

College of Agriculture, Food & Rural Enterprise

# Labour on dairy farms

### A Business Development Group investigation

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# A Business Development Group investigation



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#### An investigation into the labour supply and demand on dairy farms in County Down, in 2022.

This report will review the time spent by farmers, their families and employees working on farms, as well as asking questions about the type of work being undertaken. It will make recommendations, based on the results, that should enable farmers to lighten the load and create a better, more sustainable, work-life balance. It may also contribute to making our farms more attractive to potential employees.

# Let's talk labour efficiency

Mention efficiency on a dairy farm and farmers are happy to talk about feed efficiency, milk yields, milk from forage, fertiliser and slurry use and LED light bulbs.





A 2018 study by Deming et al. found that labour was the second-most expensive cost on pasture-based dairy farms throughout Europe. Therefore, it is time we started talking about labour efficiency. Put simply, labour efficiency is a measure of how quickly a workforce can accomplish a task. In this report, the task is the management of 2,609 dairy farms in Northern Ireland and care of 316,775 dairy cows.

# **Quick statistics**

## DAERA Agricultural Census 2022



## Co. Down Labour Study

4 labour units per dairy enterprise on average	<b>ŤŤŤŤ</b>
<b>66</b> hours average working week per farmer	$(\mathbf{S})$
<b>55</b> hours per cow per year	1 Am
2022 hours per labour unit per year	
<b>2153</b> hours a year spent milking on average	
47% of total hours worked completed by the farmer	

# **Survey background**

The County Down labour study

**Throughout Northern Ireland, and** indeed also within the European dairy market, labour has been and remains an increasingly pertinent topic of discussion.







In County Down, we found that farmers were keen to talk about labour on their farms, either the work, or the people that are required to do the work. We commissioned a simple question and answer survey to build a picture of the current labour market on farms. This included the hours that were being asked of employees and family and, most importantly with the increasing focus on farmers mental and physical health, the number of hours that dairy farmers were putting in themselves.

We took data from 38 dairy farming enterprises in County Down, producing over 56 million litres in the year. With a total of 6,650 cows, the average herd size equated to 175 cows. Whilst we acknowledge that this is bigger than the Northern Ireland herd size of 96 cows, we have been careful to include a representative range within the study, from 65 to 600 cow herds.



# **2022 Survey Results**

How do you measure up?



0

123

600

#### More cows = increased efficiency per cow

- Total hours worked per cow per year
- Total cows



No correlation between contracting work out and total hours worked

- Average % contractable work contracted out
- Total hours worked in year





# Contents



# **Labour efficiency** What is labour efficiency?

While total hours worked on farm by family members and paid employees is important, an efficiency metric is required. Hours worked per cow, per year takes the total annual hours and divides it by the herd size. Initial data suggests larger herds tend to work less time per individual cow, gaining efficiencies with time dilution on some tasks. For example, herding cows will take 20 minutes whether there are 100 or 150 cows milking. Variation in hours worked per cow per year is substantial across both discussion groups ranging from 22.5 hours/ cow/ year to an excess of 80 hours/ cow/ year. This can be down to several reasons including milking routine, facilities and work organisation. While scale may improve work efficiency per cow, the gains made will usually not be enough to offset change in total workload. In simple terms, more cows will result in more hour's work needed on the farm overall.





For many of the participants in the survey, paid staff have become an essential feature of the farm business, particularly part time staff. As farms have developed, many of the farmers have tried to do all the extra work with an expanding herd, working up to 81 hours a week. This practice is difficult to maintain in the long term and can lead to poor efficiency or exhaustion of the family or paid labour. One of the benefits of increased scale should be the ability of the farm owner to control their own hours worked. Like any business owner, a dairy farmer wants to maximise the value of paid labour and improve staff retention. It is therefore vital that best practice labour efficiency measures are adopted.



