Group Housing Preweaned Dairy Calves: Socialization versus Disease Transmission

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Calves are raised outside by their mothers in beef herds while dairy farmers have invested in a variety of types of housing to raise the newborn to weaning; traditionally in individual hutches or pens. Newer research on calf behavior has shed light on the potential effects of individual versus pair or group housing. What are the current recommendations and what are the advantages and disadvantages of different housing systems?

Behavior

A calf reared in a semi-natural environment spends its time either alone or with its dam until it is about one week old and begins interacting with other calves. Rearing calves in individual hutches or pens from birth to weaning may have a detrimental impact on a calf’s social development (1). Calves raised in pairs or groups demonstrate several favorable behaviors over calves raised
individually. The table (Table 1) below summarizes the behavioral differences seen in pair or group-housed calves when compared to individually-housed calves.

Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Increased Lying Time(_{(2)})</th>
<th>Decreased Aggression (_{(3,1)})</th>
<th>Decreased Time Before Eating Novel Foods (_{(4)})</th>
<th>Increased Social Interactions (_{(5)})</th>
<th>Increased Time Spent at Feeder (_{(6,7)})</th>
<th>Decreased Time Before First Visit to Feeder (_{(6,7)})</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pair Housing</strong></td>
<td>![5% Increase]</td>
<td>![32% Decrease]</td>
<td>![N/A]</td>
<td>![71% Increase]</td>
<td>![26-59% Increase]</td>
<td>![42%-82% Decrease]</td>
</tr>
<tr>
<td><strong>Group Housing</strong></td>
<td>![N/A]</td>
<td>![60% Decrease]</td>
<td>![50% Decrease]</td>
<td>![N/A]</td>
<td>![N/A]</td>
<td>![N/A]</td>
</tr>
</tbody>
</table>

**Health**

During the first 90 days of life, approximately 23% of calves will develop one or more diseases. Diarrhea is commonly more prevalent than respiratory disease during the first six weeks of life with the most diarrhea cases reported during the first week (8). With all this talk about disease incidences in preweaned calves, farmers and veterinarians are concerned that group housing will lead to more calf health issues. Multiple studies have found no differences in calf health treatments or mortality when comparing calves in group housing versus individual housing; however, a few differences in health have been detected in other studies. Table 2 highlights what we know so far about disease prevalence in pair or group-housed calves.

Table 2.

<table>
<thead>
<tr>
<th></th>
<th>Reduction in Respiratory Disease Incidence(_{(9)})</th>
<th>Decreased Heart Rate during Novel Environment Test (_{(5)})</th>
<th>Decreased Odds for Antibiotic Resistance in E. coli (_{(10)})</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pair Housing</strong></td>
<td>![13% Decrease]</td>
<td>![13% Decrease]</td>
<td>![13% Decrease]</td>
</tr>
<tr>
<td><strong>Group Housing</strong></td>
<td>![N/A]</td>
<td>![N/A]</td>
<td>![N/A]</td>
</tr>
<tr>
<td><strong>Individual Housing</strong></td>
<td>![57-71% Reduction]</td>
<td>![50% Decrease]</td>
<td>![50% Decrease]</td>
</tr>
</tbody>
</table>
Performance

Taking into consideration the behavioral and health implications of pair or group housing, many farmers are interested in how calf performance may be affected by these housing systems. Take a look at Table 3 to learn how calf average daily gain (ADG) and feed intake differs in pair or group-housed calves when compared to individually-housed calves.

Table 3.

<table>
<thead>
<tr>
<th></th>
<th>Increased Preweaning Starter Intake(^{11,6})</th>
<th>Increased Postweaning Starter Intake(^{9})</th>
<th>Improved Average Daily Gain(^{11,12})</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pair Housing</strong></td>
<td><img src="https://via.placeholder.com/15" alt="Diamond" /> 37% Increase</td>
<td><img src="https://via.placeholder.com/15" alt="Diamond" /> 18% Increase</td>
<td><img src="https://via.placeholder.com/15" alt="Diamond" /> 14% Increase</td>
</tr>
<tr>
<td><strong>Group Housing(^{†})</strong></td>
<td><img src="https://via.placeholder.com/15" alt="Diamond" /> 18% Increase</td>
<td><img src="https://via.placeholder.com/15" alt="Diamond" /> 16% Increase</td>
<td><img src="https://via.placeholder.com/15" alt="Diamond" /></td>
</tr>
</tbody>
</table>

\(^{†}\)Note: The outcomes associated with group housing greatly vary depending on group size. Larger group sizes tend to result in additional calf health complications.

Additional Considerations

It is apparent that advantages and disadvantages exist for individual, pair, and group housing systems. Before deciding which housing system is most appropriate for your dairy, please also consider the following:

- Cleaning protocols for calf care equipment (pens, buckets, bottles, etc.) should be in place and all calf care employees should be trained on proper cleaning procedures.

- Large group sizes are associated with an increase in respiratory disease and more severe cases of diarrhea: “Before changing to group pens, evaluating ventilation in the calf housing area is critical.” (See the WSU Extension information on calf housing and ventilation assessment for more information: [http://vetextension.wsu.edu/research-projects/calfscience/calfhousingenvironment/](http://vetextension.wsu.edu/research-projects/calfscience/calfhousingenvironment/)).

- Consult with your veterinarian before drastically altering your calf management practices.
• Colostrum management (quality and quantity) is vital to calf success regardless of the housing system (See our CalfScience resources at: http://vetextension.wsu.edu/research-projects/calfscience/resources/).

• For more items to consider in your calf facility read Amber’s Top Ten Tips: Calf Management (http://dairynews.puyallup.wsu.edu/2014/12/).
References


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