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THE STATE OF FISH MEAT QUALITY IN ROMANIA

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Abstract: Fish meat is well known for the high nutritional value based on total mineral content, proteins, essential amino acids, fatty acids, and valuable vitamins. This research paper aims to evaluate the differences between rainbow trout and trout (common name) as well as to compare the quality of fish meat available on the Romanian market, regarding nutritional value based on different databases and/or research papers. The study presents the importance of fish meat in the Romanian diet and to assess the quality of fish meat (mostly trout) and answers the question regarding the potential factors which might influence fish meat quality. The chemical composition of fish meat was analyzed based on water percent, protein, fat, dry matter, ash and minerals contents. Results were processed using MVSP and PAST software and highlight the importance of fish meat consumption and the beneficial effects on the consumers health.

Introduction

Rainbow trout (Oncorhynchus mykiss) is among the most frequently farmed species in the world, its easy to adapt to various environmental conditions and has a nutritional value. The term "trout" is a general name for multiple fish species within the Salmonidae family, while "rainbow trout" (Oncorhynchus mykiss) is a specific specie of trout. In most of the situations, the specific name of the trout is not specified. Fish meat has become an increasingly popular food among the population due to its nutritional benefits and versatility in gastronomy, standing out as an essential food in the diet due to its rich content in high quality proteins, Omega-3 essential fatty acids, vitamins and minerals (iodine, selenium, phosphorus). In contrast to red meat, which is associated with a higher risk of cardiovascular and metabolic diseases, fish helps maintain heart, brain and immune system health.

Material and method

Data on the chemical composition and mineral content of Rainbow Trout (Oncorhynchus mykiss) and Common Trout (Salmo trutta) were gathered from a variety of peer-reviewed scientific publications and recognized food composition databases. The selection of references was based on their scientific relevance, the Higher values of dry matter and fat content are observed for rainbow trout, moisture, ash and protein contents are higher for common trout. As regards the mineral profile, the highest values are observed for potassium, sodium and phosphorus, and rainbow trout has higher values than common trout.



Figure 3. Heatmap of Chemical Composition: Rainbow Trout vs Trout

completeness of the reported data, and the consistency of the methodologies employed. Whenever multiple studies reported values for the same parameter, all available data were collected and considered for further processing. To ensure a representative overview for each fish species, the recorded nutrient values were averaged. Measurements were standardized to common units (% or mg/100 g of muscle tissue) where necessary, enabling direct comparison across different sources. Parameters for which data were unavailable for a given species were noted and excluded from mean calculations. Averaging was performed manually using standard arithmetic methods.

To better illustrate interspecies differences, heatmaps and comparative bar charts were created. Microsoft Excel was used to create comparative bar charts, allowing for clear visualization of the averaged chemical composition parameters across species. The heatmap representations were generated with the assistance of AI-based tools (ChatGPT, OpenAI) under close human supervision, ensuring that the final figures accurately reflected the analyzed data.

The original literature and databases from which the data were derived are comprehensively cited in the References section. Each value presented in this study is traceable to its corresponding source.

• Results and discussions

The values of the chemical composition and mineral content of trout and rainbow trout as found in the specialized literature and in some databases are found in a table, and the following figures highlight these aspects.





Values represent mean compositions from multiple literature sources [1–16]. Color intensity reflects the concentration levels for each species. Data were averaged from referenced studies to ensure consistency. The color gradient reflects relative concentration levels across species, with warmer colors indicating higher amounts. Data were averaged to ensure comparability and visual clarity. This graphical representation highlights key nutritional variations relevant to species selection in human diets..

• Conclusions

The comparative analysis revealed clear nutritional differences between Rainbow Trout and Trout, in special regarding their mineral content and macronutrient profiles.

The use of averaged data from multiple sources, combined with visual tools such as heatmaps and bar charts, provided a comprehensive and intuitive comparison of nutrient content between species.

