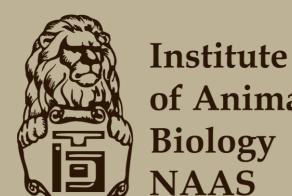
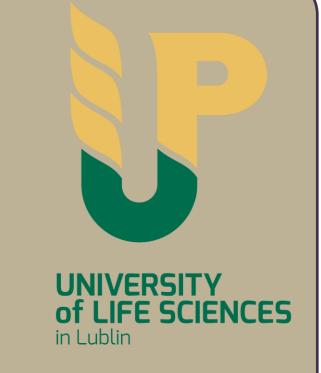


LVIV City Convention Sureau



Slaughter value and meat quality of young bulls of three genotypes fed a semi-intensive system involving flax extrudate*



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Introduction

Several studies have been conducted on diet supplementation with oilseeds to produce beef with enhanced levels of components with potential health benefits. Particularly, the effects of flaxseed supplementation on the fatty acid profiles of meat are well known whereas scarce data are available on how the inclusion of flaxseed in the diet could affect on the slaughter value and meat quality of different breeds of cattle. The use of raw flax seeds in human and animal nutrition is limited by the presence of anti-nutritional substances. Hence, the use of the extrusion process in the processing of flax seeds allows to limit the content of anti-nutritional substances while maintaining their optimal nutritional value.

Material & Methods

The aim of the study was to assess the slaughter value and meat quality of Limousine (LM), Polish Holstein-Friesian (HO) and commercial crossbreed (CC) bulls fed with a semi-intensive system with the addition of flax extrudate.

The bulls were fed with TMR (alfalfa silage, meadow hay, grain meal) enriched in the last 4 months before slaughter with the addition of flax, in the form of an extrudate in the amount of 8% of the dry weight of the diet. During the control fattening of bulls between 8 and 23 months of age, the weight gain was monitored, and after slaughter, the dressing percentage and the EUROP classification. Nutritional values (water, protein, fat, ash and heme iron content, calorific value) and physicochemical properties (pH, colour, water holding capacity, TBARS and shear force) were determined in *longissimus lumborum* (LL) and *semitendinosus* (SM) muscles.

Results

LM bulls had the highest warm carcass weight (373.7 kg) as well as dressing percentage (58%), and significant differences (p<0.05) were confirmed in comparison with HO bulls (317.8 kg and 53.6%, respectively). CC bulls had the highest daily gains (794.3 g) and body weight (645.9 kg), and the differences in relation to HO bulls were confirmed at p<0.05 level. The carcasses of LM and MM bulls were classified in U and R classes, while 83% of HO bulls were classified in the lower quality class, i.e. O. The pH values of the bulls' muscles of all genotypes were at a similar level, and the obtained results indicated the correct course of post-mortem glycolysis without DFD syndromes. The muscles of the LM and MM bulls contained significantly more protein and less fat compared to HO. On the other hand, the muscles of the HO bulls were characterized by the highest lightness (L*; p <0.05). The shear force showed a more favorable tenderness of the SM muscle compared to the LL muscle in bulls of all genotypes (average 57 N vs. 102 N).

ltem	LM (n=6)	CC (n=7)	HO (n=6)	SEN
Age at start of fattening, nonths	7,15	8,02	7,18	0,30
nitial body weight, kg	291,0 ^b	280,3 ^b	254,0°	5,2
Daily weight gain, g	743,6 ^{ab}	794,3 ^b	713,2 ^a	12,1
Age at slaughter, months	22,80	23,05	22,84	0,20
Body weight before laughter, kg	642,8 ^b	645,9 ^b	593,0°	12,7
Warm carcass weight, kg	373,7 ^b	371,0 ^b	317,8 ^a	10,8
Oressing percentage, %	58,0 ^b	57,3 ^b	53,6 ^a	0,8
Cooling loss of carcass, %	2,70	2,62	2,75	0,07
EUROP classification				
Carcass conformation,	U - 50%; R – 50%	U - 43%; R – 43%; O–14%	R – 17%; O– 83%	
at cover, class	2 - 83%; 3 - 17%	2 – 86%; 3 – 14%	2 - 100%	
EM - standard error of the mean; a, ommercial crossbreed bulls; HO- Polis		lines differ significantly	o < 0.05; LM – Limousine	bulls;

ltem	m. logis	m. logissimus lumborum			m. semitendinosus			- SEM
	LM	CC	НО	- SEM	LM	CC	НО	- JLIV
L*	34,68 ^a	36,33 ^b	37,27 ^c	0,15	39,33 ^a	40,05 ^a	40,93 ^b	0,10
a*	12,11 ^b	11,28°	11,04 ^a	0,08	12,96 ^a	12,41 ^a	12,59 ^a	0,09
b*	10,62 ^a	11,54 ^b	10,93 ^a	0,08	14,44 ^a	14,50 ^a	15,62 ^b	0,09

tem	m. logissimus lumborum			SEM	m. semitendinosus			SEM
	LM	CC	НО		LM	CC	НО	
CL	26,74 ^a	27,80 ^a	27,86 ^a	0,50	31,81 ^a	36,13 ^a	35,13 ^a	1,01
6-H	28,23 ^{ab}	30,71 ^b	25,93°	0,92	33,35 ^a	33,72 ^a	35,31 ^a	0,76
WBSF	99,79 ^a	100,31 ^a	106,19 ^a	2,32	59,64 ^a	56,18 ^a	56,22 ^a	1,20
BARS	0,16 ^a	0,12 ^a	0,28 ^b	0,01	0,15 ^{ab}	0,09 ^a	0,17 ^b	0,01
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	ine iroi	· Conce	101					

Item	m. logissimus lumborum			SEM	m. semitendinosus			- SEM	
	LM	CC	НО	SLIVI	LM	CC	НО	JLIVI	
Water	75,43a	75,48 ^a	75,74 ^a	0,21	76,52 ^{ab}	76,19 ^a	76,79 ^b	0,09	
Protein	22,60 ^b	22,90 ^b	21,53°	0,18	22,16 ^{ab}	22,70 ^b	21,24 ^a	0,29	
Fat	1,35 ^a	1,56 ^{ab}	1,72 ^b	0,10	1,12 ^a	1,07ª	1,20 ^a	0,08	
Energy value	102,53°	106,00°	102,42 ^a	1,46	98,69ª	100,67 ^a	95,55°	1,23	
Fe _{heme}	1,50 ^b	1,47 ^b	1,14 ^a	0,05	1,18b	1,20 ^b	0,88ª	0,06	
Markings as u	nder the table	1			2844904	MANAGE	2500		
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Conclusions

Flax seed extrudate may be a valuable feed additive, as previous literature data indicate its beneficial effect on the fatty acid profile of intramuscular fat, while the conducted research proves that the meat of the assessed young bulls was characterized by the desired physicochemical properties, from the technological and consumer point of view as well. Also the traits of slaughter value obtained for bulls of three genotypes should be considered satisfactory and typical for semi-intensive feeding system

*Project financed under the program of the Minister of Science and Higher Education under the name "Regional Initiative of Excellence" in 2019 - 2022 project number 029/RID/2018/19 funding amount 11 927 330.00 PLN