

QUALITY OF POULTRY MEAT AND FACTORS THAT DEFINE IT

Balș Cristina

University of Oradea , Faculty of Environmental Protection, 26 Gen. Magheru St. 410048 Oradea

Abstract

Meat is considered a food of great price by most communities. Occupies a place of prestige is often seen as the central food around which revolve the other food types. High nutritional value of meat is a property on which there is no dispute at scientific or popular level.

Key words: PUFA, SFA

INTRODUCTION

Meat among other foods of animal origin, make a valuable contribution to human nutrition, especially in developing countries, whereas in industrialized countries there is a wide variety of foods of all kinds, sold at affordable prices.

Observed in industrialized countries over time and slowly changing preferences towards the various types of consumed meat (beef, pork, lamb, chicken), preferences influenced by price, appearance, and advertisements. Lately, however, the main factor influencing consumer choice is health. Placing food on the basis of important diseases suggested changing your diet, special recommendation to reduce consumption of fats, especially saturated fatty acids of animal origin to an important sector of consumer oriented towards consumption of poultry and fish.

However, meat is a valuable food, being a relatively concentrated source of high quality protein (0,75-0,8), easily digested (digestibility 0.95, compared to "plant foods, which is 0.8 -0.9), providing a relative excess of lysine (essential amino acid lacking in most cereals).

In addition to important anatomical pieces resulting from cutting poultry include skin, which contains approximately the same amount of fat to that of mammalian meat fattening stage average about 20%, it is necessary to remove the skin and subcutaneous fat to reduce the content fat at 5%, or no less than lean meat of mammals.

However, poultry meat contains a lower amount of saturated fatty acids (33% of total) and a higher amount of polyunsaturated fatty acids (PUFA) (14%) than lean meat of mammals, which contains 45% saturated fatty acids (SFA) and PUFA 4% .

MATERIAL AND METHODS

Quality meat under the dependence of sensory factors, hygiene and toxicology and, equally, under the influence of factors related to its nutritional value, and its processing technology (Scheper J., 1962, cit. The Vacaru-Opris 1., 1983).(fig1)

