

IgG concentration of new born piglets in Western Europe

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Introduction

Early and adequate colostrum uptake of young born piglets is important for a good transfer of maternal immunity since maternal antibodies can't cross the placenta. One way to check the quality of colostrum management is to measure the serum antibodies of new-born piglets. A successful transfer of maternal antibodies is important for the immune status of weaned piglets and plays a vital role in the reduction of preweaning mortality and the use of antibiotics.

Material and methods

Starting September 2013, Farmers in the Netherlands and in Belgium were given the opportunity to measure the blood IgG concentration of new born piglets. A sample protocol was provided. Briefly: six litters (gilts together with older parity sows) in the age between minimum 24 hours and maximum 5 days were selected (cross fostered litters to be excluded). Six piglets were selected estimated on visible weight differences: 2 light weight piglets, 2 middle weight piglets and 2 heavy weight piglets. The weights was determined at sampling. A blood sample was obtained by jugular venepuncture. Blood samples were analysed for IgG using the immunocrit assay which was validated by our own ForFarmers lab with an increased centrifugation time of 10 minutes.

Results

In total 220 farms and 7828 blood samples were analysed with an average IgG concentration of 37.2 mg/ml. From 71 farms (2271 piglets) growth was followed until weaning (227 gram/day). Piglets born out of gilts (n=1785) had a significant ($p < 0.001$) lower IgG concentration (34.3 mg/ml) compared to elder parity sows (n=6043; 38.0 mg/ml). Litter size was negative correlated with piglets IgG for gilts and fourth parity sows ($p < 0.005$) but with a very poor R^2 of 0.01. In total 6.5% of the piglets had an IgG concentrations below 15 mg/ml which is associated with increased preweaning mortality. The 20% lightest piglets (<1120 gram) had significant ($p < 0.005$) odds ratio's (OR) of 4.03 for having a too low IgG concentration (<10 mg/ml) and an OR of 3.00 for having a low concentration of IgG (<15 mg/ml) compared to the other piglets. Growth of the piglets was positively correlated with weight at bloodsampling (R_{sq} of 0.16; n=2271). Piglets with a low IgG (<20mg/ml) had a significant lower daily growth until weaning compared to the piglets with an high IgG concentration (≥ 20 mg/ml). There was no seasonal or outside temperature influence on the IgG concentration.

Discussion/Conclusion

This is the first large scale report of neonatal piglets IgG concentration under practical circumstances. Our findings clearly indicate that offspring of gilts and lightweight piglets (<1120 gram) are at risk for low IgG concentrations.