



Comparative analysis of individual effects of different heat treatments of turkey leg

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Turkey meat is usually not eaten raw, so it's often heat-treated for easier consumption and increased enjoyment. In addition to heat treatment, the meat is subjected to various operations (e. g. size reduction operations). Size reduction operations include slicing, mincing and chopping of the raw materials.

In our work, we were looking for the answer to how the choice of shredding affects techno-functional properties and chemical components under different heat treatments. For this reason, cooking (75 °C, 30 min) and grilling (130 °C, 15 min) were used (Fig 1.) for meat (turkey upper thigh fillet) with different shreds (sliced, minced, chopped) (Fig 2.).

We measured weight losses, protein (with FOSS 2300 Kjeltec (Fig 3.) according to MSZ ISO 937:2002 standard), fat (with FOSS 2050 Soxtec Avanti (Fig 4.) according to MSZ ISO 1443:2002 standard), and moisture content (with Memmert UNB 200 (Fig 5.) according to MSZ ISO 1442:2002 standard) and calculated nutritional value.

In our studies, we concluded (Fig 6.) that minced meat had the lowest cooking loss (9.67%), like chopped meat (9.76%). The largest cooking loss was for sliced meat (12.05%). With these cooking loss results; the grilling loss was inversely proportional (Fig 6.). After all, the largest was for minced meat (32.04%), followed by the chopped meat in 30.07%, while the smallest loss occurred for sliced meat (28.91%). The moisture content of the starting raw meat was 72.27%, which decreased the most for sliced meat during cooking, while it was lowest for chopped meat as a result of grilling (Fig 7.). The fat content of raw turkey upper thigh fillet showed 4.54%. This value also increased with cooking and grilling. In the case of cooking, it increased the most with sliced meat, more than 3.93%, the same was also observed during grilling (Fig 8.). In this case, too, the fat content of sliced meat increased the most (by 3.59%). As a result of grilling and cooking, an increase in the initial protein content (19.02%) was also observed. As a result of cooking, it increased to 20.51% for chopped meat, 20.31% for sliced meat, and 20.13% for minced meat. As a result of grilling, the protein content of the chopped meat increased the most, to 26.95% (Fig 9.). While this value showed an increase of 6.47% for sliced meat and an increase of 7.39% for minced meat. The nutritional value of the starting raw meat was 491,12 kJ, which increased the most for sliced meat during grilling, while it was lowest for chopped meat as a result of cooking (Fig 10.).

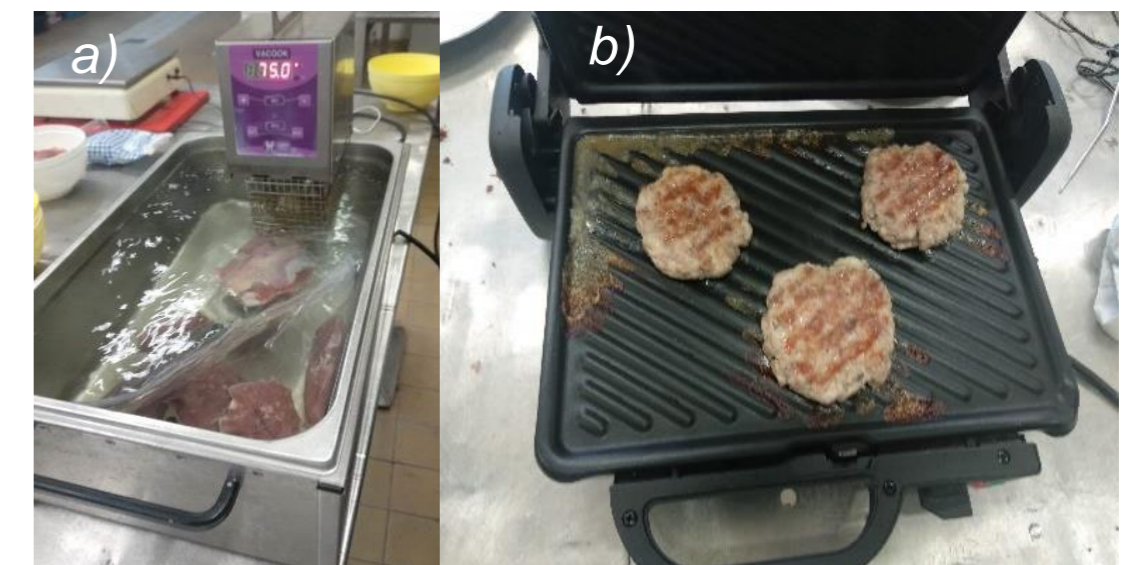


Figure 1. Heat treatment methods – a) cooking and b) grilling.

