



Mechanically Separated Poultry

What is it?

Mechanically separated poultry (chicken or turkey) is a low-cost poultry protein, which is produced by mechanically separating bone and attached skeletal muscle (1). It is also known as mechanically deboned poultry meat (MDPM) and generally depending on the source needs to be clearly stated as either MSC (mechanically separated chicken) or MST (mechanically separated turkey). The end product is a finely chopped batter like product, which can be used in a number of wholesome poultry products and may or may not contain skin with attached fat. Mechanically deboned chicken meat (MDCM) has a high content of heme pigments, connective tissue, and fat (2).

How does it work?

After dressing, the poultry carcasses (specifically chicken) are passed through a mechanical deboner to retain any skeletal muscle still attached to the carcass frames. High pressure is used to force the remaining muscle and tissue through a series of sieves and/or plates resulting in a finely chopped meat, which can be used in processed meat and poultry products and the residual bone, tendon, gristle and sinew are used to produce bone meal or sent to rendering for further processing (3).

How, when, where is it used?

The finely chopped can be used in a number of products including large and small diameter sausages, nuggets, and patties. In addition to being a common raw material for processed meat and poultry products, it is widely used in the food industry due to the functional and nutritional properties of the proteins, thus creating value-added products. Currently there are no restrictions to the amount of MSC or MST, which can be used in a product. However, excess of 15% MSC may require a product's name change in order to comply with the product's standard of identity. In an attempt to promote 'honest-labeling' the USDA FSIS now requires products containing MSC or MST to be labeled as "mechanically separated chicken" opposed to "chicken"/"turkey" or "chicken meat"/"turkey meat". MSC is limited by "kind", that is, if a product is required to be a specific kind of poultry, it cannot be substituted or added as an alternative mechanically separated poultry meat in to the product (i.e. if a product is supposed to be MSC it cannot contain turkey and vice-versa). Secondly, MSC made from fowls (mature female chickens) cannot be used in baby, junior, or toddler foods.

Why is it important?

According to several reports the technology used for producing mechanically deboned poultry and products thereof is accepted as a valuable and practical means for salvaging edible tissue from poultry parts and carcasses from which most of the muscle and other tissues have been removed by hand (4). MSC provides a low cost means to salvage chicken protein, which would otherwise be lost and provides an economical way to provide essential protein and amino acids to products and minimize waste from poultry carcasses.

For processors, retailers, and consumers?

Currently the market has a number of wholesome poultry products on the shelves, including cooked sausages (such as chicken frankfurters, salami, and bologna), ready-to-eat hotdogs, fresh chicken sausage, chicken patties and nuggets (1). MSC was found to have similar flavor and acceptability ratings in all chicken frankfurters when compared to hand deboned chicken (3). Skin removal prior to mechanical deboning will also decrease fat content and increase the water holding capacity and emulsifying characteristics of MSC, making it an ideal ingredient in sausages and emulsified products. However, use of MSC with extended freezing times has seen a decrease in final product acceptability due to oxidative rancidity. The use of traditional and natural preservatives can help prolong the shelf-life of the product.

What are the benefits?

- Low cost protein
- Nutritional value similar to whole muscle chicken
- Low fat protein ingredient
- Minimize waste during poultry processing
- Decrease edible protein loss

What are the risks?

Microbial hazards in MSC are dependent on the hygiene and sanitation of processing and their facilities, levels and types of contamination present in the raw material, and their storage history. MSC is expected to have similar microbial risks to minced meats. As muscle fibers undergo degradation during processing there is an increased risk of microbial growth with the release of nutrients and spread of contamination due to the breakdown of muscle into small particles.

Take-home Message

MSC provides a cost-effective poultry protein to a variety of processed meat and poultry products. MSC offers a practical recovery system for edible muscle, which cannot be efficiently recovered by hand deboning without compromising the safety of products. MSC is nutritionally similar to hand deboned chicken and does not pose any adverse risks to consumers.

References

1. USDA-FSIS. 1995. Poultry Products Produced by Mechanical Separation and Products In Which Such Poultry Products Are Used; Final Rule. Vol. 60, No. 213, Friday, November 3, 1995, Rules and Regulations.
2. Yang T.S. and Froning G.W. 1992. Selected washing processes affect thermal gelation properties and microstructure of mechanically separated chicken meat. *J Food Sci.* 57:325–329.
3. Mountney, G.J.; Parkhurst, C.R. *Poultry Products Technology*. Food Products Press, New York, 1995.
4. USDA-FSIS. 1995. Limitations With Respect To Use Of Mechanically Separated (Species). 9 C.F.R. § 381.173. Mechanically Separated (Kind of Poultry).

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