



FAILURE OF PASSIVE TRANSFER: Early Testing is the Key

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Newborn foals enter the world without antibody protection. Foals are entirely dependent on antibodies absorbed following ingestion of mare's colostrum in the first few hours of life for protection against infectious diseases. Mares produce colostrum only during the last 1 to 2 weeks of gestation as antibodies are actively transported from their blood and concentrated in the mammary gland. After nursing the colostrum, specialized cells that line the small intestine of the newborn foal absorb the antibodies and transfer them into the foal's blood. Absorption of antibodies by these specialized cells is greatest during the first 6 to 8 hours after birth and stops by 24 to 36 hours of age.

Failure of passive transfer (FPT) of antibodies occurs in 10 to 20% of newborn foals. A foal greater than 24 hours of age is considered to have failure of passive transfer if circulating antibody (also called immunoglobulins or IgG) levels are less than 400 mg/dl. A level of 400 to 800 mg/dl is considered partial failure of passive transfer and a blood IgG concentration greater than 800 mg/dl is considered adequate.

The most common causes of FPT are poor quality colostrum and premature lactation. Mares that drip or run milk for several hours prior to giving birth are losing colostrum

that is vital to the survival of the foal. In that situation, it is recommended that colostrum be stripped or milked out of the mare and saved for the foal. The colostrum should be strained through a gauze filter into a labeled plastic bottle and either refrigerated or frozen if foaling does not appear to be near. Other causes of inadequate transfer of antibodies include failure of colostrum production (i.e. due to fescue toxicity), inability or lack of desire by the foal to nurse, prematurity, dysmaturity, foal rejection by the mare and failure to absorb antibodies that are ingested.

Early testing for antibody levels in a neonatal foal can identify potential cases of FPT and allow for early intervention and medical management. It is recommended that a blood sample be collected from a newborn foal approximately 12 hours after birth to evaluate circulating IgG levels prior to 'closure' of the gastrointestinal tract to antibody absorption. If IgG levels are <400 mg/dl at 12 hours, oral supplementation with frozen-thawed colostrum or a commercial colostrum substitute should be performed. If IgG levels are 400 to 800 mg/dl, the need for intervention and therapy is dependent on potential pathogen exposure and/or the medical condition of the foal. Foals with partial failure of passive transfer at risk of developing infections may benefit from IgG supplementation. In contrast, foals with

partial FPT born into a clean environment with low pathogen exposure potential and good preventive management practices may not need supplemental IgG. Antibody levels of >800 mg/dl at 12 hours of age indicate that adequate passive transfer of immunoglobulins occurred and no additional testing or intervention is necessary under most management conditions.

Testing a foal at 24 hours of age or more will determine the final extent of passive antibody absorption. It is critical to understand that no significant amount of antibodies is absorbed if oral supplementation is provided after 24 hours of age. Foals greater than 24 hours of age identified with FPT require intravenous administration of plasma or a commercial equine IgG preparation to successfully increase blood antibody levels. Although plasma transfusions are commonly performed in foals for disease prevention and medical therapy, oral administration of colostrum early in the first day of life is unquestionably easier and safer to perform.

A variety of screening tests have been developed over the years for evaluation of IgG levels in foals. The single radial immunodiffusion (RID) test is considered to be the most accurate test for quantitative measurement of antibody levels in foals. Unfortunately, results of the RID test are generally not available for 24 hours or more making it impractical for routine use on a breeding farm or at a veterinary clinic when rapid results are required for therapeutic intervention. Stall-side diagnostic tests used to estimate IgG levels in foals include the glutaraldehyde coagulation test (Gamma-Check-E), zinc sulfate turbidity test (Equi-Z), latex agglutination test (Foalcheck), enzyme immunoassay (SNAP test) and a new turbidimetric immunoassay (ARS Foal IgG

Test). Consult with your veterinarian as to which test is optimal to use in your situation.

Early testing of a newborn foal can detect potential cases of failure of passive transfer in time for oral supplementation with frozen colostrum to be effective. A timely diagnosis and early therapeutic intervention will often circumvent a life-threatening medical crisis in a young foal.