



Quality characteristics of the meat at some hybrid lines of chicken

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Abstract

The paper presents the results from the study of the participation of the internal organs in the mass of the body, bones from the basic parts of the body and the part of meat at the basic types of the body at hybrids Isa Brown and Hibrid Dekalb (g) and (%). For this purpose, 7 young chicken aged 14 – 16 weeks from the hybrid lines Isa Brown and 7 from the hybrid lines Dekalb.

First, a measuring was made for each chicken separately. After the slaughter and the primary manufacture of the hybrids, the internal organs of the chicken was measured, then separation of the meat from the bones and separate measure of the meat and bones of the hybrid lines. The biggest part within the mass of the body goes to the entrails which is 7.19% at the hybrid Isa Brown then the stomach 4.30%, liver 2.05 %. At the hybrid Dekalb the entrails took 9.77% from the total body mass, the stomach 3.66 % the liver 2.67%. At the hybrid Isa Brown the head participates in the total body mass with 5.62% legs with 4.54%, neck with 2.94 %. At the hybrid Dekalb the head participates at the total body mass with 6.53 %, legs with 3.99 %, neck with 2.80 %. The bones of the leg at the hybrid Isa Brown participate with 23.61%, of the total mass of the leg, the wing bones with 44.36 % and the breast bones with 27.40%. At the hybrid Dekalb the leg bones take 25.63% of the leg mass, the wing bones 44.76% and the breast bones 16.02%. At the hybrid Isa Brown compared to the hybrid Dekalb the participation of the meat in the leg mass is higher (63.07%). At the hybrid Dekalb the participation of the meat at the wing and breast is higher (29.74; 71.63) compared to the hybrid Isa Brown.

Key words: meat, bones, heart, liver



Introduction

Following the slaughter and the primary manufacture of the chicken under biochemical, physical and other changes which took place at the body of the chicken, the muscles turn into converged part called meat. Chicken meat is categorized into three quality categories, with the first category meat breast, thigh and drumstick, the second category wings, and in the third category the coat and the pelvis (Figure 1). The most important part of the poultry meat is skeletal muscle, which is, by and large, the most prevalent. (Rede 1985; Vasilev and Kitanovski 2005; Todorovski 2015) The basic indicator for the quantity of meat obtained is the *randman*. It is the *randman* of the manufactured body and the net mass of the animal before slaughter. The slaughter mass is the mass of the manufactured body and the consumable parts (other products in the meat industry) which indicate the meat in the wider sense.

The *randman* is calculated according to the formula:

$$R = \frac{\text{Slaughter mass}}{\text{Net mass}} \times 100$$

The *randman* at chicken depends on many factors. It depends on the type, the age, the fat and the types of manufacture of the slaughtered chicken. The *randman* differentiates at various types of chicken. The age and obesity of chicken influence the *randman*. The young chicken always gives a better *randman* as well as the more obese chicken. The manufacture process also influences the *randman*. Petrićević et al., (2011) made a research on the influence of the genotype over the product slaughter characteristics of broiler chicken and determined better slaughter results at the both types of Cobb 500. Higher values in the breast were found at Cobb while the largest size of legs was found at the hybrid Ross.

The internal body parts influence the total body mass of the chicken. Numerous genetic factors (breed) and para genetic factors (nutrition, length of fattening, net mass before slaughter, and mass of the manufactured bodies).

The objective of our research is to examine the *randman*, the part of the internal organs in the body mass, the weight of the bones in the basic body parts and the part of meat in the basic body parts at young chickens hybrids Isa Brown and Hybrid Dekalb.

