The impact of work practices and technologies on labour demand

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Summary

- Fifty-nine work practices and technologies were associated with labour efficiency from February to June.
- The most labour efficient 25% of farms implemented 37 of those labour efficient work practices/technologies while 25 were implemented on the least labour efficient 25% of farms.
- Each additional work practice or technology implemented was estimated to improve farm labour efficiency by 0.6 h/cow.
- The study offers an insight into the potential time savings of key labour saving work practices and technologies.

Introduction

Fifty-seven percent of all workload occurs during the spring and summer periods on spring-calving dairy farms. This, along with difficulties attracting people to work on farms have led to workload management challenges. Accordingly, improved time-use and productivity regarding the management of dairy herds have become increasingly important. The objective of this study was to identify work practices and technologies associated with farm labour efficiency and to estimate the impact of key practices and technologies on labour demand.

Time-use study and work practice/ technology implementation survey

A labour time-use study was completed from 1st February to 30th June, 2019 on 76 farms. Farmers and farm workers recorded their time input on a smartphone app on one alternating day each week. Farm workers not using the app as well as contractor hours, were recorded through an online survey.

An additional survey, involving 110 questions related to work practice/technology implementation, was completed with each farmer. Each work practice/technology was classified according to its associated farm task and statistically tested; 59 were found to be associated with labour efficiency. A score was given to each farm depending on how many of the 59 work practices/technologies they implemented; a farm received one point for each work practice/technology that was implemented.

Results

On average, farms implemented 31 labour efficient work practices/technologies (range 10-45). The most labour efficient 25% of farms implemented 37 work practices and technologies compared to 25 on the least labour efficient 25% of farms. The implementation of labour efficient work practices and technologies, along with herd size, explained 54% of the variation in farm labour efficiency. It was estimated that each additional work practice or technology implemented would improve farm labour efficiency by 0.6 h/cow. These findings demonstrate the positive impact that these work practices and technologies can have on labour demand.

Certain labour efficient work practices and technologies (e.g., reduced rows of cows, ACRs, automatic calf feeders, drafting facilities, automatic heat detection) require large capital expenditure and a cost-benefit analysis may be required. However, many other techniques are low cost requiring improved work organisation (e.g., not leaving the milking pit to herd cows into the parlour or to feed calves during milking, not transferring milk to the calf house in buckets, pushing in silage mechanically, once-a-day AI), which could have large effects on labour efficiency through the elimination of unnecessary work. Therefore, work organisation methods should be the first focus for farmers as such techniques should be more straightforward to implement than the other high cost technologies.

Milking and calf care were the most labour demanding tasks from February to June consuming 31% and 14% of all labour input, respectively. The work practices/technologies estimated to have the greatest impact on milking and calf care labour efficiency are presented in Table 1 accompanied by their estimated time saving from February to June.

Table 1. *Work practices/technologies that had the greatest impact on milking and calf care labour efficiency from February to June (estimated time saving in brackets)*

Milking	Calf care
One person in the milking pit during mid lactation (-3.0 h/cow)	Contract heifer rearing pre-weaning (-0.8 h/cow)
Automatic cluster removers (-2.6 h/cow)	Automatic calf feeders used once calves were trained and grouped (-0.7 h/cow)
Milker not leaving the milking pit to feed calves during milking (-1.3 h/cow)	Bull calves not reared on farm (-0.7 h/cow)
Ability to operate cow exit gates from any point in the pit (-0.9 h/cow)	Group feeders used to train calves (days 1-4; -0.5 h/cow)
Using a quad/ jeep when herding cows to and from the parlour (-0.9 h/cow)	

Additionally, contracted slurry spreading was estimated to improve labour efficiency by 1.8 h/cow.

Conclusion

This study demonstrates that there are a wide variety of work practices/ technologies available to farmers that can increase labour efficiency. When accumulated these practices/ technologies have the potential to have a large impact on labour demand. Additionally, many of the work practices included required minimal capital expenditure and focused on improved work organisation, and so should be relatively easy to implement. There remains scope to increase the adoption of these work practices/ technologies on-farm with even the most labour efficient farms implementing only 63% (37) of the 59 associated with labour efficiency. The full list of labour saving work practices/technologies is available online.