

## Hygienic quality of different ham preparations

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### Abstract keywords

Foods are never sterile. They carry microbial clusters of variable composition. Microorganisms found in foods are reflecting the natural microflora of the raw material and food handling habits and conditions. Of all the meat foods, ham is the most perishable to autolysis, oxidation, hydrolysis of fat and microbial spoilage and this is due to the extensive processing of the product.

The high fat content and low aw make ham somewhat ideal for mould spoilage.

However, bacteria introduced ham preparation and preservation are capable of growing well on certain types of hams by reflecting then the hygiene conditions in ham processing and elaboration.

### Keywords

ham preparations, *S.aureus*, *E.coli*, *C.perfringens*

### Material and Method

In order to investigate the microbiological quality of different hams, samples were collected from the following, preparations:

(a) 25 samples of boiled turkey (b) 25 samples of boiled pork ham (c) 25 samples of smoked turkey (d) 25 samples of smoked pork ham.

All cold ham products were collected from important commercial areas and were homogenized in PBS by the aid of a Stomacher. After decimal dilutions of our samples in cysteinated Ringer's solution, selective media were seeded for recovery of *E.coli* and *S.aureus*. An aliquot of the Ringer's solution was heated for 10 min at 80<sup>0</sup> C and from each dilution a second plate of a non selective medium was seeded for detection of the germinated spore forms. Our media were incubated aerobically and anaerobically for 48 h at 37<sup>0</sup> C. To confirm the presence of *C.perfringens*, the L.S. (Lactose-Sulfite) medium was used. The identification of the bacteria was carried out according to the Bergey's manual. Microscopic examination of Gram – stained cells, catalase, oxidase and biochemical tests were performed when necessary to identify.

### Results

*C.perfringens* vegetative (4%) and spore (24%) forms were found in boiled turkey, together with *S.aureus* (12%) and *E.coli* (8%).

In boiled ham, *C.perfringens* vegetative (8%) and spore forms (28%) were found. *S.aureus* was present (12%) and *E.coli* was found only in one sample (4%).  
Smoked turkey showed *C.perfringens* vegetative (4%) and spore (28%) forms, *S.aureus* (12%) and *E.coli* (8%).  
Finally, smoked ham showed *C.perfringens* vegetative (8%) and spore (36%) forms, *S.aureus* (16%) and *E.coli* (8%).

## Discussion

During the last years, the European Community Legislation sets out numerous hygienic measures, such as the HACCP based principles, focusing on microbiological tools, in order to assess the safety and quality of foods. Sliced cold butchery products are the most perishable of all the meat fresh foods. Ham slicing will contribute to a higher microbial charge, as well as to the damage of antimicrobial structures by increasing nutrient availability and red ox potential. Despite stringent hygienic conditions in the food industrie, extensive handling before and after slicing and packaging of cold ham products will provide the ham bacterial microflora.

Moreover, adequate refrigeration could inhibit or inactivate both spoilage and pathogenic microorganisms. Our interest is then focused on some bioindicators as *E.coli*, *S.aureus* and *C.perfringens* which can heavily contaminate during handling and packaging. Four types of cold butchery were evaluated; boiled turkey, boiled pork ham, smoked turkey and smoked pork ham.

The high frequency of *S.aureus* (12%) found in all the above cold butchery seems to be associated with the salted conditions in these preparations.

*C.perfringens* spore forms seems to be present in higher numbers in the pork ham preparations (28%).

Moreover, smoking processing of ham and turkey preparations compared to boiling processing is associated to a higher microbial charge by *C.perfringens* spore forms (36%).

Checking of the microbiological quality of cold butchery preparations must be done systematically in order to preserve the food quality and optimizing the processing and elaboration methods of the product.

## References

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