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Parameters of Broiler Meat Quality

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Abstract: Animal originated foods are important for human nutrition and one of the major component of poultry meatToday, it was taken into account from farm to fork, food safety that consumers preferred producing and quality parameters which are so important. In the daily life; food quality is very important for consumers. Quality is a concept of flavor and visuality (color, fiber quality). The taste which remains after you eat it, flavor, freshness, crispness are components of the aroma of the meat or meat's product and this tastiness generally detected with sensory features. Wholeness, color and massiveness are the major visual characteristics. These are quality parameters of first salient and these are unidentified with measurements by the consumers, so quality of meat is related to many factors such as specie, race, gender, age of slaughter and weight, type of the production system, stress, combination of bait, additive agents, transport conditions of animals and this factors are measurable as of quantitative with several tools and equipments. These properties are shear force of meat, water holding capacity, springiness, pH, color hardness, cohesiveness and chewiness. These parameters are important characteristics for consumer preferences.

Key Words: Broiler, Meat Quality, Parameters.

Broiler Piliçlerde Et Kalitesi Parametreleri

Özet: İnsan beslenmesinde önemli bir yere sahip olan hayvansal gıdaların, önemli bölümünü oluşturan beyaz et üretiminin, büyük bir kısmı tavuk yetiştiriciliğinden sağlanmaktadır. Çiftlikten çatala gıda güvenliğinin dikkate alındığı günümüzde, tüketici tercihine yönelik ürün üretimi; kalite parametrelerini önemli hale getirmiştir. Günlük hayatta tüketici için gıda kalitesi büyük önem arz etmektedir. Et kalitesi; etin duyusal olarak lezzet ve görünümüyle (renk, fibril kalitesi gibi özellikler) birlikte oluşturduğu bir kavram olup, etin ve mamullerin tadı, aroması, sululuğu, gevrekliği ve yerken ağızda bıraktığı haz, etin ve ürünlerinin lezzetliliğini oluşturur. Bu lezzetlilik genellikle duyusal özellikler ile belirlenir. Dış bakıda tüketici tarafından gözlemlenen kalite parametreleri; bütünlük, renk, irilik gibi parametrelerdir. Bunlar tüketici tarafından ölçümle belirlenemeyen özelliklerdir. Oysaki et kalitesi tür, ırk, cinsiyet, kesim yaşı ve ağırlığı, üretim sistemi şekli, stres, rasyon bileşimi, yem katkı maddeleri, hayvan nakil koşulları, kesimhane koşulları gibi pek çok faktöre bağlıdır ve bu faktörler farklı alet ve ekipmanlarla nicel olarak ölçülebilirler. Bunlar etin kesme kuvveti, su tutma kapasitesi, esneklilik, pH, renk, sertlilik, yapışkanlılık, çiğnenebilirlik vb. dir. Bu parametrelerin belirlenmesi tüketici tercihinin ortaya konması ve üretim yapan işletmeler yön verilmesi bakımından gereklidir.

Anahtar Kelimeler: Etlik Piliç, Et Kalitesi, Broiler, Değerlendirme.

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Introduction

Poultry products are universally popular and in recent years the production and consumption of poultry meat has risen dramatically at the developed and developing countries, because they are not subject to cultural or religious constraints and the meat itself is perceived as wholesome healthy and nutritious, being relatively low in fat and with a more desirable unsaturated fatty acids content than other meats. The ensure continued growth and competitiveness of this industry have been attributed to customer satisfaction because nowadays; food safety and healthy have very important placed for the consumers. When consumers buy a product, are attend to points of the impotant that freshness, quality and price. High quality poultry products are available to many people at affordable prices and so, there is surcharge on the poultry products and thus poultry production and consumption are incresingly significant. This situation increased the interest on chicken meat and directed the poultry industry to produce more healthy and more quality poultry meat. Consumers define quality according to their own perceptions, goals and personal preferences and these can be texture, color, flavour but there are different parameters affecting of this factors like age, gender, pre-slaughter, nutritions (e.t.c)..

Texture

Tenderness is a important factor and it is affecting flavor of meat. After consumers buy a poultry product they relate the quality of that product to its texture, flavor, hardness, cohesiveness, moisture release and number of chews when they are eating it. Poultry meat is tender contingents upon the rate and size of the chemical and physical changes occurring in the muscle as it becomes meat. When an animal dies, blood stops circulating and there is no new supply of oxygen or nutrients to the muscles. Without oxygen and nutrients, muscles run out of energy, and they contract and become stiff. This stiffening is called rigor mortis. Eventually, muscles become soft again, which means that they are tender when cooked. Anything that interferes with the formation of rigor mortis or the softening process that follows it, will affect meat tenderness. For example, birds that struggle before or during slaughter cause their muscles to run out of energy quicker and rigor mortis forms much faster than normal. The texture of these muscles tends to be tough because energy was reduced in the live bird. A similar pattern occurs when birds are exposed to environmental stress (hot or cold temperatures) before slaughter. High pre-slaughter stunning, high scalding temperatures, longer scalding times and machine picking can also cause poultry meat to be tough. Tenderness of portioned or boneless cuts of poultry is influenced by the time post-mortem of the deboning. Muscles that are deboned during early postmortem still have energy available for contraction. When these muscles are removed from the carcass, they contract and become tough. To avoid this toughening, meat is usually "aged" for 6 to 24 hours before deboning; however, this is costly for the processor. When poultry is deboned early (0 to 2 hours post-mortem), 50 to 80 percent of the meat will be tough. On the other hand, if the processor waits 6 hours before deboning, 70 to 80 percent of the poultry meat will be tender. Poultry industry generally use to different methods for the soft meat. The samples can analyze with Warner Bratzler and Kramer Shear Press (KSP). This tests using to meat samples should be vacuum-packed individually and frozen rapidly in absolute alcohol at -20 C, 24h post mortem. Before tests; storage period should not exceed three months. Thawing must be carried out at $4C^0$ over 12h. These tests can be performed with raw or cooked meat. Samples are cooked in their plastic bag in a water bath (time and temperature are chosen in relation to the nature and size of the sample; e.g. 15min at 85C for half a broiler breast), then cooled for 30min in ice and hold at $4C^0$ until tested. For both tests, the measurements on one sample should be repeated at least three times and, where possible, ten times, depending on the size of the meat sample. Strips of meat should be cut so that the cross-section measures 10*10mm and the muscle fibres run parallel to the length of the sample for at least 30mm. The sample should be sheared at a right angle to the fibre axis. The Warner-Bratzler shear method uses a single blade. The parameters to be measured are the maximum force (N or kg/g) recorded and the energy (J) required at the same point.

