

## **Kinetic Study of Physical Quality Changes on Jumbo Squid (*Dosidicus gigas*) Slices during Application High-Pressure Impregnation**

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**Abstract :** This study presents the simultaneous application of high hydrostatic pressure (HHP) and osmotic dehydration of jumbo squid (*Dosidicus gigas*) slice. Diffusion coefficients for both components water and solids were improved by the process pressure, being influenced by pressure level. The working conditions were different pressures such as 100, 250, 400 MPa and pressure atmospheric (0.1 MPa) for time intervals from 30 to 300 seconds and a 15% NaCl concentration. The mathematical expressions used for mass transfer simulations both water and salt were those corresponding to Newton, Henderson and Pabis, Page and Weibull models, where the Weibull and Henderson-Pabis models presented the best fitted to the water and salt experimental data, respectively. The values for water diffusivity coefficients varied from 1.62 to  $8.10 \times 10^{-9}$  m<sup>2</sup>/s whereas that for salt varied among 14.18 to  $36.07 \times 10^{-9}$  m<sup>2</sup>/s for selected conditions. Finally, as to quality parameters studied under the range of experimental conditions studied, the treatment at 250 MPa yielded on the samples a minimum hardness, whereas springiness, cohesiveness and chewiness at 100, 250 and 400 MPa treatments presented statistical differences regarding to unpressurized samples. The colour parameters L\* (lightness) increased, however, but b\* (yellowish) and a\* (reddish) parameters decreased when increasing pressure level. This way, samples presented a brighter aspect and a mildly cooked appearance. The results presented in this study can support the enormous potential of hydrostatic pressure application as a technique important for compounds impregnation under high pressure.

**Keywords :** colour, diffusivity, high pressure, jumbo squid, modelling, texture

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