.56 % - 168 kg / cow
Total Solids / cow	- 358 kg / cow
Kg of milk solids	873kg/hectare (milking area)
Milk Price (Net)	32.5 cents /litre
Meals fed	862 kg / cow
Days in milk	271 days on average



## Farm Profit

Farm profit is the most important objective. It is no good having good composition or high yields and a nice farmyard unless you are making sustainable profits. Farm performance should be assessed on the basis of comparison with other farmers. The Teagasc Dairy Profit Monitor is the system used to do this. The table below gives the O'Sullivan's' figures for 2015.

<b>Teagasc Dairy Profit Monitor Results for Kieran O'Sullivan 2015</b>		
	<b>2015 (c/l)</b>	<b>2015 (€/cow)</b>
Co-op Milk Price	32.5	4.02% Fat 3.56% Prt
Milk Sales	30.21	1,385
+ Calves & cull cows	6.71	306
- Replacement heifers	4.10	188
+ Increase in cows	0.92	42
<b>Total Dairy Output</b>	<b>33.74</b>	<b>1,545</b>
Meal	4.80	220
Fertiliser & Lime	2.35	108
Veterinary	1.51	69
A.I. / Breeding	0.56	26
Contractor	0.19	9
Other Variable Cost	1.80	82
<b>Total Variable Costs</b>	<b>11.21</b>	<b>514</b>
Machinery Costs	5.07	232
Car, ESB and phone	1.43	66
Depreciation	2.42	111
Other Fixed Costs	1.04	48
<b>Total Common Costs</b>	<b>21.17</b>	<b>971</b>
<b>Common Profit</b>	<b>12.57</b>	<b>576</b>
<b>Return for family labour</b>	<b>8.00</b>	<b>367</b>
<b>Remaining Profit</b>	<b>4.57</b>	<b>209</b>
This remaining profit is to cover bank repayments, interest, tax, hired labour, land rent & return on capital		

# High Milk Quality Increases Profit

## Milk Quality 2015

Milk Quality bonuses (SCC and TBC), including the Drinagh Co-op bonus for being SDAS approved, were worth €3,860 to this farm in 2015 or €29 per cow.

Average	
TBC	6,000
SCC	72,000

This table below gives the quality results for 2015 and 2016 to date (all figures in ,000 cells/ml).

2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
TBC		9	7	5	6	5	6	4	4	5	11	7
SCC		53	58	59	57	62	59	71	81	103	94	92
2016	Jan	Feb	Mar	Apr	May							
TBC		4	4	3	3							
SCC		68	44	53	49							

## Milk Composition 2015 – 2016

2015 Average	
Butterfat	4.02%
Protein	3.56%

2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
BF %		3.69	3.60	3.70	3.82	3.83	4.04	4.14	4.35	4.54	4.83	4.54
Pr %		3.37	3.03	3.25	3.47	3.54	3.53	3.68	3.86	4.05	3.94	3.67
2016	Jan	Feb	Mar	Apr	May							
BF %		3.78	4.03	3.86	3.77							
Pr %		3.37	3.22	3.41	3.44							

# Economic Breeding Index (EBI)

## Herd Summary Report – May 2016

The Economic Breeding Index of this herd				
Milk Solids			€6	4% of the herd EBI
Milk (kg)	Fat (%)	Prot. (%)		
-107	0.08	0.07		
Fertility			€114	66% of the herd EBI
Calving			€26	
Beef			-€13	
Maintenance			€12	
Management			€1	
Health			€1	
Overall EBI			€146	

- The EBI of the breeding heifers is €170
- The EBI of the heifer calves is €177

The EBI is the most accurate way of establishing expected profit from your herd from breeding. You should use it for selecting AI bulls. Use bulls from the “Active Bull List” that will increase the particular areas of your herd EBI you want to improve. Increasing your herd EBI will increase your farm profit.

You can get an EBI for your herd by joining HerdPlus. Contact ICBF at 1850 600 900 for more details.

## Breeding

Bulls are selected with high EBI and as high a British Friesian % as possible. 50% British Friesian is the minimum Kieran will use. From this short list, bulls with high Kgs and % protein are chosen for use on the herd.

