Supplementary material

Model definition for genetic evaluation of purebred and crossbred lambs including heterosis

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Table S1. Number of lambs (*n*) by sire and dam breed (or cross).

Sire breed[1]	Dam breed[1]	N
½ Columbia ¼ Suffolk ¼ Texel	¼ Columbia ½ Suffolk ¼ Texel	277
CM (¾ Columbia ¼ Texel)	CM	183
	Suffolk	6
	½ Texel ½ Suffolk	16
Columbia	Columbia	4121
	Polypay	129
	Rambouillet	464
	Suffolk	251
	½ Texel ½ Columbia	31
	½ Texel ½ Suffolk	103
½ Columbia ½ Suffolk	¼ Columbia ¼ Suffolk ½ Texel	84
⅜ Columbia ¼ Suffolk ⅜ Texel	⅜ Columbia ½ Suffolk ⅛ Texel	28
PC (⅜ Columbia ⅜ Suffolk ¼ Texel)	½ Columbia ¼ Suffolk ¼ Texel	10
	Columbia	9
	PC	1052
	Polypay	173
	Rambouillet	147
	¼ Columbia ½ Suffolk ¼ Texel	9
	⅜ Columbia ½ Suffolk ⅛ Texel	4
	¼ Columbia ¼ Suffolk ½ Texel	2
	Targhee	132
	½ Texel ½ Columbia	5

¼ Columbia ½ Suffolk ¼ Texel	½ Columbia ¼ Suffolk ¼ Texel	197
½ Suffolk ½ Columbia	¼ Columbia ¼ Suffolk ½ Texel	156
Siremax	Columbia	10
	PC	21
	Polypay	140
	Rambouillet	122
	⅜ Columbia ½ Suffolk ⅛ Texel	8
	Targhee	113
½ Suffolk ½ Texel	Columbia	29
Suffolk	½ Columbia ¼ Suffolk ¼ Texel	71
	CM	104
	Columbia	557
	PC	53
	Polypay	144
	Rambouillet	562
	¼ Columbia ½ Suffolk ¼ Texel	66
	½ Suffolk ½ Columbia	14
	Suffolk	2336
	⅜ Columbia ½ Suffolk ⅛ Texel	7
	¼ Columbia ¼ Suffolk ½ Texel	21
	Targhee	119
	½ Texel ½ Columbia	303
	½ Texel ½ Suffolk	5
⅜ Columbia ½ Suffolk ⅛ Texel	⅜ Columbia ¼ Suffolk ⅜ Texel	13

¼ Columbia ¼ Suffolk ½ Texel	½ Columbia ½ Suffolk	154
	½ Suffolk ½ Columbia	351
½ Texel ½ Columbia	Columbia	245
	Suffolk	63
Texel	Columbia	233
	½ Columbia ½ Suffolk	56
	Rambouillet	421
	½ Suffolk ½ Columbia	160
	Suffolk	137
	½ Texel ½ Rambouillet	160
½ Texel ½ Suffolk	CM	48
	Columbia	101

[1] PC - paternal composite (⅜ Columbia, ⅜ Suffolk, ¼ Texel); CM - Columbia-Myostatin composite (¾ Columbia, ¼ Texel).

Table S2. Estimates and standard errors for random genetic group effects at birth, pre-weaning, weaning, and post-weaning in crossbred lambs. Estimates different from zero shown in bold[1].

Trait	Breed	Genetic group	Effect	SE
Birth	Columbia	USSES	-0.07	0.15
		Rams	0.25	0.16
		Ewes	0.44	0.27
	Polypay	Polypay	**-0.84**	**0.16**
	Rambouillet	TS1	**-0.54**	**0.16**
		TS2	0.00	0.17
	Siremax	Siremax	-0.29	0.18
	Suffolk	USSES	0.02	0.14
		TS1	**0.39**	**0.16**
		TS2	**0.34**	**0.16**
	Texel	Texel	0.12	0.17
	Targhee	Targhee	0.08	0.16
Pre-weaning	Columbia	USSES	-0.35	0.61
		Rams	0.83	0.63
		Ewes	1.41	1.24
	Polypay	Polypay	-0.68	0.75
	Rambouillet	TS1	**-3.95**	**0.69**
		TS2	-0.47	0.79
	Siremax	Siremax	0.76	0.73
	Suffolk	USSES	0.94	0.60
		TS1	**1.40**	**0.65**

