

Determining the accuracy and efficacy of hand-held refractometers as a crate side test for swine colostrum quality and uptake

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Piglet mortality prior to weaning is a significant economic and welfare concern, with inadequate colostrum intake a primary cause of piglet deaths and ill-thrift (Muns et al., 2016). However, understanding of how colostrum quality and intake varies on farm is limited, primarily due to difficulties in measurement. Therefore, this study sought to validate hand-held refractometers as an on farm test for immunoglobulin G (IgG) content in sow colostrum and piglet serum. Twenty-nine Large White x Landrace sows (parity zero to four) were induced to farrow using *Lutalyse* (prostaglandin F-2 ; Zoetis, Australia). Colostrum (20 mL) was sampled from sows during farrowing (prior to expulsion of the first piglet), and serum was obtained from piglet blood samples collected 24 hours after birth. Frozen-thawed colostrum and piglet serum were analysed for IgG concentration using the established radial-immunodiffusion (RID) method. Two hand-held refractometers were used, one to measure the percentage of total colostrum solids (TCS) in colostrum, and the other to measure percentage of total blood proteins (TBP) in piglet serum. Pearson's correlation coefficient (SPSS ® 22; IBM) of colostrum data ($n = 29$ samples) revealed that TMS correlated positively with IgG levels measured by RID ($r = 0.67$, $P < 0.01$; Figure 1), and for piglet serum, TBP was weakly correlated with IgG levels measured by RID ($n = 140$, $r = 0.34$, $P < 0.01$; Figure 2).

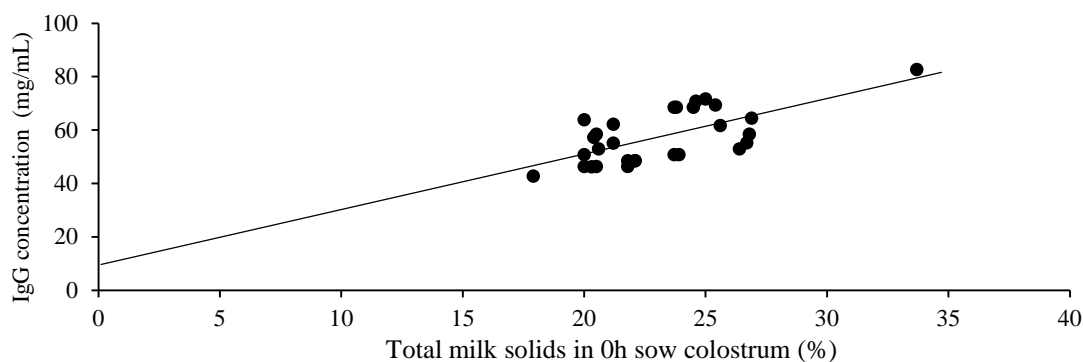


Figure 1. Correlation between IgG concentration and total colostrum solids present in sow colostrum samples collected during parturition ($r = 0.67$)

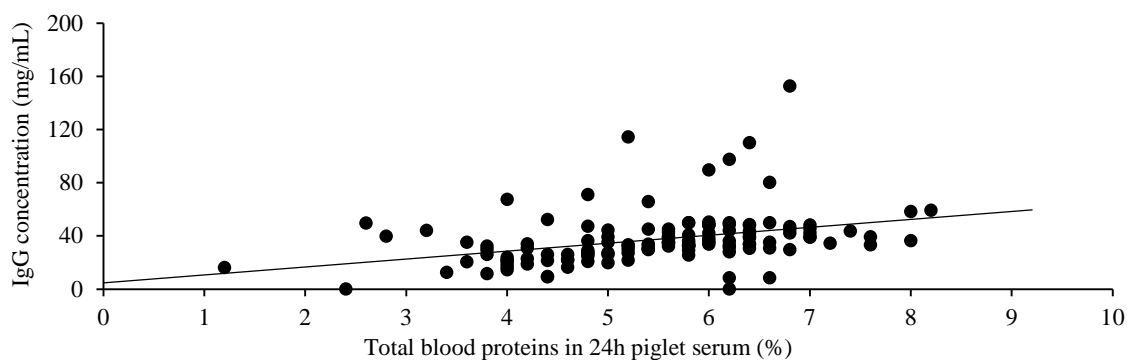


Figure 2. Correlation between IgG concentration and total blood proteins present in piglet serum collected 24 hours after birth ($r = 0.34$)

The current data indicates that the hand-held refractometer is a reliable tool for assessing swine colostrum quality as an on farm test; however, despite the positive association observed between measurements for piglet serum analysis, a weaker correlation between total blood protein and Brix % suggests that this device is less reliable for assessing piglet colostrum uptake.

References

Muns R, Nantapaitoon M, Tummaruk P. (2016). *Livestock Science* **184**, 46 - 57.

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