

# INVESTIGATION OF THE EFFECT OF MASS PRIOR TO SLAUGHTERING ON SLAUGHTER VALUES OF MALE FATTENING YOUNG CATTLE OF DOMESTIC SIMMENTAL BREED\*\*

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**Abstract:** For the purpose of investigation of factors important for slaughter yield results, a trial with three groups of young cattle of Domestic Simmental breed of different body masses was carried out. Young cattle in the first group (G1) (n=6) had average body mass of 509,00 kg (475 - 525), in the second group (G2) of young cattle (n=7) average body mass of 554,29 kg (530 – 575) was recorded and in the third group of young cattle (G3) (n=8) 591,13kg (580–615). Subsequent to slaughtering warm carcass sides were measured individually, with and without kidney fat, mass of internal organs was measured (kidneys, liver, lungs, heart, spleen) and mass of other secondary slaughter products (head, tongue, tail, muscle part of diaphragm). After cooling carcass sides were cut into main parts. Based on obtained results of research it was established that male cattle of group (G2) of Domestic Simmental breed of average body mass of 554,29 kg have realized higher slaughter yield compared to groups G1 and G3, whereas the share of kidney fat was the same in all three groups of young cattle. Share of mass of internal organs was the lowest in young cattle of group G2 (2,47%) whereas in other two groups it was the same. Share of mass of other secondary slaughter products (head, tongue, tail, muscle part of diaphragm) in all three groups of young cattle was the same. Share of mass of round (I category part of the carcass) was the highest in young cattle of group G3 (29,86), and statistically significantly ( $P<0.05$ ) lower in group G1 (28,39). Share of carcass parts of II category (loin, back, shoulder) was the lowest in young cattle of group G3 (23,655), and of carcass parts of category III (second thigh, second fore thigh, neck, breasts, ribs, belly) in young cattle of group G2 (44,45%).

**Key words:** cattle, Domestic Simmental breed, slaughter yield, internal organs, carcass parts.

## Introduction

Carcass yield (two carcass sides) or slaughter yield is share of carcass, i.e. carcass sides in relation to body mass prior to slaughtering. Accordingly, we speak of warm carcass yield and cold carcass yield. Warm carcass yield is by 2% higher than cold carcass yield. Numerous factors influence the value of yield, major factors are mass prior to slaughtering, sex, age, nutrition, duration of transport prior to slaughtering and carcass processing method.

Carcass of young cattle are carcass sides of slaughtered young cattle, regardless of the sex, where after bleeding, skin, head, lower extremities (in carpal and tarsal joint), internal organs of breast, abdominal and pelvic cavity, sexual organs, kidney and pelvic fat, diaphragm, tail and spinal cord have been removed.

It can be concluded that yield is first of all criterion showing the mass of carcass obtained from one animal, and indirectly it indicates the higher commercial value of live animal.

## Material and methods

Investigation was carried out on male fattening young cattle of Domestic Simmental breed. Cattle were fattened on experimental cattle farm of the institute for Animal Husbandry. Three trial groups of young cattle were formed depending on their body mass prior to slaughtering. First group (G1) of young cattle (n=6) had average body mass of 509,00 kg (475 – 525 kg), the second group (G2) of young cattle (n=7) average body mass of 554,29 kg (530 – 575 kg) and the third group (G3) (n=8) average body mass of 591,13 kg (580 – 615 kg). Slaughtering of young cattle and primary treatment of carcasses was done in experimental slaughterhouse of the Institute. After stunning, bleeding, removal of head, skin, cutting of carcass and evisceration, warm carcass sides were measured individually with and without kidney fat, also internal organs were measured (kidneys, liver, lungs, heart, spleen), and mass of other secondary slaughter products (head, tongue, muscle part of diaphragm). Subsequent to cooling in duration of 20 – 24 hours on temperature from 0 to 2°C, carcass sides were cut into major parts according to Regulation on quality of meat from slaughter livestock, poultry and game, and all parts were measured. Obtained data was processed, and variance analysis was performed by method of Snedecor and significance of differences between arithmetic means by t-test.

