

MODULE - 9



Meat Tenderization

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Meat tenderization

In cooking, tenderizing is a process to break down collagens in meat to make it more palatable for consumption.

➤ Factors influencing tenderness are:

- Stress
- pH
- Pre - slaughter electrical stunning
- Aging
- Age
- Marinating
- Influence of Vitamin D supplementation
- Calcium injection

Factors influencing tenderness



Stress

Research in Australia and in New Zealand has shown that when stress in transport, yarning, handling and slaughter was minimized beef meat was consistently at the tender end of the scale regardless of breed. Similar results have been shown for deer and for sheep.

Influence of pH

High pH meat is darker but less consistently tender than normal pH meat

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- Influence of pre - slaughter electrical stunning

Tenderness affected positively

- Influence of aging

The greatest activity is within the first 7 days of aging, and by 14 days the greatest gains in tenderness will have been achieved.



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➤ Influence of age

- Young animals are tendered
- Meat from older animals are less tender



Different methods of meat tenderization

- **Natural**
- **Mechanical**
- **Chemical**
- **Marinating**
- **Freezing**



Natural method of meat tenderization

- Most meat is normally required to age for a period of up to three weeks in order for it to be commercially acceptable for human consumption
- During the aging process, the connective tissues of the meat are broken down by the natural enzymes of the meat. Thereby improving the tenderness and edibility.



Mechanical method

- Grinding
- Cubing
- Blade or needle tenderization



Chemical method

- Chemical is the addition of meat tenderizing enzymes, which affect the connective tissue. This method is used to both flavor and tenderize meat.
- They are applied to meat by injection, rubbing, soaking or vacuum.
- The two most often used meat-tenderizing enzymes are Papain and Bromelain.



Marinating

- The basic ingredients of a marinade include :
 - salt
 - Acid (vinegar, lemon, Italian salad dressing, or soy sauce),
 - enzymes (papain, bromelin, ficin, or fresh gingerroot)
- The tenderizing action of marinades occurs through the softening of collagen by the salt, the increased water uptake, and the hydrolysis and breakage of the cross links of the connective tissue by the acids and alcohols.



Freezing

- When meat is frozen very quickly, small ice crystals form; when meat is frozen slowly, large ice crystals are formed.
- While the formation of large crystals may serve to disrupt components of the muscle fibres' in meat and thereby increase tenderness very slightly, the large ice crystals result in an increased loss of juices upon thawing.
- This increase in loss of juices results in meat that is less juicy upon cooking and therefore usually is perceived as being less tender



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