Antibody absorption by Santa Ines lambs using bovine colostrum from Holstein cows or sheep colostrum from Santa Ines ewes

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August, 2009

Passive Immunity in Species

IgG  IgG  IgG  IgG  IgG  IgG

GROUP I  GROUP II  GROUP III

IgA  IgA  IgA  IgA  IgA  IgA

IgM  IgM  IgM  IgM  IgM  IgM

Schmidt (1971)

Mechanism of Ig Absorption:

Factors influencing the efficiency of IgG absorption:
- Time of first colostrum ingestion
- Colostrum IgG concentration
- Volume of fed colostrum

Colostrum substitute:
- Mother's low production
- Large number of offspring
- Vehicle for pathogens

Colostrum:
- Protection components: cytokines, leukocyte, lysozyme, ANTIBODIES
- Nutritional components: proteins, fats, carbohydrates, minerals, vitamins
- Hormones and growth factors
Objective
Managements - bovine and ovine colostrum

Antibody acquisition by the newborn Santa Ines lambs

Materials & Methods
Colostrum harvest:
- Santa Ines ovine first milking colostrum: Intensive System of Sheep and Goats Production (ESALQ/USP)
- Holstein bovine first milking colostrum: Center for Animal Husbandry Practice (ESALQ/USP)

Materials & Methods
Colostrum harvest:
- Vials - 250 ml, identified and stored at -20 °C

Materials & Methods
Intensive System of Sheep and Goats Production (ESALQ/USP)

Materials & Methods
Colostrum Analyses:
- IgG quantification: RID

Materials & Methods
Serum Analyses:
- IgG quantification: RID
- TP quantification: biuret reaction

Materials & Methods
Colostrum:

Blood collection:

0 hr  6 hrs  24 hrs  72 hrs
Materials & Methods

Statistical Analyses:
- Completely randomized design
- Repeated measure-over-time scheme
- Body weight - covariable
- ANOVA - F test (PROC MIXED - SAS, 1999)
- Means comparison - Tukey’s test (PROC MIXED - SAS, 1999)

Results and Discussion

Colostrum

Table 1 Immunoglobulin G concentration in bovine and ovine pools of colostrum

<table>
<thead>
<tr>
<th>Pool of Bovine Colostrum</th>
<th>IgG Concentration (mg/ml)</th>
<th>means ± s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>75.43</td>
<td>115.69 ± 35.40ª</td>
</tr>
<tr>
<td>2</td>
<td>142.50</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>129.12</td>
<td></td>
</tr>
</tbody>
</table>

Pools of Ovine Colostrum IgG Concentration (mg/ml)

<table>
<thead>
<tr>
<th>Pool of Ovine Colostrum</th>
<th>IgG Concentration (mg/ml)</th>
<th>means ± s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32.66</td>
<td>48.12 ± 13.19</td>
</tr>
<tr>
<td>2</td>
<td>42.86</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>66.79</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>63.71</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>90.89</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>37.31</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>40.37</td>
<td></td>
</tr>
</tbody>
</table>

Means within a column having different superscripts are different by the F test (P<0.05).

Results and Discussion

Serum TP

Figure 1  Serum total protein concentration (means ± s.d.) in Santa Ines lambs fed bovine or ovine colostrum.

Means having different superscripts in the same treatment are different by Tukey’s test (P<0.05).

Means having different superscripts in the same period are different by Tukey’s test (P<0.05).

Figure 2  Serum total protein concentration (means ± s.d.) in Santa Ines lambs fed bovine or ovine colostrum.

Means having different superscripts in the same treatment are different by Tukey’s test (P<0.05).

Means having different superscripts in the same period are different by Tukey’s test (P<0.05).

Results and Discussion

Serum IgG

Figure 2 Serum IgG concentration (means ± s.d.) in Santa Ines lambs fed bovine or ovine colostrum.

Means having different superscripts in the same treatment are different by Tukey’s test (P<0.05).

Means having different superscripts in the same period are different by Tukey’s test (P<0.05).

Figure 2 Serum IgG concentration (means ± s.d.) in Santa Ines lambs fed bovine or ovine colostrum.

Means having different superscripts in the same treatment are different by Tukey’s test (P<0.05).

Means having different superscripts in the same period are different by Tukey’s test (P<0.05).

Results and Discussion

Conclusion

Holstein bovine colostrum can be an alternative source of IgG for newborn Santa Ines lambs, with advantage, since bovine colostrum is naturally richer in immunoglobulins than colostrum from ovine.