

Paired housing of dairy calves: Current best practices and tips for success

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Abstract

Pair housing is a social housing strategy that improves individual dairy calf welfare and can be easily implemented into a pre-weaned calf rearing program. The current body of literature suggests that pair-housed calves have improved growth, social skills, and learning ability as compared to calves housed individually, which becomes particularly important around the time of weaning. For successful implementation of pair housing, veterinarians should first review calf records with their producers to ensure calf management teams are achieving benchmarks for good-to-excellent calf health and growth. Calves should be paired in the first 3 weeks of life to optimize starter and growth benefits. Pairs can be formed in either hutches or pens in a barn, and each calf should have at least 35ft² of resting space with one starter and water bucket available per calf. Cross sucking can be mitigated through the use of bottles or teat buckets or separating calves at feeding time. While there is still more to be learned about calf health and management of pair housing systems, veterinarians can utilize these strategies to help producers implement this social housing strategy.

Key words: pair housing, social housing, dairy calf

Introduction

Housing calves socially during the pre-weaning period can improve individual dairy calf welfare.³ Individual housing of dairy calves has historically been used by dairy producers to decrease mortality and improve individual attention and care during the pre-weaning period.²⁶ Recently, social housing has been gaining popularity in the U.S. and Canada with between 15 and 25% of producers utilizing some form of group housing (n = 2 to 25 calves/group) during the pre-weaning period.²⁵ Pair housing (social groups of 2) is a strategy that can be quickly and easily achieved in most calf facilities, as both modified hutches^{23, 27} and in calf barns.²⁰ A recent survey from the university of Wisconsin-Madison²⁵ shows that housing calves in small groups or pairs was more popular than large groups among producers socially housing their dairy calves (61% small group/pair vs. 39% larger group).

Pair-housed calves have equivocal or improved performance and health when compared to individually housed calves. Social pairing improves the growth of calves through stimulation of starter intake and growth through the pre-^{4,6,15} and immediate post-weaned period^{4,15,19,20} with average daily gains between 0.29–0.44 lb/d (0.13–0.2 kg/d),^{1,4} higher in pair-housed calves as compared to individually housed calves. Health of calves in pair housing has largely been reported to be similar as compared to individually housed calves during the pre-weaning period^{2,11,13} with several recent studies reporting transient differences in fecal scores between pair- and individually housed calves.¹⁴⁻¹⁵

Pair-housed calves also have improved social and cognitive abilities as compared to individually housed calves. Pair-housed calves (vs. individually housed) can more easily learn a task,^{8,18} and are more socially adapted when exposed to novel situations or regrouping.^{14,7} While interesting from a behavioral perspective, these differences become important when we consider the environmental and social changes she experiences during the heifer-rearing period. Pair calves also show signs of reduced stress during the weaning process including reduced vocalizations and increased lying at weaned pen entry as compared to previously individually housed calves.^{2,6,13} The current evidence suggests that pair housing during the pre-weaning period improves the welfare of dairy calves. However, there are some important considerations veterinarians and producers should consider prior to implementation. The remainder of this manuscript will give the practitioner insight into how to successfully implement this social housing strategy at the farm level.

Best practices for pair housing

Benchmarking prior to implementation

Prior to implementing social housing of any kind, a review of pre-weaning morbidity, mortality, and growth data should be done with comparison to common calf health and management benchmarks and standards. In short, producers should already be doing a good job with their calves. Passive transfer of immunity through intake of colostrum is the single most important factor in determining calf health and survival.⁹ Therefore, greater than 90% of calves should be achieving serum total protein levels greater than 5.1g/dL.¹⁶ In addition, producers should be achieving pre-weaning mortality, scours, and respiratory disease rates of <3%, <15%, and <10%, respectively.⁵ Calves should be growing well, at a rate of > 1.6 – 1.8lb/d (0.7kg/d). Regardless of housing strategy, calves should have access to high-quality milk or milk replacer, starter grain and water. Bedding should be clean, dry, abundant and well-drained. Housing should be well-ventilated and calves should be protected from both heat and cold stress. Social housing requires producer commitment and attention to detail, even more so than when calves are individually housed.

