

Caponizing as an Old-New Possibility in Indigenous Chicken Products

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Abstract

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. Because of the spread of intensive poultry keeping the population of this species has become endangered. Hungarian preservation programs supporting ecological-biological farming that began in the last two decades placed the domestically bred birds in the forefront both as purebreds and as candidates in projects for developing merchandisable organic-poultry. Beside the gene preservation, we endeavour to find the best way for the production-purpose utilisation 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 Old Speckled varieties are examined whether they are suitable to produce such products.

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

1. Introduction

People with indigenous poultry thought about the end of the year festivities months before. Around May, some of the young cocks were castrated and became fat, ready to be roasted capons by the end of the year.

Stromberg [1] reported the technique of surgical caponization is old with records indicating that it was performed more than 2,000 years ago.

Capons were considered in the past as a gastronomic delicacy, since when roasted, they have a richer flavour than chicken or cock meat. Cockerels surgically caponized at 4 weeks of age and processed at 11 weeks of age weighed less and had poorer feed efficiency than intact male chickens, although the capons consistently received higher scores for juiciness, tenderness and flavour [2].

Chen et al. [3] wrote that the major factors considered to affect capon body weight include age at caponization, age at slaughter, species or strain and nutrition level.

The major factors considered to affect muscle physical characteristic according to other studies include muscle composition, age at slaughter, aging time, rigor conditions, heating method, post-mortem deboning time and the techniques of operation [4].

According to our observations aggression has already occurred in 10-week-old cocks.

Gan [5] reported that chicken cockerels had significantly higher aggression and mount-bite behaviour than those in female birds after 7 weeks of age, which led to decreased feed intake and weight gain (

Lin [6] wrote that significantly less aggression, feather pecking and sexual behaviour were observed in the capons than in the intact birds after 13 weeks of age, feather integrity and weight gain were thereby increased

Nowadays, this tradition is fading away and capon meat is rarely found in Hungary. The traditional

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Hungarian poultry breeds are far less productive than the modern hybrids, therefore, it is necessary to produce low-cost products that are easily sold.

2. Materials and methods

The Szeged University Faculty of Agriculture Pilot-farm has the most significant indigenous speckled chicken breed and its aim is to preserve this varieties and to protect theirs genetic material. In addition, we are attempting to produce products made from traditional chickens.

As an experiment, some cocks were castrated in 2016 in order to assess whether it would be possible to gain good quality, fattened final products.

The experiment started in mid-July. 20 cocks were used, of which 10 were castrated and ten were in the control group. The castration was completed professionally, by a vet, as follows: after immobilization, an abdominal cut is performed and then stitched are applied and the area is sterilized.

The immobilization was done with CP-Ketamin 10% injection, as 0.3 ml per animal.

The two groups were kept separated to avoid aggression. They were fed with grain fodder, including corn, wheat and sunflower. The animals were fed ad libitum while being kept indoors but were allowed to use the outdoor enclosures freely. Slaughtering took place before Christmas.

The animals of both groups were weighed before, after slaughtering and after plucking. The eviscerated weight was recorded as well as each part after cutting. The data were computerized and evaluated by the SPSS software for Windows. Based on the results, tables and graphs were designs in Microsoft Excel.

3. Results and discussion

At the first stage of the experiment, we noticed a 170 g difference in the live animals' weight for the capons-to-be's favour. After growing, this difference dropped to 150 g. For both groups, the difference in weight was over 1100 g, without any significant difference (p<5%) between the two groups' results. The average loss after slaughtering was 118.4 g bigger in the capons group.