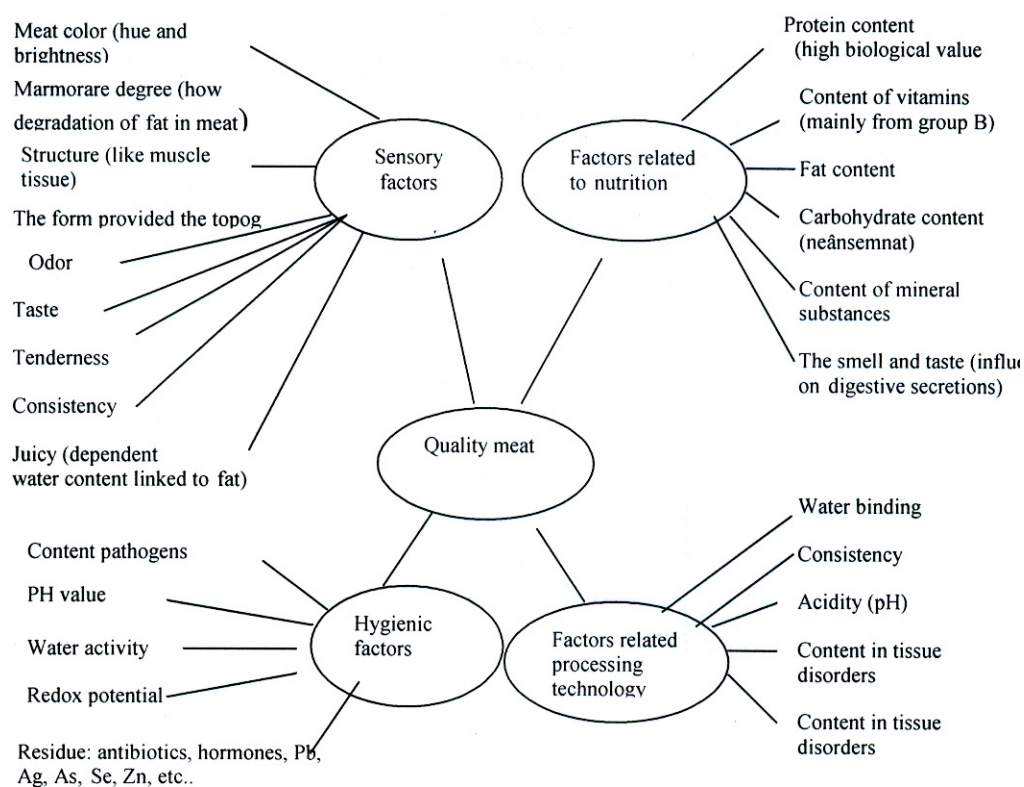


Fig.1 factors defining the concept of quality of flesh after J. Scheper, 1962, cit. the Vacaru Opris I., 1983)

The concept or notion of quality of meat has different meanings depending on the preparation of dealing with this topic. For example, the researcher Pearson 1960, cit. Gheorghe Georgescu, 2000 means the quality of meat, a combination of physical features, structural and chemical properties of them, that determines the appearance and degree of preference by consumers.

Hofmann (1973, 1986, cit. By the same author, in 2000), considered that the quality of the meat must understand the organoleptique, nutritional-physiological, hygienic and toxicological and technological processing of it.

The concept of quality of meat produced by Steihauf D., 1962, structured in turn on criteria for defining quality of meat produced by J. Scheper, 1962 is presented in Fig. 2.

Those attempts to define the concept of meat quality were made by Sonnet (1984), Demeyeur and col. (1984), Wenzel (1989), Banu C. and col. (1997). Thus, Sonnet (1984) classify meat on grades 3, respectively:

- ❖ high quality meat with good flavor and succulence fine;
- ❖ usual quality meat, that freshness comes first, the expense and savor its succulence;
- ❖ meat of poor quality, lacking tenderness and other organoleptic qualities.

Wenzel (1989) shows that a total of 5 groups of features defining the quality of meat, namely nutritional value on its chemical composition, amount of attractiveness (color, consistency, smell, taste, appearance); status hygiene (microbial load) ; technological status (processing characteristics) and toxicological status (content of toxic substances).

