



CHEMICAL AND SENSORY EVALUATION OF BARKER, MADE FROM GOAT MEAT, PARTIALLY REPLACED WITH QUAIL MEAT AND MUSHROOM

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Abstract

This paper examines to prepare a fraction of the meat of goat, which is partially replaced with the meat of birds and fungus as well as aimed to prepare a healthy meals. Results of the study showed that the humidity in the treatment 1 recorded the highest rate (63, 50%), while the lowest moisture ratio at the treatment 7 (58.44%). Despite the fact that amount of protein in the treatment 1 recorded the highest rate (18, 40)%, while the lowest protein ratio was recorded at T7 (16, 01%). Although the proportion fat in the treatment T1 recorded the maximum rate (17.20%), while the deepest fat ratio at the treatment T7 (6.98%), while for the ash where the deal T1 the lowest rate (0.91%), while the highest The percentage of ash in the treatment of T7 was 1.46%, while the percentage of carbohydrate in the treatment was T7 (16, 41%) while the lowest percentage of carbohydrate was at T1 (0%). The value of the treatment of T2, where the highest values were (236.82 kcal/100g) while the treatment T6 lowest values reached (190.66 kg/100 grams). The results might have been more useful and showed that the value of pH in the treatment T7 recorded the highest value (7.2), whereas the lowest value at the treatment T1 (6.0). The values of free fatty acids (FFA) as recorded transaction T1, highest value was (2, 05), while the lowest value at the treatment T7 (0.60). For water retention (WHC), T7 was the highest (33.81%) and the lowest (T1) was 20.32%. The rate of loss in treatment was lowest in T1 (5.90%), while the lowest ratio (T7) was (3.52%). The results showed that the percentage of change in the weight of the tablets after cooking was recorded in the treatment T1, the highest rate (28.03%), while the lowest proportion of the treatment T7 (18.20%). The percentage change in the diameter of the Barker plant after cooking has The highest ratio was recorded in treatment T1 (19, 30%), while the lowest ratio was T7 (14.80%), The percentage change in the of the Bark Thickness plant after cooking has The highest ratio was recorded in treatment T1 (20.20%), while the lowest ratio was T7 (15.80%) On combining this result with sensory qualities of flavor were recorded at T5 (8,50), while the lowest sensitivity of flavor was recorded at T1 (5, 81). The highest scores for the tenderness of T7 were (8.20), while the lowest scores for sensory characteristics were recorded at T1 (5, 67). The highest scores of sensory characteristics were recorded at T7 (8, 60), while the lowest scores for sensory characteristics were recorded at T1 (5, 20). The results showed that the best scores of the color traits were recorded at T7 (8.30), while the lowest scores were the sensory characteristics of recorded at T1 (4.80). The highest scores of sensory characteristics of the tissue were recorded at T7 (8.30), while the lowest scores were the sensory characteristics of tissue status recorded at T1 (6.20). While the best degree of sensory characteristics of general receptivity was recorded at T7 (8, 50), while the lowest scores were the sensory characteristics of the general receptivity at T1 (5,70). We investigate how to solve the possibility of partial replacement of goat meat (red meat proteins) in quail meat (white meat proteins) and fungi (plant proteins), which contributes to the improvement of the qualitative, sensory and visual characteristics of the manufactured baker. In addition, we also conclude the possibility of manufacturing a food product, good and at lower cost.

Key words: Barker, Goat, Meat, Quail, Mushroom

Introduction

The origination of meat made by the buyer, particularly those made from hamburger, was related with the high

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substance of fat and cholesterol (Schutz *et al.*, 1988). This incited some meat industry to create low fat meat, particularly after the US Department of Agriculture decided its substance of water and fat, Is over 40% and fat alone is just 30% (USDA,1992). The sustenance

