The Analysis of the Caponizing Data of Native Hungarian Speckled Chickens

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Abstract
Because of the spread of intensive poultry varieties and hybrids the indigenous varieties become endangered. Our old species are not compatible with the modern ones and cannot keep up with the industry-like economical production. For this reason, we must endeavour to preserve our old species and to keep their important characteristics that can be utilized for breeding later. Beside the gene preservation, we endeavour to find the best way for the production-purpose utilisation of our speckled chicken stocks. The experiment was designed to revive an old traditional method, the caponizing, to produce special products with culinary curiosities. In capon production experiments, two-year slaughtered values were compared. As a result, we can say the Hungarian old speckled chicken varieties are suitable to produce special and marketable products.

Keywords: caponizing, genetic preservation, Speckled Hungarian Chicken, special products

1. Introduction

When keeping domestic animals for reproduction it has always been important to improve quality, therefore breeding has been in the focus since domestication. Growers' taste, market conditions, geographic and climatic environment have influenced the methods applied when creating new domestic species. These species, just as well as monuments, are human creations [1]. By saving biodiversity we mean not only saving individual species, but also keeping the whole ecosystem sustainable [2]. There has been a decline in the biodiversity of the breeding industry in the past 50 years, which led to the decrease of the species and varieties, creating species for only specific purposes.
Appearance of the industrial poultry breeding meant that the importance of native and indigenous species became less significant and therefore, their existence was at stake.

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Well-known researchers agree that it is not enough to ensure their survival, but we also have to redefine their economic usefulness in the new market environment [3].
Traditional species show less productivity compared to the modern, specialized species, however, in quality, they often exceed them. Also, they can be used in many different ways, having double or multiple uses [4]. Meeting the increased and varied consumer needs means that industrial poultry products are not anymore the sole focus of the breeding methods. There is an interest in the rare and endangered species as well [5].
Genetic conservation includes strategy, planning, policy-making and execution of all activities that enable animals to sustain their genetic materials and to participate in the agricultural and food productions in the long run [6].

2. Materials and methods

The indigenous speckled chicken stock was founded in the pilot farm of the Szeged University, Faculty of Agriculture in 1977. We

keep two varieties of the Hungarian speckled chicken, the feathered-neck variant and the naked-neck type. Beside the gene preservation, we endeavor to find the best way for the production-purpose utilization of the speckled hen stock.

The experiment was designed to revive an old traditional method, the caponizing, to produce special products with culinary curiosities. The experiment started in mid-July 2016 [7] that we repeated in 2017.

The repeated experiment started in July also. 40 cocks were used, of which 20 were castrated (10 feathered-neck and 10 naked neck variant) and 20 were in the control group (10-10 from both variants).

Before the castration, the cocks were put on a non-food diet for 24 hours in order to empty their intestines to allow better access to the testicles. The intervention was performed by a veterinarian. The animals were sedated with CP Ketamin 10%, taking effect within minutes after injection. Feathers were pulled off from the sternum and treated with iodine for disinfection. The cocks were tied and laid on their back. Next, a 2 cm incision was performed with a surgeon's knife on the disinfected area, penetrating through the skin and the peritoneum. Through this incision, with the index finger, along the abdominal wall, after reaching the vertebral column, the testicles were located and isolated. They were removed one by one from the abdomen. The intestines were put back into their original position. Before closing the wound with stitches, Betamox LA 150 mg/ml suspension antibiotics were administered in the abdominal cavity. The skin and the peritoneum were stitched together with absorbable materials and disinfected. After surgery, for five days, the capons were put on amoxicillin medication in order to avoid bacterial infection.

The animals were weighed individually once a week on a high-precision scale and their growth and development were recorded in gram. After the growth period, before Christmas, the animals were slaughtered using the traditional farm-method. Plucking was performed with a rubber-ended machine, followed by washing to remove all contamination. The animals were opened and cut, and all pieces were weighed individually.