# **Task time and total hours**

# Hours per labour unit

## **Total Hours**

Total hours were counted by multiplying the average weekly hours, by the total number of full weeks worked in the year. This allows for holidays and annual leave days. In general, the more cows there are on a farm, the larger the total annual hours worked. These farms are also employing more staff, so even though total hours are increasing, the hours per labour unit may not be.

## **Task Time**

The Business Development Group questionnaire also looked at the 'task time' (i.e. how long it was taking to complete certain tasks) in 24 hours on the farm. Milking presents itself as the most time-hungry task (around 1/3 of total hours). This is followed by feeding and calf feeding. It is within these areas that we can focus on streamlining to improve overall labour efficiency.

Repairs office lobs preeding calving call Reating Feeding Milling

#### Why Account for Task Time

Accounting for Task Time is important, as it allows for particular areas of work on a farm to be highlighted for improvement. An example of a task-time bar chart is shown below, illustrating that milking and feeding are taking up the biggest percentage of time. This farmer has opportunities to improve cow flow around the milking parlour to reduce milking time as well as moving a hot-water source into the calf house to reduce time spent hauling warm water to the calf house for feeding.

According to the census data, the average worker in the UK (all industries) worked 36.4 hours per week between November 2022 and January 2023. This is in stark comparison to the average hours worked from the BDG Survey data, which equated to 66 hours.

Further to this, we looked at the number of labour units\* on each farm and how many hours each were doing in the year. For comparison, we averaged the total hours for the whole farm over all the labour units to find an average number of hours worked, per labour unit per year. These results showed a large range, with the lowest equating to an average of 846 hours per labour unit and the highest amounting to 3308 hours per labour unit per year.

\*This includes farmer, family, paid full time labour and part time help.



**Average hours** per labour unit per year

50

75

25

0





#### Hours worked per week

# **Understanding efficiency**

# **Embracing change**

#### **Regardless of who does the work,** the crux of the matter for dairy farming is that the work has to be done and done every day.

It is therefore imperative, that if you want to improve labour efficiency on your own farm to understand where the most time-hungry tasks are and how, if at all, time can be reduced. Within this BDG investigation we found, unsurprisingly, that

- milking was the most time hungry task on most farms, taking up between 30-50% of the day's hours.
- Calf feeding was often the second most time-consuming task
- Feeding was third, including time spent stripping silos and making up multiple TMRs in the day.

It is within these areas that we should look to change and improve to make the most significant time savings.

Before change can happen on a farm, the farmer, their family and employees all must be open to accepting change and willing to embrace new ideas.





There are also things that have a huge impact on our farming business that we can control.

What you do and how you do it **Your attitude Your work quality Your efficiency** Your willingness to improve

It is all too easy in dairy farming to blame things outside of our control.

It is imperative that we begin to accept responsibility for our businesses and the internal factors that affect our outcomes and begin to improve the things that are actually within the scope of our control.



# Case study: Rory Woods

### LEAN Management and Robotic Milking

With a labour efficiency figure of 24 hours per cow per year, Rory Woods, Ballymiscaw, is one of the most efficient farms in the study. Having understood the time-commitment of a parlour, Woods installed a Lely robot to milk his herd of 65 cows. With the help of robotics, he can run the farm almost entirely on his own and whilst he acknowledges that the robot clicks away (almost always) in the background, it is Rory's understanding of the principles of LEAN management - and the focus on improving the efficiency of the most time-consuming tasks on his own farm that enabled the business to become viable with a such a low labour requirement.

LEAN management is a term originating in Japan whereby the focus is on the removal of waste and maintenance of quality. One of the wastes that we are trying to cut out with lean management on a dairy farm is time. For example, right now, as you read this, are you able to confidently think about exactly where the calving aid is? The hand grape? The 17 spanner?

