

QUALITY TRAITS AND SAFETY OF AN ITALIAN TYPICAL PRODUCT: "CIAUSCOLO" SALAMI

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Background

The "Ciauscolo" is an unusual kind of salami spread, typical of the Marche region (central Italy). It was originally produced in the small geographical area of the mountain district, including the municipalities of Visso and Pieve Torina in the province of Macerata (Marche). The name comes from ancient Latin "*cibusculum*", meaning "small food" in the sense of "poor food" or "small meal" because of the high content of fat and consequently, the high nutritional value. The Protected Geographical Indication (PGI) "Ciauscolo" has been recently requested from the Ministry of Agricultural and Forestry Policy.

It is made with meat from adult pigs (about 1 year), using the belly, so as to contain a sizeable amount of fat (about 40%), shoulders and scraps from processing of thighs and necks and seasoned with spices. "Ciauscolo" salami is prepared as follows. Meat cuts are hot-isolated and directly sent to the factory in refrigerated (0-2°C) vehicles for processing. The meat is left at refrigeration temperature for two days and then used for preparing the mixture with the following composition: belly (66 kg), lean meat from shoulders, thighs and neck (33 kg), medium-grained salt (3 kg), pepper (300 g), white wine (0.5 l), garlic (45 g), nitrate (saltpetre 20 g). No starter cultures are usually added. The ratios of single meat cuts may slightly change on the basis of the batch of raw materials and depending on the season, that also influences the amount of salt used. During hot weather slightly more salt and less fat are used. Before grinding, meat passes through a cutter and is minced twice using two different sized meshes, the first larger and the second smaller. Then, it is put in a mixer together with salt, spices, garlic and wine and mixed well. The mixture is put in cold storage for two days before stuffing into casings called "budello gentile", consisting of small intestine from pig or bovine. After stuffing, the casing is gently pierced to allow the residual air to come out, preventing the risk of rancidity, which is the most frequent type of spoilage due to the high content of fat. Then, the salami is hand tied and stored in a drying room at 19-23°C and 65-70% RH for 7 days. During this step, the salami are smoked with a mild beech smoke made by burning sawdust in a burner located in the drying room. After drying and smoking, products are put in an ageing room, naturally ventilated, at 10-16°C and 80-82% RH for 1-3 months. In all steps, differences in environmental parameters depend on the size of the products (ranging from 5 to 10 cm in diameter) and the season. Products are marketed on an average after 2-3 months of ageing. Shorter (about 1 month) or longer (up to 6 months) aged products can be marketed according to consumers demand.

Objectives

"Ciauscolo" salami is a widespread product of the food industry in the typical area of production and represents an important economical resource for the Marche and other regions of central Italy. No data are available in the literature concerning the characteristics of this product. The aim of the present work is to point out its features, focusing on some qualitative traits, including the chemical composition, caloric value, physical parameters and safety aspects of products ready to sell.

Methods

Samples of "Ciauscolo" were purchased from a firm located into the typical area of production. They were prepared according to the traditional technique previously described and samples representative of 5 different batches, I, II, III, IV and V, aged 20, 28, 38, 46 and 56 days, respectively, were used for the analyses. Each salami was about 6 cm in diameter and weighed about 800 g.

Chemical and physical analyses of samples were carried out as follows. Moisture and ash were evaluated by A.O.A.C. methods (1990), protein by the Kjeldahl method using a Kjeltec 2300 (Tecator, Sweden) apparatus and fat by the Mojonnier method. pH was measured according to Bendall (1975). A_w was determined with a BT RS1 Rotronic Hygroskop (PBI International, Italy). Caloric values were calculated according to values reported by Fidanza (1998) for animal lipids and proteins.

Microbiological analyses were done for the following bacteria: total aerobic mesophilic count (TMC), *Salmonella* spp, *S. aureus* and *Listeria* spp. All analyses were carried out according to current methods using Oxoid (Milano, Italy) media.

