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Review Article

Individual vs. Group Housing of Dairy Calves: An Arbitrary or Provisional Rule?

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Abstract

The aim of this review article was to clarify some debatable aspects of calf housing and related health, growth and behavioral consequences. There are many options for housing young calves with their own advantages and disadvantages. Housing calves individually or in-group are the major two types of housing system worldwide. When producers decide to keep their calves with high comfort, choosing an appropriate housing system is one of the most common concerns. The first question that arises is 'which one is more comfortable and economical?' Grouping or individual housing? The answer would be multilateral and totally depend on farm equipment and facilities, feeding system, labor cost and management priorities. Control of disease transmission, easy sanitation, better growth, appearance of natural calf behavior and reasonable welfare are the main goals of a prosperous calf rearing system. Pair housing intends to mitigate some unfavorable effects of large group housing systems without negative effects on calf behavior. Each of these indices can be affected by housing type and should be considered when producers plan to build a house for calves.

Keywords: Housing; Calf health; Disease outbreak; Welfare; Economy

Philosophy and Discussion

This article aimed to explain some debatable aspects of calf housing in relation to health, growth and welfare of dairy heifer calves. To better understand how housing type and rearing system affect calf growth and well-being, it is necessary to contemplate calf raising in natural conditions. Naturally, calves are born outdoor and fed by their dams until weaning. In addition, calves are presented to herd just shortly after birth and spend most of their time in contact with other calves [1]. During the rearing period, young claves learn how to survive mostly from their dams and mimic other herd mates' behavior. Consequently, social skills of calves are formed as they grow up and interact with other herd members. However, there is a different scenario when calves are raised indoor under intensive modern systems. Raising calves in commercial conditions makes an alteration in their behavior, which may be reflected in altered calf welfare. After parturition, calves are separated from their dams and transported into individual or group stations and are kept therein until weaning.

Individual housing is a preferable system in many dairy farms worldwide (60% in Europe and 75% in the U.S.) because disease transmission risk is relatively lower in these systems, when compared to group housing [2]. Nonetheless, natural behavior of calves may be restricted in individual housing systems [2]. Housing calves in-group pens, on the other hand, has attracted much attention in recent years. It has been reported that calves housed in-group pens are able to display their natural behaviors such as competition with other calves, playing, jumping, and running;

indicating improved calf welfare [3]. In addition, greater feed intake and weight gain have been observed in-group vs. individually housed calves [2]. To this end, what should we do to maximize calf performance and rearing productivity? To answer this question, we need to look at pre-weaning period of dairy calf life cycle.

Dairy calves are susceptible to enteric infections during the first weeks of life when their immune system is not totally functional. Cloistral immunity possesses a protecting effect on enteric diseases; hence, colostrum-feeding management is critical in disease control [4]. Diarrhea and respiratory diseases are the most prevalent issues causing mortality and retarded growth in dairy calves. These diseases are contagious and can be transmitted from one calf to others, thus spread quickly among calves in a barn or group pen. In addition to optimal nutrition, housing-related factors including housing type (individual or group pens), environment and facilities hygiene, and direct contact of calves have an important role in diseases outbreak. Ensuring sufficient colostrum intake and reduced disease transmission as well as precise detection of sick calves are the most important advantages of individual housing systems, which are notable commercially. For instance, an increased fecal shedding of Escherichia coli 0157:H7 in pre-weaned group-housed calves has been reported [5]. Also, lower mortality rate was observed for individually housed calves in another study [6]. Moreover, higher respiratory diseases rates in large sized group pens (8-12 calves per pen) have been reported [7]. Authors have also illustrated those respiratory diseases rates could be reduced by minimizing pen size. The incidence of diarrhea was also high in large grouped calves [8]. However, in a recently reviewed article [9], some evidence was provided showing no detrimental effects of group housing on calf health. It seems that the effects of housing system on calf health may be multi-factorial.

It is necessary to clarify that according to the literature and our farm experience, social behavior and weight gain of pre-weaned calves might be improved if calves are housed in-group pens. However, it is notable that larger size grouping is still risky for pre-weaned calves, given the higher prevalence of diarrhea or respiratory issues, suggesting that smaller groups can help to reduce disease incidence. As such, pair housing could possibly mitigate the health problems of group housing while improving social behavior and feed intake of calves [10]. As morbidity and mortality rates are important indices of success in any calf rearing system, it is recommendable to keep calves in individual pens at least for the first two weeks of age. Then, they can be transported into smaller group pens, for instance, with a maximum of 6 calves in each pen. Furthermore, routine sanitation, hygiene of feeding facilities, and proper nutrition are important factors alongside the housing system to control diseases and improve dairy calf performance. It is proposed that future studies test interactions of the above-mentioned factors with housing systems to help optimize calf performance and welfare.

Conclusion

Housing calves in-group pens allows them to show and share their natural behaviors. Feed intake is relatively high in-group housing and weight gain may be improved. However, disease prevalence seems to be higher in group-housed calves especially in larger groups, when compared to individual housing. Pair housing intends to mitigate some unfavorable effects of large group housing systems without negative effects on calf behavior. Overall, individual housing for at least the first two weeks of life would be logical to ensure sufficient colostrum intake, diseased calf detection, and reduced infectious disease outbreak.

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Conflict of Interest

No conflict of interest.

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