**SUPPLEMENTARY MATERIAL**

**Table S1** Carcass characteristics, individual muscle weights (right-hand side) and ultimate pH values of muscles from male (n = 6) and female (n = 6) fallow deer.

**Table S2** Proximate composition of *longissimus thoracis et lumborum* muscles from selected game and ruminant livestock species, including sex comparisons where applicable. Values obtained in the present study appear in the first row. Significant differences are indicated in bold. NS = not specified.

**Table S3** Interactions between the main effects (sex × muscle) in the measurement of the proximate and mineral composition of wild fallow deer (n = 12) from South Africa. All interactions were non-significant.

**Table S4** Mineral composition (mg/kg) of *longissimus thoracis et lumborum* muscles from selected game species, including sex comparisons where applicable. Values obtained in the present study appear in the first row. Significant differences are indicated in bold. NS = not specified.

**Table S1** Carcass characteristics, individual muscle weights (right-hand side) and ultimate pH values† of muscles from male (n = 6) and female (n = 6) fallow deer

| | | Carcass characteristics | | | | | | Muscle weights | | | | | | Ultimate pH (36 h) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sex** | **No.** | **Slaughter weight (kg)** | **Warm carcass weight (kg)** | **Cold carcass weight (kg)** | **Dressing percentage (%)** | **Kidney fat (kg)** | **Gut fat (kg)** | **LTL (kg)** | **BF (kg)** | **SM (kg)** | **SS (kg)** | **IS (kg)** | **ST (kg)** | **LTL** | **BF** | **SM** | **SS** | **IS** | **ST** |
| **Males (n = 6)** | 1 | 53.5 | 32.7 | 32.2 | 60.2 | 0.037 | 0.048 | 1.154 | 0.967 | 0.822 | 0.207 | 0.215 | 0.250 | 5.30 | 5.48 | 5.34 | 5.66 | 5.67 | 5.47 |
| | 2 | 49.6 | 32.1 | 31.4 | 63.3 | 0.060 | 0.066 | 1.100 | 0.973 | 0.787 | 0.107 | 0.101 | 0.236 | 5.55 | 5.41 | 5.59 | 5.52 | 5.43 | 5.40 |
| | 3 | 41.2 | 24.0 | 23.1 | 56.1 | 0.023 | 0.072 | 0.937 | 0.742 | 0.576 | 0.162 | 0.165 | 0.180 | 5.66 | 5.40 | 5.43 | 5.56 | 5.56 | 5.41 |
| | 4 | 39.5 | 24.5 | 24.0 | 60.8 | 0.091 | 0.089 | 0.901 | 0.705 | 0.620 | 0.147 | 0.156 | 0.179 | 5.57 | 5.41 | 5.51 | 5.70 | 5.73 | 5.51 |
| | 5 | 39.5 | 23.8 | 23.3 | 59.0 | 0.056 | 0.152 | 0.847 | 0.724 | 0.618 | 0.136 | 0.179 | 0.185 | 5.34 | 5.62 | 5.58 | 5.62 | 5.60 | 5.60 |
| | 6 | 37.8 | 23.8 | 23.4 | 61.9 | 0.193 | 0.121 | 0.888 | 0.710 | 0.619 | 0.143 | 0.171 | 0.178 | 5.63 | 5.74 | 5.54 | 5.71 | 5.81 | 5.40 |
| | Mean | 43.5 | 26.8 | 26.2 | 60.2% | 0.077 | 0.091 | 0.971 | 0.803 | 0.673 | 0.150 | 0.164 | 0.201 | 5.51 | 5.51 | 5.50 | 5.63 | 5.63 | 5.47 |
| | SE | 2.63 | 1.77 | 1.77 | 0.01 | 0.025 | 0.016 | 0.051 | 0.053 | 0.042 | 0.014 | 0.015 | 0.013 | 0.062 | 0.057 | 0.039 | 0.031 | 0.055 | 0.033 |
| **Females (n = 6)** | 2 | 51.4 | 29.8 | 29.2 | 56.9 | 0.140 | 0.736 | 0.948 | 0.985 | 0.708 | 0.174 | 0.213 | 0.228 | 5.13 | 5.33 | 5.37 | 5.42 | 5.50 | 5.24 |
| | 1 | 49.7 | 31.1 | 30.6 | 61.6 | 0.283 | 0.691 | 1.104 | 0.884 | 0.770 | 0.200 | 0.270 | 0.228 | 5.47 | 5.55 | 5.50 | 5.81 | 5.78 | 5.43 |
| | 3 | 45.0 | 28.0 | 27.6 | 61.3 | 0.153 | 0.750 | 1.153 | 0.915 | 0.736 | 0.178 | 0.196 | 0.222 | 5.38 | 5.43 | 5.40 | 5.46 | 5.48 | 5.42 |
| | 5 | 44.9 | 27.3 | 26.9 | 60.0 | 0.109 | 0.566 | 1.014 | 0.890 | 0.704 | 0.170 | 0.192 | 0.215 | 5.23 | 5.42 | 5.39 | 5.39 | 5.52 | 5.26 |
| | 4 | 35.2 | 22.2 | 21.9 | 62.2 | 0.040 | 0.196 | 0.921 | 0.658 | 0.602 | 0.132 | 0.153 | 0.182 | 5.44 | 5.47 | 5.21 | 5.43 | 5.55 | 5.51 |
| | 6 | 31.9 | 19.3 | 19.0 | 59.6 | 0.052 | 0.094 | 0.854 | 0.627 | 0.543 | 0.120 | 0.120 | 0.166 | 5.46 | 5.48 | 5.45 | 5.58 | 5.49 | 5.48 |
| | Mean | 43.0 | 26.3 | 25.9 | 60.3 | 0.130 | 0.506 | 0.999 | 0.826 | 0.677 | 0.162 | 0.190 | 0.206 | 5.35 | 5.45 | 5.39 | 5.52 | 5.55 | 5.39 |
| | SE | 3.19 | 1.86 | 1.83 | 0.01 | 0.036 | 0.118 | 0.046 | 0.060 | 0.035 | 0.012 | 0.021 | 0.011 | 0.057 | 0.030 | 0.040 | 0.065 | 0.046 | 0.046 |

