Dietary ractopamine supplementation of pregnant sows: what are the impacts on the neonate?

C. H. G. Martinez, G. M. Ravagnani, B. B. D. Muro, M. V. Mendonça, M. S. Passarelli, D. H. Nakasone, R. F. Carnevale, R. F. Strefezzi, S. M. M. K, Martins and A. F. C. Andrade

***Animal* journal**

Supplementary Table S1 Blood count results of piglets from Ractopamine feeding sows during 25 to 50 days of pregnancy

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Treatments1 | SEM | P-value2 |
| Control | Rac10 | Rac20 | Treatment | C1 | C2 |
| Number of piglets | 39 | 42 | 42 |  |  |  |  |
| RBC (×106/μL) |  |  |  |  |  |  |  |
| Day 1 | 4.3 | 4.6 | 4.2 | 0.08 | Ns | Ns | Ns |
| Day 7 | 4.0 | 4.1 | 4.1 | 0.06 | Ns | Ns | Ns |
| Day 14 | 5.1 | 5.1 | 5.2 | 0.06 | Ns | Ns | Ns |
| Day 21 | 5.5 | 5.6 | 5.6 | 0.06 | Ns | Ns | Ns |
| Hemoglobin (g/dL) |  |  |  |  |  |  |  |
| Day 1 | 8.3 | 8.8 | 8.2 | 0.14 | Ns | Ns | Ns |
| Day 7 | 8.7 | 8.7 | 8.8 | 0.10 | Ns | Ns | Ns |
| Day 14 | 11.0 | 10.8 | 11.1 | 0.09 | Ns | Ns | Ns |
| Day 21 | 11.2 | 11.3 | 11.2 | 0.08 | Ns | Ns | Ns |
| MCV (fL) |  |  |  |  |  |  |  |
| Day 1 | 63.7 | 63.7 | 64.7 | 0.40 | Ns | Ns | Ns |
| Day 7 | 73.6 | 74.1 | 76.6 | 0.76 | Ns | Ns | Ns |
| Day 14 | 73.0 | 72.9 | 74.9 | 0.68 | Ns | Ns | Ns |
| Day 21 | 67.7 | 67.8 | 68.3 | 0.51 | Ns | Ns | Ns |
| MCH (pg) |  |  |  |  |  |  |  |
| Day 1 | 19.3 | 19.1 | 19.4 | 0.13 | Ns | Ns | Ns |
| Day 7 | 21.9 | 21.5 | 21.7 | 0.22 | Ns | Ns | Ns |
| Day 14 | 21.7 | 21.4 | 21.4 | 0.18 | Ns | Ns | Ns |
| Day 21 | 20.3 | 20.2 | 20.1 | 0.15 | Ns | Ns | Ns |
| Platelets (/μL) |  |  |  |  |  |  |  |
| Day 1 | 417805.6 | 426928.6 | 406555.6 | 11067.69 | Ns | Ns | Ns |
| Day 7 | 901583.3 | 931023.8 | 951522.7 | 19239.70 | Ns | Ns | Ns |
| Day 14 | 711628.6 | 794463.4 | 730066.7 | 20491.20 | Ns | Ns | Ns |
| Day 21 | 705638.9 | 761804.9 | 789590.9 | 22482.29 | Ns | Ns | Ns |

MCV= mean corpuscular volume; MCH= mean corpuscular hemoglobin; RBC= red blood cells

1Control = unsupplemented; Rac10 = 10 mg/kg ractopamine; Rac20 = 20 mg/kg ractopamine.

