Dexter Dun – Brown Mutation Discovery

by John Potter

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When I began raising Dexters in 1992, I assumed that dun Dexters were the result of a brown mutation similar to that which exists in other species of mammals. Until the summer of 2001 all of the cattle geneticists and literature that I consulted assured me that no brown mutation had been discovered in cattle. When Carol Davidson conducted her color studies in the late 1990s, she confirmed the genetic basis of our red Dexters and suggested the possibility that our Dexters are relatively unique from the standpoint that E^+/E^+ Dexters are red- for example, the renowned bull Cornahir Outlaw. This is the same E locus genotype that most Jerseys and Brown Swiss have, and those breeds certainly aren't red in appearance. Since that time I have found that E^+/E^+ animals in a number of other breeds, including Tarentaise, Red Polls, and Maine-Anjou, are phenotypically red. In Carol's research, dun Dexters turned up as black animals at the red locus. Carol then assumed that dun Dexters are the result of a dilution mutation similar to the ones that exist in other breeds of cattle such as Simmentals, Highlands, and Galloways. In July 2001 I succeeded in convincing Dr. Sheila M. Schmutz, a prominent geneticist at the University of Saskatchewan, that Dexter dun may be unique and would be worth investigating. I am very pleased that our resulting research project, begun in October 2001, culminated in the discovery of the first brown mutation ever confirmed in cattle. As of the date of the conclusion of the research project, the brown mutation had been found only in the Dexter breed. We tested 121 cattle from 19 other breeds, and none of them contained this mutation. The 19 breeds included Angus, Belgian Blue, Blonde d'Aquitane, Braunvieh, Brown Swiss, Canadienne, Charolais, Flamande, Galloway, Gelbvieh, Guernsey, Hereford, Highland, Holstein, Jersey, Limousin, Shorthorn, Simmental, and Tarentaise. One notable observation that was first made in the research project and confirmed by subsequent testing is the fact that red is epistatic to Dexter dun. Animals that are homozygous for both red and dun (E^+/E^+ b/b, E^+/e b/b, e/e b/b) are phenotypically red.

The Dexter dun study concluded with the publication in 2003 of " *TYRP1* is associated with dun coat color in Dexter cattle or how now brown cow?" by the International Society for Animal Genetics in their journal, *Animal Genetics*, **34**, 169-175.