## Results and discussion

Results of investigation of yield depending on the mass prior to slaughtering (tab. 1) show that the highest yield (56,41%) was realized in young cattle of group G2 with average body mass of 554,29 kg, group G1 had yield of 56,09%, and group G3 55,49%. According to results of *Aleksić et al.* (2002) young cattle of Domestic Simmental breed, of average body mass prior to slaughtering of 592,7 kg realized carcass yield with kidney fat of 55,66%, and carcass yield without kidney fat was 54,53%. *Čobić et al.* (1990) stated research results where male young cattle of Simmental breed realized yield of 58,47%. Share of mass of kidney fat in body mass prior to slaughtering was the highest in young cattle of group G3 (0,82%), and the lowest in young cattle of group G1 (0,79%). According to *Miščević et al.* (1997) young cattle of Domestic Simmental breed had share of kidney fat in the mass prior to slaughtering of 1,22%.

**Table 1. Average values of investigated traits of carcasses from different weight groups**

Weight groups		n	Mass prior to slaughtering (kg)	Carcass yield with fat (%)	Carcass yield without fat (%)	Kidney fat(%)
G1	x	6	509.00	56.09	55.29	0.79
	Sd		19.13	2.23	2.21	0.16
G2	x	7	554.29	56.41	55.59	0.80
	Sd		17.90	2.47	2,30	0.24
G3	x	8	591.13	55.49	54.63	0.82
	Sd		11.48	1.33	1.31	0.26

Share of internal organs (liver, lungs, heart, spleen, kidneys) and some secondary slaughter products (head, tongue, muscle part of diaphragm, tail) in body mass prior to slaughtering (tab. 2) was practically the same in all three groups of young cattle. Of internal organs the liver was most present (from 0,97% in group G2 to 1,17% in group G1), followed by lungs (0,76% in group G2 to 0,91% in group G3), srce and the lowest share was of kidneys (0,16% in group G2 to 0,19% in group G1). Of secondary slaughter products the share of head was the highest (2,63% in group G3 to 2.75% in group G2) and of tongue (0,22% in group G2 to 0.39% in group G1). Similar results were obtained by *Aleksić et al.* (2002) and *Čobić et al.* (1990).

**Table 2. Share of internal organs within weight groups**

Index	G1		G2		G3	
	x	Sd	x	Sd	X	Sd
Liver	1,17	0,12	0,97	0,08	1,09	0,08
Lungs	0,80	0,21	0,76	0,18	0,91	0,07
Heart	0,39	0,06	0,38	0,08	0,33	0,04
Spleen	0,21	0,03	0,20	0,05	0,22	0,07
Kidneys	0,19	0,03	0,16	0,02	0,17	0,02
Total	2,76	/	2,47	/	2,72	/
Head	2,73	0,25	2,75	0,21	2,63	0,32
Tongue	0,39	0,11	0,22	0,03	0,35	0,09
Tail	0,23	0,03	0,25	0,07	0,23	0,05
Muscle part of diaphragm	0,23	0,03	0,31	0,12	0,31	0,05
Total	3,58	/	3,53	/	3,52	/

According to results obtained by cutting of the left carcass side into major parts (tab. 3) it is observed that by increase of body mass prior to slaughtering of average 509 to 590 kg, statistically significantly ( $P < 0,05$ ) the share of leg/round increases (carcass part of category I) from 28,39% in group G1 to 29,86% in group G3. Share of beef steak (carcass part not categorized) is the highest in young cattle of group G1 (1,74%), lower in group G2 (1,44%) and the lowest in group G3 (1,38%). Share of carcass parts of category II (loin, back, shoulder) was the highest in group G2 (24,34%), and the lowest in group G3 (23,65%). In carcass parts of category II the highest established share was of shoulder (13,41% to 13,79%), followed by back (5,18% to 5,78%) and loin part (4,61 to 4,81%). Share of carcass parts of category III (second thigh, second fore thigh, neck, breasts, ribs, belly butt,) was the highest 45,78% in group G1, and statistically insignificantly ( $P > 0,05$ ) lower in groups G3 and G2. *Aleksić et al.* (2007) state results of research where they established that share of leg/round in carcass of young cattle of Simmental breed was 27,06%, and share of loin part 4,69%. Similar results were obtained by *Ostojić-Andrić* (2007). Of carcass parts of category III the highest yield determined was of neck (8,90 to 10,17%), breasts (8,52 to 8,65%), ribs (6,95 to 7,45%), butt (6,60 do 6,96%), belly (5,12 do 5,43%), second thigh (3,94 to 4,34%) and second fore thigh (3,24 to 3,75%).

