

Vigilijus Jukna¹, Edita Meškinytė – Kaušilienė¹, Žydrūnė Stanevičienė¹, Živilė Tarasevičienė², Paulius Bekampis²

¹Vytautas Magnus University Agriculture Academy Center of Animal Husbandry Selections, Breeding Values and Dissemination, Universiteto str. 10A, LT-53361 Akademija, Kauno r. Lithuania

²Vytautas Magnus University Agriculture Academy, Faculty of Agronomy, Studentų str. 11, LT-53361 Akademija, Kauno r. Lithuania

INTRODUCTION

Beef is an important source of amino acids, minerals and vitamins, so it plays an important role in human nutrition. In order to maintain a profitable farm, and to obtain quality meat production, it is very important for beef cattle farmers to calculate which breeds of beef cattle would be optimal for growing and whose carcasses have a higher demand in domestic and foreign markets. Therefore the influence of the breed of beef on meat quality was investigated.

MATERIALS AND METHODS

The experiment was performed with bulls of late maturing breed (Limousines) and fast maturing breed (Angus) from production farms. The animals of both breeds received the same concentrated feed depending on the weight (per 100 kg weight per 1 kg of feed) and the grass feed. Samples for the determination of the physicochemical properties, amino and fatty acids of the meat was taken from the longest dorsal muscle (musculus longissimus dorsi) at the last ribs. The chemical composition (dry matter, protein, lipid and ash contents), pH, water holding capacity, drip loss, cooking loss, color and texture (shear force) were measured. The structure of intramuscular fats fatty acids was determined using the gas chromatography method by analyzing the methyl esters of the fatty acids (Shimadzu GC – 2010 PLUS, Shimadzu Corporation, Japan) and the amino acids were determined using an amino acid analyzer (UF-Amino Station, Shimadzu Corporation, Japan).



RESULTS

Table 1. Chemical and physico-chemical properties of meat

Index	Limousines	Angus
Dry matter, %	28.88±0.25	28.19±0.28
Proteins, %	22.93±0.25	22.81±0.27
Fats, %	2.27±0.33	2.49±0.3
Ash, %	1.09±0.02	1.07±0.02
pH	5.58 ± 0.03	5.71±0.02
Water holding capacity, %	3.09±0.87	1.49±0.35
Drip loss, mg %	56.10±0.92	55.17±0.87
Cooking loss	26.31±1.13	24.31±1.02
Hardness, kg cm ²	1.98±0.07	1.80±0.24
Color		
L*	42.39±1.66	41.56±1.17
a*	19.42±1.03	20.19±0.84
b*	9.91±1.15	9.23±1.04

Note: in the columns are means ± standart error

Table 2. Fatty acids profile of meat, % from total amount of fatty acids

Fatty acid	Limousines	Angus	Fatty acid	Limousines	Angus
C10:0	0.30	0.27	C18:3y	1.04	1.10
C12:0	0.34	0.65	C18:a	0.88	1.07
C13:0	0.49	0.64	C18:3 trans	0.79	0.95
C14:0	4.72	4.27	C20:0	0.30	0.64
C14:1	0.91	0.62	C20:1	0.52	0.77
C14:2	1.41	1.65	C20:2	0.01	0.27
C15:0	1.47	1.20	C20:3n3	0.05	0.04
C15:1	0.96	0.94	C20:4n6	0.47	0.24
C16:0	20.06	21.10	C20:5n3	0	0
C16:1	4.02	4.31	C22:0	0.08	0.09
C16:2	1.77	2.11	C22:1	0.10	0.11
C17:0	1.05	0.62	C22:2	0	0
C17:1	1.25	1.32	C23:0	0.03	0.07
C18:0	15.68	15.41	C24:0	0	0
C18:1	28.34	28.13	C24:1	0	0
C18:1 trans	3.57	4.22	C22:5n5	0	0
C18:2	4.17	3.88	C22:6n3	0	0
C18:2 trans	1.79	1.19	Total	96.56	97.88

CONCLUSIONS

The meat of late maturing breed (Limousines) showed the higher drip loss by 1.6 % and cooking loss by 7.6 % comparing with Angus. Limousines meat had lower pH level. The amino and fatty acids profile was influenced by the beef breed. The meat of Limousines animals showed the higher amount of methionine and valine while Angus meat of cysteine and glutamine. Saturated and polyunsaturated fatty acids content was higher in Limousines meat and monounsaturated in Angus.