Material and method of work

As a test material, 7 young chicken were taken of the Isa Brown hybrid line and 7 young chicken from the hybrid Dekalb. Aged 14 - 16 weeks

Both hybrids are purchased as one-day chicks and are grown in a henhouse farm on the floor. The chicken are grown on sawdust, fed controlled according to the recommendations of manufacturers of hybrid lines with hanging feeders whose height is regulated by the growth of the chicken. During the breeding, the chickens receive all vaccines on the recommendation of the veterinary institute. Both hybrids at the age of 14 - 16 weeks. The chickens were brought from a farm in Kriva Palanka in cardboard boxes with openings for ventilation, a special truck for poultry transport and a document that was examined by a veterinary doctor - inspector (health certificate). The slaughtering and primary processing of the chicken was done according to all sanitary veterinary regulations. Before slaughter, the young chicken were subjected to an 8 hour fasting. After slaughtering and primary treatment, the hull of the basic parts was carried out (wings, digs, hooves, breasts and back). The breasts are part of the body that is obtained by a cut that starts above the neck of the cartilaginous part of the sternum and continues in the area where the armpit and chest ribs are merged in the direction of the shoulder joint. The wings were obtained by a cut in the area of the joint surfaces of the shoulders and the karacoid bone. The copper and the dump are obtained by a cut that begins under the digging and continues in the direction of the pelvic wrist. In the area of the acetabulum, the solid tissue of the femur, or pelvic bone, was intersected. The cut is finished in the area of the pubic bone. The pelvic coat is obtained by separation from the pelvis hoof with the dock. Then, each of the basic parts was specially processed so that the skin, the chest and the, bone meat and each part were specially measured on a digital scale with an accuracy of 0,01 g were extracted from each part, in particular with a knife. The basic parts of the trunk according to the general criteria for classification and categorization of the meat are made according to the generally accepted criteria for cutting the carcasses of chickens. Then the meat was separated from the bones of all the young chickens of the two hybrids.

Statistical analysis

The obtained results from the measures were elaborated according to the usual statistical variations of the method ANOVA – EXCEL 1997-2003 considering the:

- Middle value
- Standard deviation



- Coefficient of variation

Seven young chickens from the Decalb (n = 7). hybrid and seven young chickens from the hybrid Issa Brown (n = 7). were used for the examination.

Results and discussion

The randman and the participation of the internal organs and the basic body types in the total body mass at both hybrids are given in Tables 1 and 2. From these Tables it can be seen that average net mass of hybrid Isa Brown 1465 g is 300 g higher than the average net mass of hybrid Dekalb, which is 1165 g. The difference in the slaughtered mass between the hybrids Dekalb and Isa Brown is 229 g, whereas the average slaughtered mass at Dekalb is 673,571 g, and at Isa Brown is 902,857 g. The randman at the hybrid Isa Brown is 61,47 %, at the hybrid Dekalb is 57,78 %..Todorovski (2015) found that the randman in the hybrid line Isa Brown is 49.80% and the hybrid Dekalb line 46.80%.The differences in the randman are due to the fact that Todorovski conducted an examination in chickens excluded from production due to the completion of the production cycle.And we conducted an examination in young chickens at the age to 14 – 16 weeks.

The higher participation in the body mass at the hybrid Dekalb goes to the heart 0.60%, the liver 2.67 % and the gizzard 3.66 % compared to the hybrid Isa Brown where the participation of the heart in the total body mass is 0.48%, the liver 2.05% and the gizzard 4.30%. Bogosavljević - Bošković et al.,(2004) Examined the slaughtering characteristics of male and female chickens 56 days from the hybrid Hybro G (two groups) old and found that the average heart weight in female chickens was 0.47%, and in male chickens 0.42%. Liver in male broilers 2.23% in females 2.03%. . Gizzard in male broilers 1.36% in females 1.19%(first group).Second group average heart weight in female chickens was 0.42% an in male chickens 0.50%.Liver in male broilers 2.29% in females 2.81%.Gizzard in male broilers 1.45% in females 1.34%.The differences in the results of our trials compared to the results of the above-mentioned authors are as a result of the fact that they examined broilers 56 days old and we young chickens aged 14-16 weeks. They were examining the hybrid Hybro G. And we have the hybrids Isa Brown and dekalb.