An organoleptic test was performed after slaughtering. The breasts and legs were roasted in a roasting bag, with no spice. Upon tasting, the roasted pieces were compared. The tasting included: two pieces of breast and leg from cocks; two pieces of breast and leg from capons and two pieces of breast and leg from broiler chicken. The aspects examined in the tasting were the following: tenderness, crumbliness, springiness, taste, flavor, smell, juiciness (juice, grease), and overall impression. The tests were performed by 40 people, including teachers, students and staff from the university.

The data were recorded in computer and statistical analysis performed with Microsoft Excel and IBM SPSS Statistics 22 softwares. After analysis of the results, comparisons were made with previous experiment data.

3. Results and discussion

As shown in table 1, the initial average weight of feathered-neck animals was superior to the naked-neck animals, feathered-neck cocks exceeding the weight of feathered-neck capons by 126 grams upon initial weighing. This difference, however, decreased and stopped at 88 grams at the end of the testing period. As for the naked-neck variety, the initial weight of cocks was 234 grams superior to the capons with a difference of 280 grams at week 23 in favor of the capons.

Comparisons of the average weight of feathered-neck and naked-neck cocks show that the initial difference of 145 grams peaked at 449 g by the end of the test period. However, we will not see this same increase with the capons, since the initial difference in average weight of 254 grams between the fully feathered and the naked-neck variety decreased and stopped at 81 grams.

Compared to last year's experiments, we can say that the fattening results have been similar in the feathered-neck cock and capon groups, with a less significant difference, in the initial and final weight difference.

As for the weekly weight gain, it is shown that by week 2, the naked-neck capons showed the most significant weight gain with 266 g, followed by the feathered-neck capons with 190 g. An interesting observation in this year's experiment is the fact that there has not been any weight loss in the capon group after castration. This is explained by the stress suffered during the surgery and resulted in an average weight loss of 88,3 g of the capons. An average weight loss can be seen in the 2017 experiment in both the feathered-neck and

the naked-neck cock groups during the last period of the observation. The reason for this could be the stress due to competition and rivalry among the cocks, which affected the weight gain and the fattening results negatively. As for capons, only weight gain was recorded every week, however, with a decreasing intensity.

Table 1. Live weight measurements

Week	Feathered-neck capon		Naked neck capon		Feathered-neck rooster		Naked neck rooster	
	Average (g)	Deviation (g)	Average (g)	Deviation (g)	Average (g)	Deviation (g)	Average (g)	Deviation (g)
1	1401	214	1147	78	1527	202	1382	144
2	1591	222	1414	113	1638	216	1505	156
3	1753	218	1582	127	1764	219	1643	163
4	1809	216	1676	149	1855	222	1716	175
5	1862	218	1753	167	1926	226	1774	188
6	1969	233	1858	173	1988	233	1836	198
7	2082	241	2004	197	2092	230	1953	204
8	2174	245	2102	213	2171	243	2055	168
9	2248	251	2175	231	2234	254	2127	160
10	2299	249	2236	244	2324	261	2198	160
11	2363	252	2310	260	2433	272	2287	165
12	2421	259	2381	277	2541	278	2365	176
13	2496	283	2443	295	2617	297	2416	193
14	2543	299	2479	301	2681	282	2432	227
15	2592	313	2524	320	2692	300	2467	236
16	2627	315	2556	326	2747	301	2498	237
17	2666	312	2584	336	2812	306	2530	233
18	2703	316	2618	343	2877	315	2557	232
19	2729	325	2638	352	2932	326	2574	235
20	2771	328	2668	362	2953	347	2523	155
21	2797	323	2697	367	2970	356	2464	217
22	2832	336	2733	373	2982	395	2503	220
23	2841	332	2760	379	2929	447	2480	236

The initial weight gain of 110 g observed in cocks decreased to 100 g and fell below 70 g per week after week 13. Capons weight gain started at over 100 g per week and fell under 100 g from week 8, decreasing further from week 14 to under 50 g per week.

Table 2 shows the results of parts after weighing following slaughtering.