Abbreviations: LTL = *longissimus et thoracis lumborum;* BF = *biceps femoris*; SM = *semimembranosus*; ST = *semitendinosus*; IS = *infraspinatus*; SS = *supraspinatus*; SD = standard deviation; SE = standard error.

† pH values measured at 36-hours post mortem

**Table S2** Proximate composition of *longissimus thoracis et lumborum* muscles from selected game and domestic livestock species, including sex comparisons where applicable. Values obtained in the present study appear in the first row. Significant differences are indicated in bold. NS = not specified.

| Common name | Species | Country | Age | Sex | N | Production | Moisture (%) | Protein (%) | Fat (%) | Ash (%) | Reference |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***DEER*** | | | | | | | | | | | |
| Fallow deer | *Dama dama* | South Africa | NS | Female<br>Male | 6<br>6 | Wild<br>Wild | 73.4<br>74.2 | 22.7<br>22.6 | 3.0<br>2.5 | 1.1<br>1.1 | THIS STUDY |
| Fallow deer | *Dama dama* | Hungary | 10 months | NS | 10 | Wild | 74.90 | 22.00 | 2.50 | 1.08 | Zomborszky et al., 1996 |
| Fallow deer | *Dama dama* | Poland | 17-18 months | Female<br>Male | 10<br>11 | Wild<br>Wild | **75.10**<br>**74.29** | **21.76**<br>**22.79** | **0.30**<br>**0.50** | 1.07<br>1.10 | Piaskowska et al., 2015 |
| Fallow deer | *Dama dama* | Poland | 18 months | Male | 6 | Farmed | 74.33 | 22.46 | 0.24 | 1.09 | Daszkiewicz et al., 2015 |
| Fallow deer | *Dama dama* | Czech Republic | 2.5 years | Female<br>Male | 9<br>9 | Farmed<br>Farmed | 76.48<br>73.77 | 21.86<br>22.4 | 1.65<br>1.85 | 1.19<br>1.21 | Švrčula et al., 2019 |
| Red deer | *Cervus elaphus* | Poland | 4-6 years | Female<br>Male | 23<br>19 | Wild<br>Wild | **74.43**<br>**75.22** | 22.41<br>22.01 | **0.96**<br>**0.56** | 1.09<br>1.10 | Daszkiewicz et al., 2009 |
| Red deer | *Cervus elaphus* | Czech Republic | 16 months | Male | 9 | Farmed | 74.27 | 22.14 | 0.81 | | Bureš et al, 2015 |
| Roe deer | *Capreolus capreolus* | Poland | 3-4 years | Female<br>Male | 25<br>16 | Wild<br>Wild | **73.80**<br>**75.32** | **22.79**<br>**21.84** | **1.46**<br>**0.83** | 1.12<br>1.13 | Daszkiewicz et al., 2012 |
| ***ANTELOPE*** | | | | | | | | | | | |
| Black wildebeest | *Connochaetes gnou* | South Africa | Adult, sub-adult | Female<br>Male | 12<br>7 | Wild<br>Wild | 75.21<br>74.69 | **20.73**<br>**19.42** | 1.13<br>0.97 | 1.25<br>1.29 | Van Schalkwyk, 2004 |
| Blue wildebeest | *Connochaetus taurinus* | South Africa | Adults, sub-adults, calves | Female<br>Male | 10<br>5 | Wild<br>Wild | 75.99<br>75.55 | 22.83<br>23.31 | 1.38<br>1.26 | 1.38<br>1.26 | Van Schalkwyk, 2004 |
