INFLUENCE OF THE SOCIO-ECONOMIC FACTORS IN THE CONSUMERS PREFERENCES ABOUT COLOUR AND MARBLED IN BEEF MEAT

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Introduction

Nowadays, the consumer's role in the agriculture and food system is increasing, which makes that their opinions and preferences are determinant in the strategies that producing companies must follow. In case of the sector of bovine meat it is essential to know the likings of the consumers and the factors that influence in the quality of fresh meat, being the colour (Killinger *et al.,* 2004) and the fat some of the most important attributes for the election of this product, as they are associated to the image of quality and health in this product. The PGI (Protected Geographical Indication) "Carne de la Sierra de Guadarrama" is a figure of differentiated quality recognized in the European Union that protects a typical system of production where the origin is fundamental, what contributes to have differential characteristics (Loureiro *et al.,* 2000). It is expected to determine if there are differences between people that consume meat with PGI label and people that consume meat without any denomination, in relation with the preferences about different levels of colour and veined meat. Also, it is expected to determine the influence of different socioeconomic variables in these preferences.

Material y methods

The obtained data comes from 996 surveys realized in points of sale to consumers of beef meat. The obtained cases have been segmented in two groups, depending on the type of consumed meat: I) consumers that eat, fundamentally, meat with the label PGI "Carne de la Sierra de Guadarrama" (329 cases) II) consumers that eat bovine meat without PGI (667 cases). The preferences about the meat colour have been obtained showing to every polled person a scale of colour of 4 points, stocks in Spanish meats characterized as for their colour as fat, and classified with an increasing intensity of colour, from very lightness that would fit to young veal, to dark red, which would be associated with an older animals. Also, the preferences about the marbled meat have been obtained for the election between four photographs, with a fat level increasing. The interviewed person had to answer which of them would prefer to buy. The socioeconomic variables analyzed are: sex, age, level of income and size of the municipality of residence. The categories in which have been divided are: a) sex (1=man, 2 = woman): b) age, in years (1=less than 30, 2=31-40, 3 = 41-50, 4=51-60 and 5=more than 60); c) level of income, in Euros (1=less than 900, 2=900-1.500, 3=1.501-2.101, 4=2.101-3.000, 5=more than 3.000); d) size of the municipality, in inhabitants (1=less than 20.000, 2=10.000-50.000, 3=50.001-100.000, 4=more than 100.000). To determine if there are significant differences in the preferences of the colour and marbled meat between the mentioned groups, it has been realized the Student T test, for independent samples. Once verified if there are differences, it is realized tables of contingency relating the preference to the colour and marbled with each of the socio-economic variables. The statistical analyses have been developed with the statistical program SPSS vs 13.0 (2004).

Results and discussion

The distribution of scale frequencies about the preference for colour is showed in the Table 1. In all the considered variables, in both groups, the favourite value is 3. The test T to verify if there are significant differences between the groups "PGI" and "NOT PGI ", shows that there are significant differences ($p<0.05$).

Table 1. Distribution of frequencies (%) of the levels of preference for the meat colour.

	1	2	3	4
PGI	6,3	25,9	57,5	10,3
NOT PGI	12,1	24,4	59,1	4,4

In the group of consumers that prefer PGI meat, of all the socio-economic analyzed variables, applying the statistician Chi-square, only the level of income shows a significant association with the preference to the colour ($p<0.05$). The rest of the values that takes the statistician Chi-square are not statistically significant, which indicates that the preference to the colour is independent from the variables sex, age, and size of the municipality. In the Table 2 appears these relations, indicating between parenthesis the value of the typified corrected residue that indicates a significant association (the value of the typified residue is major of +/-1,96 for a confidence level of 95 %).

Table 2. Distribution of frequencies of changeable level of income related to the levels of preference to the colour in consumers of meat with IGP.

	1	2	3	4
Incomes less than 900 €	**25 (2,8)**	12,5	50,0	12,5
Incomes between 900-1.500 €	3,5	31,0	58,6	6,9
Incomes between 1.501-2.100 €	0,0	22,6	61,3	16,1
Incomes between 2.101-3.000 €	6,3	15,6	65,6	12,5
Incomes up to 3.000 €	11,1	37,0	51,9	0,0

The direction of this association is explained due to the positive relation between the consumers of minor level of income and the preference for the lightness colour meat (level 1). In the group of consumers who buy meat without PGI it is appreciated a significant relation between preference to the colour and the sex. The rest of the variables can be considered independent from the preference to the colour. The analysis of the typified residues shows the significant relations that are represented in the Table 3.

Table 3. Distribution of frequencies of the socio-economic variables related to the levels of preference to the colour in consumers of meat without PGI.

	1	2	3	4
Man	10,6	**18,6 (-2,0)**	62,7	**8,1 (2,8)**
Woman	12,5	**26,3 (2,0)**	58,0	**3,2 (-2,8)**

According to the value of the typified residues, men prefer meats of more intense colour (level 4), that are least accepted by women. Nevertheless, women show major preference to paler meats (level 2).
The distribution of frequencies of the scale of preference to the marbled meat is showed in the Table 4. In all the considered variables, in both groups, the favourite value is 4. The test T to verify if there are significant differences between the groups "PGI" and " NOT PGI ", shows that there are significant differences for a confidence level of 95 % ($p < 0.05$).

Table 4. Distribution of frequencies (%) of the preferences to the veined meat

	1	2	3	4
PGI	5,0	9,7	15,2	70,1
NOT PGI	7,6	12,0	19,1	61,4

With regard to the socioeconomic considered variables, according to the information provided by the test Chi-square, it is not possible to reject the null hypothesis of independence between these variables and the preference for the colour and the marbled meat. These results do not contradict indicated results of Fraj (2003) for organic products.

Conclusions
The preferences for the colour and the marbled meat are different if the consumers prefer meat with PGI "Carne de la Sierra de Guadarrama" or if consumers have no preference about this label. There is an important relation between the preferences for the colour and the level of income and between the preferences to the colour - consumers' sex and meat with no indication quality. None of the socioeconomic variables considered influences in the preference to the marbled meat.

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