



# Farmer Quality of Life as Influenced by Work Organisation

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# Farm workforce issues in a global context



Total numbers of people working in agriculture



30% reduction in agri's share of total employment in industrialised countries



Dairy farm expansion in most developed countries - increased demand for *non-family* workforce



Assistant/farm hands;  
Assistant/managers; operations managers: different issues



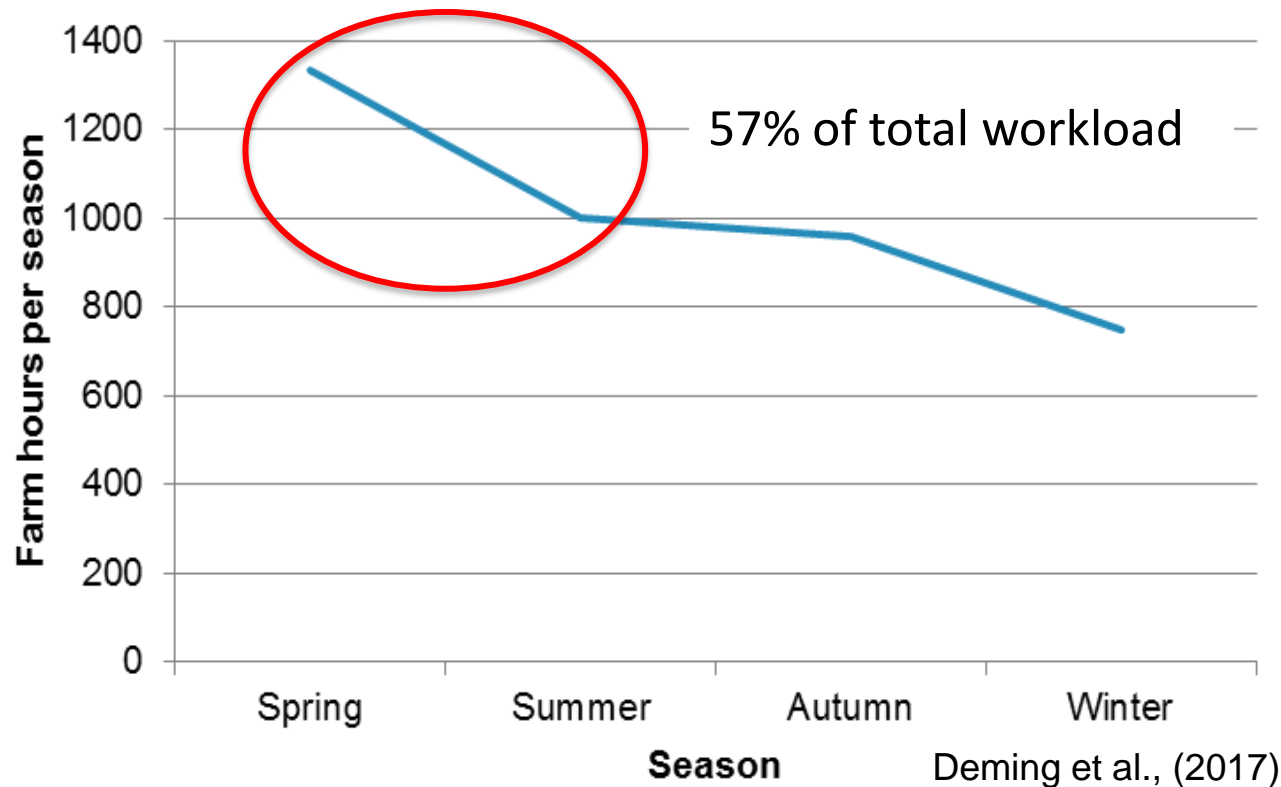
Global skills shortage

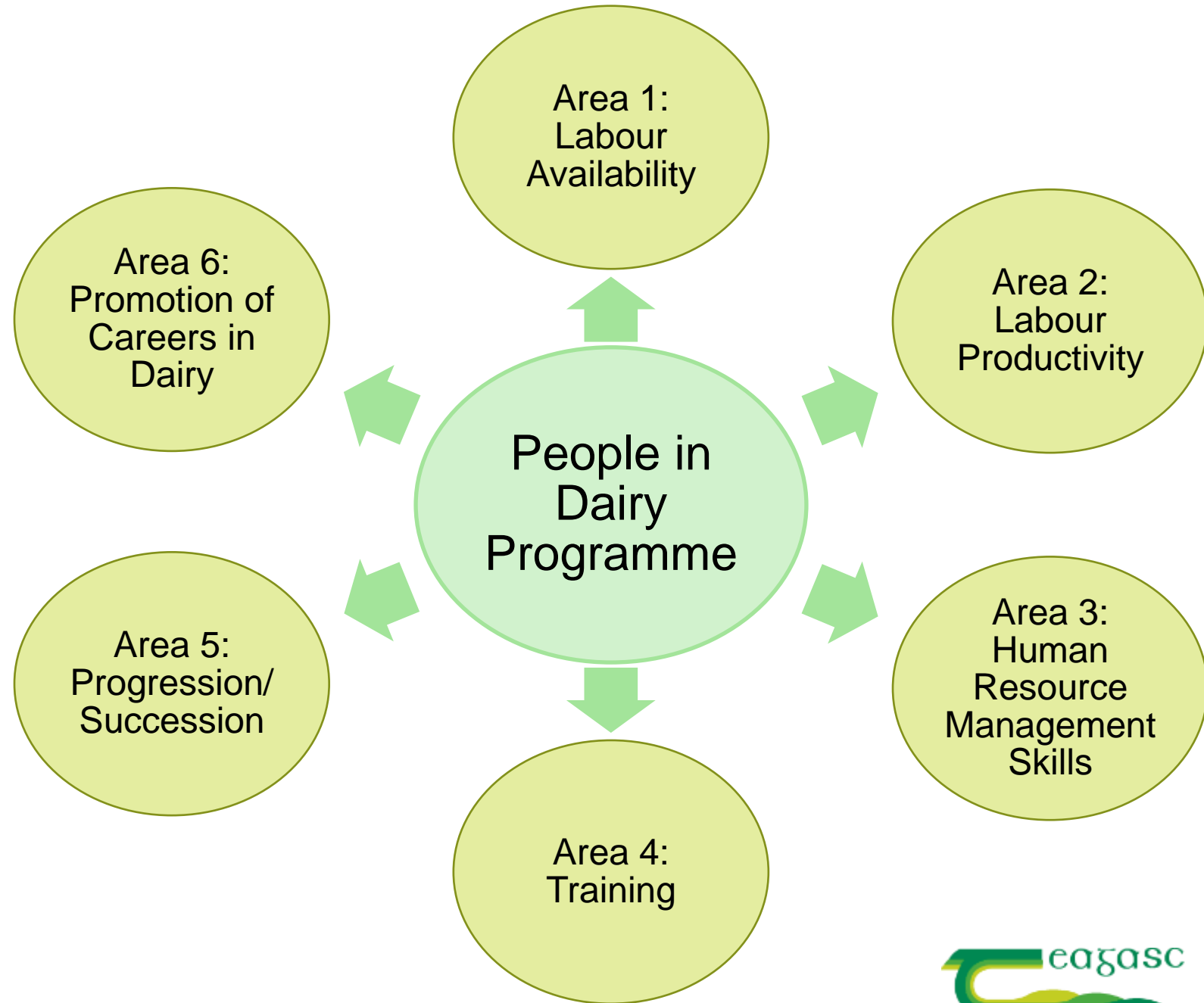
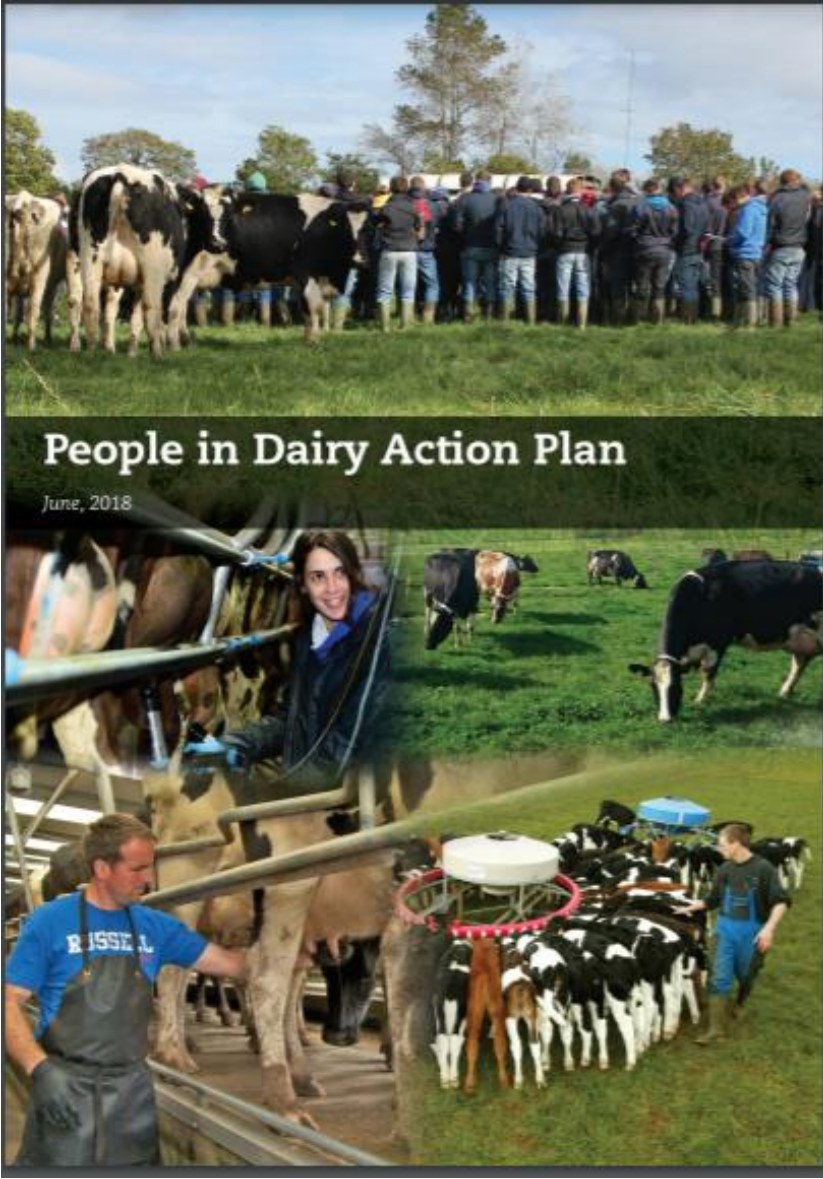