Woods farm facts	
Farm labour units	1
Hours worked per cow per year	24 hours
Average week	30 hours
Total hours per 100,000 litres	312 hours

Lean management encourages everything to have a place, and everything to stay in that place so that no time is wasted day-today trying to find the things that we need. It encourages the use of efficient systems and methods so that ideas and procedures can be communicated simply and effectively and tasks can be completed with the least amount of time spent, whilst still maintaining work quality.

Woods has a set routine for his morning and evening chores, he never circles back on himself in the yard and everything is in its place for when it is needed.



# **Case study:** Damien Gilmore Outsourcing: Can it benefit your business?

One of the key features of efficient dairy farms is the farmers ability to organise and delegate tasks. For Damien Gilmore, the contractor has taken on a new role and responsibility for the year ahead. Damien plans to sell his baler and employ a local contractor to bale all silage this year. Damien's team will continue to mow the grass and collect the bales, only the actual baling job will be outsourced.

While contractors are used on the farm for various other jobs, the baling has always been Damien's responsibility. A baler has been run on the farm for many years with four and in many cases five cuts of top-quality silage made on the farm.

The capital investment is significant on the farm in terms of baling machinery, but second-hand values are strong at the moment, and with only two seasons completed the depreciation on the baler was less than expected. However, regardless of the valuations the labour situation is dictating this decision.

"Forage quality is important for us, we just feed big bale silage and cows are yielding just over 10,000 litres sold per year, so top quality forage is critical, the big bale silage gives us flexibility to achieve this year after year".

"The baling operation requires a lot of time which ultimately reduced the time I had available to manage the herd".

Gilmore farm facts	
Cows in herd	170
Milk yield (sold per cow in herd)	10,350 litres
Farm labour units	3
Total yours worked on farm (hours/year)	9926 hours
Hours worked per LU/year	41.9 hours
Average working for farmer	77 hours

Existing contractors are treated like a part-time labour unit on the farm already. In days gone past this farm did all the slurry work, muck spreading, fertiliser spreading and reseeding. The contractor is now used for a lot more of this work. We estimate it takes 7 minutes per bale, this includes fueling, travel to field and maintenance which works out at 408 hours per year on the baler - this is equivalent to 5.3 working weeks on this farm.

## Selling the baler

Time saved from sale of baler:

#### **408 hours**

Value of time saved @ £20/hr:

## £8,166

Percentage contractable work contracted out:

## 38%

# Case study: Richard Corrie

### Getting the basics right

Richard Corrie aims to run an efficient dairy business. Calf rearing is a central part of this operation. The farm rears 200 heifer calves every year and Richard tells us automation is not always the answer when it comes to reducing workload.

#### "Getting the basics right, like colostrum and bedding is much more important than how or what you feed calves with"

Richard learned the hard way about getting the basic steps in calf rearing wrong, too many losses and massive workload peaks for staff dealing with sick calves. This can really put farm staff under pressure and lowers morale for everyone involved.

#### Developing Standard Operating Procedures (SOP's)

Two years ago, Richard invested in updating and extending existing calf rearing facilities. He pulled out automatic calf feeders and returned to feeding calves in batches of 8/9 per group for rearing. All calves now drink from batch teat feeders. Colostrum goes in at birth or soon after.

Heifer calves are fed once a day from four weeks of age, and this has worked well on the farm. It is important to always have clean fresh water, straw and concentrate available to ensure successful calf rearing. Calf mortality is much lower now, there are good SOPs in place and all staff involved in calf rearing know what is happening.

Corrie farm facts	
Cows in herd	550
Milk yield (sold per cow in herd)	10,455 litres
Farm labour units	4 full time (Richard is 1), 10 part time
Total yours worked on farm (hours/year)	15,557 hours
Hours worked per LU/year	20.6 hours
Average working for farmer	45 hours
% average daily time on calve rearing	6%
Labour saving capital investment on farm	milk taxi, bale shredder, building improvement



Calf pens have plenty of space and bedding is always kept dry and clean. Richard claims investment into the big bale shredder which attaches on front of the farm loader, and the milk taxi's for getting milk to calves, have been good in terms of labour-saving investments. The milk taxi's can feed 50/60 calves each with no heavy lifting or pushing, they make feeding the calves pleasurable, and provide the operators an opportunity to monitor calve health at feeding time.

