

Validation study of the optical refractometry method to measure total proteins in calves' serum

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Failure of passive immune transfer is a condition attributed to calves that did not receive an appropriated doses of immunoglobulins through colostrum, which is known to compromise calf's health and welfare, usually leading to an increase in antimicrobials' usage. At the farm level, immunoglobulins analysis is not feasible, thus, the standard method consists in measuring the total protein concentration in serum (TSP) with an optical refractometer. The objective of this study was to evaluate the precision of the refractometer in measuring TSP. Samples of blood were collected from the jugular vein of 20 calves at birth and shortly after (day 1, 2 and 7). Blood samples were allowed to clot at room temperature for one hour and then refrigerated until centrifugation on the same day. After centrifugation, serum was obtained and frozen until the day of the analysis. TSP was measured with an optical refractometer (OR) and with an automated colorimetric method (Fujifilm DRI-CHEM; CM). No significant differences were found between both methods ($P=0.203$; OR – 5.8 ± 0.9 g/dL; CM – 5.9 ± 1.1 g/dL). TSP measured with both methods were highly correlated, specially at day 1 and 2 ($r=0.74$, 0.94 , 0.96 and 0.83 , at birth, day 1, 2 and 7, respectively). These results corroborate the use of the refractometer as a practical and economic screening tool to evaluate passive immune transfer at the farm level.

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