Meats, Mechanically Separated

Revised 2018

Storage Life

	0°F (-18°C)	-20°F (-29°C)
	Months	Months
Beef, mechanically separated	1 to 3	2 to 6
Veal, mechanically separated	1 to 3	2 to 6
Pork, mechanically separated	1 to 3	2 to 5
Chicken, (mechanically separated)	1 to 3	2 to 5
Turkey (mechanically separated)	1 to 3	2 to 5
Fish (mechanically separated)	1 to 3	2 to 5

Monitoring Calcium Content

Mechanically separated meat (MSM), sometimes called mechanically separated tissue (MST), is produced by removing small portions of meat tissue from bones remaining after traditional deboning operations. The U.S. Department of Agriculture Food Safety and Inspection Service (USDA FSIS) has determined that meat produced by mechanical separation systems ***can*** have a similar composition as meat trimmings and, if so, can be fairly identified as "meat." The advanced meat and bone separation machinery does not crush or grind bones in the process of removing skeletal tissues like machinery previously used to produce mechanically separated meat.

However, to ensure that advanced systems are operating with good manufacturing practices, the final USDA rule limits the calcium content in the produced meat to no more than 150 mg/100 g. Products that exceed the calcium content limit ***must*** be labeled "mechanically separated meat." Numerous meat and poultry processing plants now have advanced meat and bone separation systems to improve recovery of lean tissue from carcasses.

Characteristics of Mechanically Separated Meat

Mechanically separated meat, regardless of how it is labeled, is much more vulnerable to both oxidative and microbial change than traditional skeletal tissue. The process of removing the tissue from the bones may break cell walls, and leads to a much greater total surface area of the small particles. Unfrozen, mechanically separated meat will more readily support microbial growth than intact meat pieces because: a) the surface area is greater; b) nutrients for bacteria are made more readily available due to the rupture of meat cells; and c) moisture levels are high. Inevitably, mechanically separated meat will be inoculated with ubiquitous spoilage bacteria. Good plant sanitation is essential to minimize the

number of bacteria available for inoculation of the meat. Refrigeration is essential to inhibit the growth of the bacteria that are present on and in the MST.

It has been suggested that fresh mechanically-deboned poultry be used within 3 days, whereas frozen deboned poultry should be used within 30 days. When frozen blocks of mechanically deboned meat or poultry are to be used, they should be flaked while frozen to speed the thawing process. When used for cured products containing nitrite, care must be taken to ensure that frozen deboned meat has thawed sufficiently to uniformly absorb the nitrite. Products containing mechanically-deboned meat should be cooked to at least 160°F (71°C). In all cases, mechanically separated meat must be frozen quickly (shallow containers, blast freezing) but even then, the expected frozen storage life is significantly less than for most other meat products.

There are several techniques that may be used to extend shelf life of frozen mechanically separated meat products from 1 to 3 months to as long as 4 to 6 months. The first is reduction in storage temperatures from 0°F to -20°F (-18°C to -29°C). Controlled atmosphere (CA) storage under carbon dioxide or nitrogen or in vacuum has been found to be beneficial for storage of mechanically separated meat products to reduce contact with oxygen, and addition of antioxidants will extend frozen shelf life up to 6 months. When antioxidants are combined with -22°F (about -30°C) or lower storage temperature, shelf life may be extended to as long as 10 to 12 months.

Mechanically separated red meat and poultry meat may contain higher levels of calcium, unsaturated fats, and fluoride than do conventionally hand-boned meat. Comminuted meats of this type may also possess relatively high levels of bacteria. Due to the potentially high unsaturated fat level and microbial content, comminuted meat, such as mechanically separated meat, is readily susceptible to spoilage and rancidity development. Therefore, it is important to pay close attention to the blast freezing process for comminuted meat, and to store these products for only a few months, even when utilizing the lowest feasible storage temperature.

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