INADEQUATE COLOSTRUM INTAKE DECREASES GROWTH OF CALVES ON INTENSIFIED FEEDING PROGRAMS

Johan S. Osorio and James K. Drackley

TAKE HOME MESSAGES

- Calves have greater growth rates when fed an intensified milk replacer program than when fed a conventional milk replacer program.
- The improvement in growth with intensified milk replacer is less if the calves have not had adequate colostrum intake to achieve serum immunoglobulin G (IgG) concentrations that indicate adequate passive transfer (IgG > 1,000 mg/dL).

INTRODUCTION

Intensified or accelerated nutrition programs for young dairy calves are gaining in popularity and have been well proven to result in more rapid lean growth in calves. The improvement in growth rates occurs because of greater intake of total solids, providing greater protein and energy for growth. For calves to remain healthy and grow normally, adequate colostrum intake is essential. The effects of inadequate colostrum intake on the response of calves to intensified feeding programs have not been well characterized. Our objective was to compare the effects of adequate or inadequate colostrum intake on growth of calves fed either conventional or intensified milk replacer programs.

METHODS

A total of 83 purchased bull calves less than 5 days old were fed either conventional or intensified milk replacer programs from 2 days after arrival through weaning. The conventional milk replacer contained 22% protein and 20% fat and was fed at a rate of 1.25 lb/calf daily. Starter (20% protein, as-fed basis) and water were available at all times. The intensified milk replacer contained 28% protein and 20% fat and was fed at a rate of 1.75 lb/calf daily during week 1 and 2.5 lb/calf daily during weeks 2-6. Starter (23% protein, as-fed basis) and water were available at all times.

Colostrum adequacy was assumed to be represented by achieving a concentration of immunoglobulin G (IgG) in blood serum on day 1 after arrival that indicates adequate passive transfer of immunity. Calves were divided into two groups representing adequate colostrum intake (serum IgG >1,000 mg/dL) or inadequate (serum IgG <1,000 mg/dL). Calf body weights at the beginning of the experiment and at 5 weeks of treatments were used to calculate average daily gain (ADG).

The data were analyzed using a statistical model that included diet (conventional or intensified), colostrum status (adequate or inadequate), and the interaction of diet and colostrum status.
RESULTS

Results are presented in the table. The ADG of calves was greater (P < 0.05) for calves fed the intensified milk replacer program than for calves fed the conventional program, as expected. An interaction occurred (P < 0.05) between diet and colostrum status. The IgG status did not influence ADG for calves fed the conventional treatment, but adequate colostrum status resulted in greater growth when calves were fed the intensified program. These differences are consistent with other recent reports that indicate calves with better colostrum status have greater growth rates. Growth factors or other components in the colostrum may enable calves to more efficiently use the greater nutrient supply for more rapid body growth.

Effects of colostrum status (poor or good) on growth of purchased bull calves fed conventional or intensified milk replacer programs through 5 weeks of age.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conventional</th>
<th>Intensified</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Good</td>
</tr>
<tr>
<td>Number of calves</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Mean serum IgG, mg/dL</td>
<td>558&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1793&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Average daily gain&lt;sup&gt;1&lt;/sup&gt;, lb/day</td>
<td>1.17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.09&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>1</sup>Interaction of colostrum status and diet (P < 0.05).
<sup>abc</sup> Means in the same row with different letters are different (P < 0.10).