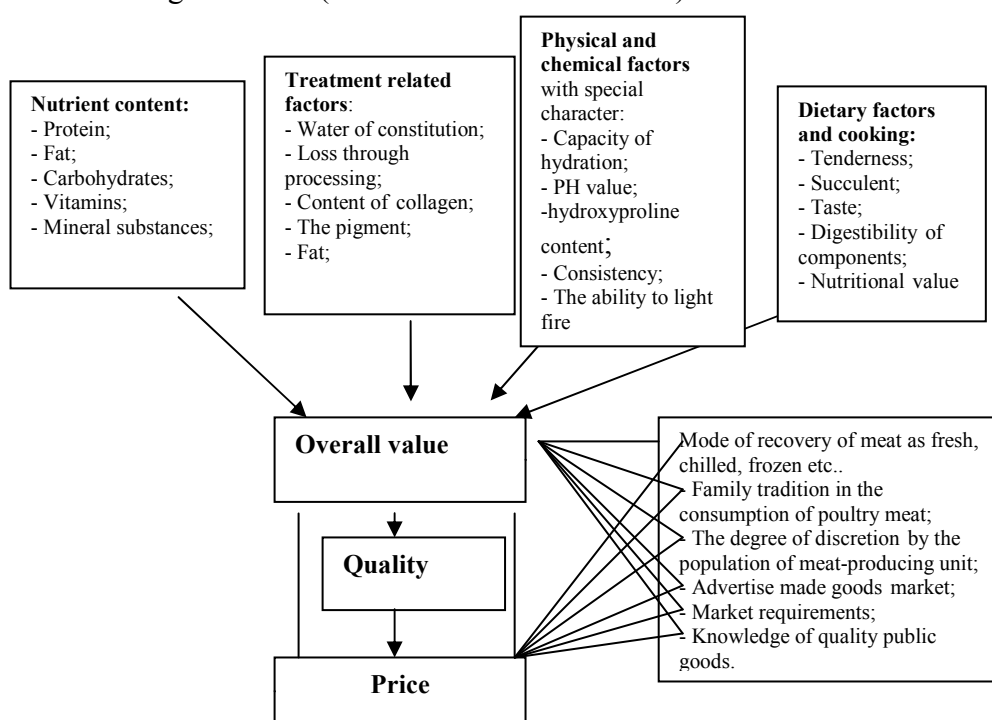


Fig. 2 Direct and indirect factors that define the concept of quality of flesh (after Steihauf D., 1962, quoted by Vacaru Opris I., 1983)

Quite suggestive, define the concept of quality of flesh Banu C. and col., 1997, which in elucidating this issue focus on training and concerns of the stakeholders to make the necessary clarifications. As such, the

consumer, a good quality cam is one that does not contain much fat and is young, juicy and fragrant.

For a nutritionist, meat quality is determined by its content in protein, fat, mineral substances, vitamins, etc.. In a good quality meat should not highlight substances and micro-contamination and pollution.

For a specialist in animal breeding, meat quality comes only from healthy animals, recreation and good fattening. If processor, key criteria for determining the quality of their meat is performance of sacrifice, the relationship between tissue components of meat and its organoleptique characteristics.

Organoleptique factors (sensory) of poultry

The consumption of meat, the man charged several of its characters or complex features such as: tenderness, succulence, color, smell and taste (taste), appearance, marmorarea, etc. perselarea. Intensity that manifests the qualities listed will depend on how the meat. For poultry, marmorarea and perselarea are not specific.

After cervical Georgescu and Gh., 2000, factors affecting the overall sensory quality of meat can be grouped into: internal or genetic factors (species, breed, genotype, sex, age, individual, etc..) And external factors or technological (fattening system prevailing conditions of animal slaughter and cooling of carcasses resulting from slaughter, etc..), so as you can see in Figure 3.

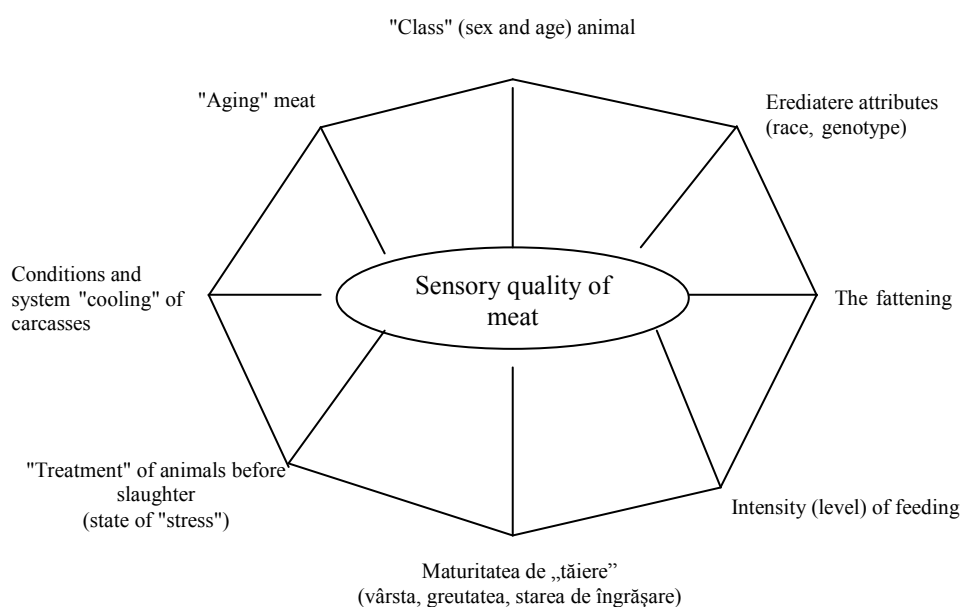


Fig. 3 Factors influencing sensory characteristics of meat
(by Georgescu and Gh col., 2000)