Table 3 gives the results of the research of the weight of bones in the basic body parts at hybrids Isa Brown and Dekalb .From the Table it can be seen that the highest part of the body mass goes to the

hoof bones at both hybrids (23.61% и 25.63%) where the higher weight is to the hoof bones of the hybrid DeKalb compared to the hoof bones of the hybrid Isa Brown. At the hybrid Isa Brown the smallest part of the bones of the hoof in the total hoof mass is (20.73%) at the hybrid De Kalb the smallest part of the breast bones in the total breast mass is (16.02%). Galović et al., (2009) state that the average weight of bones in the hooves is 20, 52 % and 10, 53 % at Ross 308 at the age of 4 - 6 weeks. According to (Kralik et al., 2012) the average weight of the hoof bones at Ross 308 at age of 42 days is 21,75 % while at the breast bones it is 11,76.

In Table 4 the results are given from the research of the participation of meat in the basic parts of the hybrids Isa Brown and Hybrid Dekalb .

At the hybrid Isa Brown the highest part of meat is in the hoof (63.07%) and the lowest (26.61%). At the hybrid DeKalb the highest part of meat is in the upper hoof (62.02%) the lowest in the wings (29.74%).Glamoclija (2013) state that the meat in the breasts at Cobb 42 - 55 days is approximately 72,05 %, in the hooves 65,57 % (Kralik et al., (2012) made a research of the hybrid Ross 308 at the age of 42 days and concluded that the average quantity of meat in the hooves is 65.88 % in the breasts 78,94 %. Galović et al., (2009) made a research of the hybrid Ross 308 at the age of 4 - 6 weeks and concluded that the meat in the hooves is present with 68,75 % while at the breasts 81,17 %.

Conclusion

From the above given it can be concluded that the highest part in the body mass from the internal organs of the chickens goes to the gizzard which at the hybrid Isa Brown is 4.30 % the liver 2.05 %., the heart 0.48% At the hybrid Dekalb 9.77%.from the total body mass goes to the gizzard, 3.66 % to the **liver** 2.67% and to the heart 0.60%. At the hybrid Isa Brown the head participates with 5.62% from the body mass, the legs 4.54%, the neck 2.94 %. At the hybrid De kalb the head participates with 6.53 % of the total body mass, the legs with 3.99 %, the neck 2.80 %. The bones and thigh of the hybrid Isa Brown take 23.61%, the wings bones 44.36 % and the breast bones 27.40%. At the hybrid Dekalb the thigh bones take 25.63%, the wings bones 44.76% and the breast bones 16.02%. At the hybrid Isa Brown compared to the hybrid Dekalb the participation of the meat in the drumstic is higher (63.07%). While at the hybrid Dekalb the participation of the meat in the wing bones and breasts is higher (29.74; 71.63) compared to the hybrid Isa Brown.

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Table 1. Participation of the internal organs in the body mass at hybrid Isa Brown

Indicator	\bar{x}	S	CV	Live weight %
Live weight	1468,714	248,095	16,892	
Mass slaughter	902,857	177,204	19,627	61,47
Head	82,571	15,819	19,158	5,62
Legs	66,714	9,981	14,961	4,54
Blood	29	4,659	16,068	1,97
Feathers	93,714	6,652	7,002	6,38
Heart	7	0,755	10,798	0,48
Liver	30,142	5816	19,297	2,05
Gizzard	63,142	13,249	20,983	4,30
Hoses	105,571	15,782	14,950	7,19
Kidneys	5,428	1,293	23,829	0,37



Lungs	11,571	3,063	26,478	0,79
Neck	43,142	8,339	19,330	2,94
Ovaries	10	4,503	45,039	0,68
Abdominal Fat	15,142	5,642	37,261	1,03

Table 2. Table 2. Participation of the internal organs in the body mass at hybrid Hibrid Dekalb

Indicator	\bar{x}	S	CV	Live weight %
Live weight	1165,71	79,654	6.833	
Mass slaughter	673,571	45,741	6,790	57,78
Head	76,142	12,240	16,076	6,53
Legs	46,571	2,821	6,057	3,99
Blood	23,285	3,880	16,666	1,99
Feathers	86,428	8,329	9,637	7,41
Heart	7	0,534	7,636	0,60
Liver	31,142	3,870	12,427	2,67
Gizzard	42,714	2,762	6,467	3,66
Hoses	114	11,389	9,990	9,77
Kidneys	6	2	33,333	0,51
Lungs	10,285	1,160	11,283	0,88
Neck	32,714	5,364	16,397	2,80
Ovaries	6,714	1,030	15,342	0,57
Abdominal fat	10,142	1,551	15,299	0,87



