

Examination Of Meat Sample

Taste , Smell, Texture, Consistency

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Introduction:

The quality of meat and meat products is defined by the following criteria:

- palatability (typical texture and consistency, juiciness, good flavour);
- proportion of lean meat to fat;
- freshness and adequate conservability of the products;
- absence of harmful micro-organisms or substances; and
- appropriate (preferably minimal) use of additives and meat extenders.

The different criteria need different methods of quality control, such as:

- organoleptic evaluation

- physical test methods
- chemical analysis
- microbiological examination

ORGANOLEPTIC EVALUATION:

Organoleptic evaluation consists in describing the attributes of food, in this special case of meat and meat products, that can be perceived by the sense organs.

The attributes to be evaluated are(appearance, colour, texture and consistency, smell and taste.)

Texture and consistency (tenderness and juiciness)

1)Meat prepared for the consumer should be tender and juicy.

2) Meat tenderness depends on:

the animal species from which the meat originates. Lamb, pork and poultry meat are sufficiently tender after slaughter

but beef requires a certain period of maturation to achieve optimal eating quality.

3)Texture and consistency, including juiciness are an important criterion, still neglected by many consumers, for the eating quality of meat.

4) Often consumers do not know that the eating quality of meat can be upgraded by ripening, especially in the case of beef and similar meats.

There is also a great deal of consumer negligence in how to prepare meat.

It should be cooked to become sufficiently tender, but cooking should not be too intense otherwise the meat becomes dry, hard and with no juiciness.

5) The texture of meat is influenced by the cook time and temperature.

6) A correlation between meat texture and heat-induced denaturation of meat proteins has been reported for beef

7) The texture is of less importance in **meat products**, such as cured or canned products, sausages, etc., because they are either made of comminuted meat and/or meat which has undergone heat treatment or long maturation periods and will therefore generally be tender.

8) Heat on meat will also change its water holding capacity (WHC). Meat generally contains 75% water.

At high temperatures greater than 55o, myofibrillar proteins denature and coagulate causing shrinkage of fibres and tightening of the myofilaments. This results in an increase in evaporation and drip loss and a much drier meat texture that is less juicy and tender.

The texture of cooked meat therefore depends on the combination of intrinsic factors (water loss, collagen content and denaturation of myofibrillar proteins) and extrinsic factors (cooking time and temperature)

Methods For Estimation of Texture:

The methods include sensory, instrumental and indirect (collagen content and amount of dry matter etc).

1)Sensory:

The simple way to check the consistency of foods is bychewin

. Although this test seems easy, in practice it is rather complicated.

Taste panelists need experience, particularly when the different samples have to be ranked,

for example which sample is the toughest, the second toughest or the most tender.

2) Instrumental methods:

are mechanical tests that measure the applied resistance of the meat to a force acting on it.

Common methods for assessing meat tenderness include:

shearingas: the Kramer

:Shear Cell and Warner Bratzler shear blades

tensile testing using(اختبار الشد): dual grips(مقابض مزدوجة) or

compression tests using(اختبار الضغط): a Texture Profile Analysis (TPA) test which is a two bite test.

Principles :

In these tests, the meat tenderness is measured as the force or energy required to cut (penetrate), tear or compress (deform) the meat. Samples need to be large enough and precisely defined.

TPA test:

simulates the biting action in the mouth.

It consists of a 2-cycle compression test.

Here the sample should have a smooth level surface with a diameter smaller than the flat faced cylindrical probe.