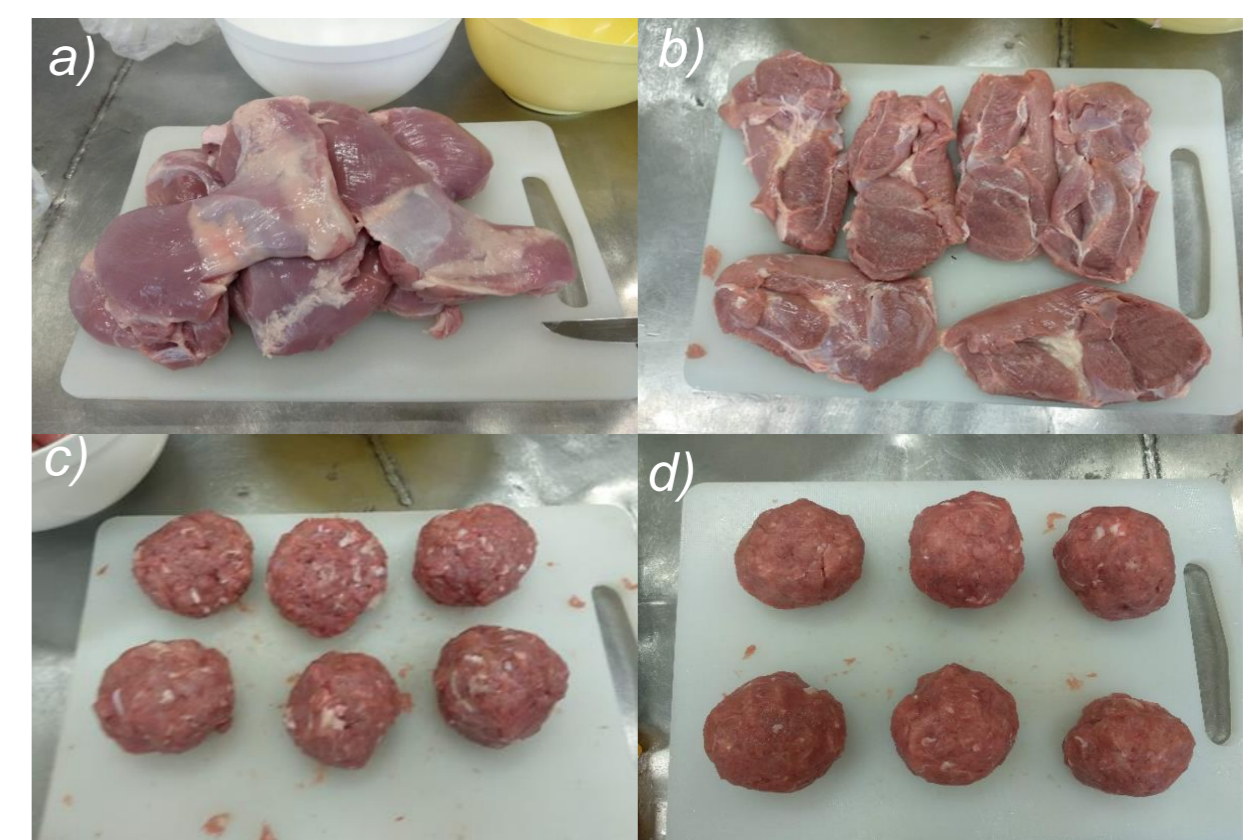


Figure 2. a) Raw material (turkey upper thigh fillet), b) sliced meat, c) minced meat, d) chopped meat.



Figure 3. FOSS 2300 Kjeltec.



Figure 4. FOSS 2050 Soxtec Avanti.



Figure 5. Memmert UNB 200.



Figure 6. Cooking and grilling losses of samples.