2Probability values for the effects of the dietary treatment Contrast 1 (C1)= Control × Rac10 + Rac20; Contrast 2 (C2)= Rac10 × Rac20

Ns, not significant

Supplementary Table S2 The white blood cell count results of piglets from Ractopamine feeding sows during 25 to 50 days of pregnancy

|  |  |  |  |
| --- | --- | --- | --- |
| Item (n/μL) | Treatments1 | SEM | P-value2 |
| Control | Rac10 | Rac20 | Treatment | C1 | C2 |
| Number of piglets | 39 | 42 | 42 |  |  |  |  |
| Leucocytes  |  |  |  |  |  |  |  |
| Day 1 | 5900.8 | 5836.7 | 5945.1 | 163.34 | Ns | Ns | Ns |
| Day 7 | 10011.4 | 10194.5 | 10620.1 | 245.28 | Ns | Ns | Ns |
| Day 14 | 8362.6 | 7926.7 | 8360.7 | 217.67 | Ns | Ns | Ns |
| Day 21 | 12277.3 | 11647.8 | 11539.5 | 505.25 | Ns | Ns | Ns |
| Neutrophils  |  |  |  |  |  |  |  |
| Day 1 | 3471.6 | 4734.0 | 3720.4 | 268.69 | Ns | Ns | Ns |
| Day 7 | 4399.8 | 5255.7 | 4696.0 | 194.99 | Ns | Ns | Ns |
| Day 14 | 2890.1 | 2730.3 | 3420.8 | 156.02 | Ns | Ns | Ns |
| Day 21 | 6248.7 | 6180.1 | 7104.8 | 566.11 | Ns | Ns | Ns |
| Lymphocytes  |  |  |  |  |  |  |  |
| Day 1 | 2054.3 | 2142.2 | 2106.1 | 73.42 | Ns | Ns | Ns |
| Day 7 | 5443.3 | 5109.9 | 5553.7 | 149.12 | Ns | Ns | Ns |
| Day 14 | 5015.4 | 4878.7 | 5086.0 | 138.74 | Ns | Ns | Ns |
| Day 21 | 5630.3 | 5508.5 | 5939.6 | 164.82 | Ns | Ns | Ns |
| Monocytes |  |  |  |  |  |  |  |
| Day 1 | 246.7 | 266.5 | 210.7 | 19.38 | Ns | Ns | Ns |
| Day 7 | 162.4 | 117.1 | 125.6 | 14.95 | Ns | Ns | Ns |
| Day 14 | 172.3 | 177.8 | 178.3 | 18.31 | Ns | Ns | Ns |
| Day 21 | 229.4 | 179.3 | 207.0 | 20.14 | Ns | Ns | Ns |
| Eosinophils  |  |  |  |  |  |  |  |
| Day 1 | 28.4 | 33.6 | 49.8 | 5.19 | Ns | Ns | Ns |
| Day 7 | 102.6 | 86.8 | 101.2 | 11.11 | \* | Ns | \* |
| Day 14 | 126.2 | 104.4 | 95.7 | 13.40 | Ns | Ns | Ns |
| Day 21 | 148.1 | 137.9 | 154.6 | 17.66 | Ns | Ns | Ns |
| Basophiles  |  |  |  |  |  |  |  |
| Day 1 | 21.9 | 16.3 | 14.6 | 2.91 | Ns | Ns | Ns |
| Day 7 | 30.6 | 22.8 | 14.8 | 4.39 | Ns | Ns | Ns |
| Day 14 | 12.8 | 20.8 | 8.3 | 2.95 | Ns | Ns | Ns |
| Day 21 | 4.7 | 5.3 | 8.8 | 2.12 | Ns | Ns | Ns |

1Control = unsupplemented; Rac10 = 10 mg/kg ractopamine; Rac20 = 20 mg/kg ractopamine.

2Probability values for the effects of the dietary treatment Contrast 1 (C1)= Control × Rac10 + Rac20; Contrast 2 (C2)= Rac10 × Rac20

