Supplementary Tables

Effects of the level of early productivity on the lifespan of ewes in contrasting flock environments

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Table S1 Parameters estimates of the logistic model relating ewes’ traits of stayability to their level of early prolificacy in contrasting flock environments, with the calculated optimal level of prolificacy

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stayability1 | Flock environment | Parameters estimated | | | | | | Optimal NLB2-32 |
| β2 | | β1 | | β0 | |
| value | *P* | value | *P* | value | *P* |
| 4|3  5|3  6|3  7|3  8|3 | Moderate  Harsh  Harsh – Moderate  Moderate  Harsh  Harsh – Moderate  Moderate  Harsh  Harsh – Moderate  Moderate  Harsh  Harsh – Moderate  Moderate  Harsh  Harsh – Moderate | − 0.36  − 0.14  + 0.22  − 0.32  − 0.12  + 0.20  − 0.35  − 0.10  + 0.25  − 0.38  − 0.08  + 0.31  − 0.52  − 0.16  + 0.36 | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \*\*  \*\*\*  \*\*  \*\*  \*\*\*  \*\*  \*\* | 3.29  1.23  − 2.06  2.98  1.02  −1.96  3.28  0.76  − 2.51  3.63  0.61  − 3.02  4.66  1.01  −3.64 | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\* | − 5.76  − 1.22  + 4.54  − 6.28  − 1.93  + 4.35  − 7.58  − 2.02  + 5.56  − 9.05  − 2.66  + 6.38  − 12.6  − 5.89  + 6.67 | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \* | 4.5  4.2  + 0.3  4.6  4.1  + 0.5  4.7  3.9  + 0.8  4.7  4.0  + 0.7  4.5  3.2  + 1.3 |

β2 and β1 = curvilinear and linear effect respectively, of the number of lamb born during the first two parities at two and three years old (NLB2-3) on ewe stayability traits (logit-transformed); β0 = sum of overall mean effect and flock environment effect.

Level of statistical significance denoted by asterisk: \* (*P* < 0.05), \*\* (*P* < 0.01), \*\*\* (*P* < 0.001)

1 Stayability *i*|*j* describes the probability of a ewe to survive in the flock until *i* years old, given that she already survived until *j* years old

2 Extrema of the fitted model calculated as Optimal NLB2-3 = – β1/(2 × β2)

Table S2 Parameters estimated using the logistic model relating ewes’ traits of marginal stayability to their level of early prolificacy in contrasting flock environments

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Stayability1 | Flock environment | Parameters estimated2 | | | | | |
| β2 | | β1 | | β0 | |
| value2 | *P* | value2 | *P* | value | *P* |
| 5|4  6|5  7|6  8|7 | Moderate  Harsh  (Harsh – Moderate)  Moderate  Harsh  (Harsh – Moderate)  Moderate  Harsh  (Harsh – Moderate)  Moderate  Harsh  (Harsh – Moderate) | – 0.10  – 0.10  0.00  –  –  –  –  –  –  –  –  – | \*\*  \*\* | 1.14  0.75  – 0.39  0.46  – 0.05  – 0.51  0.41  0.05  – 0.37  –  –  – | \*\*\*  \*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \* | – 2.48  – 1.14  + 1.34  – 1.78  0.01  + 1.79  – 1.73  – 0.83  + 0.90  0.52  – 1.18  – 1.70 | \*\*\*  \*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \*  \*\*  \*\*\* |

β2 and β1 = curvilinear and linear effect, respectively, of the number of lamb born during the first two parities at two and three years old (NLB2-3) on ewe stayability traits (logit-transformed); β0 = sum of overall mean effect and flock environment effect.

Level of statistical significance denoted by asterisk: \* (*P* < 0.05), \*\* (*P* < 0.01), \*\*\* (*P* < 0.001)

1 Stayability *i*|*j* describes the probability of a ewe to survive in the flock until *i* years old, given that she already survived until *j* years old

2 Symbol “–” alone indicates when the term was not significant (P < 0.05) and was removed from the model during the stepwise model selection procedure

Table S3 Effect of including an effect of breed on the main parameters of the logistic model relating ewes’ traits of overall stayability to their level of early prolificacy in contrasting flock environments

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stayability1 | Flock environment | Without breed effect2 | | | | | With breed effect2 | | | | |
| β2 | | β1 | | Optimal NLB2-33 | β2 | | β1 | | Optimal NLB2-33 |
| value2 | *P* | value2 | *P* | value2 | *P* | value2 | *P* |
| 4|3  5|3  6|3  7|3  8|3 | Moderate  Harsh  (Harsh – Moderate)  Moderate  Harsh  (Harsh – Moderate)  Moderate  Harsh  (Harsh – Moderate)  Moderate  Harsh  (Harsh – Moderate)  Moderate  Harsh  (Harsh – Moderate) | – 0.37  – 0.16  + 0.21  – 0.33  – 0.15  + 0.19  – 0.38  – 0.12  + 0.26  – 0.45  – 0.11  + 0.35  – 0.52  – 0.35  0.17 | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \*\*\*  \*\*  \*\*  \*\*\*  \*\*  \*\*  \*\* | 3.33  1.31  – 2.02  3.08  1.20  – 1.89  3.51  0.96  – 2.54  4.14  0.84  – 3.30  4.66  2.22  – 2.44 | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \*\*\*  \*\*\* | 4.5  4.1  + 0.4  4.6  4.1  + 0.5  4.6  3.9  + 0.7  4.6  3.9  + 0.7  4.5  3.1  + 1.4 | – 0.37  – 0.15  + 0.22  – 0.33  – 0.14  + 0.19  – 0.37  – 0.11  + 0.26  – 0.45  – 0.10  + 0.35  – 0.52  – 0.29  + 0.24 | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \*\*\*  \*\*  \*\*  \*\*\*  \*\*  \*\* | 3.32  1.20  – 2.12  3.05  1.09  – 1.96  3.46  0.85  – 2.61  4.10  0.73  – 3.36  4.71  2.13  – 2.58 | \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\*  \*\*  \*\*\*  \*\*\*  \*\*\*  \*\*\* | 4.5  4.1  + 0.4  4.6  4.0  + 0.6  4.6  3.7  + 0.9  4.6  3.6  + 1.0  4.5  3.7  + 0.8 |

β2 and β1 = curvilinear and linear effect respectively, of the number of lamb born during the first two parities at two and three years old (NLB2-3) on ewe stayability traits (logit-transformed)

Level of statistical significance denoted by asterisk: \* (*P* < 0.05), \*\* (*P* < 0.01), \*\*\* (*P* < 0.001)

1 Stayability *i*|*j* describes the probability of a ewe to survive in the flock until *i* years old, given that she already survived until *j* years old

2 Including seven levels of factor: Romney (66.4%), Romney × Texel (23.6%), Texel (3.3%), Others Romney composites (0.7%), Others Texel composites (3.7%), Romdale (2.0%), Others (0.3%)

3 Extrema of the fitted model calculated as Optimal NLB2-3 = – β1/(2 × β2)