The experiment was conducted to investigate growth performance and immune responses of weaned pigs from lactating sows fed dietary spray dried plasma (SDP). A total of 12 sows (227.78 ± 7.50 kg BW; parity = 2.0 ± 0.7) were randomly assigned to 2 dietary treatments in a completely randomized design. Dietary treatments were a typical lactation diet based on corn-soybean meal (CON) and CON supplemented with 1% of SDP (SDP). Sows were fed the dietary treatments from d 30 before expected farrowing to weaning. Weaned pigs from each sow were transferred to a nursery barn and group-housed by dietary treatments of sows and fed a typical nursery diet for 6 wk. Blood samples were collected from randomly selected 2 weaned pigs from each litter on day of weaning day, d 3, and 7 postweaning. Serum tumor necrosis factor-α (TNF-α), transforming growth factor-β (TGF-β), C-reactive protein (CRP), and cortisol were analyzed by the enzyme-linked immunosorbent assay. Body weights and feed allowance were recorded throughout post-weaning period to calculate growth performance of weaned pigs. Data were analyzed using the PROC GLM of SAS. Weaned pigs from lactating sows fed SDP tended (P < 0.10) to have increase ADG (470.47 vs. 414.52 g/d) during overall experimental period than pigs from lactating sows fed CON. Supplementation of SDP tended (P < 0.10) to decrease serum TNF-α on d 3 (344.11 vs. 449.80 pg/ml) and CRP on d 7 (78.41 vs. 112.28 ng/ml) compared with the piglets from lactating sows fed CON. The addition of SDP also reduced (P < 0.05) serum cortisol on d 3 (1.40 vs. 1.88 ng/ml) and TGF-β on d 7 (718.33 vs. 836.48 pg/ml) compared with CON. In conclusion, addition of dietary spray dried plasma in lactation diets may enhance growth performance and modulate immune responses of weaned pigs.
Introduction

- Immature immune system of weaned pigs
  ✓ Change in adaptive immunity: immunity gap

- Spray dried plasma
  ✓ Modulation gut microbiota and host immune responses
  ✓ High bioavailable source: essential amino acids, minerals
  ✓ Various physiological components
    : immunoglobulins, peptides, glycoproteins, unknown growth factors

- Beneficial to sows
  ✓ Improvement of reproductive performance: BW change, litters size & growth

Objective

- To investigate growth performance and immune responses of weaned pigs from lactating sows fed dietary spray dried plasma.
Abstract

Experimental design: completely randomized design

Animals: 12 sows (227 ± 1.64 kg BW; 2.0 parity) and their litters

Dietary treatments: sows
- Corn and soybean meal basal diet (CON)
- CON + 1% spray dried plasma (SDP)

Weaned pigs
- Group housed by dietary treatments of sows
- One nursery diet (ME 3,400 kcal/kg, CP 20.5%)

Experimental period
- d 30 before farrowing until weaning (58 days)
- Piglets were tracked until 6 wk post weaning

Measurements for weaned pigs
- Growth performance: ADG, ADFI, G:F
- Immune responses: TNF-α, TGF-β1, CRP, cortisol

Statistical analysis: PROC GLM procedure of SAS
- Experimental unit: pen
- Model: dietary treatment for sows

Materials & Methods

Growth performance and immune responses of weaned pigs from lactating sows fed dietary spray dried plasma

S. Kim¹, B. Kim¹, J. Kim¹, K. Kim², J. J. Lee¹, J. Kang¹, D. Mun¹, J. Baek¹, S. Kim², Y. Liu², J. Choe¹, and M. Song¹

¹Division of Animal and Dairy Science, Chungnam National University, Daejeon, Republic of Korea
²Department of Animal Science, University of California, Davis, CA, USA

<table>
<thead>
<tr>
<th>Item</th>
<th>Gestation</th>
<th>Lactation</th>
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<tbody>
<tr>
<td>Ingredients, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn</td>
<td>75.82</td>
<td>76.72</td>
</tr>
<tr>
<td>SBM, 45%</td>
<td>21.30</td>
<td>19.40</td>
</tr>
<tr>
<td>Spray dried plasma</td>
<td>-</td>
<td>1.00</td>
</tr>
<tr>
<td>Others¹</td>
<td>2.88</td>
<td>2.88</td>
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<tr>
<td>Calculated values</td>
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<td></td>
</tr>
<tr>
<td>ME, kcal/kg</td>
<td>3,320</td>
<td>3,320</td>
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<tr>
<td>CP, %</td>
<td>15.86</td>
<td>15.82</td>
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<tr>
<td>Crude fiber, %</td>
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<td>NDF, %</td>
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<td>ADF, %</td>
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<td>Ca, %</td>
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<tr>
<td>P, %</td>
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</tr>
</tbody>
</table>

Others¹: limestone, mono-dicalcium phosphate, and vit-min premix
Growth performance and immune responses of weaned pigs from lactating sows fed dietary spray dried plasma

Introduction

Conclusion
Growth performance and immune responses of weaned pigs from lactating sows fed dietary spray dried plasma

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Abstract

Materials & Methods

Growth performance

Immune responses

Conclusion

Fig 3. TNF-α

Fig 4. CRP

Fig 5. TGF-β1

Fig 6. Cortisol

* p < 0.05
† p < 0.1

1TNF- α: tumor necrosis factor- α, 2CRP: C-reactive protein, 3TGF-β1: transforming growth factor-β1
Addition of dietary spray dried plasma in late gestating and lactating diets may enhance growth performance and modulate systemic immune responses of weaned pigs.

More results in this experiment are presented in Abstract PSIV-19 (Dietary spray dried plasma on immune responses of lactating sows and their litters).

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