

## Research Note

### FREEZING AND SHELF LIFE OF SWEET POTATO AND CITRON BARS<sup>1</sup>

Bars from sweet potato, *Ipomoea batatas* (L.) Lam, and citron (*Citrus medica* L.) require sugar to produce a thin crust and a soft inner portion. Because of continued crystallization, the crust grows thicker until the whole bar becomes crystallized and unpleasantly hard. Cancel and Hernández controlled the rapid crystallization of citron bars during storage at room temperature by processing at pH 4.1.<sup>2</sup> No study has been done on preserving bars by freezing to maintain their good qualities (thin crust and soft inner portion) for several months. This research note reports the acceptability and shelf life of sweet potato and citron bars stored frozen at  $-23.3^{\circ}\text{C}$  ( $-10^{\circ}\text{F}$ ).

The sweet potato bars were prepared with selection 99 (SPV-52), an unsweet very dry type. The conventional method for preparing bars was followed: sweet potatoes were washed and cut in large pieces, boiled

without salt; skin and blemished spots were removed, mashed and weighed, and an equal amount of sugar and the grated pulp of one coconut per 20 lb mashed sweet potato pulp added. The mixture was boiled over medium heat, stirred until it reached a 74° Brix, poured into rectangular molds to form the bars or dropped by spoonfuls to make medium sized balls. The bars or balls were allowed to dry until they formed a firm crust, and placed in vacuum sealed polyethylene bags. The product was stored at  $-23.3^{\circ}\text{C}$  ( $-10^{\circ}\text{F}$ ) for periodical organoleptic evaluation by a trained 11- to 16-member taste panel. The same procedure can be used with other sweet potato selections.

Citron bars were prepared by the method Cancel et al. developed and described.<sup>2</sup> These bars were packed and stored as the sweet potato bars were until submitted for sensory evaluation.

TABLE 1.—*Sensory evaluation of sweet potato and citron balls and bars*

Days in storage	Mean values <sup>1</sup>		
	Sweet potato		Citron bars
	Bars	Balls	
0	1.75	1.53	1.50
30	2.00	1.93	1.92
60	—	1.25	1.89
90	1.80	1.82	1.63
120	1.70	1.46	2.00
150	—	—	1.88
180	—	1.73	1.72
210	—	1.47	1.80
240	—	1.44	1.83

<sup>1</sup> +2, -2 scale - +2= very acceptable; +1= acceptable, -1= slightly unacceptable, -2= not acceptable.

<sup>2</sup>Manuscript submitted to Editorial Board 30 June 1987.

<sup>3</sup>Cancel, L. E. and E. R. Hernández, 1977. Effect of pH on texture and organoleptic evaluation of citron bars packed in plastic film. *J. Agric. Univ. P. R.* 61 (3): 290-99.

<sup>4</sup>Cancel, L. E., E. R. Hernández and J. A. Rosario, 1975. Método para preparar pasta de cidra. Colegio Ciencias Agrícolas, Esta. Exp. Agric. Univ. P. R. Publ. 96.

For evaluation, the products were allowed to defrost at room temperature for a few hours.

Table 1 shows the result of the monthly sensory evaluation of both products by the panelists on the basis of the +2, -2 scale for overall acceptability.<sup>4</sup>

The data completed during the 8 months of frozen storage of sweet potato balls and citron bars showed good acceptability of the products. The sweet potato bars were also

well accepted by the taste panel up to 4-month storage at  $-23.3^{\circ}\text{C}$  ( $-10^{\circ}\text{F}$ ).

This study shows that preservation by freezing and vacuum packing of these products prevents the hard outer crust that normally forms in about 2 months' storage at room temperature, thus keeping the excellent qualities of the products.

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<sup>4</sup>Larmond, E., 1977. Laboratory Method for the Sensory Evaluation of Food. Canada Dep. Agric. Res. Branch Publ. 1637.