

EXAMINATION OF THE COMBINED EFFECT OF TRENBOLON ACETATE AND 17- β ESTRADIOL ON MEAT QUALITY OF FATTENING STEERS

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The application of growth promoters in animal fattening began from the desire to achieve the economic profit. Anabolics accelerate fattening in such way that they improve feed efficiency (Johnson et al., 1996, Gerken et al., 1995, Bartle et al., 1992, Perry et al., 1991, de Boer et al., 1991). In addition to the positive role in the stimulation of growth, the use of anabolics can have a deleterious effect on beef quality. This effect is especially reflected on marbling and tenderness of beef, although there are opposing opinions (Gerken et al., 1995, Huck et al., 1991, Apple et al., 1991). It should be emphasized that the effect of anabolic considerably depends on animal kind, sex, age and nutrition.

OBJECTIVES The aim of this work is to examine the combined effect of trenbolon acetate (TBA) and estradiol (E) on meat quality in fattening steers of Simmental breed, which are native in this area.

METHODS The examination were performed on a private cattle farm. Ten steers of Simmental breed, eight months old, were assigned randomly. The first five steers were used as a control group (no implant) and in the other five, Revalor S (24mg of 17- β estradiol and 120mg of trenbolon acetate) was surgically implanted under the skin behind the ear. The steers were weighed and placed in the stable. During the fattening they were fed a grower diet, consisting of hay, corn silage and ground cereals (concentrate) with 12% proteins. Sixty days after implantation, since the analysis of faeces and urine showed that trenbolon has been excreted, the reimplantation was done. 120 days from the first implantation, the presence of trenbolon was not established in faeces and urine. Steers of both groups were weighed and slaughtered. The carcass weights were recorded. Pelvis, heart and kidneys were examined in order to establish the fatness by comparing untreated and treated steers. Samples of *M. longissimus dorsi*, from the first to the third vertebra, were taken for the following analyses: pH (ISO, 1974), cont. of water, fat and proteins (AOAC, 1995), collagen (ISO, 1994), water binding capacity-WBC (Graw and Hamm, 1957), weight loss by cooking (Honikel, 1987), nitrosomyoglobin and total pigments (Mohler, 1996). Sensory evaluation of meat tenderness was carried out on 7th day in cooked samples (70°C) by six trained persons, using a scale from 1 (very tough) to 10 (very tender). All the obtained results were statistically elaborated and the significant level was established by the Student test.

RESULTS AND DISCUSSION Table 1 shows the average daily gain (ADG) of steers and the dressing percentage. The presented results show higher ADG in implanted steers in relation to not implanted ones (control group) by 21%. Treated steers had higher weights and better dressing percentage and the difference is statistically significant ($P < 0,05$). These findings are in accordance with the investigations of Johnston et al. (1996), Gerken et al. (1995) and others.

Parameters of meat quality are presented in Table 2. Values for pH (24h pm) between control group and treated group do not show significant differences. Also, the weight loss by cooking does not differ essentially between the mentioned groups ($P > 0,05$). However, the percentage of released water, as criteria for WBC, differs significantly ($P < 0,05$) between the two groups being higher in treated steers. Implant treatment did not essentially influence tenderness of meat and results for the collagen content confirm these findings ($P > 0,05$).

According to the findings of Smulders et al. (1991), inclusion of growth promoters such as anabolics, lowers the content of iron in hemoglobin of muscles. Our results confirm these findings, considering that the content of nitrosomyoglobin and total pigments in treated steers differ significantly ($P < 0,05$) from the control group.

As for basic chemical composition, differences in the contents of water and proteins are not significant ($P > 0,05$) in the mentioned groups. However, the results for fat content between two examined groups of steers show lower fat content in treated steers and this difference is significant ($P < 0,05$). By the examination of pelvis, heart and kidneys, higher fatness in control steers was established well.

CONCLUSION Results of the present study suggest that the combined use of trenbolon acetate and 17- β estradiol in fattening Simmental steers has effect on dressing percentage and on deposition of intramuscular fat. The application of anabolics had little appreciable effect on other factors of beef quality.

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Table 1. Average daily gain (kg) and dressing percentage

Investigated parameters	Control group		Treated group		Significant level
	\bar{x}	Sd	\bar{x}	Sd	
Body weight before implantation, kg	392,2	7,71	386,0	13,32	
Body weight before slaughter, kg	488,8	8,37	503,0	8,39	*
Carcass weight, kg	292,8	7,93	321,0	12,25	*
Dressing percentage	59,88	0,74	63,80	1,15	*
Average daily gain, kg	0,81		0,98		

* = P<0,05

Table 2. Characteristics of beef quality

Investigated parameters	Control group		Treated group		Significant level
	\bar{x}	Sd	\bar{x}	Sd	
pH (24 pm)	5,70	0,01	5,69	0,01	NS
Water binding capacity (% of released water)	29,65	0,61	31,18	0,51	*
Weight loss after cooking, %	24,99	0,08	25,47	0,49	NS
Mean scores for tenderness of cooked beef (1 = very tough; 10 = very tender)	7,76	0,08	7,56	0,08	NS
Collagen content, %	0,486	0,02	0,496	0,04	NS
Total pigment, mg/kg	0,41	0,24	0,34	0,38	*
Basic chemical composition					
Water, %	74,10	0,25	75,17	0,68	NS
Fat, %	3,05	0,29	2,21	0,61	*
Proteins, %	21,52	0,67	21,72	21,72	NS

NS = P>0,05; * = P<0,05