

STEPWISE ANALYSIS OF FACTORS AFFECTING
THE YIELD OF HOT-AIR-DRIED CARROTS

BY

ANNE GATHONI MBAABU (MRS)

UNIVERSITY OF NAIROBI
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ABSTRACT

Carrots (variety - Red Cored Chantenay) were subjected to a stepwise analysis during processing prior to dehydration (hot-air-drying), to determine the parameters that affect the yield of the final product and its quality.

The raw material quality was assessed as a prime factor affecting the overall results. Peeling with steam at 5 bar pressure was evaluated at 60, 65, 70 and 80 seconds peeling time. The effect of the raw material quality on the peeling and trimming losses was noted. Trimming was done by hand and the losses were found to be influenced by the raw material and the effectiveness of the peeling process.

The peeled and trimmed carrots were diced into 10 x 10 x 2 mm and 10 x 10 x 7 mm cuts; these were then blanched in hot water at 90°C. The correct blanching time was evaluated using peroxidase. The 10 x 10 x 2 mm cut required less blanching time than that of 10 x 10 x 7 mm. Leaching losses during blanching were determined by analysing the dry matter content of the carrots after each blanching time of: 0, 1, 2, 3, 4, 5 and 6 minutes.

In order to reduce leaching losses sugar was added to the blanching liquor to give a soluble solid concentration of 0, 5, 8, 10 and 12° Brix. The carrots were then blanched in these liquors and a sample of each

liquor taken after blanching in order to analyse the sugar content. The blanching liquor was recirculated and the soluble solids concentration maintained at 10^o Brix.

Carrots blanched in these liquors and air-dried to 7% moisture content were analysed for sugar content. The sugar increased in each sample depending on the amount of sugar added to the blanching liquor.

The quality of the dried product was examined for β -carotene content and hydroxymethylfurfural. The β -carotene increased with the amount of sugar added upto 10^o Brix, after which it decreased. The carrots blanched at 12^o Brix had a deep brown colour after drying. This was probably due to caramelization of sugars. The decrease in β -carotene in the same sample could be due to the fact that some intermediate compounds of the caramelization process affected its stability.

It was noted that the yield of the final product (given as a conversion ratio) for the same quality of raw material and processing parameters increased with the amount of sugar added to the blanching liquor. The limiting factor was the quality of the final dried product achieved.