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Effects of grass- and concentrate-based finishing systems on the quality of meat from the M. longissimus thoracis of young Sarda bulls

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SUPPLEMENTARY MATERIAL

Supplementary Table 1. Effect of finishing system and of slaughter weight as covariate on individual fatty acid profile expressed as % of total fatty acids detected in intra-muscular fat of *Longissimus thoracis* at 6th/8th rib of young Sarda bulls (Lsmeans±SE).

(% total fatty acids)	HAY-2.5C	HAY-3.3C	HAY-ALC	PAS-0C	Diet effect (*P*-value*)	Slaughter weigh effect (*P*-value*)
C10:0	0.04±0.004	0.04±0.004	0.05±0.004	0.03±0.004	0.06	0.97
C12:0	0.06±0.004	0.05±0.004	0.06±0.004	0.05±0.004	0.16	0.92
C14:0i	0.07±0.003 a	0.06±0.003 ab	0.05±0.003 b	0.05±0.003 b	0.008	0.19
C14:0	1.64±0.12	1.52±0.11	1.75±0.11	1.39±0.11	0.17	0.73
C15:0i	0.19±0.01	0.18±0.01	0.17±0.01	0.16±0.01	0.31	0.57
C15:0ai	0.30±0.02	0.29±0.02	0.23±0.02	0.26±0.02	0.15	0.92
C15:0	3.15±0.35	2.97±0.33	2.28±0.34	2.78±0.32	0.36	0.83
C16:0i	0.24±0.01 a	0.23±0.01 ab	0.21±0.01 ab	0.19±0.01 b	0.004	0.19
C16:0	19.5±0.53 ab	18.2±0.49 b	20.7±0.51 a	18.1±0.49 b	0.004	0.19
C17:0i	0.54±0.01 a	0.54±0.01 a	0.52±0.01 ab	0.49±0.01 b	0.02	0.95
C17:0ai	0.55±0.03	0.56±0.02	0.52±0.02	0.53±0.02	0.67	0.30
C16:1 9c	1.17±0.10	1.12±0.09	1.31±0.09	1.06±0.09	0.36	0.49
C17:0	0.96±0.04	0.91±0.03	0.89±0.03	0.94±0.03	0.59	0.30
C18:0i	0.54±0.06	0.40±0.06	0.38±0.06	0.48±0.06	0.24	0.81
C18:0	20.3±0.55	19.5±0.51	20.3±0.54	20.3±0.51	0.61	0.51