| Common eland | *Taurotragus oryx* | South Africa | 2-6 years | Female<br>Male | 6<br>6 | Wild<br>Wild | 76.6<br>77.1 | 21.6<br>21.2 | 1.48<br>1.45 | 1.1<br>1.1 | Needham et al., 2019 |
| Blesbok | *Damaliscus pygargus phillipsi* | South Africa | Adult | Female<br>Male | 37<br>28 | Wild<br>Wild | 74.88-75.33 | 22.18-22.45 | 0.21-1.48 | 1.24-1.38 | Hoffman et al., 2008 |
| Greater kudu | *Tragelaphus strepsiceros* | South Africa | NS | Female<br>Male | 10<br>8 | Wild<br>Wild | 74.14<br>74.49 | 24.3<br>23.6 | 1.56<br>1.58 | 1.29<br>1.23 | Mostert & Hoffman, 2007 |
| Common duiker | *Sylvicapra grimmia* | South Africa | >26 months | Male | 10 | Wild | 71.41 | 25.71 | 2.12 | 1.29 | Hoffman & Ferreira, 2004 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Impala | *Aepyceros melampus* | South Africa | Adult | Female | 7 | Wild | 74.01 | 23.07 | **2.4** | 1.16 | Hoffman et al., 2009 |
| | | | | Male | 11 | Wild | 74.96 | 22.63 | **2.06** | 1.22 | |
| Mountain reedbuck | *Redunca fulvorufula* | South Africa | Adult Non-trophy | Female | 19 | Wild | 72.59 | **24.51** | 2.43 | 1.22 | Van Schalkwyk, 2004 |
| | | | | Male | 10 | Wild | 72.76 | **23.68** | 2.94 | 1.23 | |
| Springbok | *Antidorcas marsupialis* | South Africa | Adult, sub-adult | Female | 76 | Wild | **73.39** | 18.8-21.16 | **3.13** | 1.28 | Hoffman et al., 2007 |
| | | | | Male | 90 | Wild | **74.24** | | **1.35** | 1.24 | |
| Springbok | *Antidorcas marsupialis* | South Africa | >2 years | Both | 27 | Wild | 73.8 | 22.06 | 3.07 | 1.14 | Neethling et al., 2018 |
| Red hartebeest | *Alcelaphus buselaphus caama* | South Africa | Adult, sub-adult | Female | 27 | Wild | 74.75 | 23.1 | **2.81** | 1.22 | Smit, 2004 |
| | | | | Male | 21 | Wild | 75.08 | 23.34 | **4.69** | 1.16 | |
| ***DOMESTIC SPECIES*** | | | | | | | | | | | |
| Cattle - grass fed (Bonsmara) | *Bos taurus* | South Africa | 3-4 incisors | Male | 20 | Farmed | 75.8 | 21.3 | 1.65 | 1.21 | Moholisa et al., 2018 |
| Cattle - grain fed (Bonsmara) | *Bos taurus* | South Africa | 9-11 months | Male | 20 | Farmed | 74.8 | 21.1 | 3.12 | 0.97 | |
| Mutton (Dorper/merino – Age C, fat class 2) | *Ovis aries* | South Africa | >6 incisors | NS | 18 | Farmed | 73.71 | 20.39 | 4.96 | 1.18 | Sainsbury, 2009 |
| Goat, indigenous | *Capra aegagrus hircus* | South Africa | 2-6 teeth | Female | 15 | Farmed | | 23.52 | 4.03 | | Simela, 2005 |
| | | | | Male (castrate) | 15 | Farmed | | 23.76 | 4.07 | | |