### Calving Pattern

Spring 2016	
Planned Start Date	1- Feb
Days to calve half the herd	23 days
Median calving date	24-Feb
Calved in 3 weeks	45%
Calved in 6 weeks	80%
Calved in 9 weeks	90%

### Fertility

Spring 2016	
Calving Interval	372 days
Submission Rate (21 days)	87%
Breeding 2015	
Not in calf (after 12 weeks breeding)	5%

# Milk Quality on this Farm

Don Crowley

Teagasc West Cork

## Milking Routine

- Gloves are worn at every milking.
- Every cow gets dry wiped with a paper towel every milking. If teats are dirty they are washed and dried after with a paper towel.
- Texts from Drinagh Co-op are used to monitor SCC from one collection to the next.
- If a high cell count comes from Drinagh via text message, all cows are checked to find the high cell count cows and quarters. Identified quarters are then treated immediately.
- After milk recording any cow with high cell count is checked with the CMT test kit to find the high SCC quarter. This quarter is then treated until cured. The cow will again be checked with the CMT kit to ensure she has cured before her milk is allowed back in the tank. (CMT = California Mastitis Test)
- Cows are teat sprayed after every milking – the motto is “spray the whole of the teat every time”. Blueguard teat spray is used. Kieran finds it good for teat condition.
- Tetra Delta milking cow tube is the usual product used. All mastitis milk is dumped until mastitis is cured and the withdrawal period observed.
- The parlour has a cluster flush system that rinses out and disinfects clusters after each cow. This helps prevent any cross contamination between a high cell count cow and the next cow to be milked.
- In spring, fresh calved cows are milked last. This milk is collected in the recorder jar and kept out of the tank for four days after calving; this milk is fed to calves.
- When a cow’s milk is not to go into the tank, Kieran clips a clothes peg onto the transfer lever as a reminder to keep that cow’s milk out. A simple and effective memory aid!
- The herd is milk recorded every month. Recording is used to monitor SCC, for breeding purposes and for selection of animals for culling.

## Milking Machine and Bulk Tank Washing Routines

- After milking, clusters are washed on the outside first.
- After milking, the plant is rinsed out with 400 litres of cold water, the first 100 litres are let run to waste with the filter in, then the filter is removed and the remaining 300 litres is circulated and checked to make sure it is clear. This is a good check that all jars are set for washing.
- Hot water is then drawn through the plant and let run to waste until the returning water is very hot. Then the hot wash solution (Hydrosan

liquid) of 200 litres is made up and the plant is washed with this for 8 to 10 minutes ONLY - so the water remains hot.

- This hot wash solution is then retained for the morning wash.
- The plant is then rinsed out with 300 litres of cold water, so it is ready for the morning milking.
- After the morning milking the procedure is repeated, except this time with the cold solution retained from the previous evening and the solution is dumped after this second use.
- Bulk tank – this operates on an automatic wash system using detergent and descaler from small drums so the volume used can be checked, Hydrosan is the product used.

### Parlour

- An 18 unit parlour was built in 2010. Dairymaster individual feeders are in the parlour, with cluster removers, and a cluster flush system.
- The milking machine is given a full service every year and liners are changed twice a year.

### Cow Cleanliness

- Farm roadways and yards (*entrances and exits*) are kept clean and scraped/washed down to prevent build up of excess dirt and teats becoming dirty.
- When cows are housed, cubicles are scraped down twice a day and limed during winter.
- If and when housed while milking, cubicles are limed twice a day with Agrical, to keep dry and disinfected.
- Calving sheds and calf sheds are cleaned out after turn out, power washed and disinfected.

### Drying off

- First calvers are dried off from mid-October on, depending on Body Condition Score (BCS) and calving date – target 10/12 weeks dry for 1<sup>st</sup> calvers.
- Cows are dried off using BCS and expected calving date.
- Cows are milked twice a day until drying off. They are then dried off abruptly in batches. They are then grazed on the rough ground on the hill until mid-December.
- The herd are treated for fluke with Fasinex when they are dried off and treated with Zanil when they are housed for rumen fluke.
- Cephavin is the product used for dry cow treatment; teat sealer is not used at present.

