PORTUGUESE CHORIZO - A TRADITIONAL INTERMEDIATE MOISTURE FOOD

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SUMMARY

Portuguese pork meat chorizo is leader in the market of the traditional country-style sausages due to its pleasant flavour, high nutritive value and long shelf-life.

Although similarity with chorizos from other countries, it is an original product with peculiar sensorial and shelf-life characteristics due to the technology used which includes a rather drastic heating process coupled with a long smoking from direct burning of hard woods usually holm oak (*Quercus ilex*), cork oak (*Quercus suber*) and olive (*Olea europaea*) trees.

The present work has confirmed after two years storage at room temperature that portuguese chorizo of industrial production is a shelf-stable product.

Introduction

The industrial can-packed country-style Portuguese Chorizo, when manufactured according to an HACCP plan (USDA-FSIS, 1991) is a safe intermediate moisture food (IMF), shelf-stable and assured african swine fever virus-free product (Melo *et al.*, 1987).

The aim of the present work is to check the behaviour of several batches of chorizo manufactured and canned according to the HACCP plan develloped in this laboratory to certify an african swine virus free condition (Barreto *et al.*, 1992).

Materials and methods

Pork lean meat and hard lard spiced with salt, red pimiento raw paste (mild), ground dry pimiento (mild and hot 50/50), garlic, and the industrial products including alkaline polyphosphates (for increased the liaison and the extraction of the fibrillar proteins), nitrite (added to salt at 0.6%) and L-ascorbic acid as preservative and colour enhancer and stabilizer, butylated hydroxy-anisole (BHA) and butylated hydroxy-toluene (BHT) as anti-oxidants (TABLE 1).

Chilled meat and hard lard are diced through a sharped grate rotational cutter, develloped to imitate the hand-cutting operation.

Meats and seasonings (TABLE 2), are tumbled in an horizontal shaft mixer for 15 minutes and transfered to a chilled room at 0-2°C for a 24 hours ripening. The ripened paste (core temperature 4-10°C), is stuffed under vacuum into collagen casings (35 mm of diameter) and portioned in a robot filler.

The string of twist-portioned sausages are imediately transfered, hanged by metalic rods to a kiln provided with temperature (T) and relative humidity (RH) record devices . To assure a sausage core temperature of at least 65°C during 30 minutes, the following schedule is used: 65°C - 60 minutes with 95% RH; 70°C - 60 min. with 85% RH; 75°C - 60 min. with 75% RH. The processed batch are moved to a country style smoking room set at 45°C (±5°C) with heavy smoke during 12 hours and then transfered for cooling to an air conditioned room where the temperature and relative humidity is reduced from 35°C, 95% RH to 14°C, 60% RH, so achieving the requested loss of weight without water condensation onto the surface.

The so-cooled sausages are individualized by cutting at the area of the twisted cases and packed in cilindrical cans. Cans (inside tin layer covered with epoxy resin) containing six chorizos are filled up with hot (90°C) soya bean oil and closed in a semi-automatic seamer.

Cans stored during two years at room temperature (16 - 24 °C) were sampled at six months intervals for analysis.

Chorizos and oil were submited to microbiological, chemical and sensorial analysis to assess their stability for two years.

Microbiological analysis including total plate count (TPC), D-group *Streptococci*, coliforms and faecal coliforms, sulfite-reducing *Clostridia* spores, *Staphylococcus aureus* coagulase-positive and *Salmonella*, were performed according to the Portuguese Standard Methods (equivalent to the I.S.O. Methods).

Chemical analysis including weight loss at 105 °C, crude protein, ether extract, total ash, total volatile basic nitrogen (TVBN), thiobarbituric acid value (TBA) and titrable acidity were performed on the homogenized chorizos according to the above mentioned Standard Methods. The titrable acidity was also evaluated on the oil covering the canned product.

Water activity (a_w) and pH were also evaluated on the final product.

The sensorial evaluation (covering oil and chorizos) has been made at each time of analysis (Martins, 1990), and the characteristics evaluated have been turbidity(of the oil), colour, flavour, and texture. Each characteristic has been rated from one (inaceptable) to ten (excelent).

Results and discussion

Results are shown in TABLE 3 and 4. No remarkable microbiological changes have been found during this period of time; only a slight meaningless increase of the total plate count (less than 1 $\log_{10}$) was noticed. There were no changes in the numbers of *Escherichia coli*, *Staphylococcus aureus* coagulase + and spores of *Clostridia*.

Also there were no changes in centesimal composition or in the values of total volatile nitrogen, thiobarbituric acid value and titrable acidity. The sensorial evaluation by a pannel produced the same marks during the same period of time.

Conclusions

The Industrial canned portuguese chorizo manufactured according to the established HACCP plan is an intermediate moisture food, shelf-stable for two years.

References

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