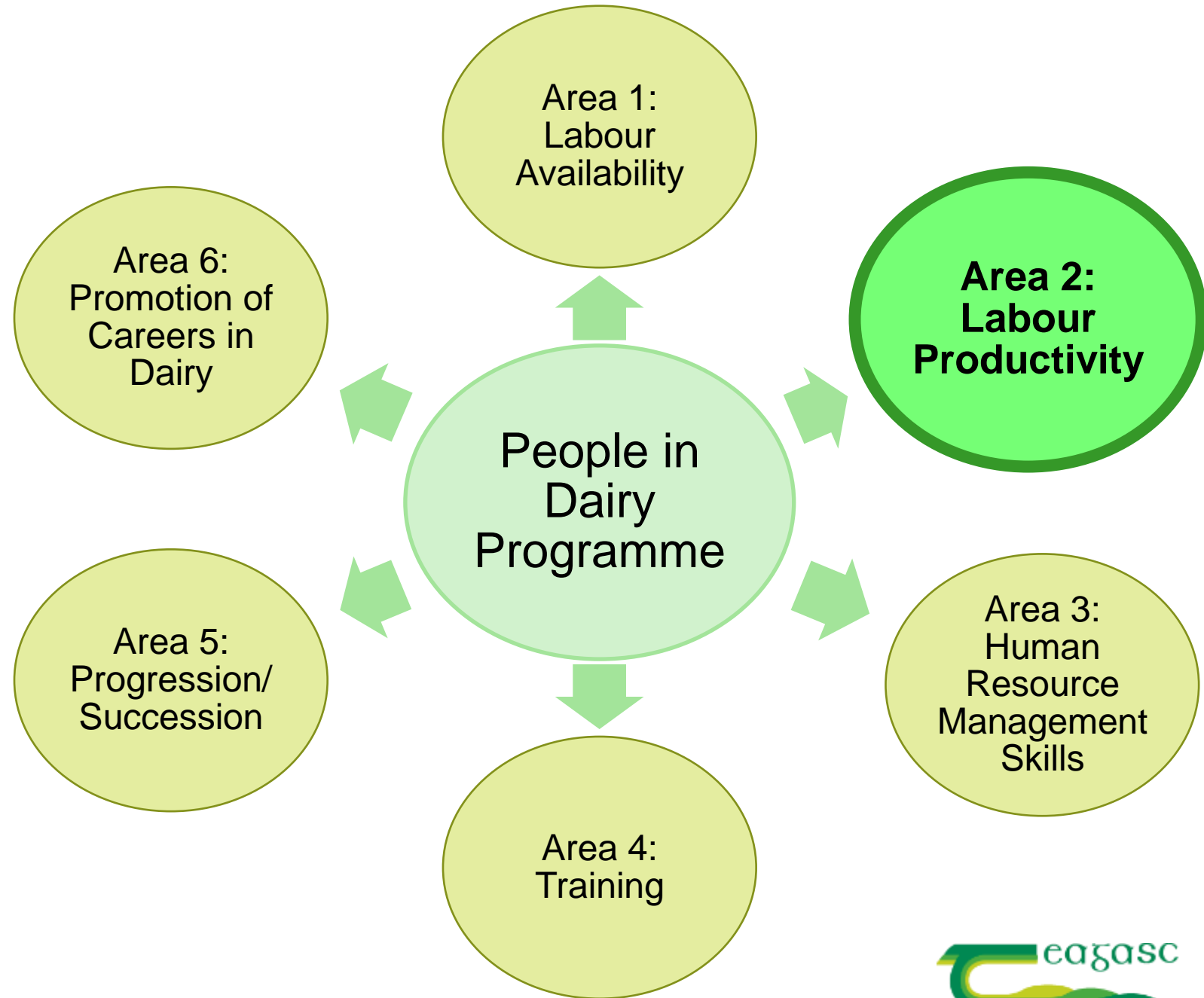
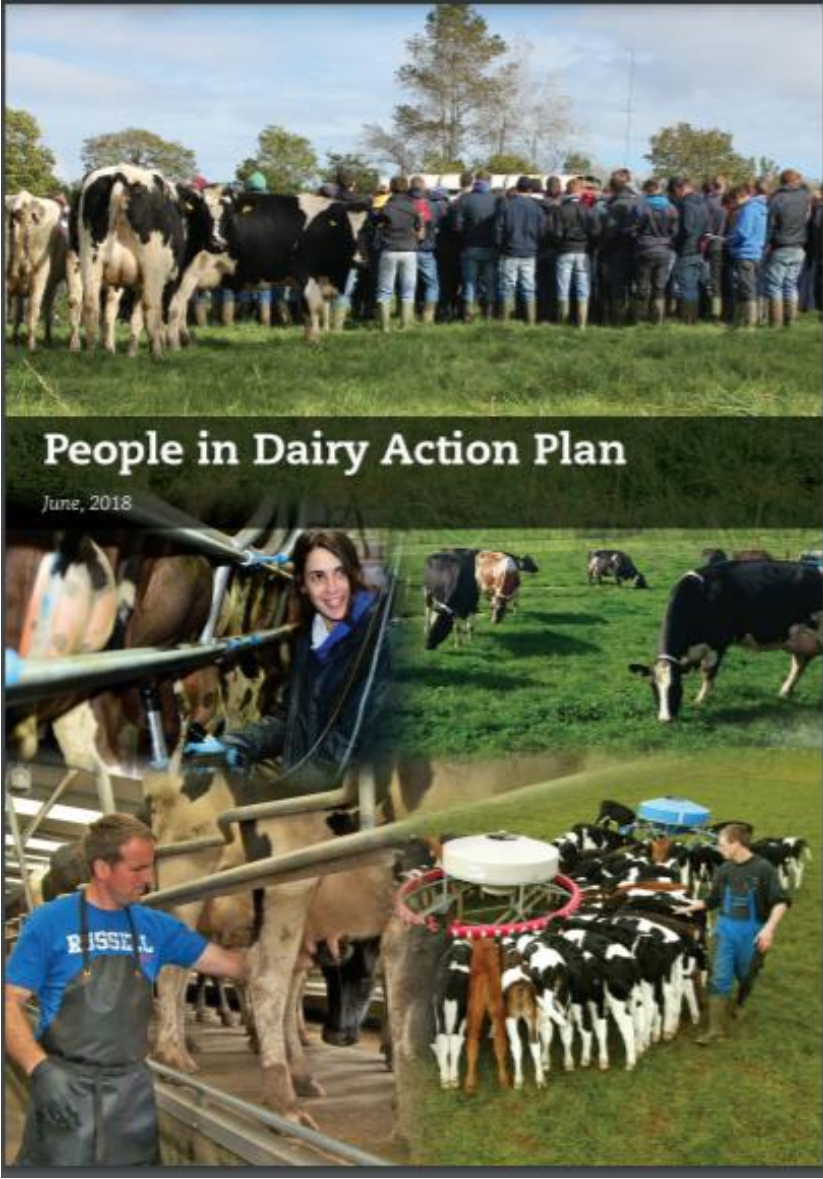
Global competition for mid-range and higher level skills (labour mobility)

# Ireland – Current Situation

- Extra cows – increased workload; 30% increase in workforce demand
- Aging workforce (average age – 55 years old)
- Highest working hours of any sector in the economy (CSO, 2015)
- Seasonality challenge and availability of seasonal staff

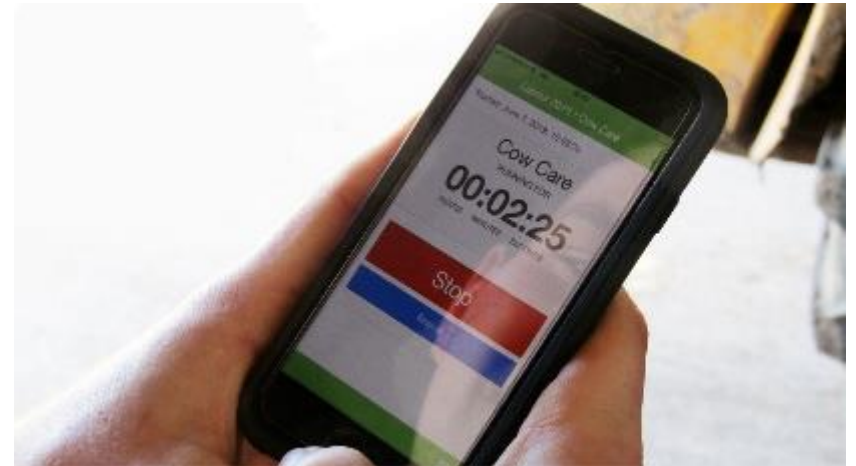






# The role of work organisation and labour productivity

- Critical to identify an approach to improve seasonal workload and labour demand issues on farms
- Improved work organisation/ labour productivity has a positive impact on a number of key aspects of social sustainability
  - Reduced stress (Brennan et al., 2021) and improved quality of life (Contzen and Haberli, 2021)
  - Improved health and safety (Osborne et al., 2010)
  - More attractive farm workplaces (Eastwood et al., 2018)
  - Farm profitability (Wilson, 2011)



# Overall research question

- How can labour demand be minimised and labour productivity maximised on dairy farms so as to create socially sustainable farming systems?