### **Strengths of the O'Sullivan System to ensure good milk quality**

- The overall hygiene is excellent. There is a very good solid and structured cleaning procedure.
- Yards, housing and roadways are well maintained and kept clean
- Milking is stress free – good routine, regular milking times. Good handling and drafting facilities.
- Constant use of information – milk quality issues monitored through text messages received from Drinagh co-op, reports from milk recording and ICBF etc.
- Records and routine – use of coloured tape / straps to indicate day cows calve/ mastitis cases etc.
- Recording of data on the whiteboard in the parlour, the chart in the dairy and use of a daily diary.

## Milk Quality Guidelines

### *Common milking machine faults:*

- Wrong fall in milk line and milk line entries not in the top third of the main milk line
- Vacuum problems i.e. inadequate reserve or high vacuum levels
- Blocked air bleeds
- Faulty pulsation
- Liners not changed regularly
- Stray Voltage

### *Milking practices and routines faults:*

- Taking clusters off under vacuum
- Poor infection control during milking
- Over milking
- Not milk recording
- Inadequate replacements

### *Poor infection control: some examples:*

- Pre-stripping cows with no gloves or no pre-spraying
- Not properly applying post milking teat spray
- No disinfection of clusters after problem cows
- Culling the wrong cows
- Ineffective dry cow therapy
- No isolation of problem cows i.e. not milked last or kept separate from main herd
- Poor teat condition

By examining the key areas listed above, a dairy farmer and his/ her adviser can identify the source of their problem and the potential solutions.

### *Solving a somatic cell count problem*

- Stop the spread of infection by correctly teat spraying and dipping all clusters post milking. This has been found on farms to be the single most effective way to reduce cell count and mastitis, caused by contagious mastitis.
- Stop damage to teat ends caused by milking machines and poor milking practices.
- Regular cell count testing at least 6 times per year through milk recording is essential, to correctly identify cows that should be culled. Thousands of cows have been culled wrongly, due to inadequate records.
- Prompt and effective treatment of clinical cases is essential, along with appropriate dry cow tubes and the use of teat sealers.
- Always seek advice to help you solve a SCC problem.



### *Maintaining a low somatic cell count in your herd*

- Wear disposable gloves at every milking.
- After milking, teat spray all cows.
- Dip clusters after clinical cases and high cell count cows.
- Ensure milking machine is serviced annually and the report is available for independent assessment.
- Milk recording; a minimum of 4 times per year is an essential tool in managing cell count.
- Prompt and effective treatment of clinical cases and appropriate dry cow tubes and the use of teat sealers.

# Minimizing Bacterial Counts and Residues in Milk

David Gleeson and Bernadette O'Brien

Teagasc, Animal and Grassland Research Centre, Moorepark

## Summary

- Bacterial levels in milk are influenced by cleanliness of the cows udder and surrounding environment and specifically milk contact equipment, storage temperature and storage time
- Thermoduric levels in milk may be minimised by: presenting clean cows for milking, replacing cracked rubberware, regular plant hot washes (70-80°C) and weekly acid descale of milking equipment
- The two most likely residues that can occur from inappropriate use of cleaning detergents that contain chlorine are Trichloromethane (TCM) and chlorates
- It is critical to minimize residues in milk and dairy products in order to maintain residue levels within customer specifications
- In order to achieve low bacterial counts and residues in milk it is necessary to use a recommended wash routine, correct rinse water levels and correct levels of an appropriate registered cleaning product

## Introduction

Production of high quality milk is essential, if product is to be manufactured according to customer specifications. Cow cleanliness at milking and proper cleaning of the milking machine is crucial to producing milk with satisfactory total bacterial count (TBC) (<15,000 CFU/mL in the bulk tank at milk collection) and thermoduric bacteria count (< 500 CFU/ml). While the use of appropriate cleaning products can achieve such levels of milk hygiene, attention must also be paid to potential residues from chlorine based cleaning products if used incorrectly.

