Effect of bovine colostrums of 1st, 2nd and 3rd milking on growth performance and the immune system of newly-weaned piglets after an E. coli LPS challenge

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Introduction

BOVINE COLOSTRUM (BC) = Alternative to in-feed antibiotics for the newly-weaned piglet

- High concentrations in: - Growth promoters
  - Anti-microbial factors
- Availability in Belgium

Effects are dependent on the pathogen pressure
- Challenge with E. coli LPS

BC of 1st milking is used for calves
- Valorisation of 2nd and 3rd milking BC which are not collected by the dairy

Material and Methods

Experimental design

4 x 5 piglets "Control -"
No LPS challenge
Commercial Diet 2
100 newly-weaned piglets 1

5 x 4 piglets "Control +"
LPS challenge
Commercial Diet 2

5 x 4 piglets "Col 1"
LPS challenge
Commercial Diet 2 + 1% of 1st milking BC 3

5 x 4 piglets "Col 2"
LPS challenge
Commercial Diet + 1% of 2nd milking BC 3

5 x 4 piglets "Col 3"
LPS challenge
Commercial Diet + 1% of 3rd milking BC 3

LPS challenge: 100 μg of E. coli/LPS/kg of BW by i.m on d 5 PW
BC supplementation: 1 % of the diet from days 0 to 12 PW

Measures

- Individual Weight (n = 20) and feed intake (n = 4 or 5)
- Blood (n = 10): haematological parameters
  - IgA, IgG, IgM (total and anti-LPS)
  - Cytokines: IL-10, TNF-α and IFN-γ

Results

BC composition

<table>
<thead>
<tr>
<th>Composition (g/kg DM)</th>
<th>Colostrum 1</th>
<th>Colostrum 2</th>
<th>Colostrum 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein</td>
<td>723</td>
<td>673</td>
<td>556</td>
</tr>
<tr>
<td>Ash</td>
<td>64</td>
<td>70</td>
<td>81</td>
</tr>
<tr>
<td>IgA</td>
<td>103</td>
<td>56.3</td>
<td>30</td>
</tr>
<tr>
<td>IgG</td>
<td>40</td>
<td>27</td>
<td>10.5</td>
</tr>
<tr>
<td>Lactoferrin</td>
<td>7.2</td>
<td>14.5</td>
<td>10.9</td>
</tr>
<tr>
<td>IGF-I</td>
<td>2040 ng/g</td>
<td>1040 ng/g</td>
<td>400 ng/g</td>
</tr>
</tbody>
</table>

Before the LPS Challenge (Days 0-5 PW)

- Important inflammation
- 25% of the piglets died

Before the LPS Challenge:
Col 1 > Col 2 and 3

After LPS challenge: no interpretation possible
- New experiment in real rearing conditions

Conclusion

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