Tenderness of meat is subject to species, breed, line, age, state of fattening, how the meat was done cooling, heat treatment, etc. applied., Also, Meat tenderness is determined by its content in lax and fibrous connective tissue, the amount and quality of fat tissue and muscle quality. Researcher Le Magnen, 1962, considered that the tenderness of meat must understand the ease with which it leaves the mastic. Forest and col., 1975, defining the amount of meat tenderness feelings that consumer during chewing it. On the other hand, Lee, in 1984, maintains that creates a feeling that came early to "melt in your mouth" and Sonnet, 1984, considered as a meat early leave "penetrated" and cut easily.

Since many factors influence meat tenderness for their orderly presentation, Diaconescu M. (1979) has grouped into factors related to animal fattening technology applied, and carcass and meat quality at slaughter results (Fig. 4).

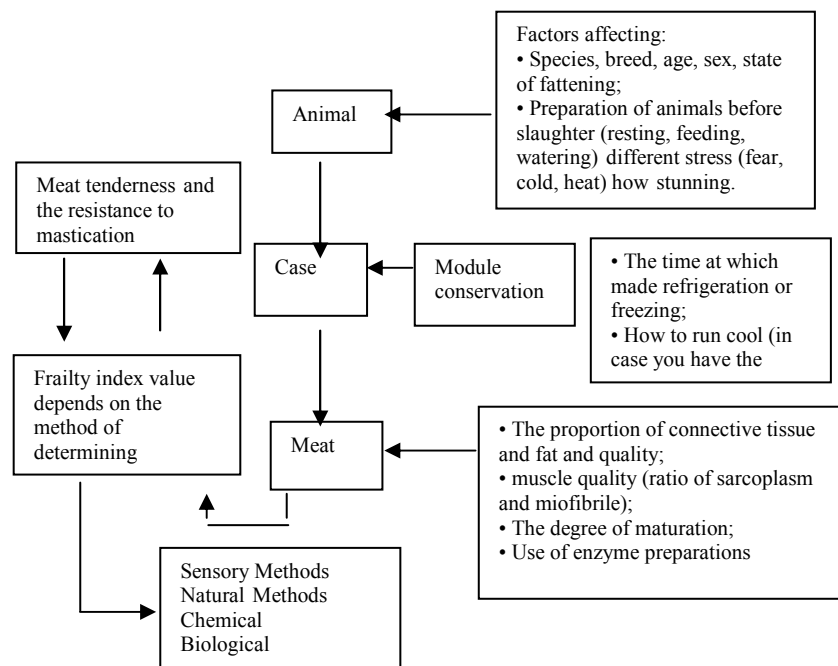


Fig. 4 Factors that influence meat tenderness (after Diaconescu M., 1979)

Poultry meat is more tender than that from poultry game. Large differences appear between the different breeds of birds, so the meat is white Plymouth Rock breed earlier than the Cornish and New Hampshire breeds (Grosman B. and R. Lucinys, 1968; Pisone J., 1973) as meat breed

chickens in Moscow early May, and thus, more juicy than the meat of white chickens Russian (Iotsious V., 1966).

Young birds, meat tenderness is better than in the adult, where sarcolemma muscle fiber is thicker (DW Peterson and col., 1959, Dodge JW and WJ Stadelman, 1959), take as birds with a higher intensity of growth meat earlier than those with a lower intensity (Shrimpton DH and Miller, WAS, 1960).

As for the effect of feeding on birds taken freshness meat, it has not proved fast charity (GB Goertz and col., 1961). Cutting technology affects birds in one way or another meat tenderness, eg scalding operation at high temperature, especially when done in a long time, delaying glycogen degradation, with adverse effect on the qualities (AA Klose and cervical ., 1956, Shrimpton DH, 1960). Instead, Dodge JW and WJ Stadelman, 1960, demonstrated that the technology applied to slaughter does not significantly influence meat tenderness, which can not be said about the temperature and time of storage of carcasses obtained.