## Thermoduric bacteria

Silage, faeces and animal bedding are the most important sources of Thermoduric bacteria in raw milk during the period while cows are indoors. Alternatively, soil is a most important source of thermoduric bacteria during the summer period when cows are on grass. Thermoduric bacteria can contaminate teat surfaces particularly during periods of both dry or wet weather and are readily transferred to the milk during milking. Thus, the **first step** is to *minimize levels of Thermoduric bacteria in the cow's environment*, i.e. maintaining clean cubicles, passageways/farm roadways and feeding good quality silage are absolute requirements. The **second step** is to reduce the teat as a transfer medium for thermoduric bacteria into milk by *ensuring cow teats are clean and DRY prior to cluster application*. If teats are washed then it is critical that teats are dried with paper before cluster application.

Teats can be maintained in a clean condition by regular clipping of cow tails and regular maintenance of farm roadways. Pre-milking teat disinfection, followed by drying with individual paper towels can also be effective in reducing bacteria on teat surfaces. Finally, the **third step** in maintaining low Thermotolerant levels and total bacterial counts in milk is **to implement a correct washing procedure for milking equipment**, which should include a weekly acid wash. With inadequate cleaning, Thermotolerant bacteria in milk attach to internal pipeline surfaces and biofilm formation occurs which facilitates the growth of thermotolerant bacteria at subsequent milkings.

*Other factors that can influence the levels of bacteria in milk:*

- Washing of clusters, while still attached to teats
- Washing down cow standings/while cows are still present
- Transferring unclean clusters from cow to cow at milking
- Inadequate use of hot water (70-80°C)- hot water at this temperature is very effective if used daily
- Not replacing old rubberware
- Incorrect equipment cleaning procedures
- Uncovered feed bins in the parlour
- Unclipped cow tails and cows with dirty flanks and udders
- Slow cooling of milk – milked should be cooled (2-4°C) within 30 min of milking
- Dirty approach roads to the parlour and unclean collecting yards

### **Washing routine guidelines**

Liquid detergent-steriliser products used for cleaning milking machines and bulk tanks contain varying levels of caustic, chlorine, surfactants and sequestrants. Caustic (*sodium hydroxide*) acts as the cleaning/detergent agent and chlorine (*sodium hypochlorite*) acts as the steriliser. Products containing less than 10% caustic will be adequate for cleaning where hot water (70– 80°C) is used for the main wash cycle, and the solution is not re-used for a subsequent wash. While detergent-steriliser products are most effective when used with hot water, if intended to be used in a cold water solution and/or recycled at the next cleaning time then a product containing greater than 12% caustic (*working solution > 800ppm*) would be required. In situations where caustic powder (76%) or caustic liquid (>20%) only based detergents (*non-chlorine*) products are used, a working solution greater than 2000ppm is recommended, e.g. cold caustic cleaning. **The preferred chlorine content within a detergent-steriliser product is < 3.5%**, and this will adequately give working solution strength of approximately 200ppm required for satisfactory cleaning. Four milking equipment wash routines used in Ireland have been defined and are available on the Teagasc website: <http://www.agresearch.teagasc.ie/moorepark/milkquality>

The routines include: Hot Detergent-steriliser cleaning; Cold cleaning; Non-chlorine cleaning; Hot Detergent-steriliser/acid cleaning.

## Other important equipment cleaning points

- Lower chemical product usage rates are required when Hot water is used for daily cleaning
- Use of night rate electricity is a cost effective way of heating water
- The cleaning product chosen should be based on the washing procedure being used
- With non-chlorine cleaning solutions the stain of the solution should be left in the plant between milkings to be effective
- Detergent-steriliser solutions when used initially with hot water may be reused cold on one other occasion
- A weekly acid descale wash is critical to remove mineral deposits on equipment from water
- Using unregistered products (*no PCS*) for cleaning equipment may have implications for farmers in a cross compliance check

## Prevention of chemical residues in milk

The key to minimizing chemical residues in milk is to follow a recommended wash routine. That includes using the correct rinse water levels, detergent levels and the correct registered product for the wash routine chosen.

