

COMPARATIVE STUDY REGARDING THE AGING INFLUENCE UPON THE QUALITY OF PIGEON AND TURKEY MEAT

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Abstract

The experiments lead on the three types of meat respectively from a 3 weeks pigeon, 6 weeks pigeon and 8 weeks pigeon have underlined the fact that there are differences between the three types according to the age, gender and species. The analyses made on the two types of meat, young turkey meat and grown-up turkey meat respectively, pointed out that there are differences between them depending on age. In turkeys meat represents the main production. It consists both of muscular mass and skin. Their most developed muscles are the pectoral ones, followed by the haunch and shank ones. Fat depositing capacity in turkey broiler is influenced by more factors such as: breed, fodder quality and quantity, husbandry system, environment temperature, age and sex. According to the data obtained, the ammonia content is below the limit admitted by specialized literature, turkey meat complying with the quality organoleptical requirements in view of consumption. As a result of the experiment it has been noticed the fact that the pigeon meat can be consumed without any restrictions because it is one of the best meats from the compositional point of view having a low fat content and being very dietetic.

Key words: pigeon, turkey meat, age, quality

INTRODUCTION

The raising of meat pigeons in some countries such as USA, France, Hungary represents a highly appreciated and of great perspective work for to obtain specimens whose meat has a great nutritional value. Nowadays when for the mankind the consumption of heavy, fat meats became health threatening the place of these products has gradually been taken by the meat rich in proteins, low in lipids, fine structured, easily digestible such as the poultry meat. A high place is occupied by the pigeon meat that is very tasty and has a high biological value.[6] The pigeon meat represents not only a dietetic meat (recommended for post operatory diets or in general for the clinical cases that require a special diet) but also a significant economical production with a high proteic level, low fat quantity and highly digestible.[6]

If the edible parts of the fattened pigeons surpasses 70% that signifies that it becomes tastier. After the stuffing even the meat of the old pigeons can be easily fried or boiled. The

body weight increases along with their ageing reaching the levels specific for the species only when the proper conditions are ensured for the pigeons. If the young pigeons are butchered before 8 weeks their dry meat level will be higher and the ratio meat/ bones lower. That is the explanation for the cases when even if the same raising conditions are applied there have been noticed big differences for pigeons of different ages these facts being comparable with the human cases when some people have more obvious fattening tendencies than others.

Grown-up turkeys do not need warmed shelters; they can be bred in husbandries outside in coops. Still mention should be made that the environment temperature influences fodder consumption and meat production implicitly. [3]

In intensive breeding system farms, of large effectives, turkeys are looked after only in permanent bedding shelters equipped with automatic feeding, watering, lighting and airing systems. Grown-up turkeys are fed

depending on their reproduction season and rest period. [3]

Turkeys' and turkey hens' carcass quality is appreciated depending on weight, fattening condition and skin colour. For the first quality, depending on age and breed, the weight should be of minimum 3 kg for females and 3.5 kg for males, the fat layer should be thin, uniformly distributed on breast, back and tail, and the skin should be white-yellowish and downless. Pectoral muscles have a higher content of proteins and lower of fats, of 1-4 % as compared to other muscles. [4]. From the quantity and quality point of view meat production is influenced by breed, sex, age, plumage covering rate, breeding, treatments undergone, etc. 20 weeks is the most suitable age for turkeys to be turned to account, since more than 50% of their carcass weight consists of breast and legs, and meat is of high quality. At 30 weeks, heavy breed females reach a weight of 10-11 kg, while males of 20-22 kg.

MATERIAL AND METHOD

The meat represents a basic diet source in the human diet. Due to its balanced chemical composition in substances with high biological value (complete proteins, fats, mineral substances and vitamins), its high digestibility and dietary potential the meat represents a vital product for the human diet. [7].

The poultry meat can be of white colour (the breast) and of red colour (the legs). In order to establish the colour of the chicken breast there is a standard scale for its quality appreciation and usually for this it's used a chromatometre Minolta CR300.[2]

Regarding the physical traits of meat a special interest is given by the strength of the muscle fiber, strength that can be appreciated with the equipment Warner-Bratzler, equipment which allows the testing for resistance at the cutting of the muscle.

The capacity of fat deposition at broiler is influenced by various factors such as: the species, fodder quality and quantity, the system of raising, the environmental temperature, the age, the gender etc.[5]

In the case of individuals with a rapid growth rate there has been noticed an intensification of internal fat deposition this intensity starting decreasing after the age of 19 days when the muscle mass formation starts to intensify. The thickness of the fat layer on the two extremes of the abdomen is different but there are direct links between the sum of the extremes and the abdomen fat quantity, fact that allows the applying of the selection for to reduce the fat quantity of the shell.