Table 1. Live weight measurements

| Week | Capon | | Rooster | |
|------|-------------|---------------|-------------|---------------|
| | Average (g) | Deviation (g) | Average (g) | Deviation (g) |
| 1 | 1770.7 | 287.3 | 1601.4 | 172.4 |
| 2 | 1682.3 | 379.5 | 1823.8 | 252.1 |
| 3 | 1902.8 | 332.6 | 1976.4 | 254.3 |
| 4 | 1935.2 | 233.6 | 2017.2 | 297.2 |
| 5 | 2023.6 | 179.3 | 2092.6 | 275.1 |
| 6 | 2067.2 | 226.2 | 2109.8 | 282.2 |
| 7 | 2071.2 | 195.2 | 2121.6 | 275.6 |
| 8 | 2168.4 | 217.8 | 2236.0 | 289.2 |
| 9 | 2270.0 | 231.0 | 2298.2 | 279.1 |
| 10 | 2315.2 | 235.8 | 2364.0 | 292.8 |
| 11 | 2422.8 | 275.6 | 2480.2 | 311.4 |
| 12 | 2490.4 | 280.6 | 2593.8 | 338.4 |
| 13 | 2547.6 | 267.9 | 2643.8 | 356.4 |
| 14 | 2614.4 | 276.6 | 2677.3 | 357.7 |
| 15 | 2688.0 | 303.5 | 2713.8 | 361.0 |
| 16 | 2755.2 | 299.2 | 2739.8 | 361.8 |
| 17 | 2843.2 | 294.7 | 2775.0 | 363.8 |
| 18 | 2832.4 | 303.6 | 2775.8 | 365.3 |
| 19 | 2819.6 | 322.3 | 2752.4 | 371.9 |
| 20 | 2941.8 | 302.5 | 2792.1 | 358.5 |

The Figure 1 shows that compared to the initial weight, the capons showed a 88.3 g loss after the

first week, which was due to the castration stress and the fact that they practically did not feed for a

few days after the castration. There was a significant difference ($p < 5\%$) in the weight of the animals (379.5 g). After recovery, they made an important progress of 220.5 g. In the next stage, they made a progress of under 100 g per week, except for week 9 and 11 when the progress exceeded 100 g. Upon winter, the groups were relocated and due to the stress, the bad weather and the poorer quality of the feed (offal wheat)

this resulted in an average weight loss from week 18.

In the breeding stable where the experimental groups were placed, the stock was moved. In the beginning of December, changes were made in the conditions the poultry were kept by regrouping them and preparing for the egg-laying period. Therefore, and due to a lack of space, the two groups had to be kept together.

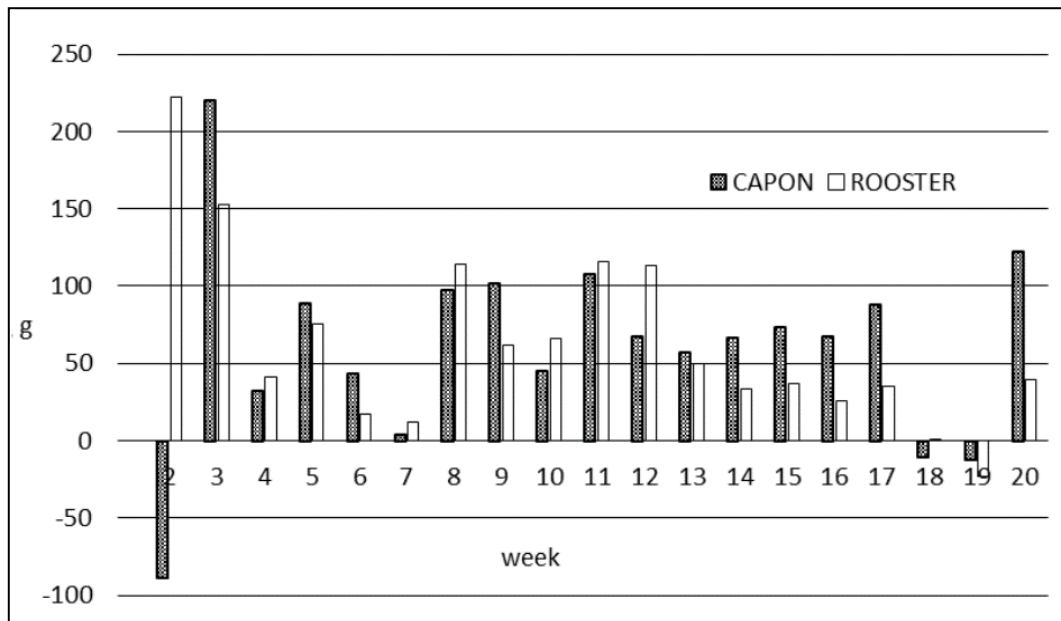


Figure 1. Weekly weight gain

After the growing period, they animals were slaughtered and were cut into pieces using the traditional slaughtered method.

