

Table 14. Predicted means (with back-transformed geometric means in parenthesis) for the significant fixed effects on $\text{Log}_{10}(\text{FEC}+20)$ of Mule ewes at housing.

	Number of ewe records	Housing FECs
Age of ewe†		***
Two	977	2.155 ^a (123)
Three	877	1.844 ^b (50)
Four	791	1.760 ^{cb} (38)
Five	442	1.750 ^{cb} (36)
Six	156	1.699 ^c (30)
s.e.d. ‡		0.0572
Breed of dam†		*
Scottish Blackface	1558	1.864 (53)
Hardy Specklefaced	1685	1.819 (46)
s.e.d. ‡		0.0161
Condition score†		***
Acceptable (≤ 2.5)	514	1.891 ^a (58)
Good (3)	2289	1.806 ^b (44)
Fat (≥ 3.5)	440	1.827 ^b (47)
s.e.d. ‡		0.0276
Birth type†		***
Single	806	1.786 (41)
Multiple	2437	1.897 (59)
s.e.d. ‡		0.0189
Year†		***
2000	319	1.713 ^{ac} (32)
2001	613	1.951 ^b (69)
2002	850	1.703 ^{ac} (30)
2003	792	2.039 ^b (89)
2004	669	1.803 ^c (44)
s.e.d. ‡		0.0549
Site†		***
ADAS	1652	1.996 (79)
IRS	1591	1.687 (29)
s.e.d. ‡		0.0179
Year x site interaction†		***
2000 ADAS	167	1.781 ^a (40)
2000 IRS	152	1.644 ^{bdef} (24)
2001 ADAS	311	2.276 ^c (169)
2001 IRS	302	1.626 ^{bdef} (22)
2002 ADAS	391	1.835 ^a (48)
2002 IRS	459	1.571 ^e (17)
2003 ADAS	441	2.196 ^c (137)
2003 IRS	351	1.881 ^a (56)
2004 ADAS	342	1.893 ^a (58)
2004 IRS	327	1.713 ^f (32)
s.e.d. ‡		0.0589

† Significance levels where * $P < 0.05$ and *** $P < 0.001$.

‡ Average standard error of difference between the predicted means for each category.

Table 18. Phenotypic correlations (above diagonal), heritabilities (on diagonal; bold) and genetic correlations (below diagonal) for the index trait.

		BFL								Mules								
		SLW	UMD	UFD	CONF	PTLW	SURVd	SURVm	LS	Longe	SLAGE	CONF15	LNWT	PTLW	SURVd	SURVm	LS	Longe
BFL	SLW	0.37	0.69	0.63	0.57	0.60	0.00	0.00	0.15	0.00	-0.09	0.00	-0.13	0.03	0.00	0.00	0.00	0.00
	UMD	0.73	0.33	0.48	0.51	0.40	0.00	0.00	0.00	0.00	-0.09	0.02	0.03	-0.02	0.00	0.00	0.00	0.00
	UFD	0.74	0.64	0.35	0.44	0.30	0.00	0.00	0.00	0.00	-0.09	-0.02	-0.17	-0.07	0.00	0.00	0.00	0.00
	CONF	0.70	0.53	0.59	0.28	0.15	0.00	0.00	0.00	0.00	-0.06	0.06	-0.07	0.02	0.00	0.00	0.00	0.00
	PTLW	0.68	0.44	0.36	0.18	0.35	0.20	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SURVd	0.01	0.00	-0.02	0.00	0.00	0.03	0.00	-0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SURVm	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LS	-0.12	0.02	0.05	-0.19	0.14	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Longe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Mules	SLAGE	-0.35	-0.32	-0.23	-0.46	-0.16	-0.01	0.00	0.04	0.00	0.23	0.04	0.37	0.00	0.00	0.00	0.00	0.00
	CONF15	0.05	0.14	0.01	0.16	0.00	0.00	0.00	-0.03	0.00	0.14	0.12	0.22	0.00	0.00	0.00	0.00	0.00
	LNWT	-0.08	0.21	-0.38	-0.21	0.08	0.00	0.00	0.09	0.00	0.32	0.05	0.36	0.23	0.00	0.00	0.00	0.00
	PTLW	0.22	0.07	-0.43	0.16	0.23	-0.03	0.00	-0.06	0.00	-0.38	0.02	0.31	0.45	0.00	0.00	0.00	0.00
	SURVd	-0.04	0.01	0.08	0.04	0.02	0.41	0.00	-0.03	0.00	0.10	0.00	-0.02	-0.38	0.04	0.00	0.00	0.00
	SURVm	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
	LS	0.03	-0.10	-0.14	-0.03	0.01	0.02	0.00	0.46	0.00	0.24	0.47	0.39	0.28	-0.04	0.00	0.05	0.00
	Longe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30

Table 19. Phenotypic variances (once accounting for fixed effects and covariates).