**Table S3** Interactions between the main effects (sex × muscle) in the measurement of proximate and mineral composition of wild fallow deer (n = 12) from South Africa. All interactions were non-significant.

| | | p-value |
|---|---|---|
| | | **sex*muscle** |
| ***Proximate components*** | | |
| Moisture | g/100g | 0.2114 |
| Protein | g/100g | 0.6676 |
| Fat | g/100g | 0.1387 |
| Ash | g/100g | 0.2213 |
| ***Macro-minerals*** | | |
| Potassium (K) | mg/kg | 0.0677 |
| Phosphorus (P) | mg/kg | 0.9768 |
| Sodium (Na) | mg/kg | 0.4150 |
| Magnesium (Mg) | mg/kg | 0.9518 |
| Calcium (Ca) | mg/kg | 0.7128 |
| ***Micro-minerals*** | | |
| Iron (Fe) | mg/kg | 0.4945 |
| Zinc (Zn) | mg/kg | 0.1712 |
| Silicon (Si) | mg/kg | 0.7156 |
| Copper (Cu) | mg/kg | 0.9558 |
| Manganese (Mn) | mg/kg | 0.1413 |
| Selenium (Se) | mg/kg | 0.4210 |
| Chromium (Cr) | mg/kg | 0.2592 |
| Cobalt (Co) | mg/kg | 0.2403 |
| Molybdenum (Mo) | mg/kg | Not detected |
| ***Undefined functions or environmental contaminants*** | | |
| Aluminium (Al) | mg/kg | 0.4785 |
| Lead (Pb) | mg/kg | 0.0859 |
| Strontium (Sr) | mg/kg | 0.8330 |
| Barium (Ba) | mg/kg | 0.3430 |
| Antimony (Sb) | mg/kg | Not detected |
| Arsenic (As) | mg/kg | Not detected |
| Boron (B) | mg/kg | Not detected |
| Cadmium (Cd) | mg/kg | Not detected |
| Mercury (Hg) | mg/kg | Not detected |
| Nickel (Ni) | mg/kg | Not detected |
| Titanium (Ti) | mg/kg | Not detected |
| Vanadium (V) | mg/kg | Not detected |

**Table S4** Mineral composition (mg/kg) of *longissimus thoracis et lumborum* muscles from selected game species, including sex comparisons where applicable. Values obtained in the present study appear in the first row. Significant differences are indicated in bold. NS = not specified.

