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STRESS DURING GESTATION ALTERS IMMUNE CELL NUMBERS BUT NOT IMMUNOGLOBULINS IN MAMMARY SECRETIONS OF SOWS

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Maternal stress during gestation can deteriorate offspring health at birth and later on. This influence of prenatal stress is assumed to rely on developmental metabolic, neuroendocrine and immune alterations in the offspring. Whether immune protection of the neonate via mammary secretions might play a role is not known. This study involved sows raised during gestation in a conventional stressful housing system on slat (SL, n=18) or in an enriched welfare-friendly system (on straw with larger pens, E, n=19). In these two systems, pre-weaning piglet mortality was steadily different (E: 17% vs. SL: 26%, $P < 0.001$ in this experiment). Salivary samples were collected on the days of gestation (DG) 35 and 105 (gestation length: 114-115 days) and 4 days after farrowing (L4). Colostrum was collected at farrowing (L0) and milk at L4 (after 1 ml oxytocin administration). Maternal salivary cortisol was greater in SL sows on DG35 and 105, and the difference had disappeared at L4, when sows were housed in comparable farrowing pens. In mammary secretions, the absolute numbers of neutrophils (polynuclear CD172+ cells), monocytes (mononuclear CD172+ cells), cytotoxic (CD2+CD8+high), memory (CD2+CD8+low) and other T-cells (CD2+CD8-) increased between L0 and L4 ($P < 0.001$), and were lower in SL than E sows at L4 ($P < 0.1$ for CD172+ cells, $P < 0.05$ for others). Concentrations of IgG and IgA were comparable in both groups at L0 and L4. Thus, immune protection provided by the mother in the milk, in particular the transfer of maternal immune cells, might be decreased by maternal stress during gestation, with unknown consequences for neonate health. Research has received funding from the EU FP7 Prohealth program (no. 613574).