

The impact of tie stall facilities on dairy cattle welfare and the broader United States dairy industry

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Introduction

Standard operating procedures and recommended practices on dairy farms are constantly evolving, driven by measurable animal welfare outcomes and societal pressures about what is acceptable by customers and consumers.

Aim

The objective was to examine U.S. dairy farm demographics, animal welfare outcomes, and best management practices (BMP) for tie stalls facilities. Additionally, a comparison of animal welfare outcomes for tie stall facilities to other housing systems was conducted as well as the economic and societal impact of tie stall facilities.

Methods

In 2016, the U.S. dairy industry was presented with customer concern about tie stalls facilities due to the potential to limit freedom of movement. The National Dairy FARM Animal Care Program, administered by National Milk Producers Federation, developed a task force to address the concern, as well as to develop BMP for tie stalls facilities. A literature review was conducted to evaluate current tie stall design and reported rates of welfare indicators. Task force members included: John Burket, Burket Falls Dairy Farm; Nigel B. Cook, University of Wisconsin, School of Veterinary Medicine; Albert De Vries, University of Florida; Fred Gingrich, Association of Bovine Practitioners; Meggan Hain, Organic Valley Dairy Cooperative; Frank Hartley, Independent FARM Animal Care Evaluator; Jason Lombard, USDA – APHIS; Kimberley M. Morrill, Cornell University Extension; Steven Nolt, Elizabethtown College; Bruce Paskewitz, Thunder Valley Dairy Farms; Lindsay Reames, Maryland Virginia Milk Producers Cooperative; Brian Reed, Agricultural Veterinary Associates.

Results

Of all US dairy herds, 38.9% are housed in a tie stall or stanchion barn (Table 1; USDA 2016). This is approximately 18,000 individual dairy operations. Approximately 50% of all tie stall or stanchion facilities are operated by a plain sect community member representing more than 9,000 dairy farms with 21,000 employees.

Tie stall facilities implementing BMPs provide equal opportunities of sound welfare for lactating dairy cattle compared to those housed in other facility types. Animal morbidity, mortality, body condition score, and hygiene score were similar in tie stall and freestall systems (data not shown). Using a unified one to three locomotion score (FARM Program 2016), the percentage of sound (non-lame) cows per operation (score of 1) was similar across tie stall, freestall and open/dry facilities in the United States (Table 2; USDA 2016). The percentage of moderately (score of 2) and severely lame (score of 3) cattle were similar across housing types.

Using a unified one to three hock and knee lesion score (FARM Program 2016), the percentage of cattle with hair loss (score of 2) or had an abrasion or swelling (score of 3) was higher for tie stall or stanchion facilities compared to freestall and open/dry operations (Table 3; USDA 2016).

Aspects of design that are critical to the comfort of the cow in a tie stall include (Figure 1 courtesy Nigel Cook):

- Stall surface (e.g., concrete, rubber mats, sand)
- Lunge area (length of chain from neck to rail and area in front of the cow)
- Resting space (the width and length of the stall platform, stall dividers)

Conclusion

In conclusion, based on current research available, tie stall facilities that implement BMP provide equal opportunities for lactating dairy cattle well-being in comparison to those housed in other types of facility specifically when compared to freestall facilities. More research is needed to evaluate the welfare of cows that are housed in tie stalls and compare these values to those in other housing systems. Results of this analysis will be used to enhance the BMP of the sector of the United States dairy industry that manages dairy cattle in tie stall or stanchion facilities.

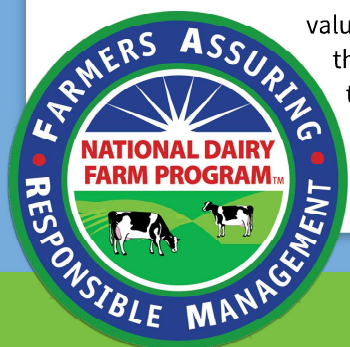


Table 1

Percentage of operations by primary housing type used for lactating cows, and herd size (USDA 2016)