When to form the pair

Social and growth benefits of pair housing seem to be most evident when calves are paired early in life (compared to later during the pre-weaning period).^{4,17} Pairing at 6 days (vs. 43 days, 14 days prior to weaning) resulted in improved weight gain and increased starter intake over the first 10 weeks of life.⁴ In another study, there was no difference in starter intake or weight gain between calves paired at birth vs. at 3 weeks of age, but both groups consumed more starter as compared to individually housed calves.¹⁷ Therefore, it seems that pairing any time in the first 3 weeks will provide benefits in calf growth and starter intake. The most important component of the decision of when

to pair is farm and calf specific, and depends on calf vigor, housing and feeding management. For example, a calf that is not vigorous (weak suckle, hard time finding bottle, etc.) in the first days of life should have a delayed pairing, as they have a higher chance of being out-competed or bullied by a potentially more vigorous pair-mate. Certainly, this decision requires attention paid to the individual calf, and therefore it might be easier for larger operations to delay pairing until calves are 1 or 2 weeks of age. In addition, most recommendations suggest no more than 7 (14 at very most) days age difference between calves in a pair.

How to form the pair

The pair can be created in a variety of ways, and depends on feeding management, facilities/infrastructure already available, and producer goals. Single hutches can be modified in a variety of ways, either in a “side-by-side” manner or as a fence between two front facing hutches (Figure 1). This author prefers the side-by-side option as it facilitates drive-by feeding and makes calf observation easier. In general, pair calves are found together in the same hutch between 60-85%²³ of the time, so having to walk between hutches to observe calves in the front facing option could create labor inefficiencies. If calves are housed in a barn with plastic dividers between calves, the center divider can simply be removed to form the pair. Importantly, square footage requirements on a per calf basis do not change with the transition to pair housing. DCHA recommends a minimum of 35ft² (3.3m²) of resting space per calf,⁵ which correlates to approximately 2 hutches or 2 calf pens per pair.

Bottle (or nipple) feeding and a milk allowance of ≥ 6 qts(L)/day should be utilized when calves are housed in a pair. Bottle/nipple feeding drastically increases the amount of time it takes a calf to consume their milk meal²⁴ as compared to bucket feeding, which has several important implications. Slowing milk feeding allows calves to feel more satiated and fulfills their natural behavioral desire to suckle. This helps reduce the risk of cross sucking,²⁴ which is a significant challenge associated with

social rearing of dairy calves. If a nipple is available, even after all milk is consumed, calves will be more likely to continue to suckle from the teat as compared to performing less desirable behaviors including non-nutritive sucking or cross-sucking of another calf.¹² Cross sucking that is learned during the pre-weaning period can lead to continuation of the behavior after weaning, which could be associated with heifer mastitis and blind quarters in first-lactation animals.

Another way to reduce the risk of cross sucking or milk stealing during milk feeding is to provide a barrier between the calves or simply to separate them altogether at feeding time. A barrier between calves that is at least 3ft (1m) long reduces milk stealing and reduces calf’s ability to interact with her pair mate or her pair mate’s milk bottle.¹⁰ Separating calves at milk feeding time is labor intensive and can add up to 1 min in labor per feeding per pair,¹³ but can eliminate the observation of cross sucking.²¹ While not a feasible solution for many farms, separating calves at feeding time is an option for producers who want to pair house their pre-weaned calves, but also want to offer milk in a bucket. In addition, each calf in the pair should have their own water and starter grain bucket available as calves are allelomimetic and prefer to synchronize activities (like eating starter grain).

Conclusion

Pair housing is a social housing strategy that is easy to implement with measurable benefits to the calf. Calves should be paired in the first 3 weeks of life, fed moderate to high volumes of high-quality milk or milk replacer, and given adequate resting space. Cross sucking is a common problem in socially housed milk-fed calves, and can be mitigated through changes in facilities and/or feeding management. With careful attention to best management practices, veterinarians can help their producers successfully implement and monitor the success of this alternative calf housing strategy.

Figure 1: Examples of modified hutch option for housing pre-weaned calves. Side by side style (A), and front facing (B) (Mahendran et al., 2021).



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