The automatic calf feeder did work well on the farm previously, however maintaining good hygiene was a challenge, and the calf rearing staff found it more difficult to monitor calf health on the auto feeder, also any malfunction in the automatic feeder was a major problem and created a backlog of hungry calves.

#### Corrie daily task time





#### Percentage of tasks contracted out



# Time well spent...

Or too much time?

Within this study, we asked questions around the time taken to complete certain tasks on the farm in 24 hours. Within milking we included time spent gathering cows from the paddocks or cubicles, time spent scraping sheds and bedding, the actual time that the parlour runs and finally the time taken to wash up the parlour. We found that on average farmers were spending hours in an average year milking.



#### hours in an average year spent milking



When we take this as a percentage of the total hours worked, on average, 30% of the time spent on farm is being spent milking.

Results ranged from 8% to 63% of hours worked in the year spent, associated with milking.

# **Parlour design**

It is no surprise that milking takes up the most significant amount of time on a dairy farm, but have you considered the effect that spending too long in the pit is having on your business?

Milking parlours on family farms should be sized to complete the actual milking in approximately 1.5 hours and allow for future herd expansion. On large commercial farms where staff are employed to carry out specific tasks such as milking, the length of the milking operation can be considerably longer depending on the farm management practices employed.

The throughput of a milking parlour depends on the level of automation, the udder preparation routine, the number of milkings per day and the efficiency of the operator. Throughputs for herringbone milking parlours typically range from 6 to 10 rows of the milking parlour per hour and rotary milking parlours range from 4.2 to 5.3 cows per point per hour.

The number of milking units that can be effectively utilised per operator depend largely on the milking routine employed on the farm. Research carried out by Teagasc (2005), based on an average milking time per cow of 10 minutes, suggests the optimum varies from 13 to 20 units per operator. The optimum number of units in a swing-over herringbone milking parlour increases as the udder preparation routine is reduced from a full routine to a basic routine including only foremilk stripping. It is important to also consider the length of the milking parlour. As cow numbers have increased it has not been uncommon for additional points to be added on to the parlour and then the distance from the first cow to the last is considerable. Attention should be given to the angle of the cow in a parlour, especially in new builds.

Cows milked in 1 hr 30 mins	Swing over parlour	Double up parlour
120	12:24	20:20
150	15:30	24:24
180	18:36	28:28
200	20:40	32:32
250	24:48	40:40



# **Reducing hours spent** in the parlour

The number of units in a parlour will have a large impact on the speed at which a herd can be milked. However, look at some of the other factors that can have an impact on the time taken to complete milking.

#### **Cow Flow**

Cow flow is imperative to milking time and it is important to consider both flow in. as well as out, of the parlour.

If you find you have to gather cows from the back of a collecting yard regularly, it is increasing the time required to milk those cows. Ideally, the milker shouldn't have to leave the pit at all throughout milking and cows should enter and leave in a steady flow.

You will have walked the loop that your cow does in and out of the parlour many times but take a walk around with a 'cows-eye-view'.

Are there any distractions on the way into the parlour that are keeping more nervous cows or younger heifers back from entering the platform? There could be a piece of tin that flaps in the wind, a draught from under a door or a slippy area on the concrete that cows avoid. Quick fixes could include sheeting gates to reduce distraction, better securing tin or grooving a concrete area for better stability.

Upon exit of the parlour, cows should have sufficient area at the front of the pit and the layout would ideally avoid sharp turns or typical congesting areas. Rubber flooring is used on some farms to make travel more comfortable for the cow and negate the effects of a particularly tight turn of direction. When flowing away from the parlour, if drafting is used, then try to have the 'draft' option for cows continuing straight on, as they are less likely to cause congestion in this scenario than when they are forced to make an unfamiliar turn.

