Processes used in the UK to manufacture MSM and former DSM meat products from poultry and pork and an initial assessment of risk

Area of research interest: Foodborne pathogens
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Conducted by: Food Refrigeration and Process Engineering Research Centre at the Grimsby institute

Background

Mechanically separated meat (MSM) is obtained by removing meat from flesh-bearing bones, after boning or from poultry carcases. This is done using mechanical means and results in the loss/modification of muscle fibre structure.

Desinewed meat (DSM) is produced from the mechanical removal of sinew and tendons from meat, which has been separated from animal bones. This is done using a low pressure mechanical technique, either as part of a continuous or a separate process. Since April 2012, the term ‘desinewed meat’ is no longer used as the European Commission had advised that DSM produced by mechanically separating residual meat from animal bones must now be regarded as MSM.

Techniques that do not alter the structure of the bones produce a product called Type 1 MSM where the calcium content is not significantly higher than that of minced meat. All other processes produce a product called Type 2 MSM. Some processes which produce DSM are classified as MSM Type 1, and some as meat preparations. Meat preparations are defined by the legislation as “fresh meat, including meat that has been reduced to fragments, which has had foodstuffs, seasonings or additives added to it or which has undergone processes insufficient to modify the internal muscle fibre structure of the meat and thus to eliminate the characteristics of fresh meat”.

There are currently restrictions on the use of MSM and DSM from poultry and pork. This research project was carried out in order to support our assessment of whether these restrictions are both proportionate and appropriate, with regards to public health protection.

Research Approach

The main objective of this project was to describe the processes used in the UK to manufacture MSM and former DSM products from poultry and pork and to carry out an initial assessment of any microbiological risk which may be involved.

The approach involved obtaining and interpreting information from scientific literature, which described the microbiological status of the meat products at various stages of the production process. Data and information on the microbiological status of the products was also gathered from industry food business operators using surveys.

An assessment and comparison of the microbiological risks associated with the different production stages was implemented. Commentary was provided on the appropriateness of the required controls and restrictions for each stage of meat product production, and any required changes/improvements were suggested. Finally, the identification of information gaps was carried out.

Results

Two pork and four poultry processors in the UK completed the survey. It was found that they all used similar production methods for poultry and pork Type 1 and Type 2 MSM and meat preparations.

All who completed the survey complied with the legislative requirements for the production of MSM and meat preparations, such as freezing and storage.

It was found that there is very little published information concerning microbial aspects of MSM. Some publications have indicated that the state and age of the raw material may be the main factor influencing the microbial load on MSM; while other statements in the literature suggest that, due to the high level of muscle fibre degradation, MSM could preferentially support microorganism growth.

There does not appear to be any clear and concise published studies which have compared the microbial growth on MSM with the level of muscle fibre degradation. Information provided by MSM producers appears to indicate that the overall microbiological quality of MSM, particularly Type 1, is similar to that of both meat preparations and minced meat. It was concluded that there is insufficient scientific evidence to establish the food safety and microbial risk of MSM, and in particular, whether there is a marked difference to mince or meat preparations.

The work undertaken to analyse information gaps suggests that, going forward, there is a need to establish the actual abundance of pathogens that may be present in MSM in comparison with minced meat and meat preparations. This could be achieved by carrying out survey work. Comparisons of MSM with minced meat, or cuts of meat, could also be carried out to see if MSM is a better growth medium under standard chilled storage conditions and whether the degree of muscle fibre degradation has an effect on microbial growth.

Research report

England, Northern Ireland and Wales

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