The most significant weight loss after plucking was recorded in the naked-neck capon group (315 g), whereas this weight loss was the least in the naked-neck cock group (253 g). The difference between the live weight and the cut and emptied body weight after slaughtering was the most in the feathered-neck capon group (542 g). Very similar results were observed in the feathered-neck cocks (540 g).

The naked-neck capons, cut and emptied, weighed 446 g less than their live weight and only 412 g less in the naked-neck cocks.

As for the meat parts, the feathered-neck cocks' legs were superior to feathered-neck capons' legs, but with a difference of only a few grams.

As for the boned breast yield, it was observed in all four groups that the average breast output is 17% of the live weight. The table shows that the two capon varieties produced significantly ($p<5\%$) more abdominal fat than the cocks. Feathered-

neck capons produced 4% of fat compared to their live weight, whereas the naked-neck variety 5%. Cocks gave 2% and 1% of fat, respectively.

Table 2. Slaughter yields

Body parts	Feathered-neck capon		Naked neck capon		Feathered-neck rooster		Naked neck rooster	
	Average (g)	Deviation (g)	Average (g)	Deviation (g)	Average (g)	Deviation (g)	Average (g)	Deviation (g)
Live weight	2841	332	2761	379	2929	447	2480	236
Carcass	2299	275	2315	471	2388	373	2068	204
Cutting loss	542	94	388	268	540	103	412	55
Breast	482	36	482	66	501	96	421	55
Thigh1	302	40	296	45	334	46	292	30
Thigh 2	289	38	299	48	337	51	289	31
Wing1	105	12	109	17	106	13	98	10
Wing2	108	15	109	17	107	14	98	7
Head	76	30	74	23	121	20	114	9
Feet	76	7	69	8	85	9	71	6
Heart	9	2	10	3	13	2	11	1
Neck	85	14	75	9	100	10	90	10
Testicles	0	0	0	0	22	4	20	5
Liver	34	13	30	4	31	4	31	4
Back-rump	401	39	411	58	366	102	367	46
Lungs	17	3	19	3	18	2	21	3
Gizzard	34	8	30	6	29	4	20	4
Spleen	7	9	4	1	7	13	3	1
Crest	10	16	9	11	36	8	36	6
Abdom. fat	113	77	139	85	70	65	28	35
Paring	152	40	153	260	107	27	58	8

When observing the heads after slaughtering, it can be seen that capons have a smaller head than cocks. This is explained by the under-development of the secondary sexual features, and capons developed a hen-like head due to the lack of male-hormone production.

In the feathered-neck groups in the second experiment the abdominal fat was the same in both cases (2%) in proportion to live weight, while capons produced slightly more (3%) compared to previous results. Boned breast yield showed similar results in both experiments and was 17% of proportion to live weight. As for the thighs, we can conclude that there was no difference between the two experiments with a better yield in the cock group like in capon group.

The organoleptic observations showed that in case of legs, 53% of the testers preferred the broiler variety in matters of softness and crumbliness. This corresponds to reality, since broiler chickens have a higher content of water, which makes the meat tenderer. However, 40% thought that capons were the most tender, which can be explained by the fat stored in the muscles. The experiment also proved that cock is an excellent meat to roast, with 12% of testers choosing it to be the tenderest.

For taste and flavor, the capon took first with 63% of answers judging it the most flavorsome. The cock received 22% of the votes and surprisingly 15% chose the broiler chicken. This relatively high score for the latter group suggests that some prefer the flavors they are used to. As for juiciness, 73% voted for the capon to be the best, with only 7% for the cock.

For overall impressions, 68% chose the capon legs to be their favorite meat, 20% the chicken and 12% the cock legs.

For breast meat, the results were very similar.

4. Conclusions

The experiment was carried out with the expected results. Our aim was to see whether the traditional Hungarian poultry varieties are prone to produce high-quality poultry products. As a result, we can conclude our native chicken can produce quality products and that capons are better for roasting and that they do not produce inferior results of valuable parts compared to cocks.

Roasted capon will remain a special dish of the Christmas menu.

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