

CARCASS AND MEAT QUALITY OF YOUNG BULLS IN SLOVAK REPUBLIC

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Keywords: beef, quality audit, young bulls

Introduction

Improvement of meat quality in slaughter cattle necessitates knowledge of its real quality immediately after killing at the slaughterhouse. Results can effectively help authorities of the country to take important decisions, and they also bring significant information to meat processors and farmers. In some countries it is usual to do a quality audit of beef (Brooks *et al.*, 2000; McKenna *et al.*, 2002). Numbers of scientific workers from various research institutions in the country take part in it. This study presents the results of the first such audits that took place in the Slovak Republic in 2003 and 2005.

Materials and Methods

The quality audit was performed on young bulls to the age of two years. The following number of carcasses was evaluated: 13,805 carcasses in 2003 and 14,111 carcasses in 2005. Conformation and fat cover of carcasses were evaluated by the classification system SEUROP (Regulation EEC No 1208/81, Regulation EEC No 1026/91). Data were obtained from the most important slaughterhouses in the country. In addition, samples were taken of the muscle *M. longissimus dorsi* (LD) from 1,360 carcasses to assess quality parameters. The following was assessed; water content, proteins and intramuscular fat by the Infratec 1265 apparatus, pH value, colour of meat (% remission) spectrophotometrically, content of free water, LD area and marbling in meat by 10 points scale (1 = very intensive marbling, 10 = without traces of i.m. fat) 48 hours post mortem. On Day 7 we detected shear force in cooked meat by Warner-Bratzler method. Variation-statistical values were calculated with each of qualitative parameters (Statgraphic).

Results and Discussion

Analysis of results (Table 1) showed that there are important differences between the compared years. While in 2003, most carcasses were in conformation classes U (46.14 %) and R (44.52 %), in 2005 they were in classes R (52.50 %) and O (31.07 %) according to the degree of meatiness. It represents a shift by 1 class towards worse meatiness on average. We found significant differences also when evaluating the degree of fat cover in 2003 and 2005. The number of carcasses increased in classes 2 and 3, and decreased in class 1. Knowledge and experience from a number of European countries show that processors of slaughter cattle are more interested in carcasses in classes of fat cover 2 and 3. Mentioned changes are due more to a stricter system of classification and to better control of classifiers than to real changes in carcass quality. Therefore it is necessary to take the results in 2005 as accurate.

Table 1: Percentual representation of slaughter carcasses.

Confor- mation	Fat class										Total	
	1		2		3		4		5		2003	2005
	2003	2005	2003	2005	2003	2005	2003	2005	2003	2005		
E	0.09	0.42	1.32	0.36	0.04	0.25	0.91	-	-	-	2.36	1.03
U	35.26	1.16	8.82	7.51	1.95	1.16	0.12	0.13	0.01	0.01	46.14	9.97
R	3.95	10.88	32.15	30.03	6.77	10.93	1.56	0.60	0.09	0.06	44.52	52.50
O	3.35	10.04	2.25	10.40	0.29	9.52	0.01	0.96	0.16	0.15	6.06	31.07
P	0.47	2.98	0.71	1.55	0.28	0.57	-	0.29	-	0.03	0.90	5.42
Total	43.11	25.49	44.71	49.85	9.33	22.43	2.59	1.98	0.25	0.25	100.00	100.00

A nutritional and physical-technological characteristic of LD is in table 2. There is low content of i.m. fat in meat of young bulls (2.22 %) which corresponds also with results of marbling in LD. We found the highest variability with shear force of meat ($v = 53.47\%$) and with content of i.m. fat ($v = 51.79\%$). We found extremely dark meat (DCB) with high end value of pH in 21.45 % carcasses, it is markedly less than in our first large study in 1982 (Mojto *et al.*, 1982), when we found DCB in 56 % carcasses of young bulls. Decrease in DCB occurrence is a result of significant changes in manipulation of animals before slaughter (shorter transport times, social stabilisation of animals, etc.). LD area was on average 94.86 cm², within the span from 60 to 135 cm². In the USA they found span from 50 to 150 cm² (McKenna *et al.*, 2002) during the audit.

Table 2: Mean values and variability of qualitative parameters.

Parameters	x	s	v %	min.	max.
Total water, %	74.80	1.62	2.17	60.09	78.87
Total protein, %	21.90	1.02	4.66	17.87	26.06
Intramuscular fat, %	2.22	1.15	51.79	0.49	9.91
Free water, %	32.35	4.48	13.85	20.17	40.88
pH value	5.90	0.48	8.14	5.20	7.10
Meat color, %	8.56	2.25	26.36	3.80	21.00
Cooking loss, %	40.84	6.25	15.31	17.17	59.35
W-B shear force, kg	6.43	3.44	53.47	0.60	18.30
Marbling score	7.55	1.27	16.89	3.00	9.00
Longissimus muscle area, cm ²	94.86	11.28	11.89	66.20	135.01

Conclusion

The first clear and representative results of carcass and meat quality in the category of young bulls were obtained in the Slovak Republic. They create the basis for observation of trends in future years that will be evaluated from periodically repeated audits of beef quality. Also, further slaughter categories will be incorporated gradually.

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