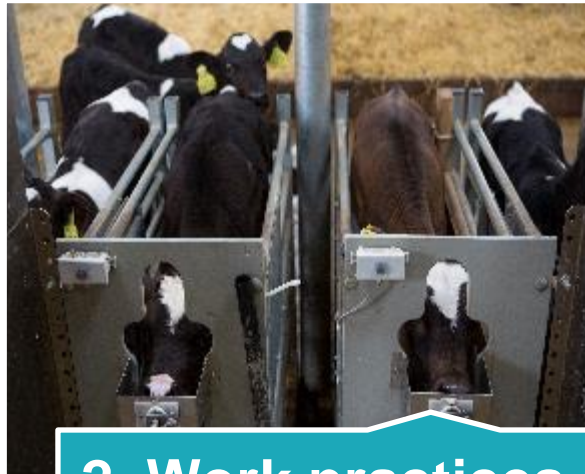


# Methodological approach

- Two key challenges:
  1. The measurement of peak farm labour time-use and efficiency
  2. Development of an understanding of the key strategies required to improve labour efficiency



**1. Work organisation**



**2. Work practices & technologies**



**3. Facilities**

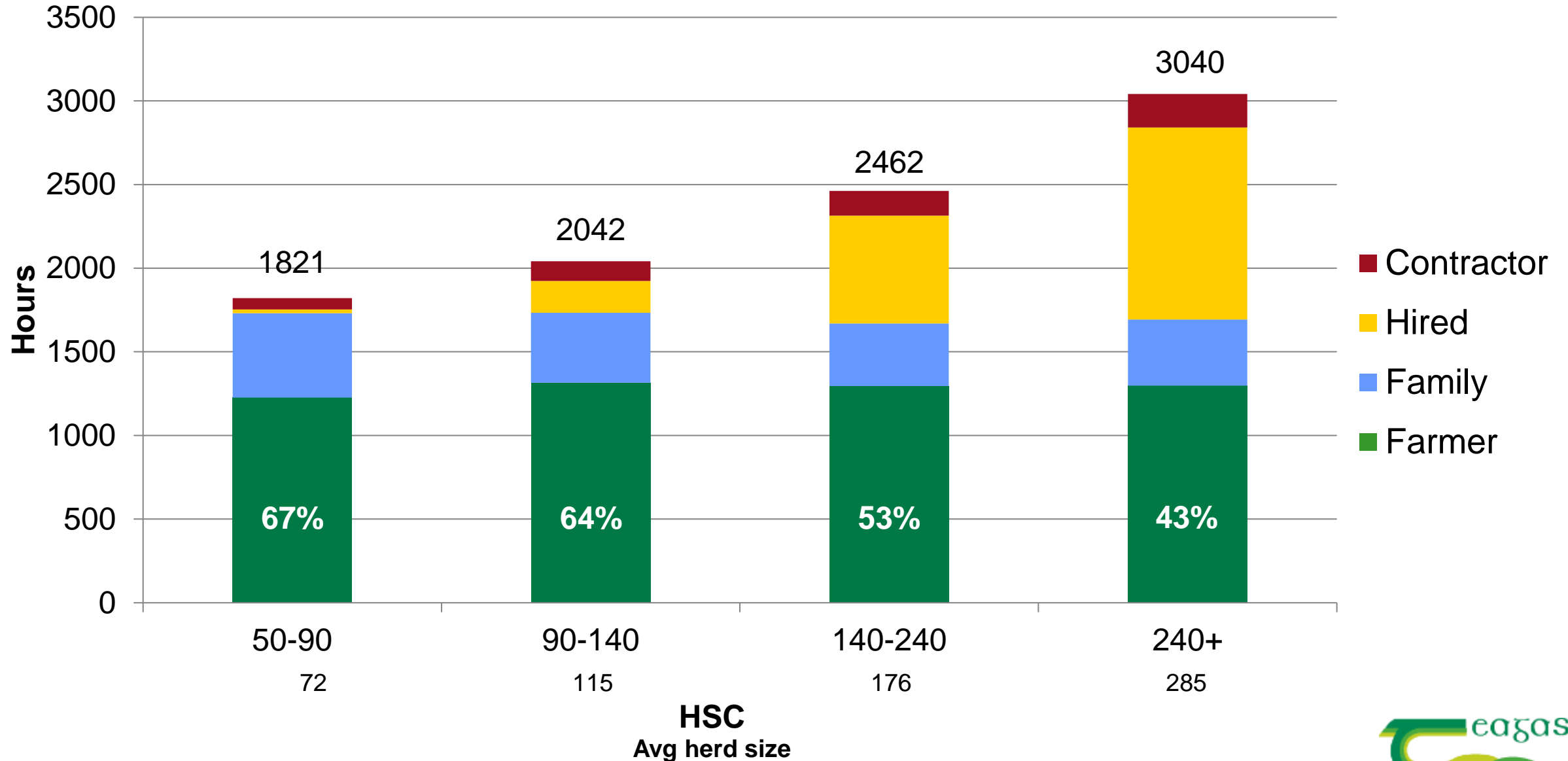


# Study design

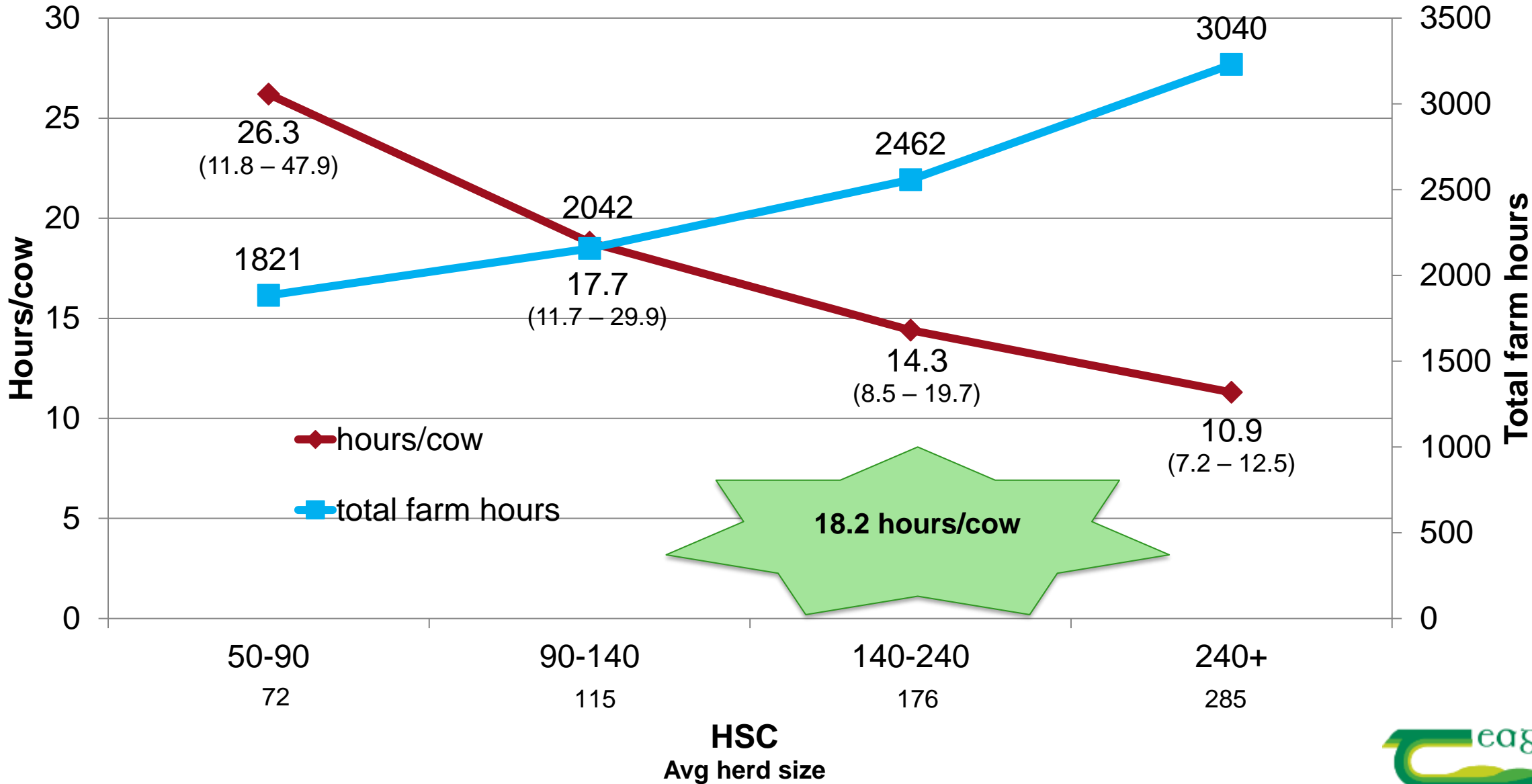
