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## BRIEF COMMUNICATION: Identification of potential impacts of New Zealand dairy housing systems on dairy cow welfare

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### INTRODUCTION

Although housing of dairy cows is not a common management practice in New Zealand, it is becoming increasingly used for a variety of reasons. Potential benefits from dairy housing have been identified as pasture protection, effluent management, cow health and welfare, supplementary feed management and increased production (Dexcel, 2005). Laven and Holmes (2008) further explored potential health and welfare issues associated with increased use of housing for dairy cows in New Zealand. However, there is to date very little empirical research on the current animal welfare issues related to housing management practices and facilities on New Zealand dairy farms. The following study served to provide an initial overview of the types of housing system currently in use in New Zealand, the management practices associated with them, and their potential animal welfare advantages and disadvantages.

### MATERIALS AND METHODS

Two separate surveys were conducted, a targeted postal survey of 14 veterinarians and a phone survey of 30 dairy farmers using housing systems. Twelve veterinarians replied for a response rate of 86% covering a combined client base of 956 dairy farmers and 24 dairy farmers responded for a response rate of 80%.

The veterinary survey was designed to capture information about the prevalence of different housing systems and to gather information on veterinarian's perceptions of the potential animal welfare risks associated with housing. This survey classified housing systems as: HerdHome™, roofed and unroofed cubicle housing, roofed and unroofed deep litter, or constructed shelters with no roof but with cubicles, slats and/or deep litter substrates employed.

The farmer survey consisted of rating scales, multiple answer options and open-ended questions investigating how the housing was being used, factors influencing its use, animal-related problems encountered, and the influence of housing on animal

health and productivity. Fifteen HerdHome™ systems, four cubicle systems and five deep litter/covered shelter systems were represented in the sample.

### RESULTS

#### Veterinarian survey

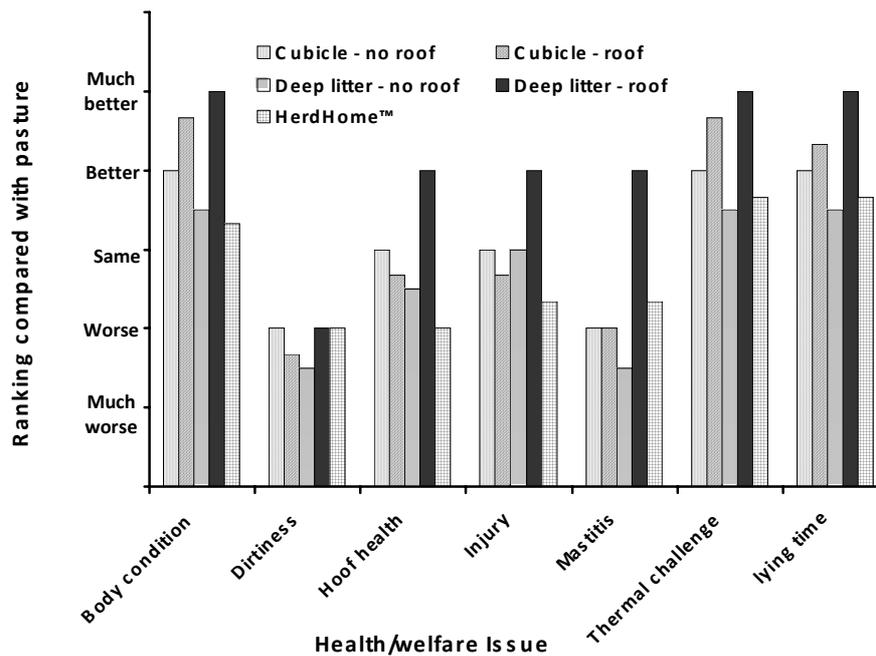
Data were obtained for the following regions: Auckland (60 clients), Waikato (293 clients), Bay of Plenty (75 clients), Manawatu (60 clients), Wairarapa (50 clients), West Coast (245 clients) and Southland (173 clients). Of these 956 farms represented in the sample, 29 or 3%, used some form of housing. Of these 29 farms, seven were reported to use a HerdHome™, 10 cubicle housing, five deep litter, six constructed shelter with no roof, and one cubicles with no roof.

Veterinarians were also asked to rate indoor systems in comparison to pasture-based management on the following specific issues: aggressive behaviour, calving issues, body condition, dirtiness, hoof health, other injury, mastitis, thermal challenge, state of newborn calf and sufficient lying time. The most highly ranked issues for cow welfare were mastitis, dirtiness, hoof health in some systems, and other injury (Figure 1). Additional comments indicated some concern that lack of exercise can be a problem with indoor management systems, and that underfoot conditions and ventilation can be a problem in deep litter systems. The main advantages of housing were perceived to be better body condition, longer lying times, reduced thermal challenge, and, in some cases, improved calving outcomes.

#### Farmer survey

Of the 24 respondents, 11 were from the North Island and eight from the South Island. Overall, farmers reported using their current housing systems for an average of 2.7 milking seasons with a range of 0.5 to 14 seasons. They listed their reason(s) for using a housing system as: environmental/effluent management (25%), animal health/welfare (42%), pasture protection (42%) and stocking rate/production goals (21%) (Table 1).

