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| Supplementary Table S1. Cluster comparisons for grazing use between pregnancy scanning and weaning |
| Time Period |  | Cluster 1 | Cluster 2 | Cluster 3 |
| Scanning - Lambing |  |  |  |  |
| Single rearing ewes | in-bye/improved | 81%a | 16%b | 73%a |
|  | rough/hill | 0% | 8% | 18% |
|  | hay/silage field | 22%a | 64%b | 9%a |
|  | other crop field | 0% | 4% | 0% |
|  | shed | 19% | 32% | 14% |
| Multiple rearing ewes | in-bye/improved | 78%a | 16%b | 77%a |
|  | rough/hill | 0% | 8% | 5% |
|  | hay/silage field | 22%a | 60%b | 23%a |
|  | other crop field | 0% | 8% | 5% |
|  | shed | 25% | 32% | 23% |
| Lambing-8 Week Weight |  |  |  |  |
| Single rearing ewes | in-bye/improved | 56%a | 20%b | 68%a |
|  | rough/hill | 0% | 12% | 5% |
|  | hay/silage field | 9%a | 44%b | 36%ab |
|  | other crop field | 3% | 12% | 0% |
|  | shed | 41%a | 48%a | 5%b |
| Multiple rearing ewes | in-bye/improved | 60% | 24% | 64% |
|  | rough/hill | 0% | 12% | 5% |
|  | hay/silage field | 9%a | 40%b | 41%b |
|  | other crop field | 3% | 12% | 0% |
|  | shed | 44%a | 52%a | 9%b |
| 8-Week Weight - Weaning |  |  |  |  |
| Single rearing ewes | in-bye/improved | 78%a | 24%b | 73%a |
|  | rough/hill | 3% | 8% | 0% |
|  | hay/silage field | 9%a | 48%b | 32%ab |
|  | other crop field | 6% | 12% | 5% |
|  | shed | 13% | 12% | 0% |
| Multiple rearing ewes | in-bye/improved | 78%a | 24%b | 73%a |
|  | rough/hill | 0% | 8% | 0% |
|  | hay/silage field | 13%a | 56%b | 32%ab |
|  | other crop field | 6% | 12% | 5% |
|  | shed | 16% | 12% | 0% |

a,bValues within a row with different superscripts differ significantly at *P*<0.05

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| Supplementary Table S2. Cluster comparisons for vitamin and mineral supplementation |
|   | Cluster 1 | Cluster 2 | Cluster 3 |
| Ewes - Copper | 13% | 12% | 41% |
| Ewes - Cobalt | 6%a | 28%a | 77%b |
| Ewes - Selenium | 16%a | 48%a | 86%b |
| Ewes - Vitamins | 16%a | 68%b | 82%b |
| Lambs - Copper | 6% | 12% | 27% |
| Lambs - Cobalt | 0%a | 36%b | 64%b |
| Lambs - Selenium | 3%a | 52%b | 86%b |
| Lambs - Vitamins | 6%a | 72%b | 64%b |

a,b Values within a row with different superscripts differ significantly at *P*<0.05

