

NOTE

**DEPRESSED FERTILITY IN ICELANDIC SHEEP
CAUSED BY A SINGLE COLOUR GENE**

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SUMMARY

The top dominant allele at the agouti locus (A^{wh}) in sheep which primarily produces tan colour or white colour in interaction with a piebald gene has been confirmed to depress ewe fertility by 0.15 lambs per ewe mated possibly in heterozygous as well as in homozygous state.

The top dominant allele at the agouti locus in sheep, A^{wh} , which was shown to cause white or tan colour in the *Icelandic* sheep (ADALSTEINSSON, 1970, 1974) was found to have a considerable depressing effect on ewe fertility (ADALSTEINSSON, 1970).

It has further been demonstrated recently that the A^{wh} gene produces tan colour in sheep which lack the recessive gene for piebaldness, and pure white colour in sheep which are homozygous for the gene S^b of piebaldness (LAUVERGNE, 1975).

The A^{wh} gene is therefore probably widespread among the sheep breeds of the world. Evidence on that point is available from Australia (BROOKER and DOLLING, 1969) and from Great Britain (RYDER and LAND, 1974).

In light of the above findings it was found to be of interest to examine further the depressing effect of the A^{wh} gene in the *Icelandic* Sheep.

In an investigation where completely white ewes were compared to tan ewes, no difference in fertility was found between completely white ewes on one hand and tan ewes on the other hand (ADALSTEINSSON, 1975).

Additional data on the performance of nonwhite ewes were also available from the same source as the data on the white and tan ewes. These nonwhite ewes were of several colours, but mainly grey, black badgerface, black mouflon, black or brown.

In table 1 is shown a comparison of the fertility of these nonwhite ewes, which lack the A^{wh} gene,

with the fertility of the white and tan ewes mentioned above, which carry the A^{wh} gene. The basis of the comparison is the same as described elsewhere when white and tan ewes were compared (ADALSTEINSSON, 1975).

Table I also shows in summarized form the results from the earlier investigations on the effect of the A^{wh} gene on ewe fertility (ADALSTEINSSON, 1970).

The depressing effect of the A^{wh} gene on ewe fertility is seen to occur at all ewe ages in the new data set, and the average depressing effect in the present study is the same as that of the previous study, or 0.15 lambs per ewe mated and alive at lambing time.

The effect of the A^{wh} gene was ascribed to increased loss of white or tan (A^{wh}) foetuses in white or tan (A^{wh}) ewes. Heterozygosity for the A^{wh} gene was not found to diminish this effect (ADALSTEINSSON, 1970).

TABLE I

*Difference between nonwhite ewes (A) and white or tan ewes (B)
in numbers of lambs per ewe*

*Différence entre les brebis non blanches (A) et les brebis blanches
ou rouges et blanches (B) pour le nombre d'agneaux par femelle*

	Age of ewe at lambing, years				
	1	2	3	4	mean ⁽¹⁾
<i>Presents results</i>					
<i>Number of ewes :</i>					
Nonwhite	132	132	132		
White or tan	1 270	1 270	1 270		
<i>Number of lambs per ewe on record :</i>					
Average, both groups	0.17	1.34	1.53		
Difference, A-B	0.08	0.32**	0.06		0.15
<i>Previous results (ADALSTEINSSON, 1970) :</i>					
<i>Numbers of ewes:</i>					
Nonwhite		465	412	309	
White		2 035	2 024	1 702	
<i>Number of lambs born per mating :</i>					
Average, both groups		1.23	1.28	1.37	
Difference, A-B		0.12**	0.18**	0.14**	0.15

⁽¹⁾ Unweighted mean.

** P < 0.01.

The two investigations described here, which are carried out on independent data give very similar results. The depressing effect of the A^{wh} gene on ewe fertility seems therefore to be well established within the *Icelandic* sheep breed.

RÉSUMÉ

UN SIMPLE GÈNE DE COLORATION QUI ABASSE
LA FERTILITÉ DU MOUTON ISLANDAIS

L'allèle dominant en tête de la série au locus Agouti chez le mouton (A^{wh}) colore la toison en rouge ou, parfois, en blanc, par interaction avec un gène de panachure. La présente étude confirme que ce gène A^{wh} est responsable d'un abaissement de la fertilité des femelles : 0,15 agneau en moins par brebis mise à la lutte. L'effet semble le même chez l'hétérozygote que chez l'homozygote.

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