

## To train or not to train heifers to the milking parlour prior to calving? That is the question for New Zealand dairy farmers

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### Abstract

A survey was conducted to identify: 1) the number of dairy farms that train their heifers to the milking parlour prior to calving, 2) the reasons why farmers chose to train or not and 3) what training methods farmers use. The questionnaire was sent to 250 randomly selected dairy farmers within New Zealand. Of the 93 respondents, 52% trained their heifers to the milking parlour prior to calving and 48% did not. Of those that trained, 79% trained to reduce stress levels, 13% to increase milk production and 19% to reduce risk of injury to animal/farmer. Conversely, of the farmers that did not train their heifers to the milking parlour prior to calving, 56% reported that “cows teach the heifers”, 24% reported that they were too busy and 31% indicated that training did not work. The main methods of training included walking heifers through the milking parlour, holding heifers in the parlour and exposing them to people. The results from this survey provide interesting information regarding the motivation of farmers to train (or not train) heifers to the milking parlour prior to calving and what training methods are used. Information gained from this survey can inform the direction of future research so that science-based farmer friendly recommendations for heifer training can be developed.

**Keywords:** behaviour; dairy; heifers; survey; training

### Introduction

During the first days of lactation, heifers are exposed to novel experiences associated with the milking process, including the presence and close proximity to humans, and the milking parlour and its associated stimuli (noise, smells). In response to this novelty, heifers will commonly flinch (contraction of the stomach muscles or udder), step or shift their body weight from one foot to another and/or kick during this period while being milked (Bremner 1997). However, heifers that constantly kick off cups, move around during milking, and display other adverse behaviours require more attention during milking, distract from the efficiency of the overall milking operation and have a higher potential to cause injuries to farm staff and themselves (Willis 1983). Therefore, it would be beneficial for the farmer and the heifer if strategies could be put into place to mitigate these behaviours.

Training heifers by exposing them to the novel environment, sights, sounds and smells of the milking parlour and milking process, has the potential to reduce their fear of humans and/or the milking process. Handling and exposure to the milking environment prior to calving was shown to reduce the frequency of adverse behaviours, such as stepping and kicking, displayed by heifers during milking (Bremner 1997). In addition, heifers handled by humans around the time of calving performed fewer flinch-step-kicks (FSK) responses than non-handled heifers during the milking process (Hemsworth et al. 1989) and brushing heifers weekly prior to calving was associated with less kicking in the presence of a stock person during the milking process and increased milk let down (Bertenshaw et al. 2008). However, Dowling and Sutherland (2012) found that heifers trained to a rotary milking parlour over three days prior to calving were more restless during cluster

attachment at milking and the time to attach the milking cluster was longer than that for untrained heifers. It was concluded that the training protocol used in the study was not adequate to reduce the behavioural response of heifers to milking during the first week of lactation. Therefore, it would be beneficial to know techniques that work to reduce adverse behaviours when milking heifers; which are also practical to implement on farm.

Few studies have investigated the use of training to mitigate stress and the associated negative behaviours during the first week of lactation and of those studies several different mitigation strategies have been reported, including training to the milking parlour and humans. However, to inform future research it would be worthwhile to first get an understanding of what strategies farmers are currently using in New Zealand to train heifers to the milking parlour prior to calving. Therefore, a survey was conducted to identify: 1) the incidence of heifer training prior to calving on NZ commercial dairy farms, 2) the reasons why farmers chose to train or not train and 3) what training methods farmers use if they train.

### Material and methods

A postal survey was selected as the most effective means to contact a large number of farms to obtain a broad picture of the degree and type of heifer training that occurs on NZ commercial dairy farms. A list of 250 randomly selected New Zealand dairy farmers was provided byASUREQuality Limited. The survey (appendix 1) was developed to identify: 1) the incidence of heifer training prior to calving on commercial dairy farms, 2) the reasons why farmers chose to train or not train and 3) what training methods farmers use if they train.

The survey responses were entered into a spreadsheet and the percentage of respondents was calculated for each question. Information on age of farmers, size of farm and herd size were split into evenly distributed categories: ranges of 10 years, 100 ha and 250 cows respectively. When comparisons between groups were made, percentage of respondents was not weighted on the number of respondents per group. Data are descriptive only.

## Results and discussion

### *Demographics of farmers who train*

The survey was posted to 250 dairy farmers throughout New Zealand and achieved a 37% (93/250) response rate. North (81%) and South Island (19%) farmers were represented with most responding farmers from the Waikato (31%), Taranaki (19%) and Canterbury (11%). Respondents were typically farm owners (72%), but also included share milkers (14%) equity partners (8%), managers (4%) and contract milkers (2%). Farms ranged in size from 40 ha to 8000 ha, however, it is not clear if these larger farm sizes refer solely to dairying only or included other land uses. In addition, it is not evident if these larger farms managed multiple herds within the same farm. Herds ranged in size from 80 to 18,000 cows. Four percent of respondents had herd sizes less than 100 cows, 15% of herds were 101-200 cows, 25% were 201-300 cows, 16% were 301-400 cows, 12% had 401-500 cows and a further 28% had herd sizes larger than 500 cows. Breeds were inclusive of Friesian, Jersey, Friesian-Jersey Cross, and other breeds. More respondents had herringbone (70%) than rotary milking parlours (30%) in the survey.