**FIGURE 1:** Mean ranking in the veterinarian survey of specific health and welfare issues in each category of dairy housing system compared with pasture based management.



**TABLE 1:** Percentage of respondents in the farmer survey reporting reasons for use of their housing system, how the system is used, and factors affecting commencement and cessation of housing use.

Factors	HerdHome (%)	Cubicle (%)	Other (%)	Total (%)
<b>Farmer reasons for use</b>				
Environmental	27	50	0	25
Animal	47	25	33	42
Pasture	40	50	50	42
Stocking rate/production	27	25	0	21
<b>Animal occupancy</b>				
Used for lactating cows	87	75	17	74
Used in winter only	40	50	50	50
Cows shut in during winter	100	100	100	100
Cows shut in during summer	33	100	100	54
Cows are let out to graze in winter	80	75	60	79
<b>Trigger to use housing</b>				
Inclement weather	66	50	33	63
Season/time of year	40	75	0	42
Pasture protection	33	50	20	42
<b>Trigger to stop using housing</b>				
Weather improvement	33	50	67	46
Pasture saturation reduced	6	50	50	20
Start of lactation	6	25	16	16
Never stop using housing	33	0	0	25

Seventy-four percent of farmers reported using their housing system for lactating and dry cows and 26% for dry cows only (Table 1). All respondents of the farmer survey used their housing system during winter and half also used it over summer. When using housing in summer, 54% shut the cows in during the hottest part of the day, with the remaining 45% allowing voluntary access. In winter, all

respondents shut cows in the housing facility, with 79% allowing cows some time on pasture each day (Table 1). Of these, approximately 20% reported letting cows out at night. A total of 10 out of 29 farms used their housing facility for calving.

Farmers were asked about factor(s) that influenced their decision to start putting cows into their housing facility. Weather was reported as a

decision making factor by 63% of respondents (46% cold weather, 17% hot weather), with 42% using time of year/season such as “moved into housing system once cows are dried off” or “start using it mid May”, and 42% using pasture condition such as “as soon as pasture becomes too wet”, as cues for commencing housing facility use (Table 1). Factors affecting decisions to stop housing during winter were all seasonally based, including: weather such as “once the weather starts improving” (46%); pasture such as “when paddocks dry up” (20%); and the beginning of lactation (16%) (Table 1). Twenty-five percent of respondents reported that they used their housing facility all year round for supplementary feeding, managing bad weather events or providing shade during summer.

According to the farmer survey, cows were monitored on average 2.1 times per day, with a range of 1 to 4 times, while in the housing facility. Only 4 out of the 24 farmers surveyed (17%) had processes in place for removing cows from the housing facility that were showing signs of health or welfare issues such as lameness, not lying down or bullying. Injury (38%), dirtiness (38%), mastitis (20%) and hoof health (17%) were the most commonly reported health related problems, with a minority reporting problems with calving and lying/resting times (8% for each).

Overall, farmers perceived the main benefits from their housing system for their business to be related to production, pasture management and animal condition with improvements in each area reported by 79%, 83% and 83% of the respondents, respectively. The main disadvantages reported were increased labour and animal health costs as reported by 37% and 58% of the respondents, respectively. Overall, 33% of farmers surveyed expressed an interest in expanding the housing system to include either more, or bigger, facilities in the future.

## DISCUSSION

Although the sample size was relatively small, data from the veterinary survey indicated that as few as 3% of New Zealand dairy farmers may currently be using housing systems of the types defined in this survey. Further, there was some indication that for many farmers, use of housing facilities was a relatively new practice with an average of 2.7 seasons reported in the survey. Data from the farmer survey indicated that current decision making about managing housed dairy cows was generally focussed around weather conditions or seasonality and motivated by pasture management and/or cow comfort. In general, farmers believed their housing system had impacted positively on their business.

Both veterinarians and farmers reported similar potential and actual health and welfare issues,

including mastitis, dirtiness, hoof health and injury. As dirtiness is a potential indicator of overstocking (O’Driscoll *et al.*, 2008), recommendations for appropriate stocking densities for New Zealand housing systems could be beneficial to the industry as it develops in this area. Further, a common risk factor potentially associated with both mastitis (Ward *et al.*, 2002) and hoof health (Faull *et al.*, 1996) is underfoot conditions. Thus, identifying appropriate bedding systems for New Zealand dairy housing is likely to assist with minimising these health and welfare risks.

Farmers reported that on average they inspected their cows twice daily while they were housed. The optimal level and nature of monitoring within housing systems for the minimisation of health and welfare risks has yet to be identified. Early detection of such problems is likely to be a valuable management strategy. The limited sample size in the farmer survey precluded any attempt to describe a relationship between the level of monitoring reported and health and welfare problems.

In conclusion, housing of dairy cows in New Zealand appears to be a relatively uncommon practice. However, adoption of new housing systems may increase as farmers explore new management options. The findings in this paper highlight a number of potential health and welfare risks for housed cows in New Zealand. Identification of key strategies for managing these risks will assist with the development of best practice guidelines for dairy cow housing in New Zealand.

## ACKNOWLEDGEMENTS

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