**Table 3. Average share of major carcass parts from young cattle from different weight groups**

Index	G1		G2		G3	
	x	Sd	x	Sd	x	Sd
Mass (kg) of left carcass side	141,78	12,26	151,63	8,38	158,91	7,39
Round+second thigh+loin+back (%)	44,37	1,93	45,24	1,86	45,50	0,36
Front part (%)	54,50	2,17	53,65	2,05	53,58	0,58
<b>Carcass side parts (%)</b>						
Round	28,39	2,14	29,16	1,49	29,86	1,43
Beef steak	1,74	0,23	1,44	0,11	1,38	0,16
Loin part	4,81	0,21	4,77	0,31	4,61	0,50
Back	5,62	1,06	5,78	0,97	5,18	0,43
Shoulder	13,41	0,94	13,79	0,86	13,86	1,03
<b>Total parts of II category</b>	23,70	0,84	24,34	1,03	23,65	1,04
Second thigh	4,34	0,19	3,94	0,67	4,20	0,63
Second fore thigh	3,75	0,28	3,39	0,26	3,24	0,38
Neck	10,17	0,70	8,90	1,35	9,64	1,28
Butt	6,60	0,71	6,96	1,47	6,93	0,89
Breasts	8,52	1,50	8,65	0,91	8,62	0,96
Ribs	7,29	0,29	7,45	0,45	6,95	0,84
Belly	5,43	0,38	5,30	0,83	5,12	0,84
<b>Total parts of III category</b>	45,78	2,43	44,45	2,12	44,75	1,39

## Conclusion

Based on results obtained by investigation of the effect of body mass prior to slaughtering of young cattle of Domestic Simmental breed, the following can be concluded:

- Young cattle of group G2 realized higher carcass yield with and without fat;
- Share of kidney fat in the mass prior to slaughtering was the lowest in group G1;
- Share of internal organs and secondary slaughtering products was practically the same in all three groups of young cattle;

- Share of leg/round was statistically significantly higher in group G3 compared to group G1;
- Share of carcass parts of category II and category III was almost the same in all three groups of young cattle;
- Share of beef steak was the highest in group G1.

## **ISPITIVANJE UTICAJA MASE PRE KLANJA NA REZULTATE VREDNOSTI RANDMANA KLANJA MUSKIH TOVNIH JUNADI DOMACE SIMENATLSKE RASE**

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### **Rezime**

U cilju ispitivanja faktora značajnih za rezultate vrednosti randmana klanja, izveden je ogled sa tri grupe junadi domaće simentalske rase različite telesne mase. Prva grupa (G1) junadi ( n=6) bila je prosečne mase 509,00 kg (475 - 525), druga grupa (G2) junadi ( n=7) bila je prosečne mase 554,29 kg (530 – 575) i treća grupa (G3) junadi ( n=8) bila je prosečne mase 591,13 kg (580 – 615). Posle klanja izvršeno je pojedinačno merenje toplih polutki sa i bez bubrežnog loja, merenje mase unutrašnjih organa (bubrezi, jetra, pluća, srce, slezina) i merenje mase ostalih pratećih proizvoda klanja (glava, jezik, rep, mišićni deo dijafragme). Posle hladjenja polutke su rasecene u osnovne delove. Na osnovu dobijenih rezultata istraživanja utvrđeno je da su muška junad druge grupe (G2) domaće simentalske rase prosečne mase 554,29 kg, ostvarila veći randman u poređenju sa grupama G1 i G3, dok je učešće bubrežnog loja bilo isto kod sve tri grupe junadi. Učešće mase unutrašnjih organa najmanje je kod junadi grupe G2 (2,47%) dok je kod je kod ostele dve grupe bilo isto. Učešće mase ostalih pratećih proizvoda klanja (galava, jezik, rep, mišićni deo dijafragme) u sve tri grupe junadi je isto. Učešće mase buta (deo trupa I kategorije) najveće je u junadi grupe G3 (29,86), a statistički značajno ( $P<0.05$ ) manji u grupe G1 (28,39). Udeo delova trupa II kategorije (slabine, leđa, plećka) najmanji je u junadi grupe G3 (23,655), a delova trupa III kategorije (potkolenica, podlaktica, vrat, grudi, rebra, poterbušina) u junadi grupe G2 (44,45%).

**Ključne reči:** Goveda, domaća simentalaska rasa, randman, unutrašnji organi, delovi trupa.

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