Net mineral requirements of dairy goats during pregnancy

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**Supplementary material**

Supplementary Table S1- Table 1. Mineral content of the uterus and mammary gland in non-pregnant goats (Experiment 1).

|  |  |  |
| --- | --- | --- |
|  | Uterus | Mammary gland |
|  | Oberhasli | Saanen | SEM1 | *P-*value | Oberhasli | Saanen | SEM | *P-*value |
| Fresh weight (g) | 83.1 | 72.9 | 11.3 | 0.547 | 415 | 312 | 876 | 0.478 |
| Dry weight (g) | 14.5 | 13.0 | 1.63 | 0.545 | 237 | 108 | 60.8 | 0.126 |
| Calcium (mg) | 20.2 | 14.0 | 1.88 | 0.203 | 0.308 | 0.582 | 0.307 | 0.529 |
| Phosphorus (mg) | 103 | 97.8 | 14.2 | 0.765 | 0.419 | 0.553 | 0.186 | 0.609 |
| Magnesium (mg) | 8.37 | 8.44 | 0.996 | 0.960 | 0.033 | 0.031 | 0.011 | 0.854 |
| Sodium (mg) | 180 | 191 | 27.3 | 0.786 | 0.511 | 0.487 | 0.511 | 0.918 |
| Potassium (mg) | 123 | 163 | 10.9 | 0.060 | 0.256 | 0.301 | 0.256 | 0.655 |

1SEM = standard error of the mean

Supplementary Table S 2- Table 2. Maternal body weight at slaughter, mineral content of the fetuses, fetal fluid, uterus, and mammary gland throughout pregnancy (Experiment 1).