The determination of the fat content. The Soxhlet method. (SR ISO1444/2008)

The principle of the method. The fat from the experimental sample is extracted until dry with organic solvents and after the extraction solvent's removal it is weighed and expressed percent. For to ensure the complete extraction, the sample undergoes firstly a moderate thermal treatment through which the destruction of the fat cells membrane is achieved.

In the case of the turkey meat building up and fat depositing capacity varies significantly with breeds, still there are differences between them. Thus, under the same breeding conditions, there are great differences in breeds, for example, there are individuals which fattening tendency is more obvious than in others. Fat depositing capacity in turkey broiler is influenced by more factors such as: breed, fodder quality and quantity, husbandry system, environment temperature, age and sex.

The determination of the total mineral substances (ash) (SR ISO 928/2007)

The meat is a rich source of mineral substances such as: iron, sodium, potassium. Calcium is to be found in meat in lower quantities. The phosphorus, sulfur and chlorine are also to be found in high quantities fact due to which the meat is acidified. The other mineral substances: cobalt, aluminum, cooper, manganese, zinc, magnesium are to be found in low quantities but they play an important role for the human and animal body.

The principle of the method.

The total mineral substances (ash) represent the residue obtained after the

sample's burning at $525 \pm 25^{\circ}\text{C}$ until it reaches a constant weight.

For the turkey it was used the easily hydrolysable nitrogen determination (SR ISO 937/2007)

Principle. Easily hydrolysable nitrogen under the form of ammonia is determined by releasing it by the help of a weak base, water steam drawing and capturing in an acid solution which is titrated by a sodium hydroxide solution.

RESULTS AND DISCUSSION

An increase of internal fat deposits was noticed at high rate breeding individuals which pace decreases at the age of 19 days when muscular mass build-up takes place. Fat layer thickness on the abdomen extremes differs; there are direct correlations between the average of extremes and abdomen fat quantity, fact which allows selection to be applied in order to reduce the fat quantity in the carcass. In the case of samples with organoleptical modifications on which fresh analyses are made only (determination of easily hydrolysable nitrogen, identification of hydrogen sulphide, etc), the modified portions are processed. The analyses made on the two types of meat, young turkey and grown-up turkey, pointed out that there are differences between them depending on age.

In both cases the turkeys were bred in extensive (husbandry) system. The feeding of the two types of turkeys was made by both cereal mixture and corn flour. Vitamins and antibiotics were not used in their feeding. The breed to be tested was the common one. Husbandry system allows pasturing which is very good for turkeys' healthy and vigorous breeding. The young turkey is 49 days, while the grown-up is 84 days. Naturally, the meat quantity obtained depends on the poultry species referred to; for eg. In the case of turkey and goose there can be obtained weights of 18-20kg, at chicken and ducks weights of 2-5kg and at pigeons weights of 0.8-1.2kg. There are also differences between species regarding the efficiency value at the butchering and regarding the quality of meat.

The capacity of meat formation and fat disposal in tissues varies significantly

between species but with differences even within the same species. Due to this fact, in the same raising conditions there have been noticed big differences between the species, differences similar to those that exist for the human race.[2]

The fat content of the experimental sample, calculated percent can be found by applying the following formula:

$$\text{Fat \%} = \frac{m}{m_1} \cdot 100 ; \text{ in which: } m = \text{the}$$

quantity of extracted fat, in g. This can be deduced from the difference between the weigh of the extracted fat balloon after drying and the weight of the empty balloon (the scale). m_1 = the quantity of the experimental for to determine the fat content there have been taken for the experimental study 3 samples of pigeon meat as it follows:

- The fat content for a 3 weeks pigeon (P1)

$$\text{Fat \%} = \frac{m}{m_1} \cdot 100 = \frac{0.05}{5} \cdot 100 = 1,0$$

- The fat content for a 6 weeks pigeon (P2):

$$\text{Fat \%} = \frac{m}{m_1} \cdot 100 = \frac{0.10}{5} \cdot 100 = 2,0$$

- The fat content for a 8 weeks pigeon (P3):

$$\text{Fat \%} = \frac{m}{m_1} \cdot 100 = \frac{0.12}{5} \cdot 100 = 2.4$$

The fat content from the meat play an important role in the defining of its characteristics.

