S U M M A R Y

RESEARCH ON THE QUALITY OF MEAT BETWEEN DIFFERENT BIRD SPECIES AND DIFFERENT ANATOMICAL REGIONS

Ph.D student: COSTACHE Mihai

Scientific coordinator: *Professor, PhD.* VAN Ilie

KEYWORDS: Poultry meat, nutrients, nutritional quality, chemical composition, nutritional profile, commercial cuts

Poultry meat is a globally successful product due to popular preferences and the absence of associated religious taboos. The continuous development of breeding technologies and species characteristics (especially chicken) makes this a rapidly expanding industrial sector, with an excellent forecast for the next decade.

Specialized studies have shown that consumer preferences vary not only regarding the preparation method of poultry meat but also in the selection of species and parts purchased. These differences can be influenced by cultural reasons or the information available to consumers at the time of choice. Thus, consumer attitudes and perceptions are dynamic, adapting to industry changes.

Modern research on the chemical composition of poultry meat pays particular attention not only to the general evaluation of nutritional values but also to the comparison between different species and their commercial cuts. This approach not only contributes to a deeper understanding of the nutritional characteristics of poultry meat but also provides a solid basis for optimizing production processes and developing healthier and more nutritious food products.

The results obtained in this study varied from one species to another and from one analyzed portion to another, with interpretation considering a rich context of similar research but with a precise research direction. This study undertook an exhaustive analysis of the chemical composition of meat

from four different bird species important in the food industry, aiming to evaluate and compare the nutritional variations between them and between the two commercial parts of each species. This research contributes significantly not only to the scientific field but also to the poultry industry, providing essential data for optimizing production processes to ultimately achieve a high-quality food product.

The bird species investigated in this study included chicken (*Gallus gallus domesticus*), turkey (*Meleagris gallopavo*), duck (*Anas platyrhynchos domesticus*), and goose (*Anser anser domesticus*). Each species was represented by samples taken from the breast and thigh portions, without the presence of skin.

The research methodology included detailed chemical analyses, such as pH determination for acidity evaluation, total fat content quantification for lipid intake assessment, protein content determination for nutritional value assessment, water content measurement, and mineral content determination (total ash) for mineral composition evaluation. Additionally, the hydroxyproline content was quantitatively assessed to estimate collagen content, a crucial indicator of meat structural quality.

For a clearer presentation of the obtained values, a summary of the results will be listed below, considering the species and selected portion for analysis.

For chicken meat, the most common pH values for breast samples were around 5.6-6.00, similar to other specialized studies on the same portion. Thigh samples showed an average pH of 6.09, with a maximum of 6.8, showing similar values compared to other research.

Chicken meat has a low fat content, with a maximum fat content in the analyzed breast portions being 1.54%, slightly different from other studies, possibly due to modified parameters within the study. In the case of chicken thighs, the average fat content was 6.52%, differing compared to other studies or reference values, with possible differences influenced by genetic, nutritional, and environmental factors.

The protein percentage varied, reaching a maximum of 23.36% for breast portions, consistent with previous studies. Chicken thigh samples had an average protein content of approximately 20.16%, comparable to other research or reference food standards.

The water content of the analyzed samples averaged 75%, with values up to 75.25%, close to food standards. The water percentage in chicken thighs was also around 74.6%.

The average total ash percentage was 1.08%, similar to other studies for chicken breast, while for chicken thighs it was 0.89%. Also, the average collagen content was 0.39% for chicken breast and 0.53% for chicken thighs, with different values reportedin other studies in both cases.

For the analyzed turkey meat samples, the average pH value was 5.95, with a maximum of 6.61, similar to other specialized studies. The results for thighs also showed similar average values for pH, in line with the specialized literature.

The average fat content in turkey breast samples was 0.28%, a lower value compared to other similar studies. For thighs, the average fat content was 3.26%, with differences observed due to nutritional, genetic, and environmental variability.

The average protein percentage was 21.95% for turkey breast and 21.82% for thighs, consistent with other research in the specialized literature.

Regarding water content, turkey breast samples had an average of 75.64%, while for thighs it was 72.57%, presenting lower values compared to other similar studies.