Table 3. Table 3. The weight of bones in the basic body parts at hybrids Isa Brown and Dekalb

Indicator	Isa Brown				Hibrid Dekalb			
	\bar{x}	S	CV	%	\bar{x}	S	CV	%
Thigh	73	12,094	16,568	23,61	50,57	3,368	6,642	25,63
Drumstic	32,285	5,443	16,860	20,73	22,428	2,770	12,350	23,01
Kerf	40,714	7,085	17,402	26,53	28,142	1,124	3,996	28,18
Wings	55,714	11,015	19,771	44,36	42,142	1,456	3,456	44,76
Breast	60,571	16,791	27,722	27,40	28,571	9,619	33,667	16,02
Coat	119,71	9,967	8,325	49,60	75,285	20,498	27,228	37,94

Table 4. Results from the research of the participation of meat in the basic parts of the hybrids Isa Brown and Hybrid Dekalb

indicator	Isa Brown				Hibrid Dekalb			
	\bar{x}	S	CV	%	\bar{x}	S	CV	%
Drumstic	194,99	33,627	17,359	63,07	116,714	19,248	16,491	59,11
Thigh	104,285	16,722	16,035	66,97	60,428	8,549	14,148	62,02
Kerf	90,714	14,868	16,390	59,12	56,285	10,872	19,316	56,36
Wings	33,428	3,110	9,304	26,61	28,00	3,251	11,612	29,74
Breast	140,428	21,225	15,114	63,53	127,714	12,769	9,998	71,63
Coat	74,571	35,696	47,868	30,90	63,00	18,110	28,747	31,75

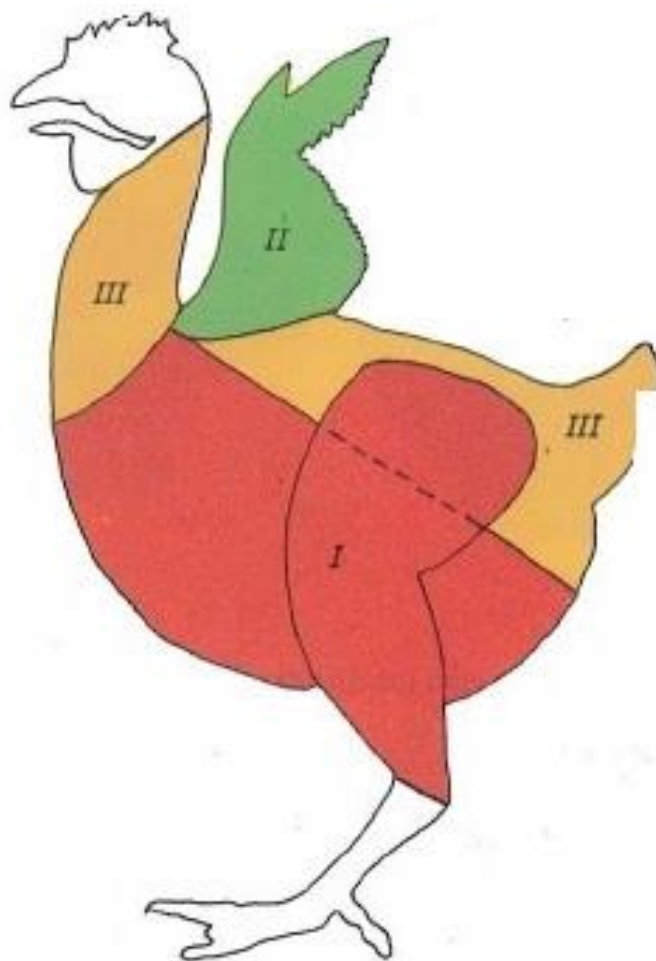


Figure 1. Categorization of meat chickens

I - category meat

II –category meat

III –category meat