|  |  |  |  |
| --- | --- | --- | --- |
|   | Oberhasli | Saanen | *P* -value |
|  | 50 | 80 | 110 | 140 | 50 | 80 | 110 | 140 |  |  |  |
|   | Twin | SEM1 | Single | SEM | Twin | SEM | Single | SEM | Twin | SEM | Single | SEM | Twin | SEM | Twin | SEM | Single | SEM | Twin | SEM | Single | SEM | Twin | SEM | Single | SEM | Twin | SEM | B2 | D | F |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Maternal body weight (kg) | 51.5 | 4.33 | 47.5 | 4.33 | 58.8 | 4.33 | 65.5 | 4.33 | 51.7 | 4.33 | 59.8 | 4.33 | 57.9 | 4.33 | 50.6 | 3.36 | 57.5 | 4.33 | 65.4 | 3.36 | 66.9 | 3.75 | 66.9 | 3.75 | 64.8 | 3.75 | 71.4 | 4.33 | 0.007 | 0.003 | 0.49 |
| Fetuses |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fresh weight (g) | 26.4 | 1.11 | 247 | 20 | 534 | 46.7 | 1412 | 53.2 | 2571 | 435 | 4267 | 170 | 6366 | 454 | 23.6 | 1.64 | 243 | 15.6 | 456 | 18 | 1191 | 108 | 2315 | 56.6 | 3653 | 397 | 5717 | 350 | NS | <0.001 | <0.001 |
| Calcium (g) | 0.032 | 4.78 | 1.02 | 4.78 | 2.8 | 4.78 | 13 | 4.78 | 18.8 | 4.78 | 47.2 | 4.78 | 54.8 | 4.78 | 0.026 | 1.67 | 0.78 | 2.15 | 1.86 | 1.86 | 7.15 | 2.63 | 15.5 | 2.15 | 25.6 | 1.86 | 39.6 | 2.15 | 0.0027 | <0.001 | 0.0052 |
| Phosphorus (g) | 0.03 | 2.36 | 0.771 | 2.7 | 1.87 | 2.63 | 8.26 | 2.7 | 13.1 | 2.63 | 26 | 2.7 | 38 | 2.63 | 0.0274 | 0.48 | 0.563 | 1.72 | 1.28 | 0.53 | 3.36 | 1.72 | 9.69 | 0.62 | 16.7 | 1.49 | 22 | 0.62 | 0.0004 | <0.001 | 0.0002 |
| Magnesium (g) | 0.002 | 0.18 | 0.0467 | 0.17 | 0.11 | 0.18 | 0.397 | 0.17 | 0.72 | 0.18 | 1.37 | 0.17 | 1.82 | 0.18 | 0.002 | 0.02 | 0.038 | 0.11 | 0.076 | 0.02 | 0.216 | 0.11 | 0.532 | 0.02 | 0.953 | 0.09 | 1.25 | 0.03 | 0.021 | <0.001 | 0.004 |
| Sodium (g) | 0.022 | 1.31 | 0.478 | 2.07 | 1.15 | 1.31 | 2.95 | 2.07 | 6.41 | 1.3 | 11.9 | 2.07 | 18.8 | 1.3 | 0.0516 | 0.35 | 0.403 | 1.23 | 0.926 | 0.39 | 2.65 | 1.23 | 3.83 | 0.45 | 10.7 | 1.06 | 14.3 | 0.45 | NS | <0.001 | 0.0017 |
| Potassium (g) | 0.0162 | 1.19 | 0.309 | 1.19 | 0.915 | 1.19 | 2.44 | 1.19 | 5.08 | 1.19 | 6.72 | 1.19 | 8.9 | 1.19 | 0.0316 | 0.53 | 0.316 | 0.68 | 0.588 | 0.59 | 1.9 | 0.68 | 3.58 | 0.68 | 5 | 0.59 | 8.33 | 0.68 | NS | <0.001 | 0.0031 |
| Fetal fluid |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fresh weight (kg) | 0.302 | 0.043 | 0.807 | 0.12 | 1.35 | 0.22 | 1.68 | 0.22 | 2.69 | 0.22 | 1.68 | 0.33 | 3.27 | 0.33 | 0.352 | 0.033 | 0.75 | 0.118 | 1.42 | 0.092 | 0.906 | 0.217 | 1.54 | 0.19 | 1.64 | 0.29 | 2.02 | 0.29 | 0.0011 | <0.001 | <0.001 |
| Calcium (g) | 0.0204 | 0.01 | 0.098 | 0.03 | 0.144 | 0.03 | 0.239 | 0.08 | 0.278 | 0.08 | 0.249 | 0.08 | 0.356 | 0.07 | 0.051 | 0.009 | 0.075 | 0.027 | 0.152 | 0.023 | 0.215 | 0.081 | 0.203 | 0.081 | 0.232 | 0.063 | 0.188 | 0.073 | NS | <0.001 | NS |
| Phosphorus (g) | 0.006 | 0.003 | 0.033 | 0.009 | 0.039 | 0.009 | 0.204 | 0.12 | 0.082 | 0.12 | 0.244 | 0.13 | 0.167 | 0.11 | 0.012 | 0.002 | 0.035 | 0.008 | 0.043 | 0.007 | 0.079 | 0.039 | 0.088 | 0.039 | 0.086 | 0.053 | 0.205 | 0.061 | NS | 0.011 | NS |
| Magnesium (mg) | 4 | 21 | 23.1 | 21 | 43.8 | 21 | 50.1 | 21 | 77 | 21 | 27 | 25.7 | 22.4 | 21 | 7.27 | 16.3 | 61 | 21 | 24.3 | 18.2 | 75.2 | 21 | 69.5 | 21 | 135 | 18.2 | 81.7 | 21 | NS | <0.001 | NS |
| Sodium (g) | 0.555 | 0.082 | 1.51 | 0.54 | 2.64 | 0.54 | 0.958 | 0.61 | 3.09 | 0.61 | 2.82 | 0.31 | 3.36 | 0.31 | 0.95 | 0.16 | 1.13 | 0.52 | 1.88 | 0.45 | 1.75 | 2.36 | 4.76 | 2.36 | 1.76 | 0.33 | 2.02 | 0.38 | NS | <0.001 | 0.041 |