| Common name | Species | Country | Sex | N | Production | Potassium (mg/kg) | Phosphorus (mg/kg) | Sodium (mg/kg) | Magnesium (mg/kg) | Calcium (mg/kg) | Iron (mg/kg) | Zinc (mg/kg) | Copper (mg/kg) | Reference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DEER** | | | | | | | | | | | | | | |
| Fallow deer | *Dama dama* | South Africa | Female | 6 | Wild | 3574.1 | 2235.0 | 450.8 | 261.8 | 37.5 | **47.978** | 19.988 | 1.939 | THIS STUDY |
| | | | Male | 6 | Wild | 3670.9 | 2256.7 | 419.8 | 257.0 | 36.8 | **38.414** | 21.7 | 1.944 | |
| Fallow deer | *Dama dama* | Hungary | NS | 10 | Wild | 3019.5 | 2269.0 | 635.0 | 213.6 | 210.1 | 16.56 | 28.89 | 1.78 | Zomborszky et al., 1996 |
| Red deer | *Cervus elaphus* | Hungary | NS | 10 | Wild | 3268.7 | 1954.3 | 584.4 | 185.5 | 250.9 | 41.77 | 41.21 | 2.04 | |
| Roe deer | *Capreolus capreolus* | Hungary | NS | 10 | Wild | 3205.4 | 2263.0 | 546.8 | 217.2 | 248.5 | 12.48 | 29.76 | 1.83 | |
| **ANTELOPE** | | | | | | | | | | | | | | |
| Black wildebeest | *Connochaetes gnou* | South Africa | Female | 12 | Wild | 1445.4 | 1514.3 | 144.8 | 184.3 | 64.7 | 27.3 | 13.7 | 1.1 | Van Schalkwyk, 2004 |
| | | | Male | 7 | Wild | 1897.2 | 1944.3 | 144.8 | 220.4 | 69.8 | 36.4 | 10 | 1.1 | |
| Blesbok | *Damaliscus dorcas phillipsi* | South Africa | Female | 40 | Wild | 1449.8 | 1528.1 | 144.7 | 197.7 | 58.5 | 33.1 | 26.7 | 1.3 | Smit, 2004 |
| | | | Male | 29 | Wild | 1504.7 | 1453.1 | 158.2 | 204.0 | 69.4 | 39.6 | 14.8 | 2.7 | |
| Greater kudu | *Tragelaphus strepsiceros* | South Africa | Female | 10 | Wild | 1190.0 | 1730.0 | 74.1 | 243.0 | 46.2 | 27.9 | 11.9 | 0.1 | Mostert & Hoffman, 2007 |
| | | | Male | 8 | Wild | 1200.0 | 1720.0 | 75.9 | 239.0 | 60.1 | 28.5 | 13.7 | 0.2 | |
| Impala | *Aepyceros melampus* | South Africa | Female | 7 | Wild | 1242.8 | 1524.2 | 109.1 | 225.5 | 74.5 | 20.7 | 11.6 | 0.7 | Hoffman et al., 2009 |
| | | | Male | 11 | Wild | 1159.5 | 1497.0 | 109.5 | 202.7 | 63.2 | 24.2 | 18.1 | 0.71 | |
| Mountain reedbuck | *Redunca fulvorufula* | South Africa | Female | 7 | Wild | 1640.0 | 2048.0 | 139.1 | 251.7 | 107.9 | 36.4 | 18.6 | 1.6 | Van Schalkwyk, 2004 |
| | | | Male | 9 | Wild | 2046.0 | 2077.7 | 169.3 | 252.5 | 80.4 | 46.1 | 17.5 | 1.5 | |
| Springbok | *Antidorcas marsupialis* | South Africa | Female | 10 | Wild | 1286.5 | 1353.9 | 140.4 | 195.1 | 437.7 | 30.4 | 13.7 | 0.9 | Hoffman et al., 2007 |
| | | | Male | 12 | Wild | 1217.5 | 1485.5 | 141.2 | 177.7 | 792.4 | 27.4 | 12.9 | 0.9 | |
| Red hartebeest | *Alcelaphus buselaphus caama* | South Africa | Female | 27 | Wild | 1409.6 | 1336.5 | 153.2 | 190.2 | 67.4 | 26.9 | 15.13 | 1.67 | Smit, 2004 |
| | | | Male | 21 | Wild | 1392.2 | 1178.1 | 187.4 | 159.6 | 70.3 | 115.1 | 14.2 | 1.3 | |

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