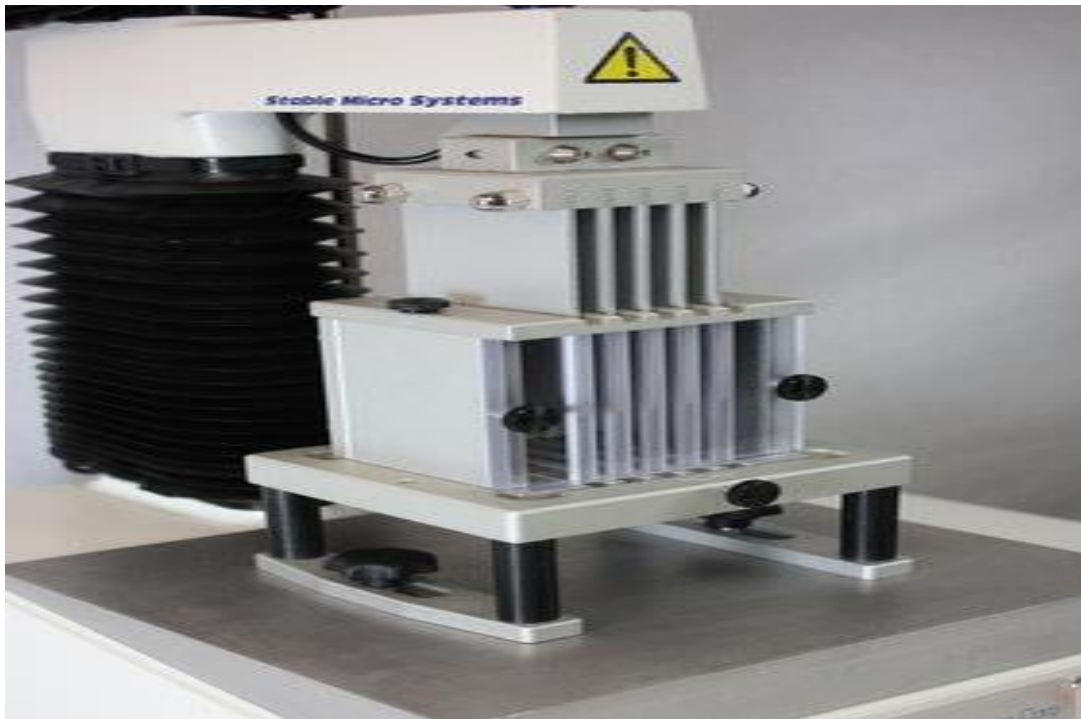
This test gives the textural parameters of tenderness (hardness), adhesion, springiness, cohesiveness and chewiness

The Kramer shear cell:

The Kramer shear cell with its multiple blades allows for samples of variable geometry to be sheared.

The results for hardness and work done are therefore an average of the forces required to shear the sample of variable geometry.

This fixture incorporates the textural methods of compression, shearing and extrusion through slots in the base of the cell. Prior to the test, cut cubes of the meat sample are weighed then placed into the cell ensuring a level surface.



Smell and taste (aroma and flavour)

These characteristics are related to each other to a certain extent because they have to be evaluated together for the reliable determination of a product's flavour.

The smell of fresh meat should be slightly acidic, increasing in relation to the duration of the ripening period because of the formation of acids such as lactic acid.

On the other hand, meat in decomposition generates an increasingly unpleasant odour owing to substances originating from the bacterial degradation of the meat proteins, such as sulphur compounds, mercaptane, etc.

The freshness of meat is generally indicated by its smell together with its



appearance and colour.

Sorting out deteriorated meat is mandatory from the point of view of the product's palatability.

It is also important because of the fact that high bacterial contamination of meat in decomposition could be accompanied by food-poisoning bacteria(pathogens), which have a deleterious impact on consumers' health.

On the other hand, the best fresh meat can also be heavily contaminated with food-poisoning bacteria because these micro-organisms do not cause organoleptic alterations by destruction of meat proteins.

Food poisoning can therefore only be avoided by proper hygienic meat handling.

Method For Estimation Of Flavour:

The flavour of fresh meat can also be checked by putting small samples (approx. 10 pieces of 1 cm³ each) in preheated water of 80°C for about five minutes (boiling test).

The odour of the cooking broth and the taste of the warm meat samples will indicate whether the meat was fresh or in deterioration or subject to undesired influences, for instance rancidity of the meat fat, any a typical meat flavour due to the feed and the sex (boar taint) of the animal or treatment with veterinary drugs shortly before slaughter.

When processing the meat, the smell and taste of the meat products can differ a great deal owing to heat treatment and the use of salt, spices and food additives.

Every meat product has its typical smell and taste, and the test person should know about it.

Changes in these qualities indicate the use of improper raw materials or a deterioration of the meat product during storage.

Experience is required to become acquainted with the typical flavour (smell and taste) of foods.

Only four basic taste components--sweet, sour, bitter and salty--will be perceived by the taste buds.

These receptors are small papillae located in certain areas of the tongue. However, the overall flavour consists of smell and taste produced by the meat components and influenced and covered by spices and those compounds produced by ripening or heat treatment.

Flavour test panelists should be aware of these special cases.

Panelists should not smoke or eat spicy meals before starting the test and should rinse their mouth frequently with warm water during the test.

Sensory evaluation plays an important role in the examination of meat and meat products.

Not only does scientific sensory evaluation with skilled panelists using special test programmes and point systems give reliable results, but useful results can also be obtained in a simple way at the consumer level.

For the average consumer sensory evaluation is the only way to decide whether or not he or she should buy or eat a certain product.

In developing countries consumers do not receive sufficient information and training on this point, although it is often the only means available for quality control. Sensory evaluation is easy to understand and to perform. What is needed is a basic knowledge of the composition of foods and their typical texture, colour and flavour.