***Animal***

**Genetic parameters of milk fatty acid profile in sheep: comparison between gas chromatographic measurements and Fourier-Transform Infrared Spectroscopy predictions**

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**Table S1.** *Distribution of sheep involved in this study (n. 989) across different levels of parity, province, and altitude of flock location*

|  |  |
| --- | --- |
| Item | *n*. of animals |
| Parity |  |
| 1 | 191 |
| 2 | 123 |
| 3 | 151 |
| 4 | 164 |
| 5 | 120 |
| 6 | 95 |
| 7 | 69 |
| >7 | 76 |
| Province |  |
| Cagliari (South) | 321 |
| Nuoro (North-center) | 319 |
| Oristano (South-center) | 111 |
| Sassari (North) | 238 |
| Altitude (m a.s.l.1) |  |
| Plain (<200) | 320 |
| Hill (200-500) | 521 |
| Mountain (>500) | 148 |

1 m a.s.l.= meter above sea level.

**Table S2.** *Additive genetic correlations between individual fatty acids and groups of fatty acids in sheep milk*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Traits1 | SCFA | MCFA | LCFA | SFA | MUFA | PUFA | *de* *novo* | TFA |
| C4:0 | -0.56 | -0.19 | 0.34 | -0.35 | 0.33 | 0.27 | -0.86 | 0.52 |
| C6:0 | 0.87 | -0.28 | 0.00 | 0.21 | -0.20 | 0.06 | 0.59 | 0.79 |
| C8:0 | 0.98 | -0.29 | -0.04 | 0.17 | -0.13 | -0.16 | 0.83 | 0.11 |
| C10:0 | 0.96 | 0.01 | -0.31 | 0.34 | -0.31 | -0.25 | 0.96 | -0.07 |
| C12:0 | 0.88 | -0.13 | -0.12 | 0.14 | -0.06 | -0.25 | 0.93 | -0.26 |
| C14:0 | 0.23 | 0.63 | -0.75 | 0.56 | -0.45 | -0.68 | 0.67 | -0.67 |
| *c*9-C14:1 | -0.01 | 0.70 | -0.70 | 0.27 | -0.15 | -0.45 | 0.38 | -0.88 |
| C16:0 | -0.36 | 0.96 | -0.83 | 0.63 | -0.62 | -0.50 | -0.10 | -0.37 |
| *c*9-C16:1 | -0.31 | 0.76 | -0.65 | 0.22 | -0.08 | -0.45 | 0.02 | -0.70 |
| C18:0 | 0.05 | -0.67 | 0.67 | -0.05 | -0.01 | 0.08 | -0.21 | 0.32 |
| *t*11-C18:1 | 0.02 | -0.46 | 0.43 | -0.39 | 0.25 | 0.71 | 0.05 | 0.97 |
| *c*9-C18:1 | -0.33 | -0.39 | 0.48 | -0.71 | 0.81 | 0.21 | -0.31 | -0.51 |
| C18:2n6 | 0.04 | -0.58 | 0.62 | -0.46 | 0.33 | 0.74 | -0.40 | 0.56 |
| C18:3n3 | 0.04 | -0.79 | 0.86 | -0.67 | 0.58 | 0.72 | -0.54 | 0.24 |
| *c*9,*t*11-C18:2 | -0.13 | -0.08 | 0.04 | -0.53 | 0.40 | 0.78 | 0.38 | 0.77 |

1Expressed as g/100g of total FAME; SCFA = short-chain fatty acids, sum of the individual fatty acids from C4:0 to C10:0; MCFA = medium-chain fatty acids, included fatty acids from C11:0 to C17:0; LCFA = long-chain fatty acids included fatty acids from C18:0 to DHA; SFA = saturated fatty acids; MUFA = monounsaturated fatty acids; PUFA = polyunsaturated fatty acids; d*e novo*: sum of C6:0, C8:0, C10:0, C10:1, C11:0, C12:0, iso-C13:0, C14:0; TFA = trans fatty acids, except CLA isomers and *t*11-C18:1.