Regardless of the composition of cleaning products or the wash routine chosen, if the detergent is not mixed at the recommended level then ineffective cleaning or issues with chemical residues in milk can occur. Adequate post-milking rinsing (14 litres/unit) to remove all traces of milk from the plant is critical to avoid milk coming into contact with the wash solution as this contact can render the detergent ineffective and increase the likelihood of residues. Similarly, rinsing of the wash solution from milk contact surfaces (14 litres/unit) is equally important to prevent residues.

## Other key cleaning points to minimize residues in milk include:

- Only use cleaning products within best before date and minimize the storage period on the farm, as out of date products have much higher chlorate levels
- Store chemicals correctly out of direct sunlight and protect from frost
- Choose products with the recommended level of chlorine (<3.5%)
- Do not add additional chlorine to the detergent/steriliser solution
- Do not dip clusters in chlorine solution between cow milking's
- Cleaning solutions containing chlorine (*detergent-steriliser*) should be rinsed from the milking system immediately after the main wash cycle
- Do not reuse rinse water previously used to remove the detergent solution
- The addition of peracetic acid instead of chlorine to the rinse water is beneficial where the microbial count of a farm water supply is considered unsatisfactory
- Avoid teat disinfectants that contain chlorine dioxide/chloride

# Reducing Somatic Cell Counts on Dairy Farms

Finola McCoy, Animal Health Ireland  
CellCheck programme

High bulk tank somatic cell count (SCC) is often seen as something outside farmers' control, something that has to be "put up with". However, this doesn't have to be the case. The financial gains to be made from improved control of mastitis are substantial and often forgotten about. It is easy to quantify payment penalties incurred, lost bonus payments and the cost of dealing with clinical cases of mastitis. However the greatest, and often unseen cost of mastitis, is the production loss that results from subclinical infection. Cows with high SCC are not yielding to their full potential, mainly due to damage and loss of milk secretory tissue in the udder. Recent Teagasc research has shown that if the herd SCC is reduced from 350,000 cells/ml to 150,000 cells/ml, the net profit per cow increases by €133/annum. The culling costs associated with chronically infected cows are also hugely significant.

## Introduction

'Prevention is better than cure'- the old adage that is as relevant to mastitis as it is to any other disease. However, to be most effective we need to broaden our interpretation of mastitis. It's very difficult to control the spread of infection if we don't firstly identify the infected animals and have an understanding of the true prevalence of infection within the herd.

## Subclinical infection

It is not difficult to identify the cow with a clinical case of mastitis -probably clots in the milk, often a hard or swollen udder and perhaps a bit stiff and slow to move. But what about the cow with subclinical mastitis? By definition, subclinical means 'a form of the disease, no symptoms of which are detectable'. The only sign that this cow is infected is an elevated somatic cell count (SCC). Any cow that has an SCC greater than 200,000 cells/ml, or any heifer with an SCC greater than 150,000 cells/ml should be identified as an animal with mastitis infection. Studies have shown a production loss of up to 3% for every increase in herd SCC of 100,000 cells/ml. Thus a herd with an average cell count of 400,000 cells/mL is producing approximately 6% less milk solids than a similar herd with an average cell count of 200,000 cells/ml.

## Dynamics of infection

So how do we control herd SCC? The first step is to understand the dynamics of mastitis infection within the herd (*Figure 1*). In any herd at any given time, a proportion of the animals are infected with mastitis (*both clinical and subclinical*), while the remainder of the milking herd are uninfected.

This classification is not static. Animals will move between groups with uninfected animals becoming infected, and animals with mastitis being cured. What influences the movement between these two circles? There are several factors that can determine whether a cow will become infected.