The position that the respondent held was associated with whether they trained or not; managers and equity partners were less likely to train (train vs. don't train: 25% vs. 75% and 43% vs. 57%, respectively) whereas share milkers were more likely to train (train vs. don't train: 69% vs. 31%). Share milkers may be more inclined to train as they own the heifers and are also involved in milking them, hence it is to their benefit to invest more time in their animals to improve the milking experience of the heifer and farmer. The proportion of respondents that trained or not was similar between farm owners (train vs. don't train: 48% vs. 52%) and contract milkers (train vs. don't train: 50% vs. 50%).

The age of the respondent appeared to be related to the likelihood of training heifers or not, with respondents aged between 26 to 35 and 56+ more likely to train than respondents aged between 36 and 55 (Table 1). Farmers aged between 36 and 55 years were likely (44% of respondents) not to train as they indicated that cows teach the heifers and secondly, they were too busy (24%). Differences in motivation to train may reflect different attitudes towards farming and animals among different age groups, however, it is not clear from the results why this actually might occur.

Farm size and herd size were associated with the likelihood of whether heifers were trained; farms between

0-100 and 501+ ha and correspondingly herd sizes of 0-250 and 1000+ cows were more likely to train than were intermediate sized farms (ha and cow numbers) (Table 1). Interestingly, farms between 0-100 ha and 0-250 herd size were more likely to milk their cows in a herringbone than rotary milking parlours (Table 1). Moreover, respondents using herringbone milking parlours were also more likely to train their heifers to the parlour (% respondents: 57% train vs. 43% don't train) than respondents using rotary milking parlours (% respondents: 32% train vs. 68% don't train). Therefore, there appears to be a relationship between parlour type and likelihood to train. Due to the layout of a herringbone milking parlour, heifers may require more training to learn how to line up and stand in the bail correctly, whereas, heifers just need to step onto and back off a rotary parlour platform. The higher proportion of smaller farms having herringbones may explain why these farms are more likely to train, but this does not explain why larger farms are also more inclined to train their heifers.

In addition, knowing the level of experience the respondents had of dairy farming and/or training heifers, and the number of cows per stockperson per farm, would have been useful to interrupt the motivation of farmers to train (or not train) heifers to the milking parlour prior to calving.

### *Reasons for training heifers*

Of the respondents that train their heifers to the milking parlour prior to calving, the main reasons for doing so were to reduce stress levels, increase milk production and reduce risk to the farmer and heifers (Table 2). Two respondents

**Table 1** Age, farm size and herd size of survey respondents that train or don't train their heifers to the milking parlour prior to entry into the milking herd and the type of parlour that they use on New Zealand commercial dairy farms.

	Training		Milking parlour type	
	Yes	No	Herringbone	Rotary
Age of respondent (years)				
16-25	0%	0%	0%	0%
26-35	60%	40%	50%	50%
36-45	47%	53%	63%	37%
46-55	39%	61%	82%	21%
56-65	57%	43%	79%	29%
66+	64%	36%	82%	18%
Farm size (ha)				
0 - 100	70%	30%	97%	3%
101-200	42%	58%	64%	36%
201 - 300	15%	85%	38%	62%
301 - 400	50%	50%	75%	25%
401 - 500	33%	67%	33%	67%
501+	75%	25%	50%	75%
Herd size (number of cows)				
0 - 250	61%	39%	100%	0%
251 - 500	51%	49%	79%	21%
501 - 750	27%	73%	21%	79%
751 - 1000	0%	100%	0%	100%
1000+	71%	29%	57%	57%

**Table 2** Reasons why survey respondents train or don't train their heifers to the milking parlour prior to entry into the milking herd on New Zealand commercial dairy farms.

Reason	Respondents (%)
<i>Why farmers train their heifers</i>	
Reduce stress levels	79
Reduce risk of injury to heifer/farmer	19
Increase milk production	13
Get heifer use to the shed	6
Other	4
<i>Why farmers do not train their heifers</i>	
Cows teach heifers	56
Training doesn't make a difference	31
Too busy	24
Causes injuries	4

also stated that they train as method of mastitis control. On the other hand, respondents who don't train indicated that the main reasons were because cows teach the heifers, they don't believe that training makes a difference or they are too busy (Table 2). One of the major limitations to this survey is that we did not stipulate whose stress levels were being reduced, the farmer or the heifer. This would be worth exploring in more detail.

#### *Methods used to train heifers*

Frequency of training ranged from daily to fortnightly and as "much as possible" to "not regularly". Duration of training sessions ranged from 1 minute to 1.5 hours with the majority of training sessions lasting 5 to 30 minutes (44% of respondents that train). In a previous study, Bremner (1997) found that frequency of handling and training to the milking parlour prior to calving affected the behavioural reactivity of heifers during the first week of lactation. Bremner (1997) suggested that as animals become tamer, behavioural reactivity subsequently decreases. Moreover, Gibbons et al. (2011) stated that very tame animals are more likely to stand stationary in response to a stressor. Hence, frequency and duration of training prior to calving can have marked effect on the behavioural reactivity of heifers during milking. It would therefore be of interest to know the optimum frequency and duration of training needed by heifers prior to calving.