As shown in Table 2. the higher live weight resulted in a higher carcass weight, but no significant difference ($p < 5\%$) was found between the average carcasses of the capons and cocks. The two main products of chicken production are breast and thighs, besides these, wings and offal are those products that can be sold at favourable prices.

The breast production of capons was also 35.7 g bigger, but this is not a significant difference ($p < 5\%$). Both groups produced thighs over 300 g each without a significant difference ($p < 5\%$) between the two groups. We also found no significant differences ($p < 5\%$) between the average weights of the wings.

As for the heads and knowing that castration provokes a phenotype-change with capons, they were on average 25.6 g heavier in the control

group, which shows a significant difference. The comb was less developed in the capon group, with an average weight of 19.3g less compared to the cocks (Table 2.). There was no significant difference ($p < 5\%$) in the state of the heart, liver and splenic, with an average weight bigger in the control group for the heart and liver, but smaller for the splenic.

As for the gizzard, there was a significant difference ($p < 5\%$) in the capon group with a 7.8 g bigger weight.

Due to the castration, fat accumulates between the muscle fibres and in the abdomen. Upon examination of the abdominal fat, there is a significant difference between capons and cocks, with a 34.9 g more fat deposit in the capon group. This result is corresponding with Cason at al. (1988) comment, who wrote, meat of capons was already in the past appreciated type of meat. The capon meat is known to be tender, juicy and tasty.

These characteristics are result of higher content of intramuscular fat as well as greater deposition

of subcutaneous fat and in abdominal cavity in capons compared to pullets and cockerels.

Table 2. Slaughter yields

| Body parts | Capon | | Rooster | |
|---------------|-------------|---------------|-------------|---------------|
| | Average (g) | Deviation (g) | Average (g) | Deviation (g) |
| Live weight | 2941.8 | 302.5 | 2792.1 | 358.5 |
| Carcass | 2471.8 | 273.6 | 2440.5 | 311.4 |
| Breast | 506.6 | 34.5 | 470.9 | 61.2 |
| Thigh1 | 317.2 | 38.1 | 322.6 | 43.5 |
| Thigh 2 | 319.6 | 37.1 | 325.0 | 42.9 |
| Wing1 | 107.4 | 8.5 | 110.6 | 14.4 |
| Wing2 | 111.6 | 6.6 | 108.9 | 16.0 |
| Head | 118.2 | 36.0 | 143.8 | 35.4 |
| Feet | 84.8 | 12.5 | 80.8 | 13.1 |
| Heart | 11.8 | 2.4 | 13.8 | 3.3 |
| Neck | 194.4 | 23.7 | 204.1 | 39.6 |
| Testicles | 0.0 | 0.0 | 15.9 | 3.8 |
| Liver | 34.6 | 3.8 | 35.5 | 8.4 |
| Back-rump | 413.8 | 57.1 | 391.5 | 60.8 |
| Lungs | 15.6 | 3.4 | 18.3 | 3.1 |
| Gizzard | 37.4 | 8.6 | 29.6 | 4.2 |
| Spleen | 3.6 | 1.1 | 3.1 | 1.1 |
| Comb | 32.0 | 19.1 | 51.3 | 20.8 |
| Abdominal fat | 87.8 | 61.9 | 52.9 | 35.4 |

The inter-muscular fat was not measurable, but it was visible that this fat was clearer and the meat was fatter, which is why this meat is a delicacy.

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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