After May KN and col., 1962, the carcasses stored at temperatures between 32 ° F and 66 ° F, the first phase of storage, freshness is better than those stored at 98.6 ° F but after 8 hours of storage these temperature differences disappear degradation freshness meat.

Haufman D.L. and col., 1961, have induced an improvement in freshness chickens meat by propionic acid injection (100 ppm) in the depth of muscle mass.

Carcass chilling dip proved to be disastrous for flavor, but favorable for tenderness. As for irradiation with gamma radiation of thawed meat, it has a minor effect on freshness meat (WJ Stadelman and Wise RG, 1961).

Meat is meat juicy ability to "give up" juice by mastication The level of meat succulent is determined by the capacity of the meat to retain a certain amount of intracellular and intercellular juices, this level is influenced by water and fat content in meat

Age plays an important role in defining the degree of succulence of the meat, as always, is sucking juicy meat of young animals than the adults, due to its increased finetii and higher water content to it.

Meat color depends on the amount of myoglobin and hemoglobin existing cams, but in some specific pigments, the relative age of the animals from which meat is examined, sex, region of muscle, provided the food, animal health, how the animal was prepared for slaughter, bleeding technique adopted etc.

Meat color is given by hue (tone), intensity and luminosity (brightness capability) fig. 5.

Flesh tone is influenced mainly by the chemical state of myoglobin and hemoglobin in the meat.

In general, good quality meat is a red open, once the presence of myoglobin within the muscle purple and pink oximioglobinei, myoglobin oxygenation resulting from the meat surface to a depth of 4mm (Georgescu and Gh col. , 2000). Contribute to the tone color and hemoglobin which is red.

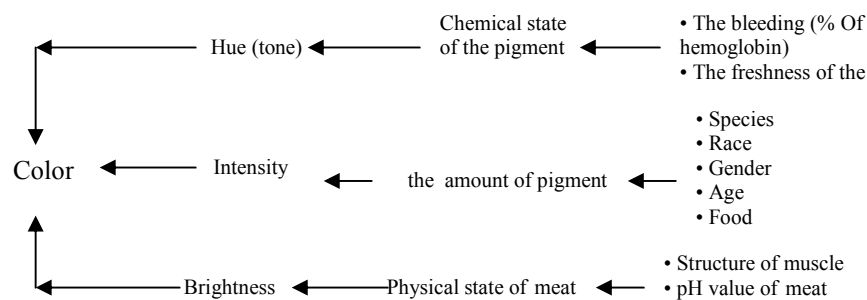


Fig. 5 Factors affecting meat color
(after Temișan V., 1995, cit. Georgescu GH. And col., 2000)

Oxidative processes, both myoglobin and oximioglobin becomes metmyoglobin amber, the first two substances have a bivalent Fe atom (Fe²⁺), and the third, one atom of Fe in the trivalent state (Fe³⁺).

In conclusion, in a normal situation, the hue of the meat or its tone varies from pale pink to red-live (on) or red (purpura), by species, breed, age, health status, type of muscle, slaughter conditions, method of preserving meat, etc. provided.

Meat color intensity is given by the quantities of hemoglobin and myoglobin present in meat.

Brightness of meat is the power reflectance of light by the meat, being influenced by bleeding technique used, ie, the amount of blood removed from the body of the animal to bleed, then: the ratio of muscle tissue and fat, the ratio of the pigment the reduced and oxidized state, tone color, etc.

Flavor or aroma of meat is an attribute that embodies the taste and smell of meat, as determined by a number of variables such as sex, age, heredity, growth conditions provided animals for slaughter, slaughter conditions, cooling and storage of meat obtained, type and amount of additives added to the processing meat, the degree of consumer perceptions of the meaning of the concept of quality meat, etc..

To those found, the question naturally arises: can be reared chickens, which came to have a certain taste, appropriate consumer preferences at a time? It is a question that answers given so far are quite controversial.

