

What is protoporphyria?

Protoporphyria was identified in Limousin and Blonde D'Aquitaine cattle in the early 1990s. It causes photosensitization which can range from sunburn so severe that young calves have to be euthanized, to sunburnt ears and noses before the animal makes a full recovery. Affected animals avoid the sunlight and generally do poorly especially in the summer.

The initial identification of the disease was in herds which had unwittingly used two carrier sires in succession. The first carrier sire produced 50 percent of carrier daughters and when these were joined to another carrier sire 25 percent of the progeny had symptoms of protoporphyria.

Protoporphyria is due to the presence of a defective gene that is normally responsible for the formation of the enzyme ferrochelatase which is involved in the combination of iron and protoporphyrins to form haem, a component of haemoglobin.

If two defective genes are present (homozygous defective) then the animal is likely to exhibit the symptoms of protoporphyria (photosensitisation) which is caused by very high levels of protoporphyrins.

If one defective gene is present (heterozygous) the animal will be a carrier but is very unlikely to suffer from photosensitisation. If both genes are normal (homozygous normal) the animal will be normal.

A DNA test for protoporphyria in the mid 1990s and made available by the Elisabeth Macarthur Agricultural Institute. Since that time it has been compulsory to test all new AI sires and many existing sires were also tested. Of the 164 AI sires tested by August 1997, 13 (eight percent) were carriers of the defective gene including some very influential sires such as Filou, Favori (Matching) and El Toro. It can be assumed that a similar proportion of cows were carriers also.

Since then breeders generally ceased using sires which were carriers of the defective gene and it has become rare to see a clinical case of protoporphyria.

Animals which have been DNA tested normal have a suffix of PN (Proto Normal) on their names and where an animal is free by pedigree it has a suffix of PF (Proto Free) which occurs where herds have tested their females. Animals which have been tested as carriers have a suffix of PC (Proto Carrier) and the occasional animal which has produced a carrier calf with the other parent being proto normal has a suffix of PS (Proto Suspect). Untested animals whose parents are not tested normal or free by pedigree have a suffix of PU (Proto Suspect).



Young calf suffering from protoporphyria (Photo courtesy of Kent Anderson)

Inheritance of Protoporphyria