In the experiments lead on the three types of meat we observed a relatively lower fat content in comparison with other poultry species. This content varies according to the age of the pigeon starting with 1.0% at the age of three weeks and arriving at 2.4% at the age of 8 weeks.

The determination of the total mineral substances (ash)

- The ash content at a pigeon of 3 weeks (P1)

$$\text{The ash content} = 15 - 10.599 = 4.401\text{g}$$

- The ash content at a pigeon of 6 weeks (P2)

$$\text{The ash content} = 15 - 10.597 = 4.403\text{g}$$

- The ash content at a pigeon of 8 weeks (P3)

$$\text{The ash content} = 15 - 10.595 = 4.405\text{g}$$

Fig.1.The evolution of the fat content

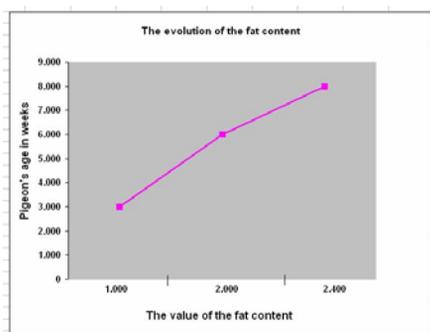
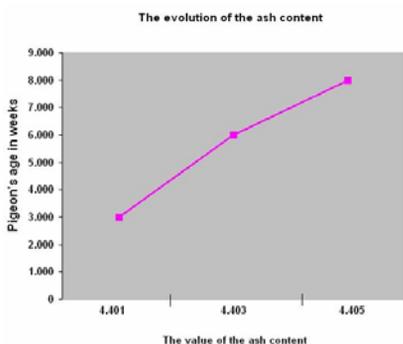


Fig.2. The evolution of the ash content



Easily hydrolysable nitrogen

$$= \frac{0,0017(V_1 - V_2)}{m} \cdot 100(\text{mg} / 100\text{gr})$$

Where:

0.0017= ammonia quantity in g corresponding to 1 cm³ of sulphuric acid 0.1 n

V₁= sulphuric acid volume 0.1μ introduced into collecting container in cm³

V₂= sodium hydroxide solution volume used at titration in cm³

m= product mass to be determined in grams

Easily hydrolysable nitrogen determination of young turkey meat:

Easily hydrolysable

$$\text{nitrogen} = \frac{0,0017(V_1 - V_2)}{m} \cdot 100(\text{mg} / 100\text{gr})$$

$$= \frac{0,0017(15 - 14)}{5} \cdot 100 = 0,034$$

Easily hydrolysable nitrogen determination of grown-up turkey meat:

$$\text{Easily hydrolysable nitrogen} = \frac{0,0017(V_1 - V_2)}{m} \cdot 100(\text{mg} / 100\text{gr}) = \frac{0,0017(15 - 14.8)}{5} \cdot 100 = 0,068$$

Specialized literature considers that up to 20 mg ammonia/100 g muscular tissue the meat is fresh, whereas above 25 mg ammonia/100 g muscular tissue is at least in incipient alteration state. In the case of the determinations of easily hydrolysable N content, made on the two meat samples, it may be noticed that easily hydrolysable nitrogen differs depending on turkey age (0.034 mg in young turkey meat and 0.068 mg in grown-up turkey meat).

According to the data obtained, the ammonia content is below the limit admitted by specialized literature, turkey meat complying with the quality organoleptical requirements in view of consumption. Fat content is calculated correspondingly to the relation

$$\text{Fat}\% = \frac{m}{m_1} \cdot 100; \text{ where:}$$

m= extracted fat quantity in g. This results from the difference between the balloon weight with extracted fat after drying and the weight of the empty balloon (without)
m₁= product quantity to work with.

Fat content determination of young turkey meat:

$$\text{Fat}\% = \frac{m}{m_1} \cdot 100 = \frac{2}{5} \cdot 100 = 40 \text{ g}$$

Fat content determination of grown-up turkey meat:

$$\text{Fat}\% = \frac{m}{m_1} \cdot 100 = \frac{3}{5} \cdot 100 = 6\text{g}$$

Fat quantity in meat plays an important part in defining meat quality characteristics. Intramuscular fat influences meat taste, consistency and succulence.