- Data collected in real-time once per week on an alternating day each week from February to June 2019 on 76 farms
- Data collected using a smartphone app
  - Ten tasks on the app
  - Used by all farmers and any staff or family with smartphone access
- Weekly online survey
  - Captured any labour not using the app, contractor hours, and livestock details
- Study repeated in February, March and April 2021 on 57 farms



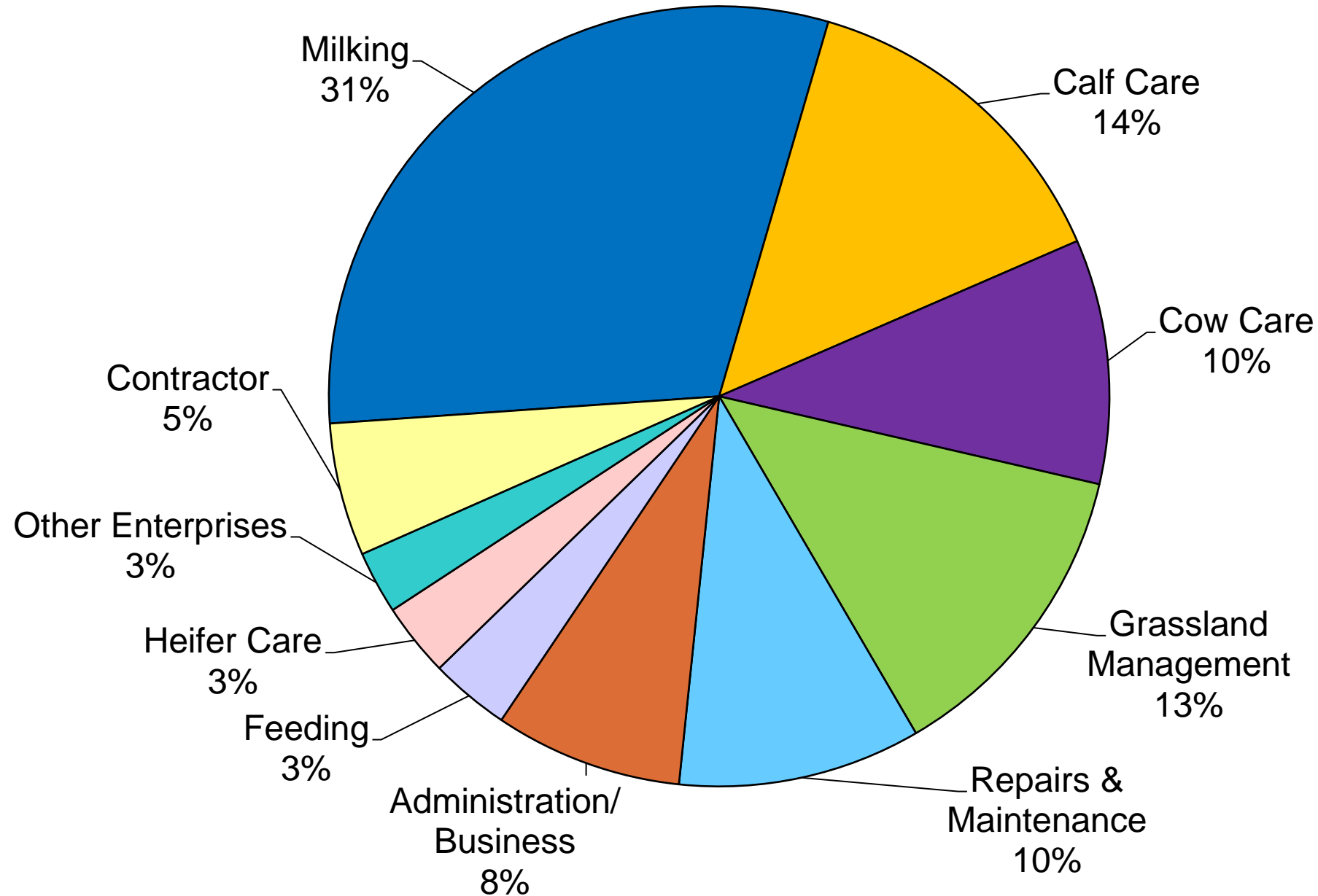
# Hours worked by labour type (Feb – June)