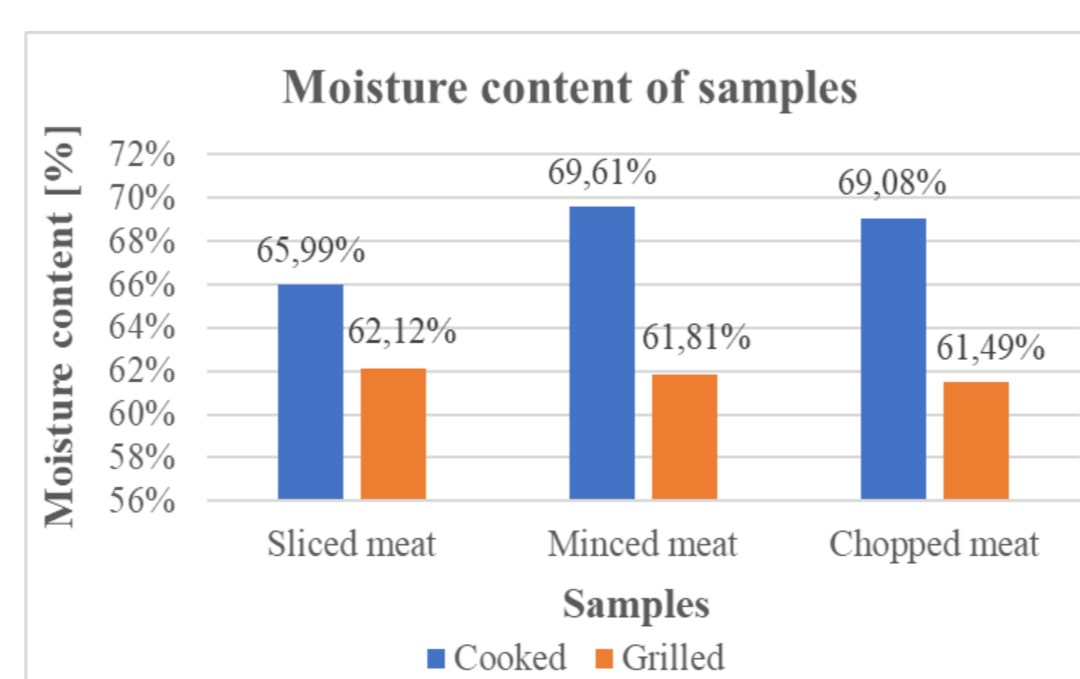


Figure 7. Moisture content of samples.

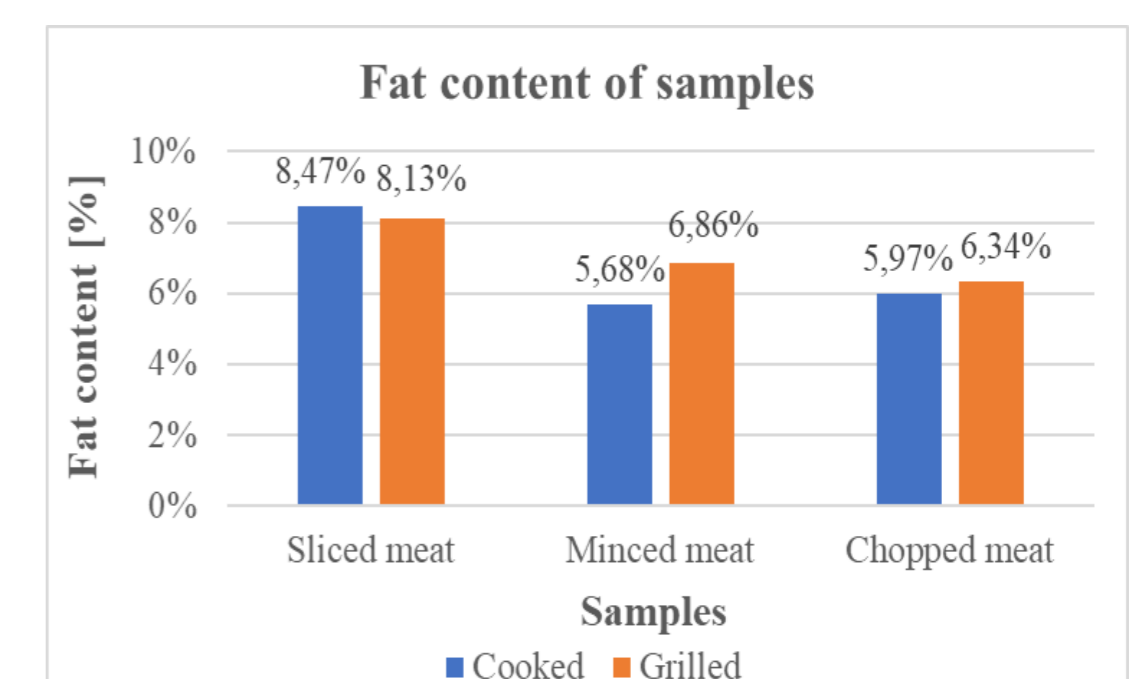


Figure 8. Fat content of samples.