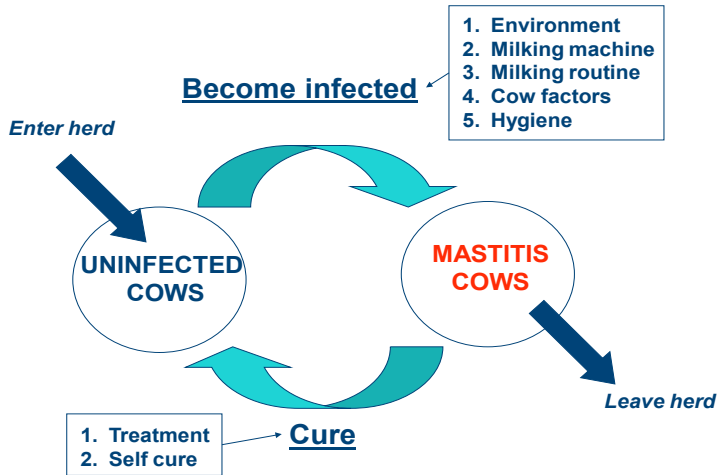
- **Environment:** People often associate environmental infection with cows that are housed indoors, but pasture, roadways and collecting yards can all be sources of environmental bacteria. The environment at calving and for in-calf heifers can determine whether an animal commences the lactation as a clean animal, or already infected.
- **Milking machine:** Both the function of the machine and the condition of the machine elements can play a vital role in the spread of infection.
- **Milking routine:** This includes milking technique, teat disinfection, segregation of infected animals etc.
- **Cow factors:** Factors such as age, stress and breed-related resistance can all play a part in the likelihood of that animal becoming infected.
- **Hygiene:** This includes hygiene of the milker, the environment, the milking parlour and the cow.

On the other hand there are only two possible factors that result in infected animals returning to the uninfected group:

- **Antibiotic treatment:** This refers to milking cow therapy and dry cow therapy. While there are many products licenced for use in Ireland, it is important to consider the expected cure rates. Cure rates for milking cow treatments will range from 20 to 70%, while dry cow therapy cure rates are higher at 50 to 80%. The cure rate will be influenced by the pathogen involved, duration of treatment and cow factors such as age and infection history.
- **Self cure:** Self cure rates can vary greatly and are influenced by the pathogen involved, among other factors.

This produces a rather unbalanced picture. There are far more factors that influence the likelihood of an animal becoming infected than there are involved in cure. Thus if we focus our efforts on mastitis prevention, rather than treatment, we have more opportunities to influence the outcome and really be in control of the disease.

**Figure 1:** The dynamics of mastitis infection within a herd



### Summary

- Prevention is better than cure.
- Cows with mastitis do not always show visible signs.
- Subclinical infection will result in significant milk production losses.
- Mastitis control cannot rely on treatment alone.

### Further information

Log on to the CellCheck website at [www.animalhealthireland.ie](http://www.animalhealthireland.ie), consult the CellCheck “Farm Guidelines for Mastitis Control” or contact your Co-op Milk Adviser/ Teagasc Adviser for details of CellCheck Workshops.

# Sustainable Dairy Farming: The Carbery Experience

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## Summary

- There is an increasing demand from national and international markets to measure the sustainability of the food supply chain from an environmental and resource use perspective
- Key areas of sustainability including nutrients, greenhouse gas emissions, carbon footprint, water use, biodiversity and energy consumption were assessed on 12-18 farms for a period of 4 years, from 2012 to 2015
- To date the study has found improvements across a range of sustainability indicators including carbon footprint, energy usage and nitrogen efficiency.
- Soil fertility was identified as one of the priority areas of improvement, after it was found that 140 of the 159 soil samples analysed from the participating farms were deficient in either phosphorus, potassium or lime

## Introduction

The Carbery Greener Dairy Farms and E-Ruminants projects are farm sustainability projects carried out by Carbery, Teagasc and DAFM. The purpose of these projects is to improve the economic and environmental sustainability of Carbery and Irish milk suppliers. Data was collected on 12 farms involved in the Carbery Greener Dairy Farms from 2012-2014. These farms joined E-Ruminant in 2015 along with a further 6 farms. To date, four years of detailed analysis has been carried out looking at key areas of sustainability – milk production, nutrient use efficiency, water use efficiency, greenhouse gas emissions, carbon footprint and energy use efficiency. Of the 18 farms involved in the study, 13 have a spring calving herd and the remaining 5 have a winter milk production system.

