

# Study of the fatty acid profile of milk in different sheep breeds: evaluation by Multivariate Factorial Analysis

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**Supplementary Table S1.** Feeding system details and feed composition

	Massese	Comisana	Sarda (Tuscany)	Sarda (Sardinia)
Pasture Botanical composition	<i>Avena sativa</i> <i>Lolium italicum</i> <i>Trifolium repens</i>	<i>Avena sativa</i> <i>Lolium italicum</i> <i>Trifolium repens</i>	<i>Avena sativa</i> <i>Lolium italicum</i> <i>Trifolium repens</i>	<i>Lolium multiflorum</i> <i>Hedisarum coronarium</i> <i>Cyborium intybus</i>
DM (%)	9.0	9.0	9.0	22.3
CP (%)	14.6	14.6	14.6	18.2
CF (%)	3.0	3.0	3.0	1.5
Ash (%)	10.9	10.9	10.9	10.4
NDF (%)	42.2	42.2	42.2	42.5
ADF (%)	25.6	25.6	25.6	25.2
ADL (%)	4.0	4.0	4.0	3.0
Concentrate amount	~ 800 g/head	~ 800 g/head	~ 800 g/head	~ 800 g/head
DM (%)	90.0	90.0	90.0	91.9
CP (%)	17.9	17.9	17.9	17.7
CF (%)	2.9	2.9	2.9	3.3
Ash (%)	7.8	7.8	7.8	6.9
NDF (%)	24.3	24.3	24.3	17.0
NSC (%)	32.7	32.7	32.7	31.8
NEL (Mcal kg <sup>-1</sup> DM)	1.5	1.5	1.5	2.0
C16:0	17.8	17.8	17.8	15.3
C18:0	3.8	3.8	3.8	2.0
C18:1c9	21.9	21.9	21.9	23.0
C18:2c9c12	47.9	47.9	47.9	54.1
C18:3c9c12c15	4.3	4.3	4.3	3.5

Abbreviations: DM, dry matter; CP, crude protein; CF, crude fat; NDF, neutral detergent fibre; NSC, non structural carbohydrates; NEL, net energy lactation. Fatty acid values are given as g/100 g of total fatty acid.

**Supplementary Table S2.** Descriptive statistics for individual milk fatty acids (g/100g of total lipids) of Massese breed (n = 118)

	Mean	SD	CV%	P5	P95	kurtosis
C4:0	3.28	0.60	18.33	2.32	4.73	0.70
C6:0	1.55	0.48	30.76	0.83	2.27	0.07
C8:0	2.01	0.50	24.76	1.28	2.21	0.07
C10:0	6.04	1.70	28.11	3.32	8.64	0.35
C10:1c9	0.08	0.05	58.12	0.03	0.19	4.85
C12:0	3.68	0.91	24.73	2.31	4.94	0.72
C13:0	0.09	0.04	47.91	0.04	0.19	2.72
C14:0	9.51	1.92	20.21	6.28	12.36	0.41
C14:0iso	0.11	0.03	28.09	0.07	0.18	0.28
C14:1c9	0.57	0.09	16.37	0.39	0.60	3.57
C15:0	1.07	0.25	23.08	0.68	1.57	3.21
C16:0iso	0.25	0.05	20.73	0.16	0.34	0.69
C16:0	22.44	3.01	13.38	17.56	26.97	0.47
C16:1c9	0.86	0.41	48.12	0.27	1.59	-0.63
C18:0	10.11	4.31	42.57	6.56	13.12	34.58
C18:1 t6-8	0.13	0.06	48.53	0.03	0.26	0.20
C18:1t9	0.20	0.08	38.51	0.05	0.35	0.24
C18:1t10	0.31	0.21	66.13	0.05	0.78	5.53
C18:1t11	2.13	1.28	60.31	0.58	4.61	-0.71
C18:1c9	17.96	2.71	15.11	14.35	22.12	2.59
C18:1t15	0.20	0.06	29.91	0.11	0.31	0.28
C18:1c12	0.14	0.06	42.34	0.06	0.24	0.68
C18:2n6	2.28	0.86	37.57	0.97	3.60	0.54
C20:0	0.22	0.10	44.97	0.14	0.38	39.21
C18:3n3	0.81	0.35	42.46	0.27	1.37	-1.03
C18:2c9t11	1.12	0.53	47.71	0.40	2.19	-0.74
C20:1c11	0.05	0.03	54.59	0.00	0.10	1.88
C21:0	0.06	0.02	35.92	0.02	0.10	0.82
C20:4n6	0.11	0.04	37.28	0.06	0.19	0.80
C20:5n3	0.08	0.04	53.59	0.03	0.14	-1.23
C24:0	0.05	0.02	44.30	0.02	0.08	4.54
C22:5n3	0.11	0.04	33.94	0.06	0.18	0.66
C22:6n3	0.03	0.03	97.69	0.00	0.08	3.55

