

Foal Immunodeficiency Syndrome

Affected breeds: Fell, Dales and Coloured ponies, and potentially any cross-bred ponies.

Foal Immunodeficiency Syndrome (FIS; formerly known as Fell Pony Syndrome) is a progressive immunodeficiency and anaemia which is fatal within the first few weeks of life. Affected foals appear normal at birth, but at 2-4 weeks of age begin to show signs of infection and fail to thrive.

FIS is a recessive disease, and is spread via carriers which have one copy of the FIS gene, but are physically normal. Carrier-carrier matings should be avoided in order to prevent affected foals.

However, due to the high percentage of carriers in the Fell and Dales breeds, carriers should be retained for breeding to avoid the loss of desirable breed traits and prevent a reduction in genetic diversity. Carriers can be bred to FIS-clear ponies; on average 50% of the offspring will be clear and 50% carriers, with no affected foals produced - offspring to be used for breeding can be DNA tested to determine whether they are clear or a carrier.

This test is particularly useful for breeders:

- To identify carriers among their breeding stock so that they can avoid CARRIER X CARRIER mating combinations which would risk AFFECTED foals.
- To conclusively diagnose FIS in sick foals.
In suspected FIS-affected foals for which a rapid, accurate diagnosis is required veterinarians should contact the laboratory on 01223 395577 or 07870 456808 to liaise directly.

This test will be reported as:

CLEAR : no evidence of the FIS mutation

CARRIER : carries one copy of the mutation, which will be passed to 50% of offspring

AFFECTED : carries two copies of the mutation and will develop FIS

The genetic status can be used to predict breeding outcomes when different combinations are mated:

CARRIER X CARRIER = 25% AFFECTED, 50% CARRIER, 25% CLEAR

CARRIER X CLEAR = 50% CARRIER, 50% CLEAR

CLEAR X CLEAR = 100% CLEAR

Coloured ponies which carry the FIS gene should not be used for breeding in order to prevent the further spread of FIS into this population.

Reference:

The FIS mutation was characterised at the Animal Health Trust in Newmarket in a research programme led by Dr June Swinburne of Animal DNA Diagnostics Ltd.

Fox-Clipsham LY, Carter SD, Goodhead I, Hall D, Knottenbelt DC, May PDF, Ollier WE, Swinburne JE (2011) Identification of a Mutation Associated with Fatal Foal

Immunodeficiency Syndrome in the Fell and Dales Pony. PLoS Genetics Jul;7(7):e1002133. Epub 2011 Jul 7.

Fox-Clipsham LY, Brown EE, Carter SD, Swinburne JE (2011) Population screening of endangered horse breeds for the foal immunodeficiency syndrome mutation. Veterinary Record 169(25): 655