After the experiments have been led both upon the pigeon and turkey meat comparison of the results obtained gave the following figures:

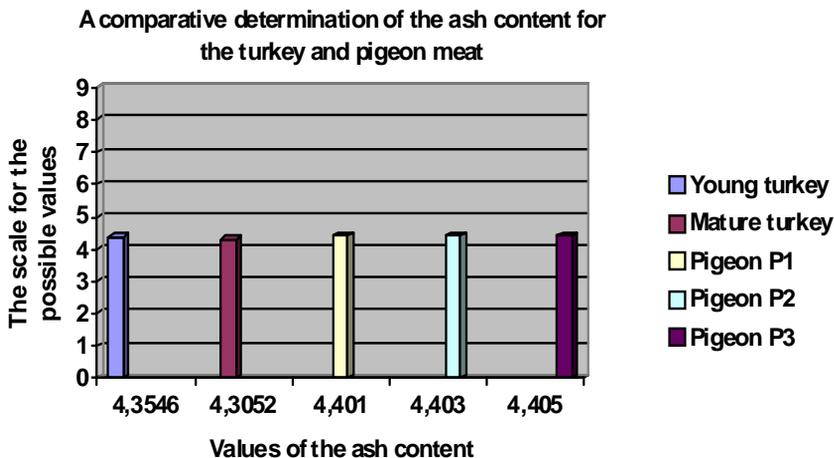


Fig. 3. A comparative determination of the ash content for the turkey and pigeon m

A comparative determination of the chemical composition and caloric value of the turkey and pigeon meat

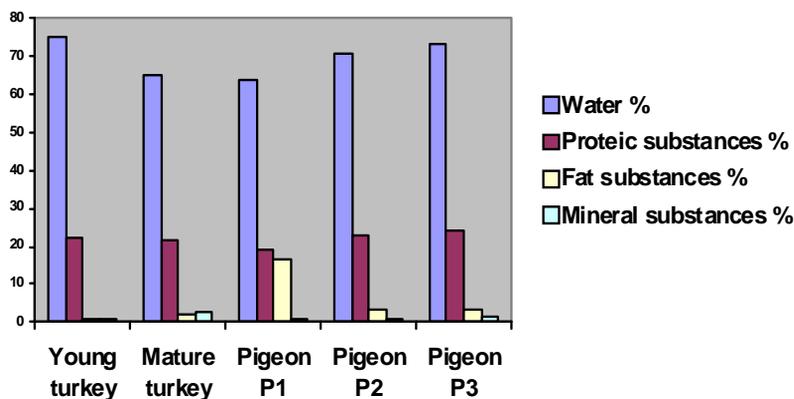


Fig. 4. A comparative determination of the chemical composition and caloric value of the turkey and pigeon meat

CONCLUSIONS

The meat represents the principal product obtained from this species of birds and due to its dietetic qualities it is recommended to persons of all ages. It has a high nutritional value a low fat content and a high digestibility being superior through its chemical composition to other types of meat from other species.

The consumers prefer the young pigeons (between 25-30 days old, when their weight is of approximately 400-500gr) these ones

having an excellent meat, easily digestible, very tasty and rich in nutrients. The maintenance in the farm of small meat pigeons older than a month from hatching is not profitable. The adult pigeons meat that can feed themselves is constituted by dry fibers of dark colour. In this case for the pigeon if we do not apply the stuff feeding it will not gain weight. As other poultry the pigeons can be fattened by stuff feeding the process resulting in the obtaining of a high quality meat almost equal to that of the

young pigeons. The meat of fattened pigeons has a bright yellow colour in comparison with the dark coloured meat of the slim pigeons.

The experiments lead on the three types of meat respectively from a 3 weeks pigeon, 6 weeks pigeon and 8 weeks pigeon have underlined the fact that there are differences between the three types according to the age, gender and species.

As a result of the experiment it has been noticed the fact that the pigeon meat can be consumed without any restrictions because it is one of the best meats from the compositional point of view having a low fat content and being very dietetic. It has low fat content and relative humidity.

The analyses made on the two types of meat, young turkey meat and grown-up turkey meat respectively, pointed out that there are differences between them depending on age. Specialized literature considers that up to 20 mg ammonia/100 g muscular tissue the meat is fresh, whereas above 25 mg ammonia/100 g muscular tissue is at least in incipient alteration state. We have noticed from the samples analyzed of the two types of meat that fat content increase depending on turkey age is lower (40g) in the young one than in the grown-up one (60g). In the case of the determinations of easily hydrolysable N content, made on

the two meat samples, it may be noticed that easily hydrolysable nitrogen differs depending on turkey age (0.034 mg in young turkey meat and 0.068 mg in grown-up turkey meat).

In the experiments lead on the three types of meat we observed a relatively lower fat content in comparison with other poultry species. This content varies according to the age of the pigeon starting with 1.0% at the age of three weeks and arriving at 2.4% at the age of 8 weeks.

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