Respondents indicated several different methods used to train their heifers prior to entering the milking herd and often used more than one. The majority of respondents that trained their heifers did so by walking them through the milking parlour (85%), exposed them to the presence of people (69%), held them in the milking parlour (48%), exposed them to the noise of the milking machine (29%) and/or touched the udder (21%). The least-used methods included using the cups (2%), touching the top of tail (2%) and using the backing gate (2%). The majority of respondents used one to three different methods, with one farmer incorporating eight different methods. Furthermore, 23% of the respondents that trained used feed during training, likely as a form of positive reinforcement. Farmers

that did not train their heifers prior to entering the milking herd used other methods of training them to the milking parlour; the majority put the heifer through the milking parlour with the cows (38%), milked the heifers when they had calved (29%) or gently introduced the heifers through exposure to the milking parlour at the time of milking (11%). Several strategies have been studied in the literature, including positive handling of heifers and familiarising them with the milking parlour before calving (Bremner 1997; Hemsworth et al. 1989; Bertenshaw et al. 2008). Positive handling around the time of calving reduced the physiological and behavioural response of heifers during milking, as well as their fearfulness of humans (Hemsworth et al. 1989). Moreover, handling and experience of the milking parlour before calving reduced the frequency of movement and kicking during milking in the first week of lactation (Bremner 1997). However, little is known in regards to what particular aspects of the training process is most important for the welfare of heifers, whether it is reducing the heifer's fear of humans, habituating them to the milking process, or a combination of both.

In conclusion, approximately 50% of farmers appear to train their heifers to the milking parlour prior to calving to some extent. The main reason farmers give for training is to reduce stress levels, with training predominantly involving walking the animals through the milking parlour and exposing them to the presence of people. The four main gaps in our knowledge identified from this survey included: why are farmers aged between 36-55 years less likely to train? Do farmers train to reduce the stress experienced by the heifer, the farmer or both? The optimum frequency/duration of training? What aspects of the training process are most important? Future research directed towards understanding what methods of training are best for the heifer and the farmer, under different New Zealand systems, is needed with a goal of developing science-based recommendations.

#### **Acknowledgments**

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#### **References**

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**8. Current herd size before calving:**

Herd size (please state number) \_\_\_\_\_

**9. Number of heifers to be introduced into the herd:**

Heifers (please state number) \_\_\_\_\_

**10. When are heifers introduced into the herd? (e.g. pre-calving, immediately post-calving, other)**

(Please state) \_\_\_\_\_

**11. Are the heifers to be run as part of the main herd or as a separate group after calving? (Please Circle)**

Part of                      Separate to                      Other (please state) \_\_\_\_\_

**12. Date range of calving:**

(Please state approx. herd date range of calving) \_\_\_\_\_

**13. Are heifers calved at an earlier or same date as cows? (Please Circle)**

Earlier                                      Same date

**14. If calved earlier, why?**

Please state reason: \_\_\_\_\_

**15. How often are the heifers milked after calving? (Please Circle)**

Once daily                                      Twice daily

Combination (please describe) \_\_\_\_\_

**Section Three- Heifer Training Procedures (Please answer the following):****16. Do the heifers have any exposure to the milking shed prior to calving? (Please Circle)**

Yes                                      No

**17. How often are the heifers exposed to the milking shed prior to calving?**

(Please state) \_\_\_\_\_

**18. If exposed to the milking shed prior to calving, why? (Please Circle)**

Drenching                      Teat Sealing                      Pregnancy Testing                      Lameness                      Vaccinating

Training                      Other (please state) \_\_\_\_\_

19. Do the heifers receive any **milking shed training** prior to calving? (Please Circle)

Yes

No

***If yes, answer questions 20-27***

***If no, answer questions 28-29***

20. How long prior to calving do you aim to start training?

(Please state) \_\_\_\_\_

21. Who conducts the shed training?

(Please state) \_\_\_\_\_

22. How frequently are the heifers trained?

(Please state) \_\_\_\_\_

23. How long is each training session?

(Please state) \_\_\_\_\_

24. What training methods do you use? (Please Circle all that apply)

Walk through shed

Hold in shed

Hand on udder

Wash udder

Use cups

Noise of machine

Presence of people

Other (please state) \_\_\_\_\_

25. If more than one training method is used, are they introduced gradually or altogether? (Please Circle)

Gradually

Altogether

26. Is food used during training? (Please Circle)

Yes

No

27. What is the **main** reason for training prior to calving? (Please Circle One Option Only)

Reduced stress level

Increased milk production

Reduced injury risk for farmer and heifers

Other (please state) \_\_\_\_\_

28. What is the **main** reason for **not** training prior to calving? (Please Circle One Option Only)

Cows teach the heifers

Too busy

Training doesn't make a difference

Other (please state) \_\_\_\_\_

29. If no training is given, what introduction practice is used?

(Please state) \_\_\_\_\_