



Assessment of Passive Immunity in Neonatal calves in Dairy herd in Mashhad suburb By Measuring Serum Total Protein

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Background: The transfer of immunoglobulins through the placenta or colostrum is called passive transfer. Cattle's placenta is syndesmochorial, which separates the contents of the mother's blood from the fetus, thereby preventing the transfer of protective immunoglobulins (Ig) from the mother to the fetus. As a result, calves are born without maternal immunity (agammaglobulin). Therefore, the development of maternal immunity in newborn calves is almost completely dependent on the absorption of maternal immunoglobulins in the colostrum³ received at birth. Inadequate intake of colostrum and insufficient absorption of colostrum immunoglobulins by newborn calves in the first hours of life leads to failure of passive transfer immunity. FPT is not a disease, it is a condition that makes newborn calves susceptible to disease and infection. The failure of passive immune transfer in newborn calves can be evaluated by measuring serum or plasma immunoglobulins (IgG) or total serum protein between 24 hours and 7 days of age.

Methods: In each herd, 12 neonatal calves aged between one and seven days were subjected to jugular venipuncture to collect blood samples. The tubes used for collection did not contain anticoagulants, as the purpose was to evaluate passive immune transfer. Following serum separation through centrifugation, the total protein was measured using a refractometer.

Results: According to the results of the McGuirk and Collins study in the year 2004, in the successful passive transfer of maternal immunity, serum total protein⁴ (TP) is more than 5.2 g/dL in healthy calves and more than 5.5 g/dL in sick calves. A failure of passive transfer in a herd can be indicated if the total protein value of 4 out of 12 neonatal calves falls below the cutoff.

Conclusion: In this research, a herd-based test was used to monitor the passive transfer status in neonatal calves. The results showed that herds with a suitable passive transfer status of maternal immunity had fewer neonatal diseases such as septicemia, diarrhea, pneumonia, and infectious arthritis.

Keywords: Assessment passive immunity 1, Neonatal calf 2, Colostrum 3, Serum total protein 4