Primary housing type	Herd Size									
	Very small (< 30)		Small (30-99)		Medium (100-499)		Large (500+)		All Operations	
	%	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
Tie stall or stanchion	42.6	(6.5)	58.1	(2.4)	12.1	(1.9)	1.2	(0.7)	38.9	(1.7)
Pasture	17.6	(5.0)	5.8	(1.1)	8.0	(1.6)	1.5	(0.6)	7.5	(1.0)
Freestall ^a	18.5	(5.4)	24.3	(2.1)	68.1	(2.6)	76.4	(1.8)	39.6	(1.5)
Open/dry lot ^b	8.4	(3.7)	5.5	(1.1)	6.7	(1.3)	17.0	(1.4)	7.3	(0.8)
Other ^c	12.9	(4.3)	6.3	(1.3)	5.2	(1.3)	3.9	(1.1)	6.7	(0.9)
Total	100.0		100.0		100.0		100.0		100.0	

^a Includes Freestall with no access to open/dry lot and Freestall with access to open/dry lot
^b Includes Open/dry lot/multiple animal outside area without barn or shed (with or without shade structures) and Open/dry lot with open shed/loafing shed
^c Includes Multiple animal inside area/barn and Not housed on this operation

Table 2

Operation average percent cows by locomotion score, and by primary housing type used for lactating cows (USDA 2016)

Locomotion score	Primary Housing Type							
	Tie stall or stanchion		Freestall ^a		Open/dry lot ^b		All operations ^c	
	Percent	SE	Percent	SE	Percent	SE	Percent	SE
1	89.6	2.1	89.7	1.0	91.7	2.2	90.2	0.9
2	8.6	2.0	7.1	0.6	6.3	1.3	7.3	0.7
3	1.8	0.4	3.2	0.5	2.0	1.0	2.6	0.3
Total	100.0		100.0		100.0		100.0	

^a Includes Freestall with no access to open/dry lot and Freestall with access to open/dry lot
^b Includes Open/dry lot/multiple animal outside area without barn or shed (with or without shade structures) and Open/dry lot with open shed/loafing shed
^c The All Operations category includes categories not presented in this table (those with Pasture and Other housing for lactating cows)

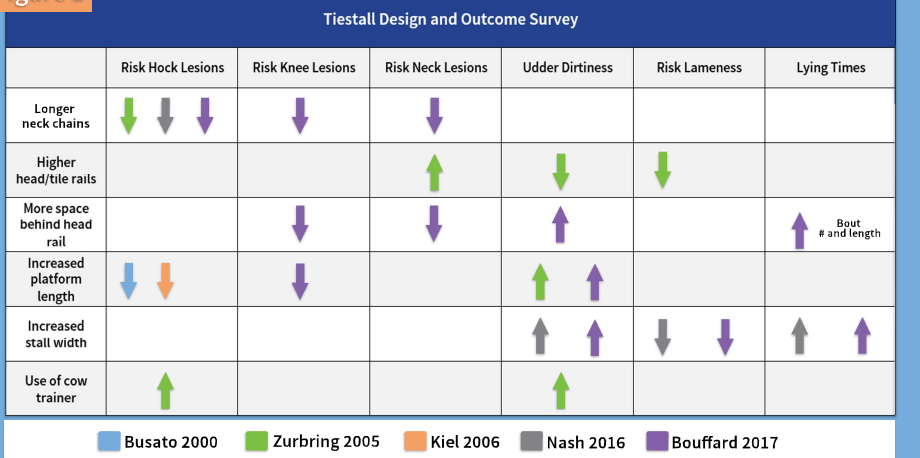
Table 3

Operation average percent cows by hock lesion score, and by primary housing type used for lactating cows (USDA 2016)

Hock lesion score	Primary Housing Type							
	Tie stall or stanchion		Freestall ^a		Open/dry lot ^b		All operations ^c	
	Percent	SE	Percent	SE	Percent	SE	Percent	SE
1	69.8	5.2	88.8	2.4	96.1	0.8	82.5	2.4
2	23.1	3.9	9.1	2.0	3.8	0.7	13.9	1.9
3	7.2	1.7	2.1	0.5	0.1	0.1	3.6	0.7
Total	100.0		100.0		100.0		100.0	

^a Includes Freestall with no access to open/dry lot and Freestall with access to open/dry lot
^b Includes Open/dry lot/multiple animal outside area without barn or shed (with or without shade structures) and Open/dry lot with open shed/loafing shed
^c The All Operations category includes categories not presented in this table (those with Pasture and Other housing for lactating cows)

Figure 1



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