## Farm Characteristics

Total agricultural area on the farms increased from 65 ha in 2012 to 72 ha in 2015 with average stocking rate also rising from 189 kg N/ha in 2012 to 194 kg N/ha in 2015. The average number of dairy cows per farm increased from 100 to 126 over the course of the project, and the total milk produced on farm increased from an average of 539,438 L in 2012 to 698,582 L in 2015.



## Carbon Navigator and Carbon Footprint

The Carbon Navigator decision support tool was completed for each farmer based on 2012 data and targets to be achieved by 2015 were set. Based on the targets set out in the Carbon Navigator an average reduction in GHG of 8.9% and an average increase in net profit of €5,766 could be achieved per farmer over the three-year period by focusing on different technologies. Increasing the grazing season length of the Carbery farmers from a current average of 278 days to a target average of 286 days would result in a reduction in GHG emissions intensity by 1% while increasing net profit per farmer by €716 per year for a three-year period. The average herd EBI of the Carbery farmers was €115 in 2012. They set a target of €156 to be achieved by 2015. This increase in EBI would result in an average increase in net profit per farmer of €1,826 for the three years and a reduction of 3% in GHG emissions. The 2015 average carbon footprint was 12% lower than the mean for 2012-2014, which surpassed the group's navigator goal. The reduction was driven by improvements in milk solids production per ha, grass utilization and nitrogen use efficiency.

## Energy Audits

The 2015 average electricity consumption per cow was 6% lower than the mean for 2012-2014. These efficiency gains were realised primarily through improvements in milk cooling efficiency. The potential saving that could be made by switching electricity supplier was assessed for each farm. Farms on the project with an average electricity consumption of 20,000 kWh per year could save up to €430 by simply switching their electricity supplier. Farms with a higher electricity consumption of 30,000 kWh per year could save up to €660 per year by changing supplier. Analysis of the use of night rate electricity on the farms involved found that the average farm could save between €100-150 per year by heating water on night rate electricity alone.

**Table 1. Key figures on the farms involved in the Carbery Greener Dairy Farms and E-Ruminant projects from 2012 to 2015.**

	Average	
	2012-2014	2015
Number of farms	12	18
Carbon footprint, kg CO <sub>2</sub> e/ kg energy corrected milk	1.15	1.01
Electricity, kWh/cow	199	187
Nitrogen efficiency	21%	24%
Water heating, L water/l milk	0.16	0.13
EBI (€)	131	154
Milk solids (kg/cow/year)	428	445
Milk solids (kg/ha)	704	788
Bought-in concentrate(kg/LU/year)	686	540
Fertilizer N usage (kg N/ha)	244	236

## Soil Fertility and Nitrogen Efficiency

Approximately 75% of soil samples had a pH of less than 6.0. The optimum soil pH for grassland is at or above 6. The release of nutrients from the soil and the response to applied fertilizers will be reduced where the soil pH is low. It was recommended that farmers apply lime to raise the soil pH to 6.5. The level of lime use on farms increased from an average of 8 t per farm in 2012 to an average of 111 t per farm in 2013. The average Soil Test Phosphorus (STP) level was 6.5 mg P/L in 2015, and overall 57% of all samples analysed were in Index 3 and 4 for Phosphorus (P). The distribution of STP levels in the soils samples on individual farms varied considerably (*range of 1.9 to 12.4 mg P/L*). This suggests that slurry is being recycled on fields closer to the yard and the fields furthest away from the yard had lower STP levels. Slurry applications should be targeted at fields that are low in P and K (*Index 1 or 2*). Soil Test Potassium (STK) was an average 121 mg K/l across all the samples taken. The use of fertilizer N relative to fertilizer K was found to be excessive across all the farms and a ratio of 3:2 or 2:1 on low index soils was recommended. Overall, these changes along with a reduction in concentrate feeding contributed to nitrogen efficiency increasing from an overall average of 21% in 2012-2014 to 24% in 2015

## Conclusions

These projects have identified key areas for improvements across the Carbery farms involved in the projects. Making these improvements, particularly regarding soil fertility, will serve to increase the sustainability of these farms for current and future generations of farmers in West Cork.



