

A Survey of Australian Alpaca Breeders to Determine the Incidence of Clinical Deafness in Blue-Eyed White Alpacas within the Australian Herd

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It is generally accepted that blue-eyed solid white alpacas have a high incidence of congenital deafness. The incidence of deafness using objective assessment has ranged from 63.6% to over 90%. Anecdotal reports from Australian breeders suggested that the incidence was significantly less than 90%.

It has been postulated by Elizabeth Paul that blue-eyed solid white alpacas are the result of the incomplete dominant merle gene possibly in combination with other white spotting genes such as Tuxedo. The merle gene is the gene most commonly associated with grey alpacas. In fact Elizabeth Paul states that grey alpacas are all "merles". If this theory is correct, the matings most likely to produce blue-eyed white (BEW) alpacas are white X white, or white X light fawn or grey or "multi" (Tuxedo).

In order to determine the clinical incidence of deafness in Australian BEW alpacas, and the type of matings that most commonly produced BEWs, Australian breeders were asked to provide information on BEWs that they owned. The information requested was:

1. Whether the breeder perceived their BEW to be deaf
2. The colour of the sire and dam of the BEW.

Results

Total BEWs	78
Deaf	43 (55%)
Non-Deaf	35 (45%)
No. Breeders	24

Overall, 55% of the 78 blue-eyed white (BEW) alpacas entered into the survey were deemed to be deaf by their owners. This is consistent with the results obtained by the Department of Veterinary Medicine at Justus- Lieberg University, Giessen, obtained by objective assessment using brainstem auditory evoked response audiometry. They reported 63.6% of 63 BEW alpacas were deaf. This is in contrast to the similar studies of Dr David Anderson of Ohio State University that claim that about 90% of BEW alpacas are deaf. It is possible that the Dr Anderson has performed his tests on a very selective group of BEWs, as he has been mating BEWs together (personal correspondence Elizabeth Paul). In the present Australian survey, BEWs whose sire and/or dam were also BEW were 100% deaf (see below).

In order to assist breeders in their breeding decisions regarding avoidance of producing BEWs, the survey collected information regarding the colours of the sire and dam of the BEWs. (Tables 1 & 2)

Table 1

<u>Colours of Sire and Dam of BEWs</u>	DEAF (n)	NON-DEAF (n)
BEW	14	0
White	21	33
Fawn	16	8
Grey/Roan	13	14
Tuxedo / Multi	7	4
Brown	4	0
Black	3	1
Unknown	8	8

Table 2
Specific Matings and Relationship to BEWs Deaf and Non Deaf

			DEAF (n)	NON-DEAF (n)	TOTAL (n) (%)
BEW	x	BEW	2	0	2
BEW	x	Brown	3	0	3
BEW	x	Grey	3	0	3
BEW	x	White/Fawn	4	0	4
White/Fawn	x	White/Fawn	11	16	27 (35%)
Grey/Roan	x	Grey/Roan	2	2	4
Grey/Roan	x	White	3	8	11 (14%)
Grey/Roan	x	Tuxedo/Multi	2	2	4
Grey/Roan	x	Black	1	0	1
White/Fawn	x	Tuxedo/Multi	5	2	7
White/Fawn	x	Black/Brown	3	1	4
Unknown	x	Unknown	4	4	8
Total			43 (55%)	35 (45%)	78 (100%)

(Note: for simplicity of presentation white and fawn alpacas have been grouped together in Table 2 and designated as “white/fawn” group. Similarly, steel grey and rose grey/roan have been grouped together as “grey/roan”)

Discussion

The results are totally consistent with the theories of Elizabeth Paul presented in her recent lectures and articles (see previous thread: BEWS – a few calm facts).

The most important observation from the survey relates to the 100% deafness reported in the BEW progeny of BEWs. There were 10 BEWs that either the sire (7) or dam (3) was BEW also. There were 2 BEWs where both sire and dam were BEW. All 12 were perceived to be profoundly deaf by their owners. This compares with an average of 45% deafness in BEWs produced from dark-eyed parents.

Although some breeders may argue that there may be genuine reasons for using a BEW sire (eg to produce better fleece characteristics in dark fleeced alpacas), it would seem that if one is to avoid producing deaf BEWs, a BEW sire should never be used. The results of the survey may add weight to the argument that blue eyes in a solid white alpaca should be a disqualifying fault for male certification.

From Table 2 it can be seen that deaf BEWs can be produced even when BEWs are mated to dark coated animals. It must be noted however that one brown dam produced 2 of the deaf BEWs and she had a BEW as her sire. Therefore when selecting a dark-eyed, solid dark fleeced sire for a BEW dam, it would seem prudent to examine the pedigree of the sire to ensure that there is no white, grey or “multi” animals in its pedigree.

Hopefully, this information may help breeders in their understanding of BEWs and how to best use them and at the same time avoid breeding deaf alpacas. The basic principles however have been stated many times before by Elizabeth Paul

I wish to thank all those breeders who have contributed to this survey.