Ns, not significant; \*P < 0.05

Supplementary Table S3 Serum biochemistry results of piglets from Ractopamine feeding sows during 25 to 50 days of pregnancy

|  |  |  |  |
| --- | --- | --- | --- |
| Item (mg/ dL) | Treatments1 | SEM | P-value2 |
| Control | Rac10 | Rac20 | Treatment | C1 | C2 |
| Number of piglets | 39 | 42 | 42 |  |  |  |  |
| Urea  |  |  |  |  |  |  |  |
| Day 1 | 31.8 | 38.5 | 33.0 | 1.59 | Ns | Ns | Ns |
| Day 7 | 17.9 | 15.8 | 15.7 | 0.52 | Ns | Ns | Ns |
| Day 14 | 15.7 | 16.6 | 16.0 | 0.64 | Ns | Ns | Ns |
| Day 21 | 15.0 | 13.8 | 15.0 | 0.50 | Ns | Ns | Ns |
| Total Protein  |  |  |  |  |  |  |  |
| Day 1 | 6.1 | 6.5 | 6.3 | 0.11 | Ns | Ns | Ns |
| Day 7 | 5.7 | 5.9 | 6.1 | 0.08 | Ns | Ns | Ns |
| Day 14 | 5.5 | 5.4 | 5.5 | 0.06 | Ns | Ns | Ns |
| Day 21 | 5.1 | 5.2 | 5.4 | 0.06 | Ns | Ns | Ns |
| Creatinine |  |  |  |  |  |  |  |
| Day 1 | 0.5 | 0.6 | 0.6 | 0.01 | Ns | Ns | Ns |
| Day 7 | 0.6 | 0.6 | 0.6 | 0.01 | Ns | Ns | Ns |
| Day 14 | 0.8 | 0.7 | 0.7 | 0.01 | Ns | Ns | Ns |
| Day 21 | 0.8 | 0.8 | 0.8 | 0.01 | Ns | Ns | Ns |
| Cholesterol |  |  |  |  |  |  |  |
| Day 1 | 97.9 | 113.2 | 106.7 | 3.22 | Ns | Ns | Ns |
| Day 7 | 138.0 | 152.5 | 154.8 | 2.99 | Ns | Ns | Ns |
| Day 14 | 173.2 | 164.5 | 153.8 | 4.18 | Ns | Ns | Ns |
| Day 21 | 144.6 | 143.9 | 162.1 | 5.14 | Ns | Ns | Ns |
| Triglycerides  |  |  |  |  |  |  |  |
| Day 1 | 160.6 | 150.4 | 185.0 | 9.52 | Ns | Ns | Ns |
| Day 7 | 119.8 | 117.9 | 139.6 | 4.18 | Ns | Ns | Ns |
| Day 14 | 96.7 | 92.7 | 107.7 | 3.65 | Ns | Ns | Ns |
| Day 21 | 74.4 | 69.3 | 92.5 | 2.84 | Ns | Ns | Ns |
| HDL |  |  |  |  |  |  |  |
| Day 1 | 32.3 | 33.7 | 33.2 | 0.81 | Ns | Ns | Ns |
| Day 7 | 56.3 | 57.7 | 58.1 | 0.92 | Ns | Ns | Ns |
| Day 14 | 64.2 | 60.9 | 56.9 | 1.08 | Ns | Ns | Ns |
| Day 21 | 49.6 | 48.2 | 52.7 | 1.01 | Ns | Ns | Ns |
| VLDL |  |  |  |  |  |  |  |
| Day 1 | 32.1 | 30.1 | 36.7 | 1.89 | Ns | Ns | Ns |
| Day 7 | 24.0 | 23.5 | 27.9 | 0.83 | Ns | Ns | Ns |
| Day 14 | 19.3 | 18.6 | 22.2 | 0.72 | Ns | Ns | Ns |
| Day 21 | 14.9 | 13.9 | 18.5 | 0.57 | \* | Ns | \* |
| LDL |  |  |  |  |  |  |  |
| Day 1 | 34.6 | 48.3 | 38.5 | 2.87 | Ns | Ns | Ns |
| Day 7 | 61.5 | 70.5 | 68.7 | 2.91 | Ns | Ns | Ns |
| Day 14 | 89.6 | 86.1 | 81.1 | 4.03 | Ns | Ns | Ns |
| Day 21 | 79.2 | 81.8 | 91.5 | 4.67 | Ns | Ns | Ns |
| Glycose |  |  |  |  |  |  |  |
| Day 1 | 103.1 | 104.9 | 104.4 | 1.93 | Ns | Ns | Ns |
| Day 7 | 127.0 | 126.9 | 130.3 | 1.48 | Ns | Ns | Ns |
| Day 14 | 136.2 | 132.1 | 136.0 | 1.67 | Ns | Ns | Ns |
| Day 21 | 119.3 | 120.5 | 121.7 | 1.80 | Ns | Ns | Ns |