## West Cork Farming for the Future

The Carbery Sustainability Programme is an on-going process of production and processing improvement, with short and long term goals for Carbery, Co-op's and supplier farms. Long term we see a move toward Sustainable Dairying as having a positive impact on our environment while also gaining recognition for the Irish Dairy Industry through our efforts.

## Sustainable Dairy Assurance Scheme (SDAS)

This programme has been designed by the Dairy Industry and Bord Bia to demonstrate to customers of dairy products that milk is produced sustainably under an accredited scheme. It also sets out the criteria for best practice in Irish dairy farming. Some of the areas that are covered in the programme are:

- Traceability
- Animal Health and welfare
- Biosecurity
- Environment
- Health and Safety
- Sustainability
- Milk Quality

We would like our suppliers to work with Bord Bia and their Co-op in measuring sustainability and profit using tools such as the **Teagasc Carbon Navigator**. This is an online method of assisting farmers:

- In understanding how their farms produce GHG emissions
- In setting targets to reduce emissions and costs

The Carbon navigator will be provided to you on completion of your SDAS audit through the Bord Bia website.

*If you would like to find out more about the Carbon Navigator please contact your Teagasc Advisor or Co-Op Technical Advisor.*

## Herd Health Programme; Johne's Programme

Since 2010 Drinagh Co-op and Carbery are asking all suppliers to utilise the availability of Carbery Johne's testing programme. Carbery need to quantify and prove to the market place that our milk supply is working towards long term Johne's free status. Testing can be completed via your own vet by a blood test, or through individual cow samples with milk recording. In addition to individual whole herd testing, a Herd Risk Assessment plan, unique to your herd will be drawn up by your vet, taking into account the disease results and improving

long term biosecurity. In 2016, Carbery have increased their contribution towards the cost of testing and risk assessment to €150. For more information please contact your vet or milk recording agency directly or your local Co-op.

### **Herd Health Programme; Cellcheck Programme**

The CellCheck programme, designed and implemented by Animal Health Ireland, is aimed at reducing the somatic cell count of the national herd. As part of this programme, interactive and practical workshops are run for small groups of suppliers. These short (*approx. 3 hours*), farmer-friendly courses are given by experts in animal husbandry (*a veterinary practitioner*), a milk quality specialist and a qualified milking machine maintenance technician, so that all aspects of mastitis control and prevention can be covered. A charge of €40 is required to participate which is used to cover the costs of the course. If you would like to attend a workshop, please contact your local Co-op Technical Advisor.

### **Carbery / Teagasc Monitor Farm Programme**

Carbery and the four West Cork Co-ops working with Teagasc run this programme with the objective of improving farm efficiency and therefore farm profit. Some of the programme objectives are:

- Increasing grass utilised per hectare
- Compact calving pattern
- Higher milk solids yields
- More replacements available
- Planning for expansion, budgets, return on investment

### **Carbery Greener Dairy Farms**

**At Carbery we want to work with you to reduce the effect of milk production and processing on the environment while increasing your business profitability.**

Efficient Resource Management is now in the spotlight for Carbery and our suppliers, and is driven by our customers. Since January 2012, 18 of our suppliers have been working with Teagasc on the Carbery Greener Dairy Farms (CGDF) project. This involves measuring and identifying the potential for continuous improvement in areas on farm such as carbon emissions, nutrient use, energy and water use. The economic sustainability of these farms is also being evaluated and improvement plans will be supported by Teagasc experts.

The results to date show that the mean carbon footprint of Carbery farms with sequestration declined from a high of 1.15 kg of CO<sub>2</sub> equivalent/kg of milk in 2013 to 1.01 kg in 2015. All findings from this project will be communicated to each Co-op's suppliers and advice on best practice will be given by Teagasc at public events and in newsletters. Carbery want all of our Co-op suppliers to learn from the effort given and experience gained by our project farms.

# Notes







*#madeforthis*