Hanson H.L. and col. (cit. by Vacaru-Opris I and col., 2002), studying the effects exerted by the race, age, sex and the pleasure of feeding

meat chickens have concluded that race, age and sex that affects fewer than itself, in contrast, food plays an important role. Furthermore, RI Bouthilet., Quoted by the same authors, showed that all chemical compounds in meat chickens resulting flavor can be concentrated through distillation columns, that the recovery of meat in the form of concentrated soups ensures obtaining high-quality food. The same author has shown that ammonia is found in the volatile fraction that gives the flavor of chicken meat, with a series of sulfur compounds.

Line of similar concerns, Pippen E.L. and col., 1958, reported as diacetyl help give flavor chicken, prepared by culinary stew or roasting.

Consistency of meat. After Gheorghe Georgescu, 2000, the meat consistency is the resistance which it opposes the deformation by pressing a finger on its surface, while composition is given and how to store form results when cutting pieces of meat. Many factors influence this trait, including: species, age (young birds have meat less consistent than adults), chemical modification post-slaughter stage (chilled meat has the consistency harder than maturity), the state of fattening, how to submit of fat (meat and intermuscular fat is stored in more consistent than that of subcutaneous fat distribution), sex (males were more consistent meat than females), the degree of freshness of meat (meat is warm, soft consistency, that is fresh elastic and old meat is soft to the touch).

Normally, the best meat for consumption should have an elastic consistency, firm

The appearance of meat is the presentation of meat on the outside, is a trait-dependent process in which the fast subject to conservation and the degree of freshness to them. Thus, well chilled meat has a dry film surface, while the chilled surface wet poorly presented.

Frozen meat is clean, covered with a thin layer of fine ice crystals and the defrosted have wet surface.

Fresh meat is dried on its surface, to the relatively fresh surface is usually moist, slightly sticky, especially in areas rich in connective tissue.

Meat obsolete is wet and sticky surface, with abundant mucus and philanthe, light gray or green.

Texture of meat is the relationship between meat components, namely the actual meat, fat, bones, tendons, etc.

As such, the definition of meat texture, occur: beam size, muscle tissue composition link, thickness, density and structure of muscle fibers, structure and amount of connective tissue (fat, fibrous, cartilage, bone), etc.

Texture of meat is positively correlated with tenderness, consistency and amount of fat in muscle tissue.

In birds, the texture is smooth and sarcolemme muscle fibers are smooth and thin.

Physico-chemical and technological factors of meat

There is no doubt that in giving quality meat and other features of this occurring, such as physical or chemical technology.

So, the meat has a higher protein content, the value is greater trophic-biological. Except methionine and phenylalanine, meat cover minimum daily requirements of essential amino acid for an adult (at a consumption of 100 g meat / day). Essential amino acids in poultry are raised and nutritional value of protein from other sources within the human consumption.

If the meat is a large amount of collagen protein, decreases the overall nutritional value of meat such as these proteins are poor in methionine, isoleucine and tyrosine, and tryptophan is missing.

Lipids are important for energy intake of fatty acid components, energy required for the smooth clearance is vital functions of the body. If meat consumption is not normally meet in person a failure in essential fatty acids (Vacaru-Opris I., 2004).

Carbohydrate content of the meat is low, since this does not mean that these substances even in small quantities which are not positively influence the quality of meat.

Poultry meat is an excellent source of vitamins of group B, the macro and micronutrients, etc.

The richness of nutrients in poultry gives a special flavor and, in turn, causes a massive secretion of gastric juices necessary for digestion and absorption of food ingested by humans.

Always a high quality poultry has outstanding technological features, namely: capacity retention and water binding capacity of hydration or absorption rate of maturation and storage losses, the rate of loss by boiling or roasting, meat etc. resistance .

Binding capacity or water retention is the force with which meat proteins retain some of its water and some water added during processing, under the action of external forces (bending, cutting, etc..)

Percentage, 70% of the amount of water in muscle is in miofibrile, 20% and 10% in sarcolemă interstitial space (Georgescu and Gh col., 2000).

In terms of physical muscle water is present in two forms, namely

- ❖ water related;
- ❖ free water.

