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Methodology for the analysis of low-consumption markets with a view to promotion: Application to avocados in Spain

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SYNOPSIS
This work is aimed at developing a methodology for the estimation of avocado consumption by the Spanish market. It is subsequently applied to the Granada market in order to check its accuracy and to draw preliminary conclusions on the behaviour of the variables supposedly affecting the demand.

INTRODUCTION

One of the unknowns limiting accurate knowledge of the current and prospective economic situation of the avocado in Spain, is the potential consumption by the home market.

In 1981 a paper on the situation of home consumption - at that time still incipient - presented at the first seminar on avocados during the VIII Semana Verde of the Costa del Sol, pointed out the need of measuring its potential (Calatrava & Lopez Nieto, 1981). This paper was subsequently complemented by one on institutional consumption (Calatrava & Lopez Nieto, 1983).

A paper read at the VIII International Symposium of Horticultural Economics (Calatrava, 1984) predicted the structure of the European market for 1990. From the conclusions drawn in this paper, the need to analyse the potential of the home market was apparent. The potential consumption of the nearly 40 million Spaniards is of utmost importance, not only from the viewpoint of the obvious need to increase the European market demand, but also from the advisability of creating a home market for the product bound to absorb abrupt changes in export demands. Preliminary conclusions of the guidelines of the paper 'Analysis of the Potential of the Home Avocado Market', corresponding to only the first year of work in Granada, are given in this paper. The possible extrapolation of the results obtained for the Granada urban market, chosen for testing and application of the model to the remainder of the Spanish market, will be the subject matter of future analysis. Because of the very structure of the analysis, a specific design was applied, based on the analytical use of primary analytical information obtained by site measurements of overall consumption responses added to simulated variables supposedly affecting demand (price, propaganda, display

and rent). The development of such a design and its application - still limited - to the Granada market, are the subjects of this paper.

An early precedent of the analysis of the potential of the avocado market by micro-methods, was carried out in Florida about ' a quarter of a century ago. The method applied in Granada, however, involves more basic and strategical variables and does not deal with the influence of variables related to fruit appearance on consumption, which is logical taking into account the greater development of the Florida market of those days, as compared to the present Granada market. On the other hand, the statistical model used here is more comprehensive and hence more complex and open to inferences from interactions between variables. Brooke (1959), Markeson (1963) and Williams, Brooke & Rieggan (1962) dealt with different aspects of the above-mentioned work. Ellsworth (1963) analysed the effect of some variables on the Californian market.

MATERIAL AND METHODS

The variables on which the method was developed, are the following:

Price variable, considered from three levels, namely:

- -The daily market price.
- -Reduced by 35 per cent.
- -Reduced by 20 per cent.

These reductions were not maintained throughout the project because of operational strategy problems. Thus, at times, the reductions had to be only 15 per cent and 25 per cent respectively, as the application of simulated 20 per cent and 35 per cent reductions to the decreased real market price (imposed by fruit scarcity in summer) resulted in an offer price below the prices corresponding to intermediate marketing prices, which was to be avoided at any cost.

Propaganda variable, of which three levels were considered, namely:

- -No propaganda.
- -Visual propaganda implemented on-site by means of leaflets and recipes.
- -Free tasting.

Display quality variable, considered from two levels, namely:

- -Standardised selected fruits, displayed in 4 kg boxes.
- -Fruits displayed in bulk, in 10-11 kg boxes.

Different rent tags associated with the various districts from which the different sale sites or retail outlets were chosen to simulate the above-mentioned variables, will henceforth be referred to as 'control sites'.

In its second year of implementation, the project will be applied in the same way, with the added introduction of a new variable, namely 'external propaganda',

which shall materialise in an advertising campaign based on radio and press adverts and street bills.

The model applied can be summed up by the following expression:

$$Y_{ijkl} = \mu + A_i + B_j + C_k + D_l + AB_{ij} + AC_{jk} + BC_{jk} + ABC_{ijk} + ß_1X_1 + ß_2X_2 + E_{ijkl}$$

where A denotes factor 1 (propaganda, i = 1,2,2), B factor 2 (price, j = 1,2,3) and C factor 2 (display quality, k = 1,2), D the blocks (control sites, i = 1,2,3,4,5), AB, AC, BC and ABC the second- and third-order interactions between the three main factors, X_1 the market price for the week (Y_{ijkl}), X_2 the sales at the pilot sites throughout the nine weeks of each cycle, E_{ijkl} the experimental error and Y_{ijkl} weekly sales.

The practical implementation of the project involved some interesting aspects, namely:

(a) Five retail outlets, the so-called 'control sites', were chosen and the variables involved were modified, as described above. Every one was allocated a coefficient according to the district rent.

Retailers were compelled to purchase the product from a wholesaler chosen in advance by Merca-Granada, as well as introduce in their shops the variable levels corresponding to each week of the cycle, according to the previously established calendar.

(b) Retailers acting as 'pilot sites', who would not use simulated variables and from whom weekly turnover and price data would be obtained, were chosen.

(c) A working calendar, of which the second cycle is illustrated in Table 1.

(d) The mechanism through which the control sites were supplied with fruit.

