

## **STUDY OF SOME PRETREATMENTS FOR OPTIMIZING THE DEHYDRATION OF BIOLOGICAL CARROTS**

**MASTER STUDENT:** Andrea Emiliozzi

**SUPERVISORS:** Prof. Riccardo Massantini  
Ass. Prof. Roberto Moscetti

### **ABSTRACT**

The experimental work proposed has tested the use of some pre-treatments to optimize the dehydration of biological carrots (var. Romance). The pre-treatments used were: 1) blanching (95°C) for 1.5 min, 2) blanching (70°) with citric acid 2% (w/v) for 2 min, 3) dipping in pectin's 1% (w/v) for 1 min, 4) dipping in pectin's 1% (w/v) with vacuum impregnation technology for 10 sec at 734 mbar. The aim of this work was to evaluate and compare the effects on carrot quality attributes. For this goal, the trial involved the use of various analytical techniques such as the enzyme activity test for peroxidase (POD), colorimetric analysis, determination of the total phenol content, extraction and quantification of carotenoids, rehydration process analysis. In addition, four semi-theoretical mathematical models were used to describe the pattern of dehydration of the pre-treated carrot washers. In light of the results obtained, the blanching pre-treatment at 70°C with 2% citric acid (w/v) has preserved more than all the nutritional characteristics of the carrot during the dehydration process. This pre-treatment showed an almost complete inactivation of the enzyme peroxidase (POD), an average dehydration rate of 6 hours, a colour angle (h) with a tint tending to red tones (the visual appearance is appreciated by some consumers and therefore considered a positive attribute in the choice of the product). Analysis of the carotenoid and total phenol content showed that blanching at 70°C with 2% citric acid was, like control and immersion in 1% pectin's, the best pre-treatment with less loss of quality components (carotenoids and phenols) during dehydration.

The work has also shown that the Logarithmic model can be used as the only model to predict moisture loss for all the dehydration pre-treatments used in experimentation.

**KEYWORDS:** Carrot (var. *Romance*), blanching, dipping with pectin, vacuum impregnation technology, dehydration