BFL									Mules							
SLW	UMD	UFD	CONF	PTLW	SURVd	SURVm	LS	Longe	SLAGE	CONF15	LNWT	PTLW	SURVd	SURVm	LS	Longe
41.82	6.92	1.62	0.46	48.72	0.09	0.09	0.65	1.51	2783.80	1.12	1.05	47.80	0.09	0.09	0.30	1.51

Table 21. Summary of genetic and economic responses for goal traits when alternative combinations of records are available to identify the top 5% of young rams available

Trait	Response in trait units [†]	Economic response (£/ewe mated)				
		Base scenario	Ewe live weight [‡] dropped	Scanning traits [§] and ewe live weight [‡] dropped	Assessed leg conformation added ⁱ	Longevity Dropped ⁵
Days to target fat	-0.64	0.05	0.04	-0.04	0.02	0.06
Carcass conformation score (pts)	0.02	0.01	0.01	-0.00	0.01	0.01
Weight of lean (kg)	0.08	0.46	0.46	0.02	0.50	0.67
Ewe mature weight (kg)	-0.24	0.12	0.13	0.03	0.12	0.17
Lamb survival, direct (lamb)	0.002	0.09	0.09	0.05	0.08	0.13
Lamb survival, maternal (lamb)	0.000	0.00	0.00	0.00	0.00	0.00
Litter size (lamb)	-0.008	-0.04	-0.03	0.00	-0.03	-0.05
Mule ewe longevity, 1-year increase (ewe lambing)	0.068	0.77	0.77	1.02	0.76	0.00
Total response £/hill ewe mated		1.46	1.45	1.09	1.46	1.00

[†] Response in trait units when all base scenario traits as described above are recorded.

[‡] Ewe live weight dropped from the base scenario selection criteria for the selection candidate's mother and her sisters.

[§] Scanning traits dropped from the base scenario selection criteria for the individual and all paternal half sibs.

ⁱ Leg conformation added to the base scenario selection criteria for the individual and all paternal half sibs.

⁵ Ewe longevity dropped from the base scenario selection criteria for the selection candidate's mother and her sisters.

Table 22. Summary of genetic and economic responses for goal traits when alternative combinations of records are available to identify the top 5% of extensively used stock sires

Trait	Response in trait units [†]	Economic response (£/ewe mated)				
		Base scenario	Ewe live weight [‡] dropped	Scanning traits [§] and ewe live weight [‡] dropped	Assessed leg conformation added [!]	Longevity Dropped ⁵
Days to target fat	-0.39	0.03	0.02	-0.03	0.02	0.07
Carcass conformation score (pts)	0.01	0.00	0.00	-0.00	0.00	0.01
Weight of lean (kg)	0.03	0.15	0.14	0.04	0.16	0.40
Ewe mature weight (kg)	-0.18	0.09	0.10	0.03	0.08	0.24
Lamb survival, direct	0.004	0.15	0.14	0.12	0.15	0.39
Lamb survival, maternal	0.000	0.00	0.00	0.00	0.00	0.00
Litter size	-0.000	-0.00	0.00	0.02	-0.00	-0.00
Mule ewe longevity	0.223	2.50	2.50	2.60	2.50	0.00
Total response £/hill ewe mated		2.91	2.91	2.79	2.91	1.11

[†] Response in trait units when all base scenario traits as described above are recorded.

[‡] Ewe live weight dropped from the base scenario selection criteria for the selection candidate's mother and her sisters.

[§] Scanning traits dropped from the base scenario selection criteria for the individual and all paternal half sibs.

[!] Leg conformation added to the base scenario selection criteria for the individual and all paternal half sibs.

⁵ Ewe longevity dropped from the base scenario selection criteria for the selection candidate's mother and her sisters.