Approximately 50% of total water striated muscle is linked by hydrogen bonds miofibrilelor proteins, this water is not influenced by changes in water retention capacity (Banu C., 1999). In contrast, free water affects the water retention capacity of the meat.

Retention or binding capacity of water is determined by: species (birds, is the level of the cattle and sheep, but in particular, of the pig), age (young animals have a holding capacity or binding water higher than the

old), the state of fattening (animals with a mean fattening state has the highest binding capacity and water retention), muscle type (red muscles have a holding capacity and water binding in May than white muscle), state of freshness of meat (as meat is fresher, the latter has a holding capacity of binding water or higher), the technological processes of meat (meat mincing petty as and addition of salt and polyphosphates increase the capacity of its retention or binding) protein structure (at a low pH, which favors union with actinic miozina, to form a rigid complex, hydrophobic, acto-miozinic, retention or binding capacity of water falls visible, while a high pH, above 6.0, the acquiring technological meat becomes significant), etc.

Meat has a holding capacity or high water binding, retracts to boiling, reduce its volume and lose a large amount of juice, which reduces its nutritional value.

Hydration capacity of meat is the property of meat to absorb liquid when submerged in it.

The hydration, meat bulk and weight, improving tenderness and juicy, thanks to the weakening of the cohesion force component of muscle fibers.

The capacity of hydration is influenced by the same factors as binding capacity or water retention.

In birds, the hydration capacity of meat is as low as retention or binding capacity of the water, however, the intensity of the two methods described features are considered to be normal in birds with an average state of fattening (Vacaru - Opris I., 2004).

Rates of maturation and storage losses are acquiring meat to lose a certain amount of water and its juice during maturation or storage.

In general, meat loses a larger amount of water in aging or storage, have a low coefficient of loss through training (col Georgescu and Gh., 1983). The same attribute depends on the species, breed, sex, age of slaughter, individual, being fattening, like aging and preserving meat (carcass or portions maturing cut) etc.

Rates of loss by boiling and roasting a criterion for the expression of water retention capacity for processed meat.

Thicker muscle fibers ($\geq 67.3 \mu$) have a delinquency rate by boiling or roasting more than mal thin ($\leq 64.9 \mu$).

Factors of variation for the rate loss by boiling or roasting is considered to be: species, breed, body region, like muscle, the state of fattening-keeping processes processing of meat, etc..

Meat is meat resistance ability to resist stretching, cutting and crushing, it is freshness opposite, depending on the morphological structure of skeletal muscle and fat content of meat and lax connective tissue

and fibrous. Provides information on meat content in connective tissue and muscle structure in (Vacaru-Opris I., 2004).

The main factors influencing the resistance of meat are: species, breed, age, sex, state of fattening, conditions and procedures for processing and preserving meat, etc..

PH value of meat can be, as a valuable indicator of its quality assessment. Living muscle has a pH value 7,0-7,1 and more, after slaughter, muscle pH of scale relatively quickly, so after 12 to 24 hours reached a level of 5.4 to 5.6, up at a pH of 6.2, the meat is considered to be of high quality, but at a level of 6.2 to 6.7, its value decreases, because at a pH above 6.7 will not be consumables (Holzel and Mahr, 1939; Vacaru-Opris I and col., 2000).

Poor conditions of transport of poultry to the slaughterhouse, and lack adequate preparation for the birds before slaughter, in particular by non rest needed to restore muscle glycogen, leading to abnormal decreases pH of meat, with adverse effects on its nutritional value.

CONCLUSION

Freshness is a key feature total acalității food. Also, the total quality of food is the result of all the desired characteristics that are acceptable items to be accepted for consumption.

Poultry meat is an important in human nutrition because of its quality. Compared with other domestic animals producing meat, the bird has the advantage of providing, through her lower body weight, always fresh meat.

Contains all essential amino acids required for human consumption and has no fat within and between muscle fibers. In addition, poultry meat and organs are a rich source of minerals and vitamins.

Poultry meat has gained a very important position between the human food of animal origin both because of its nutritional quality and low costs compared with other sources of animal protein.

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