		TS2	**2.12**	**0.65**
	Texel	Texel	-1.27	0.79
	Targhee	Targhee	-0.74	0.65
Weaning	Columbia	USSES	0.63	1.10
		Rams	**2.75**	**1.14**
		Ewes	3.74	2.17
	Polypay	Polypay	-1.98	1.29
	Rambouillet	TS1	**-5.91**	**1.18**
		TS2	-2.19	1.37
	Siremax	Siremax	-0.05	1.28
	Suffolk	USSES	1.57	1.08
		TS1	**2.59**	**1.16**
		TS2	**3.78**	**1.15**
	Texel	Texel	**-3.69**	**1.37**
	Targhee	Targhee	-1.28	1.15
Post-weaning	Columbia	USSES	1.41	3.25
		Rams	**8.89**	**3.34**
		Ewes	9.69	6.74
	Polypay	Polypay	-2.35	4.16
	Rambouillet	TS1	**-17.23**	**3.82**
		TS2	-7.17	4.40
	Siremax	Siremax	1.50	4.07
	Suffolk	USSES	6.01	3.31
		TS1	6.08	3.41

		TS2	**10.65**	**3.49**
	Texel	Texel	**-12.82**	**4.39**
	Targhee	Targhee	-4.75	3.42

[1]Significance determined using a confidence interval at the $\alpha = 0.05$ level.

Fig. S1. Distributions of birth weight Estimated Breeding Values (EBV) for Columbia, paternal composite (PC), Siremax, Suffolk, and Texel sires defining genetic groups (founders).