fabricating imperative is in charge of the pattern toward delivering low-fat items instead of for the make of high-fat items by offering low substitution items in fat substance. Advancement underway and preparing Food handling has given limit bearings, for example, the creation of low-fat (Putnam, 1993). Goat meat for the most part has numerous advantages for containing a few nutrients. It additionally contains large amounts of potassium and low in sodium. The significance of goat meat is that it is the most minimal in calories, the fat is among the red meat, and contains numerous amino acids that assistance fabricate a great deal of protein mixes (Naude and Hofmeyr, 1981). The demand for white meat consumption worldwide has increased because of cheaper prices and increased nutritional value. Quail meat is popular among consumers; quail birds are small to medium-sized birds belonging to the same biological family as chickens. The weight of adult quail is about 300 grams, sexual maturity is 42-48 years old, and produces up to 290 eggs / year of egg weight from 9-10 grams (Boni *et al.*, 2010; Daikwo *et al.*, 2013). In the last few years, quail meat has become more acceptable to consumers. As an alternative to white meat to obtain proteins, essential amino acids and unsaturated fatty acids. In many parts of the world quail is the desirable meat as a source of animal protein. Quail meat can be considered a competitive source with chicken meat. According to some studies, high quality quail meat is believed to be almost the same or even better than chicken meat (Ayyub *et al.*, 2014). With increasing demand for eggs and meat. There are many attempts to diversify sources of meat production such as ostrich, pheasant or quail meat. The production of quail meat plays a vital role in the production of poultry meat (Genchev *et al.*, 2008).

Agaricus bisporus is a fungus of Fleshy Fungi, which has a high nutritional value because it contains a higher protein content than most vegetables (Kassem., 1976; Safwat and Al-Kholi., 2006). The food fungus *A. bisporus* contains mineral elements Phosphorus, copper, phosphorus, copper, potassium, sulfur, calcium and lithium, while it does not contain starch, and all its materials are easily digestible, so it contains several non-harmful compounds and contains essential vitamins C, B, A, D and some essential amino acids, folic acid, which helps digest fats and inhibits their build-up in the human body, and primary niacin and pantothenic acid, which is used to treat rheumatic disease (Pellagra) (USDA, 2006) *Bisporus* fruit contains active substances that reduce cholesterol in the blood, making it beneficial for diabetics and atherosclerosis. Its low calorie content has another advantage in the treatment of obesity, immunity against

influenza and some other viruses, and in the treatment of certain diseases (Ren *et al.*, 2008; Halpern, 2006). The current study aimed at manufacturing the Barker of modified goat meat replaced with Partly with flying meat quail, mushrooms and also aimed to study sensory properties and chemical changes of the processed baker, as well as preparing fast meals from fast food to the consumer.

Materials and Methods

Meat: Used from the local goat meat as obtained meat from the markets of the city of Kirkuk, the meat of the bird quail was obtained from the Department of Animal Production/Faculty of Agriculture/University of Kirkuk. The physiological separation of the thighs was done to separate the meat from the fat and bone and then the meat was cut into small pieces to facilitate the process of chopping later. The pieces were placed in polythene bags and sealed tightly and kept at a temperature of $-18 \pm 2^{\circ}\text{C}$ until they were used to manufacture the meat breaker.

Mushrooms: White mushrooms of *Agaricus bisporus* were obtained from the mushroom farm/Faculty of Agriculture/University of Kirkuk and were incubated in an incubator at a temperature of 40°C for 24 hours and kept in plastic cans in frozen until use.

Garlic: Used garlic after crispy and crushed Hrsa well to be ready and add during the process of preparing the paste of meat and the proportion of garlic used 1.5% of the weight of the product and each transaction.

Spices: A mixture of spices that are available in the local markets in the city of Kirkuk and containing (black pepper, coriander, camomile, desserts, nutmeg) and suit the consumer's desire and saved in a glass box until use and by 1% The product is manufactured for each transaction.

Salt: Used sodium chloride pure and free of impurities by 1% of the weight of the manufactured product and each transaction, the experiment included the following

Table 1:

Treat-ment	Ratio		
T1	goat meat 100%	quail meat 10%	Mushrooms 0%
T2	goat meat 80%	quail meat 15%	Mushrooms 5%
T3	goat meat 70%	quail meat 25%	Mushrooms 10%
T4	goat meat 60%	quail meat 25%	Mushrooms 15%
T5	goat meat 50%	quail meat 30%	Mushrooms 20%
T6	goat meat 35%	quail meat 40%	Mushrooms 25%
T7	goat meat 25%	quail meat 45%	Mushrooms 30%

factors and the fact of one kilogram per transaction as showed in table 1.