C18:1 6t8t	0.18±0.01 a	0.19±0.01 a	0.20±0.01 a	0.12±0.01 b	<0.001	0.93
C18:1 9t	0.25±0.01 a	0.24±0.01 a	0.27±0.01 a	0.18±0.01 b	<0.001	0.26
C18:1 10t	0.33±0.02 a	0.34±0.02 a	0.38±0.02 a	0.24±0.02 b	<0.001	0.36
C18:1 11t (VA)	2.42±0.18	2.46±0.17	1.95±0.17	1.95±0.16	0.07	0.63
C18:1 12t	0.48±0.03 a	0.49±0.03 a	0.57±0.03 a	0.35±0.03 b	<0.001	0.32
C18:1 10t/ C18:1 11t	0.14±0.01 b	0.14±0.01 b	0.21±0.01 a	0.12±0.01 b	0.001	n.d.
C18:1 9c	23.5±1.09 ab	23.1±1.01 ab	25.6±1.01 a	20.3±1.00 b	0.01	0.82
C18:2 9c,12c (LA) n-6	12.4±1.45	14.2±1.34	11.6±1.40	15.3±1.33	0.31	n.d.
C18:1 11c	1.31±0.05	1.34±0.05	1.35±0.05	1.36±0.05	0.90	0.65
C18:1 12c	0.24±0.02 b	0.28±0.01 ab	0.32±0.01 a	0.16±0.01 c	<0.001	n.d.
C18:1 13c	0.17±0.01	0.17±0.01	0.19±0.01	0.15±0.01	0.10	0.18
C18:3 9c,12c,15c (ALA) n-3	1.40±0.16 b	1.58±0.14 b	1.03±0.15 b	3.47±0.14 a	<0.001	0.31
CLA 9c,11t	0.36±0.04	0.43±0.03	0.33±0.04	0.30±0.03	0.09	0.53
C20:3 5c,8c,11c,14c n-6	0.51±0.07	0.58±0.07	0.41±0.07	0.65±0.07	0.14	0.97
C20:4 5c,8c,11c,14c n-6	2.17±0.35	2.66±0.33	1.66±0.34	2.96±0.33	0.06	0.70
C20:5 5c,8c,11c,14c,17c (EPA) n-3	0.04±0.006 b	0.04±0.005 b	0.02±0.005 b	0.08±0.005 a	<0.001	0.58
C22:5 7c,10c,13c,16c,19c (DPA) n-3	0.83±0.12 ab	1.14±0.11 a	0.71±0.12 b	1.34±0.11 a	0.003	0.95
C22:6 4c,7c,10c,13c,16c,19c (DHA) n-3	0.05±0.01 ab	0.07±0.01 ab	0.04±0.01 b	0.08±0.01 a	0.04	0.74
SFA	48.5±1.06	45.8±0.98	48.4±1.03	46.3±0.97	0.15	0.29
MUFA	33.1±1.26 ab	32.7±1.17 ab	34.8±1.17 a	28.8±1.17 b	0.01	n.d.
PUFA	18.5±2.04 ab	21.5±1.88 ab	16.5±1.97 b	25.0±1.87 a	0.03	0.41
UFA	51.5±1.06	54.2±0.98	51.6±1.03	53.7±0.97	0.15	0.29
Σn-3	2.60±0.27 bc	3.18±0.25 b	2.04±0.26 c	5.29±0.25 a	<0.001	0.47
Σn-6	14.9±1.80	17.3±1.67	14.2±1.67	18.9±1.67	0.20	n.d.
Σn-6/Σn-3 ratio	5.97±0.38 a	5.49±0.35 a	6.61±0.35 a	3.54±0.35 b	<0.001	n.d.
AI	0.52±0.03 ab	0.46±0.02 ab	0.55±0.02 a	0.45±0.02 b	0.02	0.28
TI	1.30±0.06 a	1.13±0.05 ab	1.41±0.06 a	1.01±0.05 b	<0.001	0.19
PUFA/SFA	0.38±0.06	0.47±0.05	0.35±0.06	0.55±0.05	0.06	0.44
HH	1.91±0.13	2.17±0.12	1.83±0.12	2.27±0.12	0.06	0.29

VA: vaccenic acid; LA: linoleic acid; ALA: linolenic acid; EPA: eicosapentaenoicacid; DPA: docosapentaenoic acid; DHA: docosahexaenoic acid; SFA: Saturated Fatty Acids; MUFA: Monounsaturated Fatty Acids; PUFA: Polyunsaturated Fatty Acids; UFA: Unsaturated Fatty Acids;

ω3: ΣC18:2 11t,15c, C18:2 9c,15c, C18:3 9c 12c 15c, C20:3 11c,14c,17c, C20:5 5c, 8c 11c 14c 17c, C22:5 7c 10c 13c 16c 19c, C22:6 4c 7c 10c 13c 16c 19c.

ω6: ΣC18:1 12c, C18:2 9t,12t, C18:2 9t,12c, C18:2 9c 12c, C20:2 11c,14c, C18:3 6c 9c 12c, C20:2 11c 14c, C20:3 8c 11c 14c, C20:4 5c 8c 11c 14c.

AI = [(C12:0 + (4 × C14:0) + C16:0)]/(MUFA + n6-PUFA + n3-PUFA).

TI = (C14:0 + C16:0 +C18:0)/[(0.5 × MUFA) +(0.5 × n6-PUFA) + (3 × n3-PUFA) + (n3-PUFA/n6-PUFA)]

HH=(C18:1n-9+C18:2n-6+C20:4n-6+C18:3n-3+C20:5n-3+C22:5n-3+C22:6n-3)/(C14:0 + C16:0)

Means in the same row with no letters after them or with a common letter after them are not significantly different (P>0.05);

*: P values for the effect tested.

HAY-2.5C: fed natural pasture hay ad libitum and 2.5 kg/animal of concentrate; HAY-3.3C: fed natural pasture hay ad libitum and 3.3 kg/animal of concentrate; HAY-ALC: fed natural pasture hay and concentrate ad libitum; PAS-0C: grazing 24 h/day on natural pasture

n.d.=not determined. The data were analysed with Anova model, with finishing system as fixed effect, because of the assumptions of the Ancova model were not met

Supplementary Table 2. Regression coefficient, coefficient of determination (R^2) and significance (P) of the relationship between the concentrations of fatty acids (expressed as % of total fatty acids detected in intramuscular fat of *Longissimus thoracis* at $6^{th}/8^{th}$ rib of young Sarda bulls) and the level of intramuscular fat (%).