Each retailer was supplied daily with a product responding to the characteristics stipulated in the proposed programme through their customary channels. The project involved weekly purchases from the source by the wholesaler, Merca-Granada. The determination of prices was left to the law of supply and demand in order to reach the market in a realistic manner.

RESULTS AND DISCUSSION

Due to the lack of some data and unbalanced variables, the experimental design was also unbalanced and had to be analysed by regression techniques. A detailed description of the procedure involved and the results obtained by site, week and cycle, can be found in Garcia Guzman *et al* (1986). However, by way of example, results obtained for the control sites along the second cycle are listed in Table 1.

TABLE 1 Results in kg/week obtained at the sites during the second cycle (from 7/1/85 to 23/3/85) at market prices (MP) between 115 and 200 pts.

			1		2		3		4		5		6		7		8		9				
Week			Without propaganda						With visual propaganda						Free tasting						Site totals		
No direct action			MP		-35%		-20%		MP		-35%		-20%		MP		-35%		-20%				
Site	MP	MP	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	B	P	Totals
1	18	7	7		38,0	3,0	33	10,5	27,0	7,0	14,0	8,0	6,5	4,5	17,0	5,5	22,0	10	11,5	8	201,0	56,5	257,5
2	36	24	6	8,5	98,5	16,0	33	46,0	48,5	23,5	58,5	36,5	33,5	29,0	31,0	10,5	67,0	38	29,0	10	453,0	230,0	683,0
3	47	71	14	56,0	235,0	253,0	128	152,0	38,0	15,5	164,0	266,0	100,5	19,0	54,5	50,0	108,5	339	49,0	106	1009,5	1 456,5	2466,0
4	21	12	10	1,5	74,5	8,0	35	9,0	19,0	4,0	48,5	27,5	25,5	7,0	45,5	3,5	79,0	14	49,5	7	419,5	80,0	499,5
5	2	4	12		10,0	2,5	8	3,0	11,5		7,0	3,5	4,5	3,5	5,0	2,5	15,0	6	15,0	2	94,0	24,5	118,5
Week total	124	118	49	660	456,0	282,5	237	2205	1 4 0	150 0	292.0	341,5	1705	1630	1530	720	291,5	407	154,0	133	2177.0	1847,0	4024,0
			115		738.5		457.5		294		633		3335		225		698,5		287				

B: bulk P: dish-packed

Conclusions drawn from the statistical analysis will not be final until data corresponding to the second year of application are available. Detailed differences between cycles will not be commented upon, only general comments made.

In the course of 34 weeks, the five control sites sold 9789,5 kg of avocados, accounting for 14,69 per cent of the overall sales of Merca-Granada for the 1984/85 season - virtually all avocado retail sales filtered through Merca-Granada. Taking into account that 201 of the 679 Granada-based retailers are usually avocado outlets and assuming all the fruit consumed in Granada was distributed by Merca-Granada - which is not strictly true - the *per capita* consumption during 1985 would have been 225 g. Thus, the real consumption must have been somewhat higher and could well be between 250 and 300 g, the level at which the preliminary conclusions established are applicable.

The relationship between rent level (expressed as an ordinal) and avocado sales for the different sites was as follows:

Site number	Rent level	Turnover	Sales rank
1	3	589,5	4
2	4	1 790,5	2
3	1	5 721,0	1
4	2	1 294,5	3
5	5	344,0	5

The Kendall and Spearman ordinal coefficients, T=0,6 and p=0,7 respectively, are indicative of the rent level and sales rank; such a correlation has no statistical significance, because of the low 'n' values found. However, the correlation between the highest and lowest rent tags seems to be quite clear.

As far as the display quality is concerned, the consumer appears to show a trend for preferring the lower-priced, bulk-presented fruit. However, this trend shifted to standardised fruit as indicated by sales of the former, decreasing from 66,5 to 53,5 per cent in the third cycle.

The following preliminary conclusions are drawn from these results:

(a) The price has a significant effect on consumption.

(b) The effect of propaganda, however, is not statistically significant (P=0,95). The effect will be studied in greater detail as soon as the influence of the external propaganda variable has been evaluated.

(c) The site district is indeed a significant factor.

(d) There appears to be some correlation between the district rent level and consumption, although this does not allow one to assume this variable to be statistically significant because of the low number of sites studied.

(e) There is a significant interaction between propaganda and site (rent). Such an interaction could be the result of propaganda preferentially affecting some rent levels.
(f) Under these conditions - and bearing in mind that it was the Granada market which was dealt with - reductions of 35 per cent in the sales price would increase consumption by a factor of 2,5, whereas reductions of only 20 per cent would foster consumption of merely 25 per cent. This assumption is only valid for the current consumption situation.
(g) The Granada avocado market is at a turning point, as its present consumption, between 250 and 300 g per inhabitant, can be considered the limit of avocado consumption as a luxury product.
(h) Thus there is a considerable, wide potential market for avocados in Granada as the above-mentioned conclusions indicate. These will be compared to those abstracted from results obtained in the second stage of project implementation, which will also investigate the effect of the external propaganda variable.

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