Findings indicated that Warner-Bratzler values in the range of 6.5-6.0kg and Allo-Kramer values in the range of 8.8-6.0kg per g would correspond to the ‘slightly tender’ to ‘moderately tender’ part of the sensory scale. The benefits of this device are its reliability, ruggedness and low cost. It is recommended

that it be evaluated by the poultry industry as a quality control method also Warner-Bratzler test is simple, small and portable.

Colour

Twice important factor is colour that is very complex and a major component of appearance in poultry meat or products. Poultry meat colour is affected by factors such as chicken age, gender, race, nutrition, intramuscular fat, dankness, preslaughter conditions and processing variables. Breast meat is expected to have a pale pink color when it is raw, while thigh and leg meat are expected to be dark red when raw. There are times when poultry meat does not have the expected colour and this has created some special problems for the poultry industry.

Colour of meat depends upon the presence of the muscle pigments myoglobin and hemoglobin. Discoloration of poultry can be related to the amount of these pigments that are present in the meat, the chemical state of the pigments or the way in which light is reflected off of the meat. The discoloration can occur in an entire muscle or it can be limited to a specific area, such as a bruise or a broken blood vessel. When an entire muscle is discolored, it is frequently the breast meat because it accounts for a large portion of the live weight (~5%).

PSE which is characterised by low water holding capacity, soft texture and light color, is one of the most important quality issues of poultry meat and the meat with a pH above 6.0 is considered dark, firm and dry meat (DFD). Other factors of affected meat color are the problem of PSE and DFD in poultry meat. Dark, firm, dry poultry meat is foreclosed by consumers because it is drier, darker and has a higher pH level, a shorter shelf life and good water holding capacity and emulsifying properties. Establishing a cut off point at pH, L value or water holding capacity may be used to categorize poultry meat in terms quality into PSE, normal and DFD. These samples can measure with several instruments.

There are two principal color measurement techniques. These are colorimeter and spectrophotometer. Colorimeter is the technique that quantifies color by measuring three primary color components of light seen by human eye, specifically red, green and blue. This “tristimulus” color measurement provides data on how much of these three components are present in the light reflected or transmitted by a food product. Spectrophotometer is presently the most precise and accurate technique for the measurement, formulation and quality control of desired colors in prepared food product.

Flavor

Flavor is another quality attribute that consumers use to determine the acceptability of poultry meat. Flavor is the sensation caused by those properties of any substance taken into the mouth which stimulates one or both senses of taste and smell and also the general pain, tactile and temperature receptors in the mouth. Many attempts have been made to define flavor in precise terms. The popular use of words such as aroma, smell, fragrance and taste both in conversation and writing with little or no reference to their actual definition makes it more complicated. When poultry is cooked, flavor develops from sugar and amino acid interactions, lipid and thermal oxidation and thiamin degradation. These chemical changes are not unique to poultry, but the lipids and fats in poultry are unique and combine with odor to account for the characteristic "poultry" flavor.

Few factors during production and processing affect poultry meat flavour. Age of the bird at slaughter affects the flavor of the meat. Minor effects on meat flavor are related to bird strain, diet, environmental conditions, scalding temperatures, chilling, product packaging, and storage. There are two main categories of test to evaluate the flavor of meat: hedonic or consumer tests and analytical tests with trained panels. Specific trained Panelist must have received.

Water holding capacity

Meat have got juice in itself as a nature and this resource is called water holding capacity and there are affected of water holding capacity are that just effect load, sterical effect, postmortem proteolysis, oxidation of protein and factors of management.

Water makes up 73-76% of raw poultry meat and it is an important factor that principally use for the juiciness of cooked meat and technological profit for processed products. The water holding capacity of meat is too often predicted by measuring drip loss in raw, fresh meat after cold storage at $4C^0$, liquor loss after freezing thawing and cooking treatments. Meat instances are huck from the carcass and measured instantly. They are then placed in plastic bags and stored at $4C^0$ for 24h or more and is gener-

ally expressed as a percentage so results are recorded. There are different methods like this instance. For example; filter paper method, compressive of filter paper method. Solely at in recent years, researchers are slanting new study for determination of water holding capacity. They usually make use of spectroscopic techniques.

Conclusions

Evaluable basic of quality parameters are texture, colour and water holding capacity. More recently, these properties will exhibit in the aisle at the developing industry of poultry. There was concept of the whole chicken in the years of 1980 but, in the present time; portioned of products provide to consumers. At the next process, this compilation was refer to parameters that they were proved at the view point of consumers so will provide uniform of last product. The near future shear force, colour and water holding capacity will precondition at the preferred of sequence.

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