| Potassium (g) | 0.065 | 0.009 | 0.166 | 0.03 | 0.355 | 0.03 | 0.341 | 0.135 | 0.624 | 0.11 | 0.705 | 0.266 | 2.31 | 0.217 | 0.096 | 0.013 | 0.608 | 0.178 | 0.233 | 0.155 | 0.656 | 0.203 | 0.584 | 0.203 | 1.61 | 0.444 | 1.39 | 0.512 | NS | <0.001 | NS |
| Uterus |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fresh weight (g) | 428 | 26.1 | 877 | 354 | 2178 | 354 | 2339 | 872 | 1875 | 836 | 1920 | 137 | 1938 | 1706 | 349 | 20.2 | 1194 | 354 | 1310 | 274 | 1972 | 755 | 3316 | 724 | 1442 | 119 | 3884 | 1477 | NS | <0.001 | NS |
| Calcium (g) | 0.111 | 0.007 | 0.185 | 0.158 | 0.609 | 0.158 | 0.564 | 0.22 | 0.359 | 0.22 | 0.459 | 0.336 | 0.422 | 0.336 | 0.098 | 0.006 | 0.467 | 0.158 | 0.304 | 0.137 | 0.542 | 0.22 | 0.94 | 0.22 | 0.355 | 0.291 | 0.438 | 0.336 | NS | <0.001 | NS |
| Phosphorus (g) | 0.521 | 0.054 | 1.18 | 0.14 | 2.4 | 0.171 | 1.69 | 0.329 | 2.44 | 0.268 | 2.37 | 1.3 | 2.64 | 0.753 | 0.31 | 0.042 | 1.03 | 0.172 | 1.63 | 0.121 | 1.5 | 0.268 | 2.43 | 0.329 | 2.04 | 0.753 | 2.91 | 0.753 | NS | <0.001 | 0.026 |
| Magnesium (g) | 0.046 | 0.003 | 0.091 | 0.041 | 0.254 | 0.041 | 0.25 | 0.099 | 0.191 | 0.099 | 0.237 | 0.055 | 0.259 | 0.055 | 0.033 | 0.002 | 0.121 | 0.042 | 0.139 | 0.036 | 0.257 | 0.099 | 0.463 | 0.099 | 0.148 | 0.047 | 0.194 | 0.067 | NS | <0.001 | NS |
| Sodium (g) | 0.97 | 0.069 | 2.12 | 0.255 | 4.84 | 0.313 | 2.79 | 0.468 | 3.75 | 0.382 | 4.27 | 0.818 | 4.5 | 0.818 | 0.907 | 0.053 | 1.62 | 0.313 | 2.76 | 0.221 | 3.3 | 0.468 | 4.42 | 0.662 | 3.17 | 0.709 | 4.04 | 1 | NS | <0.001 | 0.002 |
| Potassium (g) | 0.718 | 0.043 | 1.51 | 0.429 | 4 | 0.429 | 2.29 | 1.56 | 3.4 | 1.27 | 3.4 | 1.1 | 5.04 | 1.1 | 0.504 | 0.033 | 1.9 | 0.429 | 1.89 | 0.372 | 2.73 | 1.56 | 6.19 | 1.56 | 2.89 | 0.955 | 4.02 | 1.35 | NS | <0.001 | 0.016 |
| Mammary gland |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fresh weight (g) | 492 | 329 | 612 | 329 | 917 | 329 | 1225 | 329 | 1036 | 329 | 2269 | 329 | 2836 | 329 | 484 | 255 | 608 | 329 | 901 | 255 | 1154 | 285 | 1692 | 285 | 2332 | 229 | 3077 | 229 | NS | <0.0001 | 0.047 |
| Calcium (g) | 5.76 | 2.01 | 2.98 | 2.01 | 3 | 2.46 | 1.29 | 2.46 | 2.74 | 2.01 | 5.77 | 2.01 | 1.68 | 2.46 | 0.451 | 1.46 | 0.805 | 2.01 | 7.61 | 1.74 | 1.63 | 2.01 | 1.83 | 2.46 | 8.42 | 1.74 | 3.44 | 2.01 | NS | NS | NS |
| Phosphorus (g) | 3.36 | 1.28 | 1.44 | 1.28 | 3.54 | 1.28 | 2.65 | 1.28 | 2.49 | 1.28 | 5.71 | 1.28 | 3.98 | 1.28 | 0.604 | 0.99 | 1.01 | 1.28 | 3.87 | 1.11 | 2.05 | 1.28 | 3.02 | 1.57 | 7.51 | 1.11 | 4.53 | 1.28 | NS | 0.003 | NS |
| Magnesium (g) | 0.299 | 0.146 | 0.135 | 0.146 | 0.322 | 0.146 | 0.286 | 0.179 | 0.25 | 0.146 | 0.818 | 0.146 | 0.513 | 0.146 | 0.058 | 0.113 | 0.09 | 0.146 | 0.249 | 0.126 | 0.218 | 0.146 | 0.321 | 0.179 | 0.856 | 0.126 | 0.679 | 0.146 | NS | <0.0001 | NS |
| Sodium (g) | 1.47 | 0.921 | 1.47 | 0.921 | 1.73 | 0.921 | 2.75 | 1.13 | 2.75 | 0.921 | 2.99 | 0.921 | 4.39 | 0.921 | 1.41 | 0.714 | 1.41 | 0.921 | 1.37 | 0.798 | 2.57 | 0.921 | 4.16 | 0.921 | 3.07 | 0.921 | 4.86 | 0.921 | NS | 0.001 | NS |
| Potassium (g) | 0.512 | 0.38 | 0.584 | 0.38 | 1.26 | 0.38 | 2.38 | 0.465 | 1.81 | 0.38 | 2.23 | 0.38 | 2.3 | 0.38 | 0.508 | 0.294 | 0.767 | 0.38 | 0.729 | 0.389 | 1.59 | 0.38 | 2.48 | 0.38 | 2.47 | 0.38 | 1.94 | 0.465 | NS | <0.0001 | NS |

 1B = breed; D = days of pregnancy; L = Litter size; NS = non-significant (*P* > 0.05).

2SEM = standard error of the mean.