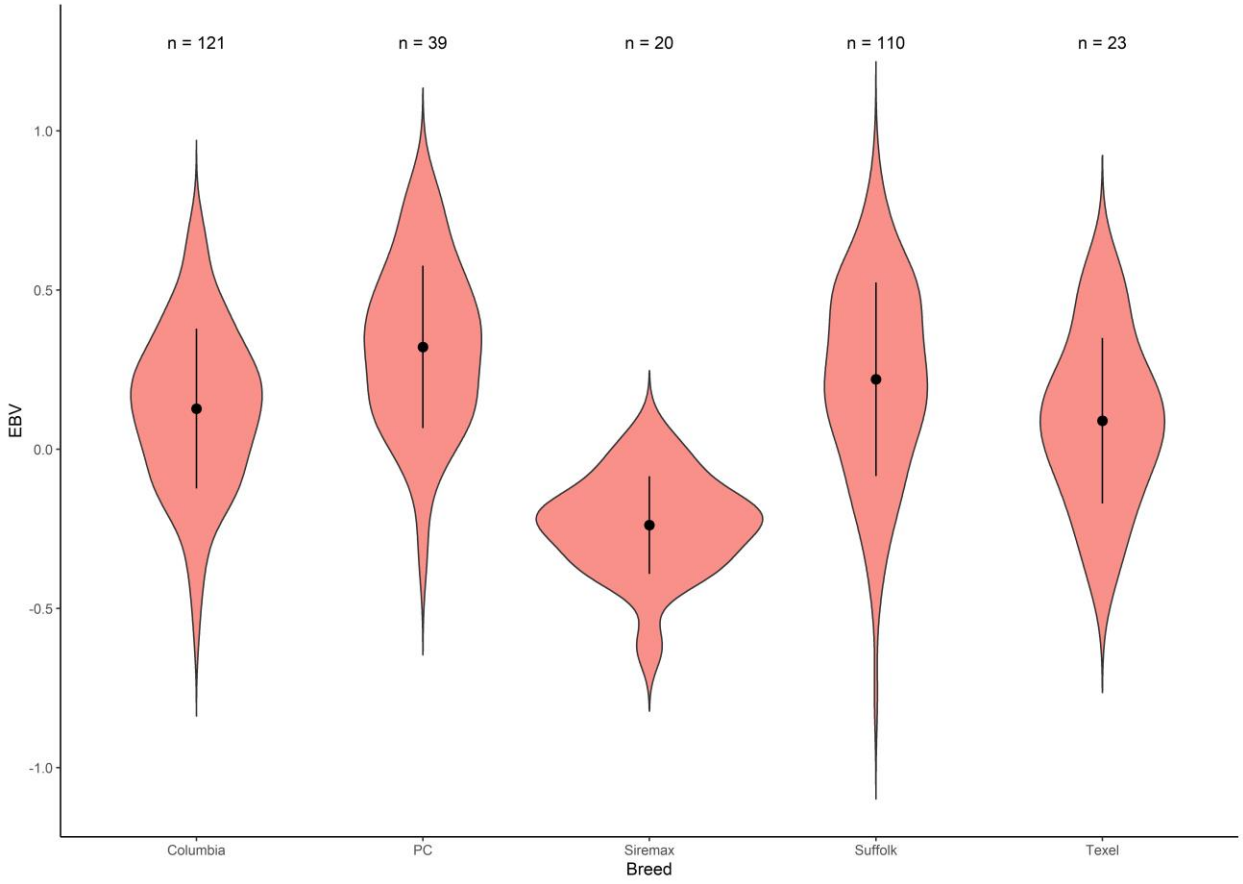


Fig. S2. Distributions of pre-weaning weight Estimated Breeding Values (EBV) for Columbia, paternal composite (PC), Siremax, Suffolk, and Texel sires defining genetic groups (founders).