Results and discussion

The results of chemical, physical and TMC analyses and caloric values of samples are showed in table 1. The fat content is high in all samples, representing the main feature of this product, as previously mentioned. Actually, this product has more fat than other similar Italian products. The amount of protein ranges from 13.32 to 16.94%, both low values if compared to other similar salami. Moisture seems to decrease slowly during ageing, but values of longer aged samples are rather high. All reported data emphasise the uniqueness of "Ciauscolo" compared to other traditional Italian salami, especially long ripened ones, in which moisture and fat content are lower, whereas protein is higher (Vizzani et al., 1992; Zabeo et al., 1993).

pH trend is gradually lower, reaching the minimum value (5.39) in samples aged 56 days. In these, pH is lower compared to that of other traditional Italian salami, characterised by long ageing and low acidity (pH about 6), and slightly higher compared to so-called acid salami (pH less than 5.3), generally short aged, in which sugars and starter cultures are added (Leistner, 1992; Incze, 1993). Furthermore, the increase in pH during later ripening stages of fermented meat products reported by Demeyer (1992), due to production of basic compounds from protein catabolism, does not appear in this salami. The drop in pH is quite slow, probably due to the absence of added sugar and starter cultures. The high content of fat may also influence the pH values, as reported by Incze (1993).

All samples have similar A_w values, even at different ripening stages. A_w values in longer aged products are considerably higher compared to other traditional Italian salami, in which A_w drops down even to 0.88 at the end of ripening (Incze, 1993). Probably, high moisture and A_w values may be related to the high content of fat that interferes with drying.

TMC ranges from 3.2×10^6 to 2.1×10^7 CFU/g, and it does not appear to be related to ageing time. These values are slightly lower than the mean ones reported by Leistner (1992) in "normal" fermented sausages and by other authors in many typical salami (Zabeo et al., 1993; Forastiero et al., 1998; Samelis et al., 1998). Low pH and the particular formulation of the mixture (high fat and low protein content, absence of added sugar) and the slight smoking during the initial stage of drying may contribute to limiting the growth of bacteria. Moreover, no pathogenic bacteria were detected in all samples.

All samples have high caloric values, markedly influenced by the content of fat. These values are higher compared to that calculated by Vizzani et al. (1992) in some other typical Italian salami, and seem to be more similar to the values reported for typical Italian cured and aged pigmeat products (pancetta, capocollo), obtained from fat or semi-fat meat cuts. Caloric values similar to that of "Ciauscolo" are reported by Riva et al. (1988) in some typical Italian salami (Milano and cacciatorino).

Conclusions

The peculiarity of "Ciauscolo" can be especially identified in the high content of fat. It prevents a pronounced drying, allowing it to be spread, too, even after long ageing. Moreover, the high amount of fat probably ensures low A_w values during the initial steps, when pH is still high. Afterwards, the stability is ensured by the progressive decrease in pH. These observations also agree with results of microbiological analyses. Actually, low TMC and the absence of pathogenic bacteria suggest that "Ciauscolo" salami is a stable and safe product. Nitrate also contributes to its safety. No cases of foodborne disease linked to consumption of "Ciauscolo" are reported, neither in an epidemiological survey carried out in the Marche region, where production and consumption of this product, also home-made, are considerable (Loschi et al., 2000). Considering the role of fat in this product, the study of the lipidic fraction seems to be interesting, for contributing to understanding some yet unclear aspects. The evolution of the microbial flora also appears important to investigate, particularly microbial species with lipolytic activity, mainly responsible for flavour production.

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Table 1- Chemical composition (% of total matter \pm sd), pH, water activity (A_w) and total aerobic mesophilic count (TMC) of samples of "Ciauscolo" salami at different ageing times (days).

Batch	Time	Moisture	Fat	Protein	Ash	pH \pm sd	$A_w \pm$ sd	TMC (CFU/g)	Kcal
I	20	41.01 \pm 0.16	38.00 \pm 0.15	16.94 \pm 0.10	4.06 \pm 0.21	5.65 \pm 0.01	0.940 \pm 0.003	9.1 x 10 ⁶	423
II	28	40.81 \pm 2.13	39.64 \pm 1.05	16.55 \pm 1.01	4.66 \pm 0.16	5.62 \pm 0.01	0.929 \pm 0.004	2.1 x 10 ⁷	437
III	38	41.85 \pm 0.44	41.05 \pm 0.63	13.32 \pm 0.26	3.80 \pm 0.06	5.59 \pm 0.04	0.943 \pm 0.005	8.7 x 10 ⁶	436
IV	46	39.07 \pm 0.51	40.92 \pm 1.65	16.71 \pm 0.21	4.30 \pm 0.06	5.47 \pm 0.01	0.925 \pm 0.003	3.2 x 10 ⁶	449
V	56	38.13 \pm 0.79	42.19 \pm 0.30	15.40 \pm 0.67	4.28 \pm 1.18	5.39 \pm 0.05	0.933 \pm 0.001	1.4 x 10 ⁷	456