After calculating the required quantities of goat meat, quail meat and mushrooms and 1kg of each transaction, then cut meat and mushroom pieces with an electric crusher for two consecutive times for the purpose of homogenization and then added the prescribed proportions of spices, garlic and salt. The mixing process was carried out on a per-transaction basis and the 50g perker discs were manufactured by a special machine for manufacturing. After calculating the quantities, the tablets were placed in polythene bags, separating one disc from another, then the bags were sealed well and placed at -18°C ($\pm 2^{\circ}\text{C}$) until they were used to make the meat breaker. The oven was cooked at 180°C for 40 minutes. Sensory evaluation scores were determined for flavor, softness, juiciness, general receptivity, shape, phenotypic, and tissue and followed the method (Cross, 1980) in that the flavor rating ranged from

1= Completely rejected and = Very acceptable), = General shape = 1) Appearance is very comfortable = 9 Excellent appearance, Tissue = 1) Very rough tissue = 9 The evaluation included 10 people with sufficient experience to perform the sensory assessment. The residents were provided with detailed information about the nature of the evaluation with a preliminary evaluation prior to the basic test adopted in this study. Changes that may affect the degree of evaluation are: the test time at 11am, the cooking temperature, the cooking time, the test and the 25m water drink between the test and the last and the size of the piece presented for the assessment, according to Lee & William. Until now this methodology has only been applied in this area.

Determination of some chemical and physical properties:

- A- Expending the drying furnace to estimate the humidity and the use of the suxalite to estimate the fat and the use of a kcal machine to estimate the protein and the use of the kiln to estimate the ash. Despite its shortcomings, this method has been widely applied to determine some chemical and physical properties.
- B- The proportion of carbohydrates calculated by the difference after the collection of protein and ash, fat and moisture and put out of 100 and the difference is the proportion of carbohydrates.

The price value was estimated by multiplying the percentage of protein and carbohydrates $\times 4$ and multiplying the percentage of fat by $\times 9$

- C- Determination of free fatty acid (FFA): - The ratio of

free fatty acids based on the method mentioned (Pearson, 1972).

- D. pH Determination:- The pH of the transactions was measured by a PH meter and according to the method mentioned by (A.O.A.C, 2004).
- E- Water retention is estimated by (Denhertog *et al.*, 1997) method and others

Changes in weight, fish and diameter:- A new methodology is described to measure the change in weight and change in fish and diameter according to the methods proposed by (Berry, 1980) and (Engler, 1975).

Results and Discussion

Various approaches have been found in table 1, which indications some of the chemical characteristics of the processed barker and price values. The results showed that the humidity ratio in T1 rrecorded the highest percentage (63, 50%), while the lowest moisture content at T7 was (58.44%) followed by humidity. For the T6, T5, T4, T3 and T2 which was (61, 40, 61, 80, 61, 40, 61, 18, 59, 10), coefficients, respectively, the results were agreement with the findings of (Abbas and Sakran, 2016) and (Abbas, 2009). In recent years there has been considerable moisture content of the plant-based processes is reduced with the increased replacement of animal proteins with plant proteins. This result is significant only showed that the proportion of protein in the treatment T1 recorded the highest rate (18, 40%), while the lowest proportion of protein at the treatment T7 (16, 01%) followed by the proportion of protein for the factors T6, T5, T4, T3, T2 (18, 01, 17, 77, 17, 28, 16, 80, 16, 49)%, respectively, observed (AL-Dooryi, 2009) periodic low protein content in processed meat products with increased proportion of plant additives Results were inconsistent with the findings (league and others), in their study on the manufacture of the Barker mixture tablets of sheep and goat meat.

Remarkable result to emerge from the data is that in table 1 which shows that the fat ratio in T1 was the highest (17.20%), while the lowest fat ratio was T7 (6.98%) followed by the fat ratio of T6, T5, T4, T3, T2 was 16.74, 12.96, 12.17, 10.39 and 7.78%, respectively. The reason for this rather contradictory result is still not entirely that T1 which was the highest fat to goat meat since this treatment consisted only of goat meat followed by other treatments (Abbas and Sakran, 2016) and (Abbas, 2009), if they reduce the fat ratio of the processed Barker with Z Reduced fat intake of red meats in vegetable fats has been shown in some studies (Al-Ani 1992; Al-Ani, 1999) The reason for this decrease is the low fat content in

plant sources used as a result of plant proteins, as was c(Al-Jumayli, 2005) alluded low fat content in the powder compound added 20% protein powder Soybean moisturizer compared to non-added, which amounted to 15.8% without the addition and with the addition of 16.05%, attributed to the reason for low fat to soy protein. There is a considerable ratio of ash to T6, T5, T4, T3 and T2 was highest (1.01, 1), (Abbas and Sakran, 2016) and (Abbas, 2009), if the increase in the ash content of the arsenic processes was increased with increased replacement of red meat proteins. This result has further strengthened our confidence in white proteins and plant proteins.