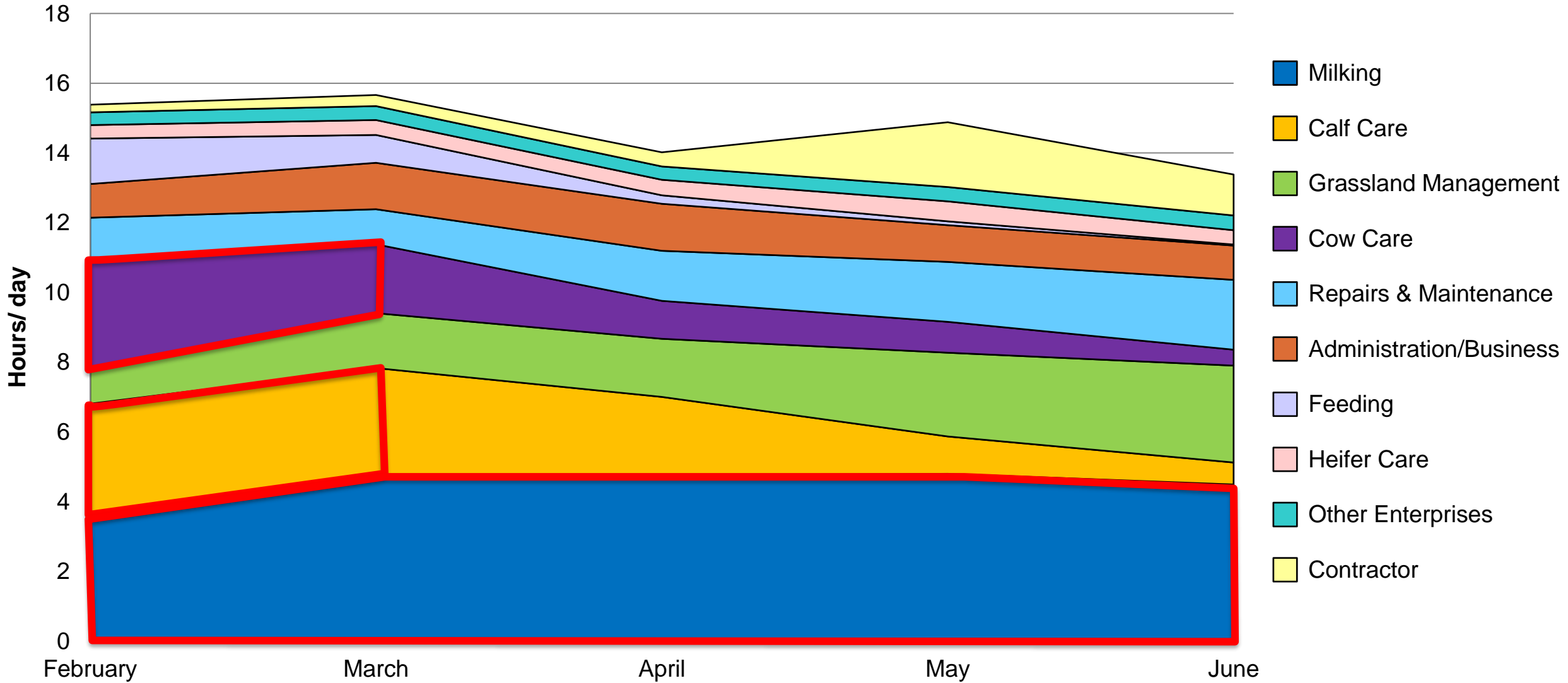
# Farm hours and labour efficiency (Feb – June)



# % of time devoted to each farm task (Feb – June)



# Average labour input (h/ day) for each task for each month



# Effective work organisation

- The way tasks are organised and co-ordinated with a focus on the workers available, the tasks being completed and when they are being completed

## Efficient/ productive

Maximising output from inputted labour without negatively affecting work quality

- h/ cow
- Farmer work h/ day

## Flexible

Balance between work and personal life – **TIME OFF**

- Farmer length of working day
- No of days off

## Standardised

Sequence and structure of tasks to ensure productive work

- Fewer tasks completed
- Early/ consistent finish time

# Descriptive characteristics of the farmers' working day

Item	Work organisation effectiveness ranking <sup>1</sup>		Average <sup>2</sup>	P-value
	Top 25 %	Bottom 25 %		
Herd size	112	113	108	
Labour efficiency (h/ cow)	17.4	20.9	20.4	0.60
Start time (h)	07:00	06:47	06:48	0.72
Finish time (h)	18:25	19:58	19:08	< 0.001
Length of working day (h/ day)	11.4	13.2	12.3	< 0.001
Non-farm activity (h/day)	4.2	3.4	3.8	0.03
<b>Labour input per week (h/ week)</b>	<b>51.2</b>	<b>70.0</b>	<b>61.1</b>	<b>&lt; 0.001</b>
Farmer days off between start of calving and end of breeding	2.0	0.9	1.7	0.71
Number of tasks completed per day	9.6	12.5	10.9	0.02

