**Cod powder as a nutritional and flavor enhancer in pork burgers**

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ABSTRACT

Health and well-being play very important roles as the population wants to stay healthy. Consumers have started searching for healthier options, trying to change their lifestyle and looking for more convenient foods. Dietary supplements arise to provide the body with the missing ingredients to keep it in good physical and mental condition. Within these, fish protein supplements seek to add an extra supply of this nutrient to the diet. The object of the present study was to evaluate the effect of the incorporation of two levels of cod powder (5 and 10%) on the physicochemical and nutritional quality of pork burgers. Along with these treatments, a control batch were used to compare the analytical results. Cod powder was obtained from first-class raw materials of wild-caught cod (*Gadus morhua*) from the North Atlantic Ocean, which were steam-cooked, air-dried and micro-milled. The extract obtained was characterized by protein contents of 75% and 4% fat. These values were reflected in the composition of the burgers. The incorporation of cod powder resulted in a significant (*P*<0.001) increase (18.9% and 38.1%) of protein contents (25.08% *vs.* 21.62 and 18.19% for burgers with 10% and 5% of cod powder and control samples, respectively). However, no significant effect was observed in fat contents, which were slightly lower in the samples treated with a higher dose of powder (9.20% *vs.* 10.01 and 11.56% for burgers with 10% and 5% of cod powder and control samples, respectively). Color parameters were also affected by the incorporation of extracts, displaying higher values of L\* and b\*. A very marked effect was observed in the case of water holding capacity. This parameter, measured as cooking loss, is one of the determining parameters of visual and sensory appeal of meat products. The lowest values were observed in burgers treated with cod powder (11.24% vs. 11.97% and 30.48% for burgers with 10% and 5% of cod powder and control samples, respectively, respectively). In the case of texture, evaluated using TPA test, the mean values obtained for all the evaluated parameters (hardness, springiness, cohesiveness, gumminess and chewiness) showed significant (*P*<0.05) differences among batches. The incorporation of the powder resulted in an increase in the hardness values (324 N *vs.* 235 N and 195 N for burgers with 10 and 5% and control samples, respectively). The amino acid profile improved significantly with the addition of the extract. The samples with cod powder were those that showed the highest amino acid content, being the non-essential amino acids the predominant ones. Glutamic acid, aspartic acid, and alanine were the most abundant in this fraction, representing together around 64% of non-essential amino acids and 34% of TAAs. Regarding the essential amino acids fraction, lysine was the most abundant, followed by leucine and arginine, representing together about 49% of essential amino acids and 23% of TAAs. Considering all studied parameters, cod protein could be used to enrich meat products as an alternative to other proteins commonly used in the meat industry.

This research was funded by the EU Commission through the BBI-JU H2020 Project AQUABIOPRO-FIT (Grant Agreement no. 790956).

Keywords: Meat product,nutritional improvement, *Gadus morhua*, protein, amino acids