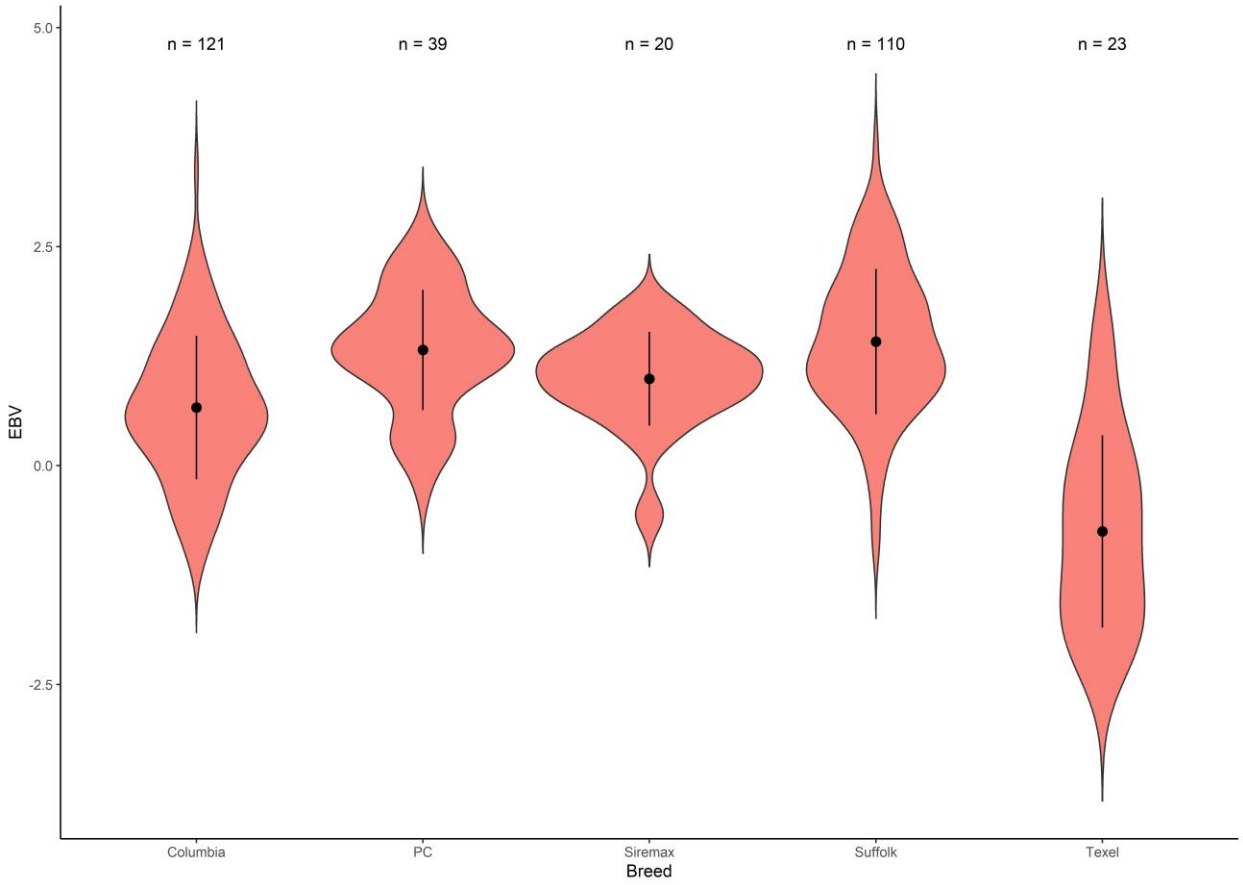


Fig. S3. Distributions of weaning weight Estimated Breeding Values (EBV) for Columbia, paternal composite (PC), Siremax, Suffolk, and Texel sires defining genetic groups (founders).