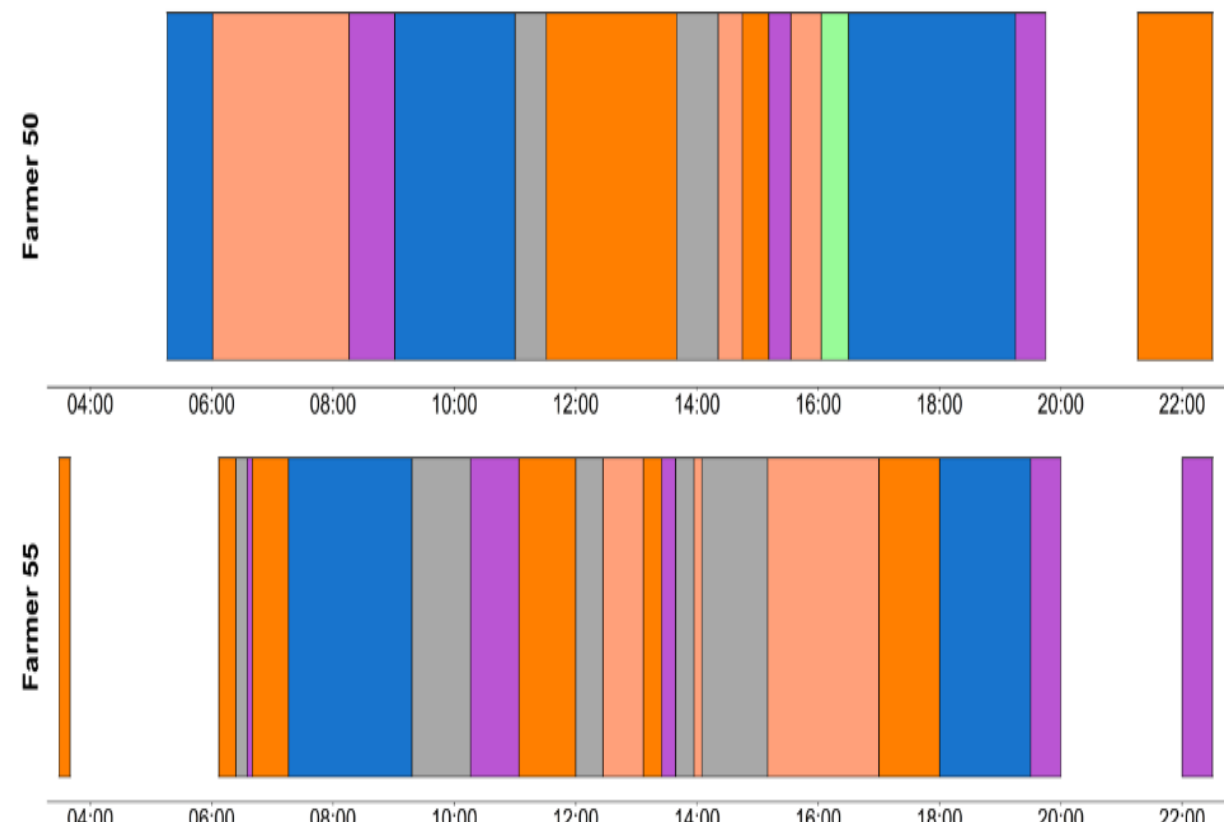
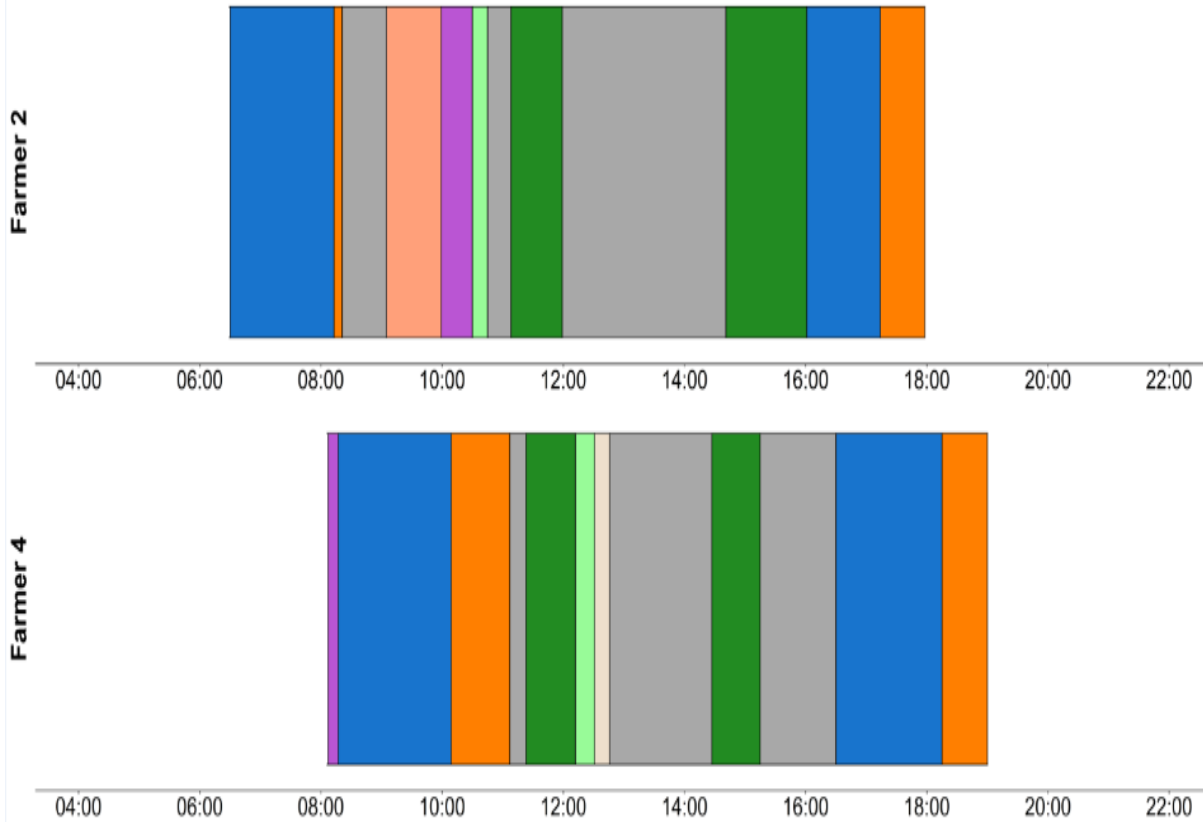
<sup>1</sup> = Top 25 % - 13 farms (average 112 cows); <sup>2</sup> = Bottom 25 % - 15 farms (average 114 cows).

<sup>2</sup>Average of all farms used in the analysis (n=55).

# Working day patterns in March – Daily task timelines of 4 farmers

## Effective

## Ineffective



- |                         |             |           |                   |                       |
|-------------------------|-------------|-----------|-------------------|-----------------------|
| Administration/Business | Breaks      | Calf Care | Cow Care          | Feeding               |
| Grassland Management    | Heifer Care | Milking   | Other Enterprises | Repairs & Maintenance |



# Preliminary results – Survey of 313 farms

Item	Work organisation effectiveness ranking		Average	P-value
	Top 25 %	Bottom 25 %		
Days holidays per year	16.6	5.1	10.3	< 0.001
Weekends off per year	8.3	2.4	4.5	< 0.001
Average nights up per week during calving	3.4	4.5	3.9	0.02

## ■ Key characteristics

- Better facilities
- Implementing more labour efficient and HRM practices
- Less difficulty attracting and retaining employees
- More positive attitudes towards careers in farming

# Work practices and technologies

- Study using combination of on-farm surveys and time-use data collected in 2019
- Aims
  1. Identify the work practices and technologies associated with labour efficiency
  2. Estimate the potential improvements in labour efficiency achieved by implementing these practices