SD= Standard Deviation; CV%= coefficient of variation; P5= 5<sup>th</sup> percentile; P95= 95<sup>th</sup> percentile

**Supplementary Table S3.** Descriptive statistics for individual milk fatty acids (g/100g of total lipids) of Comisana breed (n = 303)

	Mean	SD	CV%	P5	P95	kurtosis
C4:0	4.06	0.82	20.22	2.85	5.42	0.40
C6:0	2.09	0.36	17.49	1.55	2.75	0.08
C8:0	1.73	0.37	21.61	1.15	2.37	0.74
C10:0	4.89	1.16	23.81	3.05	6.99	0.70
C10:1c9	0.18	0.06	32.31	0.09	0.29	-0.03
C12:0	2.80	0.51	18.40	2.08	3.68	1.23
C13:0	0.06	0.01	14.65	0.05	0.08	0.67
C14:0	8.59	0.92	10.66	7.22	10.19	0.16
C14:0iso	0.20	0.03	15.95	0.15	0.24	1.24
C14:1c9	0.21	0.05	24.25	0.14	0.32	0.38
C15:0	1.48	0.14	9.28	1.25	1.71	0.32
C16:0iso	0.43	0.06	13.63	0.33	0.53	-0.08
C16:0	22.58	1.65	7.29	20.46	25.40	2.39
C16:1c9	0.70	0.07	9.97	0.58	0.81	-0.16
C18:0	9.45	1.31	13.83	7.32	11.41	1.46
C18:1 t6-8	0.23	0.04	16.42	0.17	0.30	0.54
C18:1t9	0.26	0.03	12.52	0.21	0.31	0.09
C18:1t10	0.42	0.06	14.78	0.32	0.53	0.59
C18:1t11	1.94	0.42	21.37	1.32	2.72	0.17
C18:1c9	20.79	2.43	11.70	17.22	25.66	0.55
C18:1t15	0.38	0.04	10.46	0.31	0.44	1.65
C18:1c12	0.31	0.03	10.46	0.26	0.37	1.65
C18:2n6	2.56	0.27	10.53	2.11	3.05	0.02
C20:0	0.34	0.05	15.34	0.26	0.43	0.70
C18:3n3	1.21	0.16	12.97	0.97	1.46	1.44
C18:2c9t11	1.51	0.35	23.53	1.00	2.17	1.21
C20:1c11	0.03	0.01	54.80	0.01	0.05	4.37
C21:0	0.09	0.04	43.34	0.01	0.13	-0.23
C20:4n6	0.22	0.04	18.00	0.16	0.29	0.78
C20:5n3	0.08	0.02	19.07	0.06	0.11	0.36
C24:0	0.07	0.02	25.03	0.04	0.09	0.97
C22:5n3	0.20	0.03	15.34	0.15	0.25	0.94
C22:6n3	0.11	0.03	24.88	0.07	0.16	1.18

SD= Standard Deviation; CV%= coefficient of variation; P5= 5<sup>th</sup> percentile; P95= 95<sup>th</sup> percentile

**Supplementary Table S4.** Descriptive statistics for individual milk fatty acids (g/100g of total lipids) of Sarda breed reared in Tuscany (n = 133)

