Results of a Consumer Acceptance Test for Two Types of Containers for Guava Paste

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INTRODUCTION

Guava paste has been manufactured traditionally in Puerto Rico by a relatively large group of small concerns or individuals with a very limited production. The lack of the necessary capital and management on the one hand and of processing techniques on the other has kept this industry from rapid growth. Nevertheless, the local demand for the product has been in an ever-increasing trend.

An economic study (*1*)[2] of the production of 22 small guava-processing plants showed that in the early 1950's, 421,510 pounds of guava paste were produced with a value of $69,153. Lately, the production of guava paste has been increased 3-fold or more; however, this increment has not been sufficient to satisfy the demand. Retail stores have resorted to importing large quantities of the product to supply the local needs.

The Food Technology Laboratory of the Agricultural Experiment Station has done extensive research work to improve processing methods and to develop the necessary control means to ensure better and more uniform-quality guava paste (*2*,*3*).

It has been common practice among processors to use rectangular cardboard boxes with cellophane or waxed-paper linings and overwrap to pack this guava paste. Experience has shown that such boxes offer very little protection against the syneresis of the product and against rodent and insect attack, the combined action of which causes heavy losses to the industry every year. Realizing the importance of this packing problem, the Food Technology Laboratory began to seek an adequate container that would have the acceptance of both processors and consumers. A marketing test was conducted to determine the consumer's reaction to a rib-foil aluminum cup, technically valuable and adequate to pack such a product as guava paste.

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[2] Italic numbers in parentheses refer to Literature Cited, p. 143.

MATERIALS AND METHODS

PREPARATION OF GUAVA-PASTE SAMPLES

The samples were prepared by the method described by Rieckehoff and Rodríguez (*3*), used at present as standard procedure in the guava-paste industry.

One-to-one mixtures of canned guava pulps and refined cane sugar were carefully boiled and concentrated to refractometric readings of 73-percent soluble solids. The addition of neither acid nor pectin was required. The acid content of the pulps was high enough to produce the necessary acidity in the finished product (0.64 to 0.66 percent). Care was taken to control the cooking time at from 35 to 40 minutes so that optimum color development and proper consistency could be obtained in the samples. The hot paste was filled into the 1-pound cardboard boxes and aluminum cups, and both were closed while the product was still hot. This filling procedure was followed to ensure the complete sterilization of containers and covers. After cooling, the samples in aluminum cups were labeled and those in cartons were overwrapped and labeled.

THE TEST

To accomplish our objective, *i.e.*, the determination of the degree of acceptability by the consumers of guava paste packed in a new container entirely different from the customary cardboard box, a careful selection of the universe was necessary to avoid the collection of possibly biased information that could lead us to wrong conclusions.

Supermarkets in the San Juan Metropolitan Area were selected to display our guava-paste samples. The constantly increasing popularity of this type of retail store among consumers of different social and economic levels favored our selection. The location of the stores was carefully studied to procure a representative cross-section of the consumer population so as to increase the reliability of the data to be collected. Arrangements to use the facilities of supermarkets were made through personal interviews with the general managers of the stores.

Samples in both types of containers were displayed on the same shelf where similar commercial products were. Boxes and cups were stored side by side and arranged to attract customer attention to an equal degree. Guava paste in both containers was retailed at the same price. Daily deliveries and inspections were made to replace sold samples with new ones to keep a balanced display at all times.

RESULTS AND CONCLUSIONS

A distribution of 1,188 pounds of guava paste in cardboard boxes and 972 pounds in aluminum cups were made in the course of the 78 days of the investigation (table 1). The samples were supplied to distributing centers in various quantities since some stores sold the product faster than others.

TABLE 1.—*Number of boxes and cups of guava paste delivered to and sold by the 6 supermarkets*

Supermarkets No.	Deliveries		Sales	
	Boxes	Cups	Boxes	Cups
1	108	108	52	57
2	288	216	285	183
3	360	216	360	203
4	180	180	180	81
5	180	180	180	164
6	72	72	72	48
Total	1,188	972	1,129	736

TABLE 2.—*Observed and calculated frequencies of the number of boxes and cups of guava paste sold in the 6 supermarkets during the test period*

Supermarket No.	Boxes		Cups	
	Observed	Calculated	Observed	Calculated
1	52	54.2	57	54.5
2	285	234.0	183	234.0
3	360	281.5	203	281.5
4	180	130.5	81	130.5
5	180	172.0	164	172.0
6	72	60.0	48	60.0
Total[1]	1,129		736	

[1] Calculated $\chi^2 = 109.33$. Table value of χ^2 0.01, 5 d.f. = 15.086.

The sales data for the six supermarkets were analyzed to determine the preference of the consumers for either one of the guava-paste containers. The chi-square method of analysis was used to compare the experimental data against expected values (table 2).

The chi-square of 109.33 obtained in our test shows a highly significant difference between the sales of the cardboard boxes and the aluminum cups. A consumer preference in favor of the rectangular box was positively established.

The rib-foil aluminum cups, although more sanitary, attractive, and suitable for mechanized procedures than the cardboard boxes, turned out to be too frail for normal handling in the supermarkets. In some stores heavy damage was caused by the removal of the covers and the buckling of the cups.

SUMMARY

An acceptance test was conducted to determine the preference of consumers for one of two types of containers for guava paste, *i.e.*, the rib-foil aluminum cup and the rectangular cardboard box.

Samples in both types of containers were displayed at the same retail price in six supermarkets of the San Juan Metropolitan Area. After a 78-day sales period the data collected were statistically analyzed by the chi-square method. A highly significant preference was found in favor of the cardboard box. The aluminum cups were also easily damaged.

RESUMEN

Se llevó a cabo una prueba para determinar el grado de aceptación que tendría entre los consumidores un nuevo envase para las pastas de guayaba.

Muestras del producto en envases de aluminio corrugado y en la tradicional caja rectangular de cartón se pusieron a la venta en seis supermercados del área metropolitana de San Juan. La pasta en ambos tipos de envases se ofreció al mismo precio durante los 78 días que duró el estudio.

Los datos relacionados con la venta se analizaron estadísticamente por el método de chi-al-cuadrado y demostraron una preferencia altamente significativa a favor del envase de cartón.

LITERATURE CITED

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