# Development of a scoring system to measure the effects of work practice/ technology implementation

## Steps

1. 59 work practices/ technologies associated with labour efficiency of their particular task
2. Each farmer was allocated a score – **1** point allocated for each work practice/ technology where best practice was implemented and **0** if not
3. Points totalled to give a labour efficient work practice and technology implementation score for each farm

A **high** score = high number of labour efficient work practices/ technologies implemented

A **low** score = low number of labour efficient work practices/ technologies implemented

# Labour efficient work practice/ technology scores

- 59 work practices/ technologies

- Milking - 19
- Calf care - 9
- Cow Care - 12
- Grassland Management – 5
- Admin/ business – 2
- Heifer Care – 3
- Feeding – 5
- General - 4

- Average score of 30.9 (max – 59)

- Range: 10 - 45

**Labour Efficient Work Practices and Technologies**  
A checklist to improve labour efficiency on your farm

A survey completed on Irish dairy farms identified 59 work practices and technologies associated with labour efficiency between February and June, which are listed below. It is estimated that each additional work practice or technology implemented will improve labour efficiency by 0.60 hours/ cow during the February to June period.

Take the time to read the following statements and tick the labour efficient work practices and technologies that you are implementing on your farm.

Milking Work Practices and Technologies (21% of all time)		Yes
1. One person present in the milking pit for mid lactation		<input type="checkbox"/>
2. Automatic cluster removers present		<input type="checkbox"/>
3. Operator does not leave the milking pit to feed calves during milking		<input type="checkbox"/>
4. Cow exit gates can be operated from anywhere in the milking pit		<input type="checkbox"/>
5. Cows are normally herded to and from the parlour for milking mechanically		<input type="checkbox"/>
6. Milking less than 9 rows of cows		<input type="checkbox"/>
7. Once a day milking is practiced in early lactation		<input type="checkbox"/>
8. Operator does not leave the milking pit to herd cows into the parlour		<input type="checkbox"/>
9. Cow entry gates can be operated from anywhere in the milking pit		<input type="checkbox"/>
10. No pre-milking teat preparation		<input type="checkbox"/>
11. Dropdown sprayers are used for post-milking teat disinfection		<input type="checkbox"/>
12. Meal feeders are operated automatically		<input type="checkbox"/>
13. Cow-handling facilities are located next to the milking parlour		<input type="checkbox"/>
14. Cow-drafting facilities present		<input type="checkbox"/>
15. Dumpline present		<input type="checkbox"/>
16. Automatic plant wash present		<input type="checkbox"/>
17. Automatic backing gate present		<input type="checkbox"/>
18. Cows can walk straight out of the milking parlour or there is > 2.5m before they have to turn		<input type="checkbox"/>
19. Cows can go directly to the paddock after every milking		<input type="checkbox"/>
Milking Score		/19
Calf Care Work Practices and Technologies (14% of all time)		Yes
20. Calves are trained on group feeders from days 1-4		<input type="checkbox"/>

# Work practice/ technology scores on most and least labour efficient farms

Score	Maximum score	Labour efficiency ranking		P - Value
		Top 25%	Bottom 25%	
Total score	59	37.1	25.3	< 0.001

- Total labour efficient work practice/ technology score and herd size explained 54% of the variation in labour efficiency
- On average, each additional work practice/ technology implemented estimated to improve labour efficiency by 0.6 h/ cow

# Key work practices/ technologies affecting milking labour efficiency

- One person milking for mid lactation (-3.04 h/ cow)
- Automatic cluster removers present (-2.55 h/ cow)
- Not leaving to feed calves during milking (-1.31 h/ cow)
- Cow exit gates can be operated from anywhere in the pit (-0.94 h/ cow)
- Cows herded in and out mechanically (-0.87 h/ cow)



\*labour savings relate to the February to June period during which the study was completed

# Key work practices/ technologies affecting calf care labour efficiency

- Contract calf rearing before weaning (-0.79 h/ cow)
- Using automated or ad libitum calf feeding methods once trained (-0.71 h/ cow)
- Not rearing bull calves on farm (-0.69 h/ cow)
- Calves trained on group feeders (days 1-4) (-0.52 h/ cow)



\*labour savings relate to the February to June period during which the study was completed

# Key work practices/ technologies affecting grassland management labour efficiency

- Contracted slurry spreading (-1.78 h/ cow)



\*labour savings relate to the February to June period during which the study was completed



# Farm facilities and technologies

- Longitudinal study completed in spring 2021 –
  - Aimed to measure the effect of facilities and technologies changes on labour demand and efficiency (57 farms)
- Real-time on-farm case studies could reassure farmers of the labour saving benefits – support modelled data
- Farm labour input increased by 3% but labour efficiency improved by 7% between 2019 and 2021
- Farmer hours worked in spring remained similar (64.0 vs 64.5 h/ week)



# Differences on farms that made significant calf care changes

	Farms that made significant calf care changes (n=19)			Farms that didn't make significant calf care changes (n=38)		
	2019	2021	% Difference	2019	2021	% Difference
<p>Efficiency improved and time input remained the same despite herd size increases</p> <p>Herd size</p> <p>Calf care labour input (h)</p>	135	160	18.3%	150	160	6.8%
	231	232	0.5%	251	282	12.5%
<p>Auto calf feeders had the greatest impact on labour efficiency - 21% improvement</p>						

\*\* Significant changes were mainly automatic calf feeders/ new calf sheds/ selling bull calves

# Differences on farms that increased milking units or built new milking parlours

	Farms with new milking parlours or added units (n=7)			All other farms (n=50)		
	2019	2020	Difference	2019	2020	Difference
Herd size	160	177	10.5%	143	157	10.3%
Milking labour input (h)	405	417	2.9%	388	417	7.6%
Milking labour efficiency (h/cow)	3.2	3.0	-6.7%	3.1	3.0	-1.5%

Greater efficiency improvements on farms that have made changes

# Farm performance indicators among the most and least labour efficient farms

Item	Labour efficiency ranking		P - Value
	Top 25%	Bottom 25%	
6 week calving rate (%)	86	78	0.05

Farms can be highly labour efficient and still achieve high levels of farm performance

# Take home messages

- Quality of life on dairy farms in terms of workload – It can be done!
- Positive cases in terms of farmer working hours and the potential flexibility of the dairy farming workload should be highlighted –
  - To show farmers what can be achieved on their own farms
  - To address the negative perceptions associated with careers in dairy farming
- Time-off flexibility remains a key challenge



## Simple system

- ✓ Effective work organisation
- ✓ Practices, facilities and technologies
- ✓ Efficient pasture based system
- ✓ Easy care cow



# Thank You For Listening

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