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Effect of high hydrostatic pressure application (HHP) and osmotic dehydration (DO) as pretreatments to hot –air drying of abalone cubes

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The following study submits a high hydrostatic pressure application (HHP) and osmotic dehydration (DO) as pretreatments to hot –air drying of abalone cubes. The drying time was reduced to 6 hours at 60ºC as compared to the abalon drying by only a 15% NaCl osmotic pretreatment and at an asmopheric pressure that took 10 hours to dry at the same temperature. This was due to the salt and HHP saturation since osmotic pressure increases as water loss increases, thus needing a more reduced time in a convective drying , so water effective diffusion in drying plays an important role in this research. Different working conditions as pressure (350-550 MPa), pressure time (5-10 min), salt concentration, NaCl 15% and drying temperature (40-60ºC) will be optimized according to quality parameters (colour, pH and texture). The models used for drying experimental curves were those corresponding to Weibull, Logarithmic and Midilli-Kucuk, but the latest one was the best fitted to the experimental data. The values for water effective diffusivity varied from 4.54 – to 9.95*10-9 m2/s for the 8 curves (DOHHP) whereas the control samples (without DO nor HHP) varied among 4,35 and 5,60*10-9 m2/s, for 40 and 60°C, respectively and as to drying by osmotic pre-treatment at 15% NaCl from 3,804 to 4,36*10-9 m2/s at the same temperatures. Finally as to energy and efficiency consumption values for drying process (control and pretreated samples) it was found that they would be whithin a range of 777-1815 KJ/Kg and 8.22 – 19.20% respectively. Therefore, a knowledge concerning the drying kinetic as well as the consumption energy , in addition to a knowledge about the qyuality of abalones subjected to an osmotic pretreatment (DO) and a high hydrostatic pressure (HHP) are extremely important to an industrial level so that the drying process can be successful at different pretreatment conditions and / or variable processes.

Biography

Teresa Roco Bugueno is a Lecturer from Universidad De La Serena, Chile.

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