The average total ash content was 1.15% for breast and 1.12% for thighs, values close to those reported in other similar research. Regarding collagen content, the results showed values of 0.24% for breast and 0.36% for thighs, with variations observed compared to those in the specialized literature.

Duck meat is becoming increasingly popular, especially in Asia, due to its value and accessibility in animal husbandry. Selected portions of duck meat were analyzed in this study, and the results are presented below.

Regarding pH, duck breast portions had an average value of 5.94, with a maximum value of 5.96, consistent with the values reported in the literature. For thighs, the average pH was 5.98, lower compared to other similar studies, which reported an average of 6.75 for the same species and portion.

The average fat content for duck breast was 5.33%, a higher value compared to other studies. For thighs, an average fat content of 28.04% was recorded, with variations attributed to hybrid and environmental or nutritional conditions.

The average protein percentage for duck breast was 22.53%, similar to other studies. In the case of thighs, the average percentage was 15.72%, lower compared to other research that reported values between 19% and 21.4%.

The water content was 70.77% for breast and 55.54% for thighs, lower values compared to other similar studies. Similarly, the average total ash

content was 1.24% for breast and 0.67% for thighs, with similar results compared to similar research. Additionally, the collagen content was 0.33% for breast and approximately 0.28% for thighs, lower results in this study compared to other authors.

Samples from goose meat, a species with distinct characteristics compared to the other selected species, were also collected and analyzed in this study, serving as a comparison point. Below are the results of the determinations on selected goose meat portions.

Regarding pH, goose breast portions recorded an average value of 5.88, with a maximum value of 6.09, similar to previous studies. For thighs, the average pH was 5.94, close to other research in the literature.

The average fat content for goose breast was 30.91%. The analysis included portions with attached skin, leading to significant differences compared to other studies. For thighs, the average fat content was 38.51%, well above the values reported in other similar research.

The determination of the protein percentage indicated an average content of 18.93% in goose breast, close to other studies but slightly lower than some reports. In thighs, the average protein content was 17.54%, lower compared to the research literature.

The average water content for goose breast was 52.5%, different from other studies reporting higher values. For thighs, the average water content was 43.57%, below previously reported values.

The average total ash content for goose breast was 0.84%, and for thighs, it was 0.64%, lower values compared to other research in the literature.

The collagen content for goose breast was 0.17%, with values close to those reported in other studies. In thighs, the average collagen content was 0.28%, lower compared to other similar studies.

The obtained results demonstrated significant differences between bird species regarding the chemical composition of meat. For example, turkey breast showed a higher protein content compared to the other analyzed species, while goose thigh portions had a higher total fat content. These findings highlight the importance of adapting production processes and nutritional practices according to the species to maximize the nutritional value and organoleptic characteristics of the meat.

Analyzing the variations in chemical composition between different anatomical portions of the same species, significant differences were found in terms of pH, total fat content, and water content. These results underscore the importance of separate evaluation of each portion for a comprehensive

understanding of the nutritional composition and for optimizing the use of meat in the food industry.

Statistical analyses confirmed the significance of the observed differences between species and commercial cuts, highlighting the complexity and variability of the nutritional composition of poultry meat. These findings are essential for guiding future research and developments in the field of poultry nutrition and food production, contributing to continuous innovation and improvement of food quality.

In addition to the scientific importance of the research, this study also brings important practical contributions, influencing decisions in the food industry. The obtained data can be used to optimize farm animal diets and improve food products intended for human consumption, ensuring better adaptation to market demands and consumer preferences.

In conclusion, this study provided a detailed perspective on the chemical composition of poultry meat, highlighting significant differences between species and anatomical portions. The obtained results represent a solid basis for future research in the poultry industry, aiming to promote healthy and sustainable eating and to meet the demands of increasingly informed and demanding consumers.

In the future, it is recommended to extend the research to include other economically important bird species and diversify the analysis methodologies for a deeper understanding of the chemical composition. Investigating fatty acids, vitamins, and other essential nutrients would complete the picture regarding the nutritional value of poultry meat, contributing to the development of healthier and more balanced food products.

These efforts continue to support progress in the global food industry, promoting innovation and sustainability in food production, and ensuring the healthy nutrition of the population in a responsible and efficient manner.