The results from table 1 show that the percentage of carbohydrates in the treatment T7 was 16, 41%, while the lowest percentage of carbohydrate in the treatment T1 was (0%) followed by the proportion of carbohydrates for the transactions T6, T5, T4, T3, T2, (3, 53, 5, 47, 7, 20, 965, 13, 67%), respectively, due to the high percentage of carbohydrates in the treatments followed by the first treatment of mushrooms due to its high content of carbohydrates, the results are consistent with what reached (Abbas and Sakran, 2016) if confirmed that the proportion of carbohydrates increases for the transactions Barker plant with the increased replacement of red meat proteins plant proteins. Our technique shows a clear in table 1 the high value of T2 (236.82 kcal/100g), while the lowest T6 (190.66 kcal/100g) followed by T7, T5, T4, T3, T1 (228, 4, 10, 80, 207, 45, 199, 30, 192.5 kcal/100g), respectively, due to the low value of the transactions with the increased replacement of proteins of red meat proteins, white meat and plant is a lack of proportion Fat in the meat of the bird quail and mushrooms in addition to the high content of carrot mushrooms for the fact that 1 gram of fat gives 9 calories, may be attributed to the decline in the role of plant sources. The proportion of more than 1 gram carbohydrates because carbohydrates gives 4 calories Bartov, the results are consistent with the findings of the (Abbas and Sakran, 2016) if the price Ahouda that the value of the transactions Albrker factory increases

with the replacement of red meat proteins plant proteins.

Table 3 displays some physical characteristics of the prepared Barker. The results showed that the PH value in T7 recorded the highest value (7.2) while the lowest value at T1 was (6.0) followed by the pH value (T6, T5, T4, T3 and T2), respectively, the results were consistent with the metastasis (Abbas and Sakran, 2016) where they reached (Al-Jumayli, 2005) when adding 20% of the moisturizing soybean protein to the processed meat burger. The results are similar to the increase in pH values when adding different percentages of some plant proteins (chickpeas) This is due to the effect of the base reaction of the plant proteins added to, whi(AL-Nouri, 1979) resulted in a decrease in the total acidity of the substituted plant proteins followed by the control of and FADI as well as the solubility of plant proteins and their diffusion with water and thus the form(Al-Sakini, 1997; Faide, 1997) ation of base solutions that contribute to the pH as this result is consistent with what mentions)(Al-Hajio *et al.*, 2004). The value of free fatty acids (FFA) was recorded from (Table 2) with T1 recording the highest value (2, 05), while the lowest value at T7 was (0.60), followed by the value of FFA for T6, T5, T4, T3, and T2 (2, 02, 1, 97, 1, 84, 1, 32, 0, 81) respectively. This relationship shows an inverse relationship between pH values and free fatty acids, The pH (Alldoori *et al.*, 2009) the increase in free fatty acids (FFA) makes the product more prone to damage to the analytical tincture, and conversely the lack of free fatty acids (FFA) make the product less prone to

Table 3: Some physical characteristics of the Barker plant.

Quality Treatment	PH	FFA	%WHC	Loss of dissolution%
T1	6.0	2.05	20.32	5.9
T2	6.2	2.02	28.87	5.01
T3	6.4	1.97	29.01	4.70
T4	6.5	1.84	29.45	4.62
T5	6.6	1.32	30.81	4.03
T6	7.0	0.81	31.45	3.71
T7	7.2	0.60	33.81	3.52

Table 2: Represents some of the chemical properties of the manufactured bark and price values.

Quality Treatment	Humidity %	Protein %	Fat %	Ash %	Carbohydrate %	Price values Cal-ories K cal/100 g
T1	63.50	18.40	17.20	0.91	0	228.04
T2	60.01	18.01	16.74	1.01	3.35	236.82
T3	61.80	17.77	12.96	1.15	5.47	210.80
T4	61.40	17.28	12.17	1.21	7.20	207.45
T5	61.18	16.80	10.39	1.28	9.65	199.3
T6	59.10	16.49	7.78	1.40	13.67	190.66
T7	58.44	16.01	6.98	1.46	16.41	192.5

