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The quality of deep-frozen octopus in the Portuguese retail market: Results from a case study of abusive water addition practices

Rogério Mendes, Bárbara Teixeira, Susana Gonçalves, Helena Lourenço, Fernanda Martins, Carolina Camacho, Rui Oliveira, Helena Silva



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1 **THE QUALITY OF DEEP-FROZEN OCTOPUS IN THE PORTUGUESE RETAIL MARKET: RESULTS**
2 **FROM A CASE STUDY OF ABUSIVE WATER ADDITION PRACTICES**

3

4 Rogério Mendes ¹, Bárbara Teixeira, Susana Gonçalves, Helena Lourenço, Fernanda Martins,
5 Carolina Camacho, Rui Oliveira, Helena Silva

6

7 Portuguese Institute for the Sea and Atmosphere - IPMA, I.P.

8 Department for the Sea and Marine Resources

9 R. Alfredo Magalhães Ramalho, 6, 1495-006 Lisbon, PORTUGAL

10

11 ¹Corresponding author: rogerio@ipma.pt

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13 **Abstract**

14 *Octopus spp.* are among the most important cephalopod traded. However, consumers
15 frequently complain of excessive reduction of weight/volume, after cooking. A case study in
16 the Portuguese market was held with deep-frozen octopus, being added water and cooking
17 losses evaluated, as well as product's biochemical and microbiological quality. Negative
18 deviations (1.3 % to 7.7 %) to the declared weight were detected in 28 % of the products.
19 These shown to be good sources of K, Mg, Cu and Zn and contaminants (Cd, Hg and Pb) were
20 lower than limits. Microbiological quality was generally good though coliform, *E.coli*, molds
21 and yeasts detected indicate poor hygienic conditions in a number of production facilities.
22 Cephalopod species determined were in accordance with the label in all samples. Most of the
23 products (92 %) presented significantly higher moisture and lower protein contents than
24 unprocessed samples, signaling water soaking. Cooking losses were also higher than in
25 unprocessed samples. Overall unconformities were accounted in 80 % of the samples, mostly
26 because water was added and not labelled (68 %), or because citrates listed as ingredients
27 were not detected. Consumers were shown to be at high risk of being defrauded. New
28 regulations and reference criteria for water addition control need to be enforced.

29

30 **Keywords:** Mollusk; conformity; safety; water soaking; cooking losses;

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32 **1. Introduction**

33 Cephalopods of the genus *Octopus spp.* are among the most important commercially octopus
34 species harvested worldwide, being these cephalopods typically marketed fresh, dried salted

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