	Mean	SD	CV%	P5	P95	kurtosis
C4:0	2.87	0.28	9.71	2.49	3.39	1.26
C6:0	2.03	0.36	17.80	1.44	2.65	-0.63
C8:0	1.80	0.49	27.06	1.07	2.56	-0.47
C10:0	5.27	1.99	37.72	2.51	8.80	-0.24
C10:1c9	0.20	0.04	19.68	0.14	0.26	-1.05
C12:0	2.94	0.83	28.03	1.82	4.32	1.06
C13:0	0.06	0.01	24.10	0.04	0.08	-0.20
C14:0	8.93	1.47	16.41	6.59	11.47	-0.33
C14:0iso	0.10	0.02	14.85	0.08	0.13	-0.81
C14:1c9	0.13	0.06	45.52	0.06	0.24	1.53
C15:0	0.81	0.15	18.74	0.56	1.07	-0.21
C16:0iso	0.21	0.08	40.46	0.13	0.28	39.04
C16:0	20.70	3.72	17.95	14.88	26.54	0.00
C16:1c9	0.41	0.06	15.78	0.32	0.53	-0.62
C18:0	10.32	2.31	22.43	6.46	14.99	0.47
C18:1 t6-8	0.42	0.19	44.91	0.17	0.73	-0.99
C18:1t9	0.42	0.15	36.49	0.24	0.69	-0.82
C18:1t10	0.58	0.17	30.30	0.35	0.84	7.43
C18:1t11	3.56	2.68	75.16	1.16	9.69	1.41
C18:1c9	18.83	3.62	19.22	13.10	24.81	0.72
C18:1t15	0.48	0.19	38.76	0.19	0.82	-0.40
C18:1c12	0.27	0.05	19.19	0.19	0.35	-0.41
C18:2n6	2.10	0.38	18.15	1.58	2.74	0.94
C20:0	0.20	0.04	21.11	0.13	0.27	-0.11
C18:3n3	1.43	0.66	46.12	0.56	2.51	-1.15
C18:2c9t11	1.44	0.91	63.04	0.59	3.61	2.45
C20:1c11	0.05	0.02	45.85	0.02	0.09	14.55
C21:0	0.06	0.03	46.36	0.03	0.10	30.43
C20:4n6	0.09	0.03	37.80	0.04	0.15	-0.36
C20:5n3	0.05	0.02	34.20	0.03	0.08	1.30
C24:0	0.05	0.02	32.73	0.02	0.08	-0.09
C22:5n3	0.09	0.02	25.40	0.06	0.14	0.60
C22:6n3	0.04	0.01	35.49	0.02	0.06	1.11

SD= Standard Deviation; CV%= coefficient of variation; P5= 5<sup>th</sup> percentile; P95= 95<sup>th</sup> percentile

**Supplementary Table S5.** Descriptive statistics for individual milk fatty acids (g/100g of total lipids) of Sarda breed reared in Sardinia (n = 298)

	Mean	SD	CV%	P5	P95	kurtosis
C4:0	2.67	0.34	12.62	2.20	3.17	0.71
C6:0	1.82	0.33	18.07	1.29	2.37	-0.13
C8:0	1.70	0.42	24.74	1.01	2.36	-0.07
C10:0	5.93	1.65	27.81	3.43	8.70	0.04
C10:1c9	0.26	0.08	30.47	0.15	0.40	0.57
C12:0	3.72	0.97	26.13	2.30	5.39	0.66
C13:0	0.03	0.01	33.29	0.02	0.05	0.71
C14:0	11.22	1.42	12.68	8.96	13.33	0.16
C14:0iso	0.12	0.04	32.89	0.07	0.20	0.95
C14:1c9	0.19	0.07	37.83	0.09	0.33	1.19
C15:0	1.18	0.18	15.10	0.86	1.43	-0.03
C16:0iso	0.34	0.07	19.94	0.25	0.46	0.42
C16:0	25.65	2.85	11.10	21.26	30.37	0.43
C16:1c9	0.85	0.21	25.21	0.55	1.23	1.14
C18:0	10.20	2.24	21.96	6.43	13.79	0.14
C18:1 t6-8	0.22	0.11	49.23	0.13	0.44	3.25
C18:1t9	0.26	0.09	32.63	0.19	0.44	3.04
C18:1t10	0.37	0.22	59.01	0.19	0.82	3.41
C18:1t11	2.22	1.05	47.39	0.78	4.12	0.68
C18:1c9	16.35	3.12	19.11	10.99	21.49	0.03
C18:1t15	0.56	0.10	17.50	0.43	0.76	0.68
C18:1c12	0.29	0.13	42.44	0.17	0.53	2.26
C18:2n6	1.93	0.46	23.96	1.28	2.67	0.76
C20:0	0.29	0.10	33.76	0.15	0.47	0.72
C18:3n3	0.96	0.55	57.82	0.38	2.11	1.53
C18:2c9t11	1.07	0.50	46.29	0.45	1.98	1.15
C20:1c11	0.03	0.01	41.12	0.02	0.05	4.17
C21:0	0.11	0.03	27.91	0.06	0.16	0.08
C20:4n6	0.11	0.04	35.10	0.06	0.18	0.89
C20:5n3	0.06	0.02	28.15	0.04	0.10	0.30
C24:0	0.08	0.03	41.56	0.03	0.13	0.70
C22:5n3	0.12	0.03	25.43	0.07	0.17	0.18
C22:6n3	0.04	0.01	36.59	0.02	0.06	1.56

SD= Standard Deviation; CV%= coefficient of variation; P5= 5<sup>th</sup> percentile; P95= 95<sup>th</sup> percentile