SENSORY CHARACTERISTICS OF DRY-CURED HAM FROM IBERIAN PIGS

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SUMMARY

Sensory characteristics that define the organoleptic quality of Iberian dry-cured hams are analyzed. Moreover, the influence of fattening period on these sensory characteristics has also been studied. The dry-cured hams come from Iberian pigs with 3 different levels of acorn pasture ('montanera') : i) 34.5 kg. ii) 46.0 kg, and iii) 57.5 kg of weight gain. Six different panel sessions were carried out. One ham of each group was tasted in each session. First, in slices from three representative areas of the ham, twelve variables related to color, flavour, taste, characteristic of the fat, and the texture were evaluated. In a second part, in the whole ham 5 variables related to fat attributes and color were evaluated.

The Correlation Matrix (CM) results show that there is an elevated positive correlation of the general acceptability with taste, taste intensity, taste persistence, fat fluidity, and juiciness. The general acceptability seems not be affected by the diet. Principal Components Analysis (PCA) suggests similar results and it shows the presence of two groups which differ mainly in the general acceptability. The Stepwise regression shows that taste intensity and fat fluidity are the variables that more affect the general acceptance.

INTRODUCTION

Geographical, climatological and cultural features of the Southwest of Spain have promoted a livestock vocation mainly directed towards the extensive animal production. The Iberian pig must be highlighted within this type of exploitation. This exploitation is characterized by carrying out the feeding period of these animals making good use of natural resources provide by the sort *Quercus* from the ecosystem 'Dehesa'. As the acorn production is considered as something limited, it is necessary to determine the number of pigs per hectare in relation to fattening period gain (kg). However, these kilograms must guarantee the quality of the products transformed.

The use of sensory evaluation is getting more important in the field of food technology. Its aims are descriptive analysis (Stone et al., 1974) of the organoleptic properties of the product and a study of preferences and level of acceptance by consumers of such a product (Costell & Durán, 1981 a) , (Le Magnen, 1990). In addition to this, it is an useful tool to determine not only the final quality of food products but also how this final quality is affected by the different raw material and processing methods.

However, this is a technique which requires the use of different systems specially designed for each case. A panel of tasters previously selected and trained is needed. This selection is carried out by means of checking their efficiency and evaluating the consistency of their answers, as well differences (Costell & Duran, 1981 b). In this preliminar study it is intended to settle the basis which would define the organoleptic quality of the Iberian pig dry cured ham. This quality can be function of the different levels of fattening period in acorn pasture. This organoleptic quality will be related, doubtlessly, to a bigger intramuscular fat content and to the quality of such fat which presents a high degree of insaturation and specially monoinsaturation (high content of oleic fatty acid) (Fallola et al., 1992), thus affecting ham texture and flavour. The quality of this fat as a flavouring agent or as taste conditioning agent depends not only on racial factors but also on feeding during fattening process, and of course, on the technological process experienced during curing period (Crespo, 1985).

MATERIAL AND METHODS

This study has been carried out on 18 hams having been cured for 24 months and which came from the Valdesequera line of Iberian pig. These pigs were reared and fed under controlled conditions in an experimental farm belonging to the Servicio de investigación y Desarrollo Tecnológico de la Junta de Extremadura. During the fattening period in acorn pasture, this pigs were underwent three different levels of fattening period gain in kg. Acording to the experimental scheme presented on table 1. The pigs were sacrified when having a weight of 160 kg.

Six different panel sessions were carried out on the 18 hams and 15 judges, specially trained for this products, took part. In every session, a sensory evaluation of three different areas of the hams in slices 8 cm long and 1 mm thick was first carried out. These slices were parts from *Biceps femoris, Semimembranosus, Semitendinosus,* and *Fascia lata* mainly. Eleven variables related to color, flavour, taste, characteristics of the fat and texture(table 2), were evaluated; a second evaluation which consisted of a visual valuation of the ham in which 5 variables related (table 4) to the characteristics of the fat and lean color were considered.

RESULTS AND DISCUSSION

The Principal Components Analysis (Powers et al., 1984) about organoleptic analysis from samples made it possible to define two Principal Components that explain 55% of accumulated variance. The first component represents 38.36% of information and the second one represents 16.54% of it. On table 2 we can observe the importance of the studied variables over the Principal Components. In the component 1, the effect made by variables fat color and tenderness is almost none for having a minimal projection over the axis. The rest of the variables show a big contribution from which we can outstand the following variables: general acceptabilty, taste intensity and taste persistance. In the principal component there are two variables having a bigger influence: lean color and grade of salting. This is due to the considerable projection over the mentioned component. In the same way, it can be appreciated a set of variables as fat fluidity, taste, taste intensity, persistance and general acceptability, as suggested by the correlation matrix.

By studying this matrix we have obtained a significant correlation among general acceptability of the sample, taste, taste intensity and taste persistence (r^2 = .89, .77, .70 respectively). Regarding the tasting tests and visual test of the ham, we have found an important correlation with the marbling from the sample evaluated at the tasting session and the marbling from the visually evaluated ham (r^2 = 0.81). However, the color keeps a minor correlation between the two tests. So, the marbling seems to indicate that it is a parameter easier to measure. Besides, the results regarding this characteristic are not affected by the way that samples are presented for testing. It has also been checked the existence of a good correlation between fat fluidity, juiciness, taste persistence and the general acceptability evaluated during the tasting session, as well as with fat fluidity evaluated visually in the ham.

In addition to this, a stepwise regression has been made and we have obtained the adjustment model for the independent variable of general acceptability (table 3). We can infer from this model that the variables taste intensity and fat fluidity influence the most in the variable general acceptability of the ham.

The carrying out of the PCA for the visual analysis of the ham has determined two principal components that explain 79% of the total information. On table 4 we can observe the coefficient of the different variables. Thus, it is observed a big influence from the marbling and the presence of the ham over the principal component 1. On the other hand there is, as it is shown in the correlation matrix, an elevated positive correlation between these two variables. The variables fat color and fat fluidity show a big influence over the principal component 2.

CONCLUSIONS

The results prove that PCA is very useful to study the relations between the different sensory attributes evaluated. It makes easier the interpretation of the organoleptic differences fond in the analyzed samples. Therefore the tandem the quantitative descriptive analysis and the multivariate analysis could be used as an objective technique to distinguish the sensory quality Iberian pig ham through organoleptic test.

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