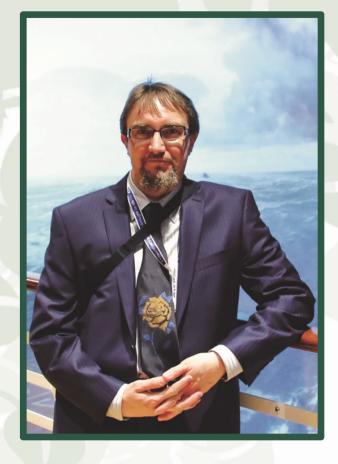# THE EFFECT OF AGEING ON CHOSEN QUALITY CHARACTERISTICS OF SKELETAL MUSCLES OF ABERDEEN ANGUS BULLS

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KEYWORDS. beef cattle, *semimembranosus, adductor femoris, longissimus,* muscle, colour, shear force, cooking loss, Aberdeen Angus

AIM. The objective of this study was to evaluate some physicochemical and textural properties of beef of Aberdeen Angus. The effects of different ageing times and cooking methods on the quality traits of the two muscle groups were studied.

MATERIAL AND METHODS. The carcasses were obtained from free-ranged Aberdeen Angus bulls that had been slaughtered at a commercial abattoir in Arke Lihatööstus Ltd. Three randomly selected carcasses from the different batches were used. The age of the animals were 20–24 months and weight of the carcasses 250–330 kg.
Samples of the *longissimus thoracis et lumborum* muscle and a group of unseparated muscles, *semimembranosus* and *adductor femoris*, were removed. The samples were wet aged at +2°C for 10, 14, 18 and 20.
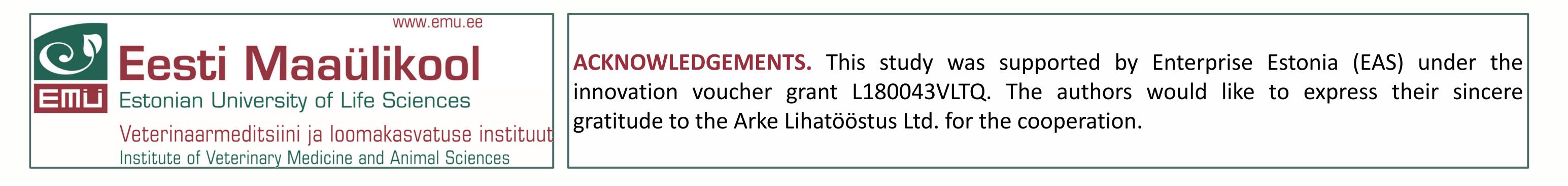Two cooking methods, sous-vide and electric contact grill, were used for the preparation of samples. Meat pH, electrical conductivity, shear force, colour and cooking losses were recorded.
Analysis of variance was used to test the effects of muscles, ageing times and muscles by ageing time interaction, the fixed blocking effect of bull and the random effect of the muscle portion assigned to each ageing duration were also considered.

RESULTS. The effects of muscle groups, ageing times and muscle groups by ageing times interaction on parameters of beef. *LSM* of the same factor's levels without common superscript letter are statistically significantly different (*P* < 0.05).

Factor / Levels	Technological parameters				Cooking losses		
	pH (raw)	Electrical conductivity, µS cm^{-1} (raw)	Shear force, N (raw thawed)	Shear force, N (sous-vide)	Sous-vide	Grilled (hot)	Grilled (cooled)
Muscles (M)	*P* = 0.114	*P* = 0.074	*P* < 0.001	*P* = 0.538	*P* = 0.995	*P* = 0.908	*P* = 0.977
Longissimus thoracis et lumborum	5.55	1081.6	27.6 [a]	38.7	28.2	14.1	19.0
Semimembranosus & adductor femoris	5.47	1103.7	23.1 [b]	30.7	28.1	14.5	18.8
SE	0.051	16.2	2.24	9.68	3.88	2.41	2.64
Ageing time (AT)	*P* = 0.398	*P* = 0.305	*P* = 0.094	*P* < 0.001	*P* = 0.646	*P* = 0.105	*P* = 0.058
Day 10	5.46	1087.6	27.9	40.8 [a]	29.3	18.9	25.7
Day 14	5.50	1110.1	24.1	34.7 [b]	27.8	15.5	19.7
Day 18	5.54	1081.3	25.1	29.7 [b]	28.1	11.5	14.8
Day 20	5.52	1091.6	24.3	33.7 [b]	27.4	11.3	15.3
SE	0.033	10.20	1.20	6.80	2.90	2.46	2.73
Interaction M x AT	*P* = 0.302	*P* = 0.857	*P* = 0.002	*P* < 0.001	*P* = 0.754	*P* = 0.445	*P* = 0.313
Longissimus thoracis et lumborum							
Day 10	5.47	1069.9	29.0 [a]	41.5 [ab]	29.0	21.6	29.9
Day 14	5.56	1098.3	23.0 [ab]	37.9 [abc]	27.0	15.5	19.1
Day 18	5.62	1076.0	30.0 [a]	32.3 [acd]	28.9	10.2	13.5
Day 20	5.53	1082.3	28.2 [a]	43.2 [b]	27.9	9.2	13.4
Semimembranosus & adductor femoris							
Day 10	5.46	1105.2	26.8 [ab]	40.0 [abc]	29.6	16.3	21.5
Day 14	5.43	1121.9	25.1 [ab]	31.5 [cd]	28.6	15.6	20.4
Day 18	5.46	1086.7	20.2 [b]	27.1 [d]	27.4	12.8	16.2
Day 20	5.52	1101.0	20.4 [b]	24.2 [d]	27.0	13.4	17.3
SE	0.048	15.50	1.72	9.61	4.10	3.47	3.86

CONCLUSIONS. Ageing time has an effect on the technological and qualitative parameter of beef, by improving tenderness and colour. Muscle effect in ageing must consider as *longissimus thoracis et lumborum* muscle was tougher than *semimembranosus* and *adductor femoris* muscle group and therefore need longer ageing. Although both muscle groups were tender on the ageing day 10, the optimal ageing time for the vacuum-packed *semimembranosus* and *adductor femoris* muscle group is 18 days.
The *semimembranosus* and *adductor femoris* muscle group has a higher colour value, which attracts consumers more, compared to the *longissimus thoracis et lumborum* muscle. Muscles showed good colour (lightness, redness and yellowness) stability within ageing for 20 days.
Ageing has a slight positive effect on the grilled beef cooking loss, but there are no changes in sous-vide treated meat.