HDL = high-density lipoproteins; VLDL = very-low-density lipoproteins; LDL = low-density lipoproteins

1Control = unsupplemented; Rac10 = 10 mg/kg ractopamine; Rac20 = 20 mg/kg ractopamine.

2Probability values for the effects of the dietary treatment Contrast 1 (C1)= Control × Rac10 + Rac20; Contrast 2 (C2)= Rac10 × Rac20

Ns, not significant; \*P < 0.05

Supplementary Table S4 Time effects of Complete blood count and Serum biochemistry results of piglets from Ractopamine feeding sows during 25 to 50 days of pregnancy

|  |  |  |  |
| --- | --- | --- | --- |
| Item (n/μL) | Days | SEM | P-value |
| 1 | 7 | 14 | 21 | Time |
| RBC (×106/μL) | 4.36a | 4.07b | 5.11c | 5.58d | 0.04 | \*\*\* |
| Hemoglobin (g/dL) | 8.43a | 8.73a | 10.95b | 11.25b | 0.08 | \*\*\* |
| MCV (fL) | 64.07a | 74.88b | 73.67b | 67.95c | 0.36 | \*\*\* |
| MCH (pg) | 19.28a | 21.71b | 21.48b | 20.19c | 0.10 | \*\*\* |
| Platelets (n/μL) | 416804.88a | 929729.51b | 746553.72c | 755198.35c | 12605.82 | \*\*\* |
| White blood cell count (n/μL) |
| Leucocytes | 5896.66a | 10302.50b | 8210.42c | 11801.25b | 186.25 | \*\*\* |
| Neutrophils | 3993.67a | 4800.44b | 3034.54a | 6541.41b | 178.08 | \*\*\* |
| Lymphocytes | 2103.28a | 5369.82bc | 4995.18b | 5703.44c | 93.90 | \*\*\* |
| Monocytes | 240.29 | 133.61 | 176.36 | 204.28 | 9.32 | Ns |
| Eosinophils | 38.36 | 96.36 | 107.51 | 147.16 | 6.60 | Ns |
| Basophiles | 17.34 | 22.13 | 13.88 | 6.45 | 1.62 | Ns |
| Serum biochemistry, (mg/ dL) |
| Urea | 34.51a | 16.38b | 16.10b | 14.60b | 0.59 | \*\*\* |
| Creatinine | 0.56a | 0.60a | 0.74b | 0.80c | 0.01 | \*\*\* |
| Total Protein | 6.30a | 5.90b | 5.50c | 5.25d | 0.04 | \*\*\* |
| Cholesterol | 106.35a | 149.18b | 163.18b | 150.81b | 2.21 | \*\*\* |
| Triglycerides | 166.06a | 126.43ab | 99.42bc | 79.34c | 3.20 | \* |
| HDL | 33.09a | 57.48b | 60.40c | 50.25d | 0.68 | \*\*\* |
| VLDL | 33.08a | 25.29a | 20.11b | 15.89c | 0.64 | \*\*\* |
| LDL | 40.78a | 67.23b | 85.30b | 84.63b | 2.02 | \*\*\* |
| Glycose | 104.16a | 128.20b | 134.73b | 120.59c | 1.01 | \*\*\* |

MCV= mean corpuscular volume; MCH= mean corpuscular hemoglobin; RBC= red blood cells; HDL = high-density lipoproteins; VLDL = very-low-density lipoproteins; LDL = low-density lipoproteins

a,b,c,d Means with different letters, within a row, are statistically different, P < 0.05

Ns, not significant, \*P < 0.05, \*\*\*P < 0.001