damage to the analytical shingles (Abbas, 2009). Table 3 shows that the ratio of water retention (WHC) in treatment T7 recorded the highest percentage (33.81%), while the lowest ratio was recorded at T1 (20.32%) followed by water retention (WHC) for T6, T5, T4, T3 and T2 (28.87, 29, 01, 29.45, 30.81 and 31.45%) respectively. This is due to the high PH value, (WHC) as described by The (Taher,1983) correlation between

plant proteins and water is determined by the functional properties of these proteins. Table 3 shows that the rate of loss of treatment in T1 was the highest (5.90%), while the lowest ratio was T7 (3.52%), followed by the percentage of the loss of T6, T5, T4, T3, T2, where it was (5.01, 4.70, 4.62, 4.03, 3.71%), respectively. This decrease was due to the fact that the higher the ratio of the replacement of animal proteins to the plant, Picking in the meat burger.

This underlines in table 4 shows the changes in some of the characteristics of the prepared Barker after cooking. Our study provides additional support for the results that indicated the percentage of change in the weight of the tablets after cooking was recorded in treatment T1, the highest rate was (28.03%). Followed by the percentage of change in weight after cooking for T6, T5, T4, T3 and T2, where it reached (25, 07, 23, 80, 22, 40, 21, 90, 20, 30%) respectively, A decrease in the weight of the tablets is due to the fact that meat and meat products lose during cooking variable percentage of weight and the basis of the loss is liquid when cooking (Cokking drip), This is due to the susceptibility of proteins in plant sources Which is used in the manufacture of tablets Birekr on water retention and fat during cooking and the high value of the hydrogen, which increase the retention of moisture and low loss of it during cooking (Taher, 1983) has already noted (Al-Jumayli, 2005) that the percentage of weight loss in baker baker and baker made of chicken meat (28.1%) were found in non-subsidized products such as soybeans, while 25.1% were in soy-supported and plant proteins. These results extend to consistent with (Abbas and Sakarn, 2016) because they reduced the weight loss ratio by adding some plant proteins as well as widen our knowledge of some plant proteins.

It is also noted from table 4 that the rate of change in diameter of the Barker tablets produced after cooking has been recorded in treatment T1 highest (19, 30%), while the lowest ratio at treatment T7 (14.8%), followed by the percentage of change in diameter of the tablets After the cooking of T6, T5, T4, T3, T2 (17, 04, 17.09, 16.03, 16.90, 15.70%) respectively, this increase and weight loss was due to T1 The occurrence of protein synthesis and the accumulation of meat tissue, which helps shrink and thus reduce the tablets of mixture Barker manufactured so as the replacement of animal bronzes vegetable proteins, the less loss of weight, where these results converge with Decline in chicken meat and Barker, who reached (20%) (Al-Jumayli, 2005). The results from table 4 indicate that the percentage of change in thickness of the post-cooking Barker tablets was

recorded in treatment T1 (20.20%), while the lowest ratio T7 was (15.8%), followed by the percentage of thickness For T6, T5, T4, T3, T2 (18, 60, 18, 30, 17, 80, 17, 10, 17, 40%) respectively, due to the applicability of the used plant sources Water intake and reduction of shrinkage in the processed and cooked meat burker. The hot plate method also contributed to reducing the rate of change for both diameter and thickness of the beef burger for direct contact between heat source and Cooked meat Barker, leading to hardening of the speed of proteins sarcomas and non-meat during the cooking process (Yousif, 1995), and the results are consistent with him Maachar (Abbas and Sakarn, 2016) as the percentage of loss thickness increase the replacement of animal proteins with plant proteins.

Our results were appointing in Fig. 1 for some of the sensory characteristics of the Barker. The results showed that the highest sensitivity of the flavor characteristics was recorded at T5 (8, 50), while the lowest of the sensory characteristics of flavor were recorded at T1 (5, 81) T7, T6, T4, T3 and T2 (6, 40, 6, 90, 7, 30, 8, 10, 7, 80), respectively, showed no flavor of impurity or unwanted flavor. The flavor of plant proteins of fungi, (Zangana, 2011) pointed to the high flavor of the powder of the rest and soy protein in the processed turkey baker. It is noted from Fig. 1 showed that the highest degree of sensory characteristics of trophies were recorded at treatment T7 (8, 20), while the lowest degrees of sensory

Table 4: Changes in some qualities after cooking.