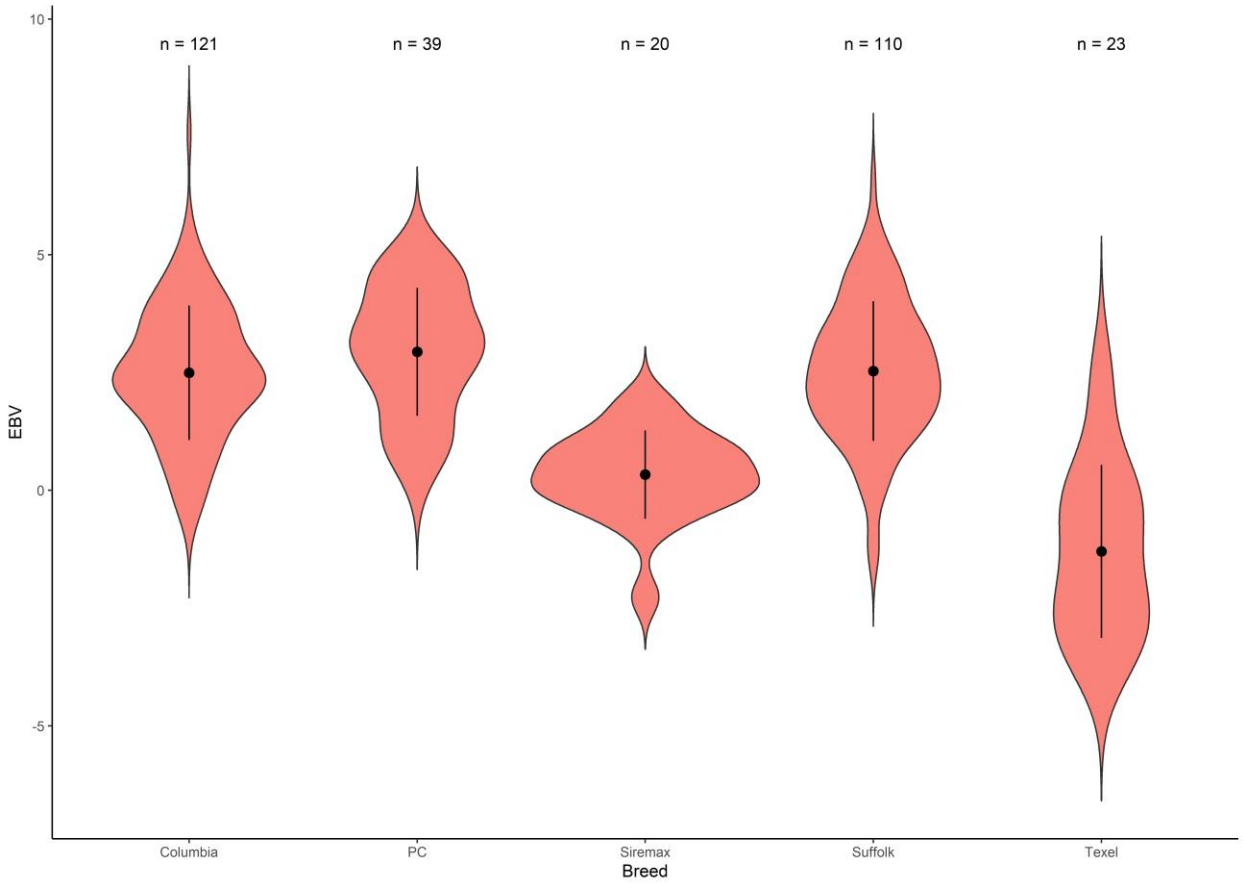
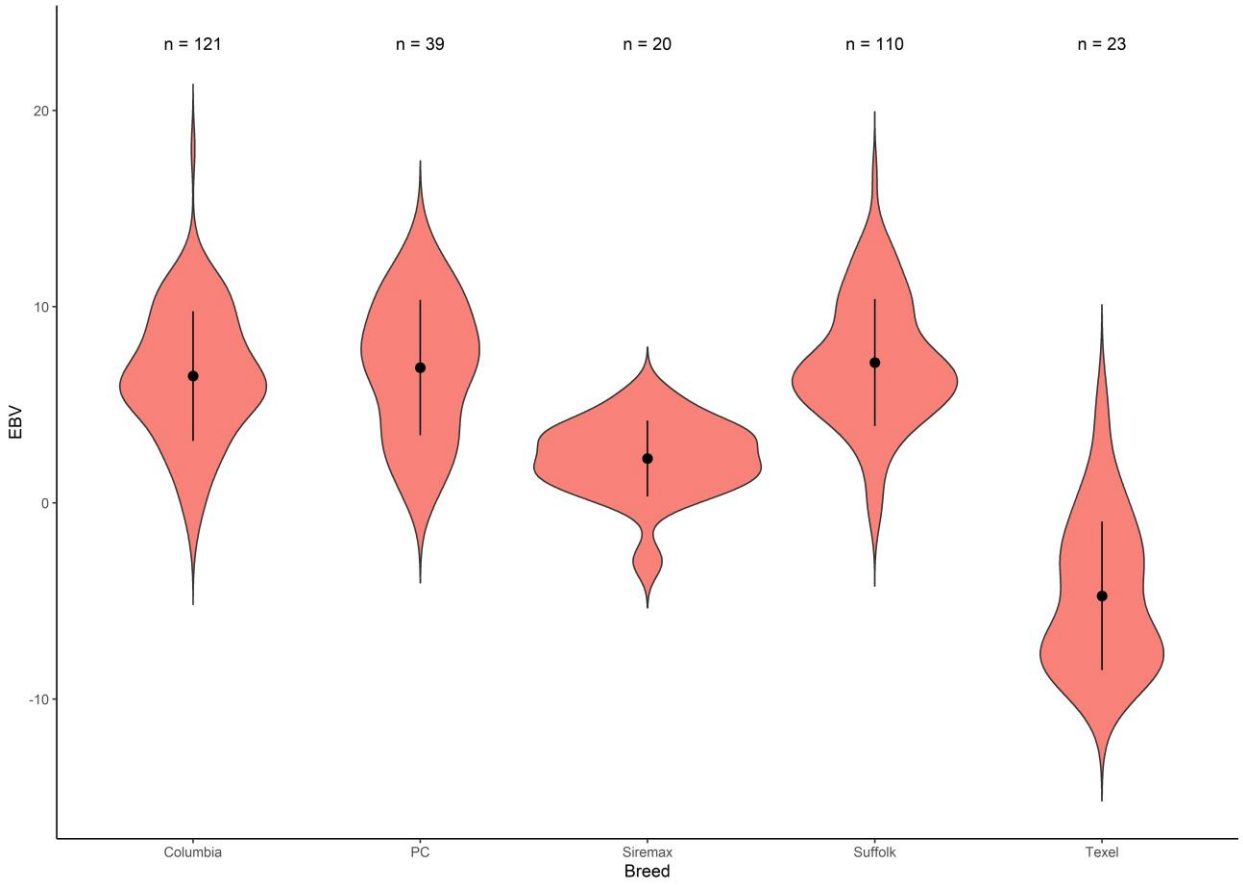


Fig. S4. Distributions of post-weaning weight Estimated Breeding Values (EBV) for Columbia, paternal composite (PC), Siremax, Suffolk, and Texel sires defining genetic groups (founders).


n = 121
n = 39
n = 20
n = 110
n = 23
20
10
0
-10
EBV
Columbia
PC
Siremax
Suffolk
Texel
Breed