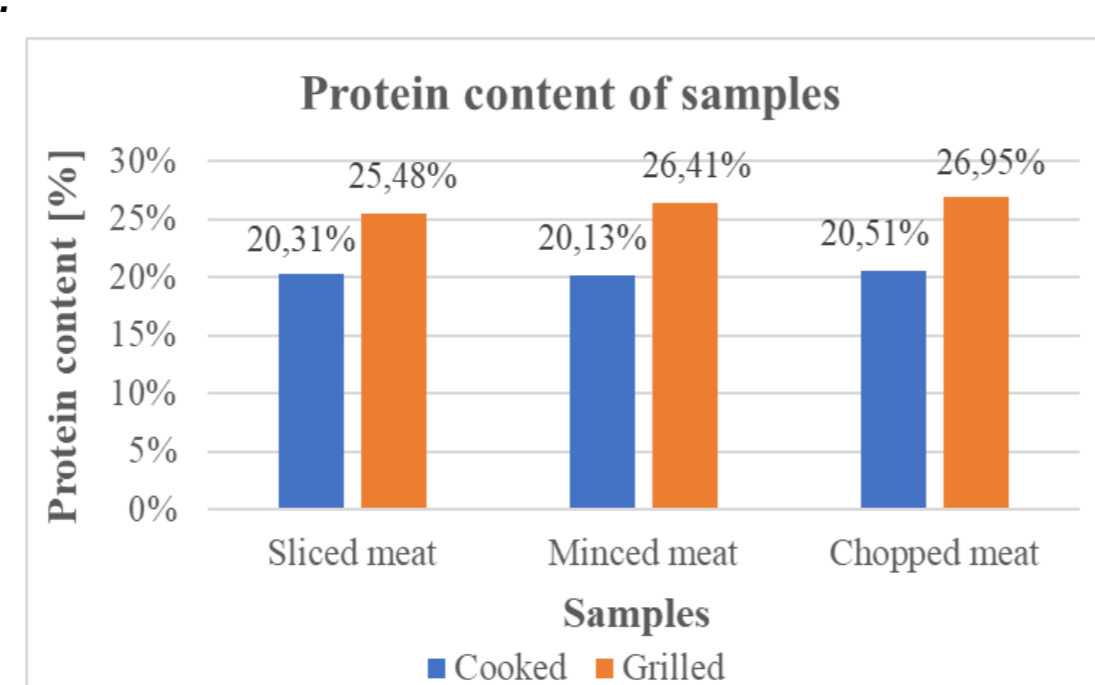


Figure 9. Protein content of samples.

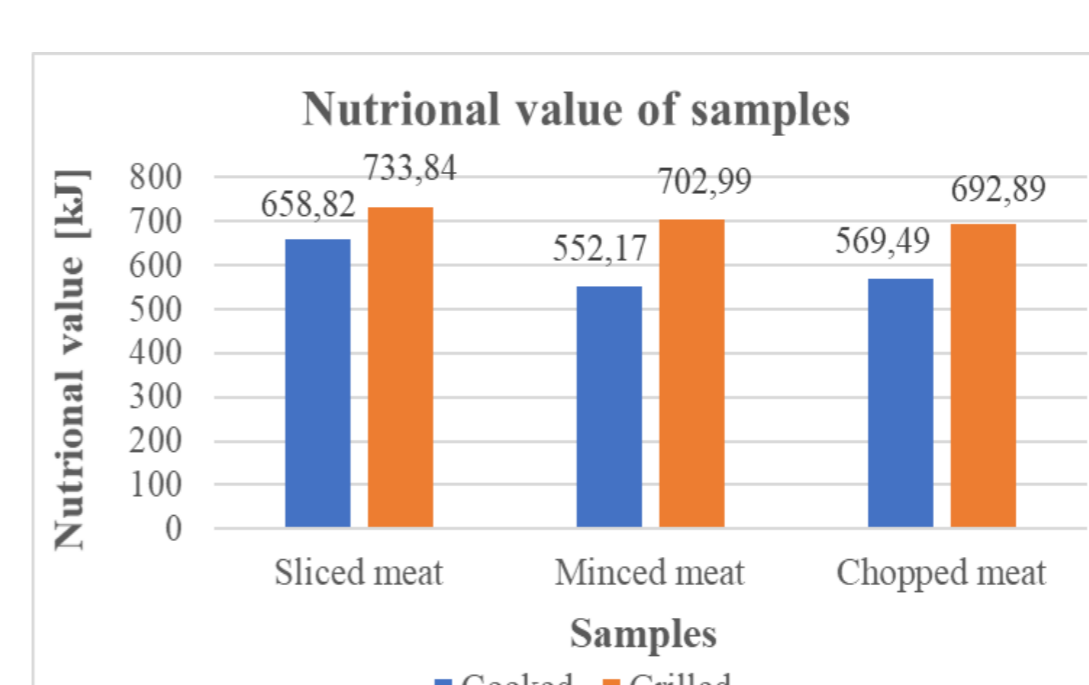


Figure 10. Nutritional value of samples.

At the end of our work, we found that shredding has only a small effect on techno-functional properties and chemical components. Based on the measured properties, chopped meat is considered the best sample.