	Regression coefficient	R^2	*P*-value*
C10:0	0.003	0.22	0.01
C12:0	0.001	0.03	0.42
C14:0i	0.0003	0.002	0.82
C14:0	0.157	0.51	<0.001
C15:0i	0.007	0.13	0.06
C15:0ai	0.004	0.01	0.61
C15:0	-0.320	0.26	0.006
C16:0i	0.004	0.04	0.34
C16:0	0.823	0.50	<0.001
C17:0i	0.002	0.008	0.65
C17:0ai	0.018	0.16	0.04
C16:1 9c	0.111	0.39	<0.001
C17:0	0.010	0.02	0.44
C18:0i	-0.069	0.39	<0.001
C18:0	0.281	0.09	0.13

C18:1 6t8t	0.013	0.21	0.01
C18:1 9t	0.014	0.25	0.007
C18:1 10t	0.013	0.06	0.23
C18:1 11t (VA)	0.088	0.06	0.21
C18:1 12t	0.044	0.37	<0.001
C18:1 10t/C18:1 11t	-0.001	0.001	0.86
C18:1 9c	1.645	0.52	<0.001
C18:2 9c,12c (LA) n-6	-1.703	0.42	<0.001
C18:1 11c	-0.052	0.32	0.002
C18:1 12c	0.012	0.05	0.24
C18:1 13c	0.003	0.02	0.48
C18:3 9c,12c,15c (ALA) n-3	-0.339	0.20	0.02
CLA 9c,11t	0.028	0.15	0.04
C20:3 5c,8c,11c,14c n-6	-0.098	0.48	<0.001
C20:4 5c,8c,11c,14c n-6	-0.464	0.44	<0.001
C20:5 5c,8c,11c,14c,17c (EPA) n-3	-0.008	0.20	0.02
C22:5 7c,10c,13c,16c,19c (DPA) n-3	-0.160	0.35	0.001
C22:6 4c,7c,10c,13c,16c,19c (DHA) n-3	-0.013	0.32	0.002
SFA	0.892	0.21	0.02
MUFA	1.871	0.48	<0.001
PUFA	-2.763	0.46	<0.001
UFA	-0.892	0.21	0.02
Σn-3	-0.519	0.26	0.006
Σn-6	-2.274	0.46	<0.001
Σn-6/Σn-3 ratio	0.019	<0.001	0.93
AI	0.036	0.49	<0.001
TI	0.096	0.41	<0.001
PUFA/SFA	-0.070	0.38	<0.001
HH	-0.148	0.36	<0.001

VA: vaccenic acid; LA: linoleic acid; ALA: linolenic acid; EPA: eicosapentaenoicacid; DPA: docosapentaenoic acid; DHA: docosahexaenoic acid; SFA: Saturated Fatty Acids; MUFA: Monounsaturated Fatty Acids; PUFA: Polyunsaturated Fatty Acids; UFA: Unsaturated Fatty Acids;

ω3: ΣC18:2 11t,15c, C18:2 9c,15c, C18:3 9c 12c 15c, C20:3 11c,14c,17c, C20:5 5c, 8c 11c 14c 17c, C22:5 7c 10c 13c 16c 19c, C22:6 4c 7c 10c 13c 16c 19c.

ω6: ΣC18:1 12c, C18:2 9t,12t, C18:2 9t,12c, C18:2 9c 12c, C20:2 11c,14c, C18:3 6c 9c 12c, C20:2 11c 14c, C20:3 8c 11c 14c, C20:4 5c 8c 11c 14c.

AI = [(C12:0 + (4 × C14:0) + C16:0)]/(MUFA + n6-PUFA + n3-PUFA).

TI = (C14:0 + C16:0 +C18:0)/[(0.5 × MUFA) +(0.5 × n6-PUFA) + (3 × n3-PUFA) + (n3-PUFA/n6-PUFA)]

HH=(C18:1n-9+C18:2n-6+C20:4n-6+C18:3n-3+C20:5n-3+C22:5n-3+C22:6n-3)/(C14:0 + C16:0)

*: P values for the effect tested