# **Making the right** capital investments

Throughout this study one of the single best investments and labour-saving devices or technology available to dairy farms is a cubicle sweeper. There is no affiliation or bias towards a Cubicle bedder/sweeper machine, but we would be mistaken if we did not highlight the impact they have had on those dairy farms who have invested in one. Cubicle bedder/sweeper is viewed as a key worker on many of the farms in this study. The dairy farmers themselves claim substantial savings in time, and reduction in physically demanding work.



"The cubicle bedder has worked on the farm for three years now, it sweeps and beds 300 cubicles in 15 minutes twice a day on the farm. We've counted that it saves 80 minutes per day for us and substantially cleans and beds the cubicles better than we previously did by hand". **Ryan McCarthy on** 

**Cubicle bedder sweeper** 







# **Little changes = big difference**



# **Building the profile of your farm** what can you offer employees?

#### Sam and Thomas Steele. from Kircubbin, manage 550 cows and followers.

They will admit dairy farming is labour intensive and their own farm is no holiday camp for anyone on the farm. With that said, both men are very proactive at trying to reduce the heavy workload on the farm, especially the physically challenging work.

#### "There's plenty of modern technology out there now which can reduce or eliminate the heavy or physically demanding workload on dairy farms".

The Steeles employ several casual and part time workers on the dairy farm, "it's our job as owners/managers to make the farm attractive for employees". Even the milking parlour moves the cows to the operator to attach clusters, minimising steps and additional effort required from the operator.

**Is Your Farm Attractive?** 



#### **Providing training**

Increasingly it is becoming more difficult to source trained staff or staff from a dairy farm background. Many farmers see this as an issue, the Steeles see this as an opportunity to widen the search for farm staff. however they appreciate training on the job will need to be offered, which requires time and effort.

#### "The farm will not operate without hired staff. in fact 58% of all hours worked on this farm are from hired staff. If we need to invest time or capital resource into training for staff, we will".

A good example of this is the AI work on the farm. Traditionally Thomas had full responsibility for this task, working alongside heat detection equipment and a good drafting setup. Recently one of the full-time employees has been trained in AI technique with the aim to assist and provide backup for Thomas in this critical area of work. While the Steeles hope this investment will not walk out their gate after getting trained, the extra responsibility and encouragement offered towards this employee provides job satisfaction and empowers the person with an improved skill set - the question of additional wages remains unanswered!

Is the work intense or physically demanding all the time?

**Can you** maintain positive relationships with your staff

# **Managing people**

**Conclusion** 

Not just cows

QUICK ANALYSIS	STEELES FARM
Number of 'workers'	10
Total hours worked in the year	17,618
Average work week by farmer (hours)	69.5
% of total hours done by 'farmer'	39%
% of total hours done by 'family'	11%
% of total hours done by 'employee'	50%
Total hours worked per livestock unit per year	26.39
Total hours worked per cow per year	34.55
Total hours worked per 100,000 litres	339



Most studies on improving labour efficiency tend to conclude on a similar vein. It is through the implementation of a range of changes, improvements, and small tweaks, that farmers can achieve real and meaningful decreases to the hours and input required to run successful dairy businesses.



Evaluate the efficiency of your milking routine and equipment. Minimise the number of times the milker needs to leave the pit, use automation to include ACRs, Auto ID and backing gates and improve cow flow around the milking system.



Give everything a place, return it to that place and create an ethos of tidy and mindful workspaces to minimise confusion and time spent searching for things.



Review the capacity of your technology and machinery. Is your parlour inefficient because it's too small? Your feed wagon overworked? Could you feed more calves in a pen with a bigger feeder?



Communication is key to a smooth operation. Use of whiteboards, WhatsApp groups and standard operating procedures makes sure everyone is working towards the same goal.







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