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| **Supplementary Table S3.** Cluster comparisons for quantitative variables |  |  |
|   | Cluster 1 | Cluster 2 | Cluster 3 |
|  Variable | Mean | +SD | Mean | +SD | Mean | +SD |
| Altitude from (m) | 102.8 | 63.2 | 98.7 | 76.6 | 142.1 | 89.3 |
| Altitude to (m) | 136.1 | 70.1 | 169.7 | 165.1 | 216.8 | 130.4 |
| Size of farm (ha) | 128.0 | 95.7 | 543.8 | 2167.1 | 173.6 | 310.7 |
| Average winter rainfall 2005-2009 (mm) | 224.6a | 76.5 | 289.2b | 123.1 | 364.5c | 104.8 |
| Average spring rainfall 2005-2009 (mm)  | 189.4a | 44.3 | 230.0b | 68.6 | 268.7c | 58.6 |
| Average summer rainfall 2005-2009 (mm)  | 240.0a | 46.9 | 282.4b | 49.2 | 309.0c | 37.2 |
| Average autumn rainfall 2005-2009 (mm)  | 254.6a | 74.0 | 318.3b | 118.4 | 390.9c | 97.8 |
| Average winter temp. 2005-2009 (oC) | 4.6 | 0.7 | 4.6 | 0.6 | 4.3 | 0.9 |
| Average spring temp. 2005-2009 (oC) | 8.7a | 1.0 | 8.5ab | 0.8 | 7.9b | 1.1 |
| Average summer temp. 2005-2009 (oC)  | 15.5a | 1.2 | 15.0 | 0.9 | 14.3b | 1.1 |
| Average autumn temp. 2005-2009 (oC)  | 10.7a | 1.1 | 10.4ab | 0.8 | 9.9b | 1.1 |
| Average winter sun 2005-2009 (hours) | 182.3a | 15.5 | 171.9ab | 21.2 | 161.1b | 23.7 |
| Average spring sun 2005-2009 (hours) | 481.6 | 14.8 | 473.9 | 12.7 | 473.3 | 15.9 |
| Average summer sun 2005-2009 (hours) | 549.4a | 58.2 | 518.9ab | 57.6 | 492.4b | 63.0 |
| Average autumn sun 2005-2009 (hours) | 312.8a | 30.0 | 290.5b | 38.2 | 272.8b | 40.5 |
| Total number of ewes on farm | 249.4 | 322.4 | 587.7 | 1833.9 | 578.3 | 1291.9 |
| Average no. of performance recorded ewes on farm | 88.3 | 63.2 | 75.4 | 50.7 | 87.0 | 91.6 |
| Average no. of recorded ewes mated naturally | 59.1 | 45.9 | 54.6 | 54.9 | 75.8 | 87.7 |
| Average no. of recorded ewes mated via artificial insemination (AI) | 20.2ab | 34.6 | 36.6a | 43.7 | 7.1b | 16.5 |
| Average number of days recorded ewes with ram | 48.1a | 17.5 | 33.4b | 17.2 | 44.1ab | 25.1 |
| Average recorded ewe:ram ratio  | 32.0 | 14.0 | 26.6 | 22.9 | 31.4 | 19.7 |
| Average recorded ewe:ram lamb ratio  | 16.3 | 12.8 | 13.6 | 10.5 | 17.5 | 14.5 |
| Average recorded ewe:AI ram ratio  | 14.2ab | 20.5 | 21.3a | 24.7 | 5.8b | 14.2 |
| Lambs born in winter 2005-2009 (%) | 59.8 | 38.6 | 67.2 | 29.8 | 43.4 | 37.5 |
| Lambs born in spring 2005-2009 (%) | 33.9 | 36.4 | 28.8 | 27.0 | 52.1 | 38.1 |
| No. of months feed blocks provided to ewes | 1.2a | 1.9 | 3.7b | 4.4 | 2.6ab | 2.9 |
| No. of months hay provided to ewes | 2.3 | 2.1 | 2.3 | 2.3 | 2.1 | 2.1 |
| No. of months silage provided to ewes | 1.1 | 1.6 | 2.1 | 2.0 | 1.4 | 1.9 |
| No. of months concentrates provided to ewes | 3.8 | 1.2 | 4.0 | 1.0 | 3.3 | 1.5 |
| No. of weeks pre-weaning lambs have access to conc. feed | 6.5 | 4.9 | 8.1 | 4.8 | 5.4 | 4.8 |
| Percentage of farm in-bye/improved grazing (%) | 40.5ab | 34.1 | 26.1a | 29.2 | 54.5b | 27.7 |
| Percentage of farm hay/silage field grazing (%) | 22.5 | 25.2 | 32.9 | 23.8 | 22.3 | 18.1 |
| Percentage of farm hill/rough grazing (%) | 5.9 | 14.7 | 13.6 | 18.0 | 14.7 | 23.1 |
| Percentage of any other type of grazing/crop fields (%) | 14.2 | 24.9 | 16.5 | 23.2 | 6.6 | 12.4 |

a,b Values within a row with different superscripts differ significantly at *P*<0.05