Treatment	Qualities	Percentage (%)
T1	Weight (g)	28.03
	Diameter (mm)	19.30
	Thickness (mm)	20.20
T2	Weight (g)	25.07
	Diameter (mm)	17.04
	Thickness (mm)	18.60
T3	Weight (g)	23.80
	Diameter (mm)	17.09
	Thickness (mm)	18.30
T4	Weight (g)	22.40
	Diameter (mm)	16.03
	Thickness (mm)	17.80
T5	Weight (g)	21.90
	Diameter (mm)	16.90
	Thickness (mm)	17.10
T6	Weight (g)	20.30
	Diameter (mm)	15.70
	Thickness (mm)	17.40
T7	Weight (g)	18.20
	Diameter (mm)	14.08
	Thickness (mm)	15.80

characteristics of the tenderness was recorded at the treatment T1 (5, 67), while the remaining transactions T6, T5, T4, T3 and T2 amounted to (6, 20, 6, 70, 6, 90, 7, 50, 7, 80) respectively, improved softness with increased replacement of red meat proteins with white meat proteins (quail meat) and plant proteins (Al-Jumayli, 2005), adding 20% with different proportions of beef and chicken meat gave the best degree of softness. Our study was successful in Fig. 1 which that the highest scores of sensory characteristics of the steroid were recorded at T7 (8, 60), while the lowest scores were the sensory characteristics of the vertebrate status recorded at T1 (5, 20). It is very likely for remaining T6, T5, T4, T3 and T2 (6, 10, 6, 50, 7, 10, 7, 80, 8, 10), respectively, which was improved with the increased substitution of red meat proteins with white meat proteins (quail meat quail) and plant proteins Mushrooms). (Al-Jumayli, 2005) noted that the addition of 20% of soy protein with different percentages of beef and chicken meat gave the best degree of juice.

It was found that in Fig. 2 some sensory characteristics of the Barker. This value has been found to be highest levels of sensory characteristics of the color were recorded at T7 (8.30), while the lowest scores were the sensory characteristics of the color label recorded at T1 (4.80) T6, T5, T4, T3 and T2 (5, 60, 5, 90, 7, 80, 6, 70,

7, 20), respectively. We note from the results that the color of the factory powder tends to brown because the reason is Increasing the replacement of red meat proteins with white meat proteins and plant proteins. The higher the replacement ratios, the more brown the color. added that the addition of 20% soy protein with different proportions of meat The beef and (Al-Jumayli, 2005) the old chicken meat gave the best color grading. Given that our findings are based on a limited number of noted from Fig. 2 which that the highest degree of sensory characteristics of the tissue was recorded at T7 treatment (8, 30), while the lowest scores were the sensory characteristics of tissue status recorded at T1 treatment (6, 20). The remaining treatments T6, T5, T4, T3 and T2 (6, 70, 6, 90, 7, 30, 7, 70, 8, 10), respectively, improved tissue status with increased replacement of red meat proteins with white meat proteins (quail meat quail) and plant proteins of (Mushrooms). Our findings appear to be well substantiated in Fig. 2 which that the highest scores of sensory characteristics of the general receptivity were recorded at T7 (8, 50), while the lowest scores were the sensory characteristics of the general receptivity score at T1 (5, 70), T6, T5, T4, T3 and T2 (5, 90, 6, 30, 6, 80, 7, 30, 7, 60), respectively, overall receptivity was improved with increased replacement of red meat proteins with white meat proteins), and vegetable proteins, this is in good agreement with (Al-Jumayli, 2005). The addition of 20% soy protein with different percentages of beef and chicken meat gave the best overall tolerances.

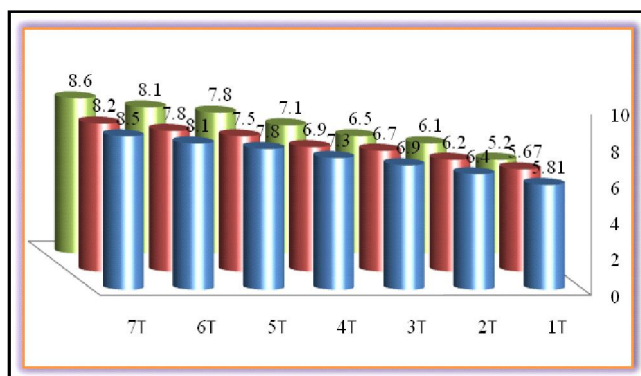


Fig. 1: shows the characteristic flavor, softness, juicy

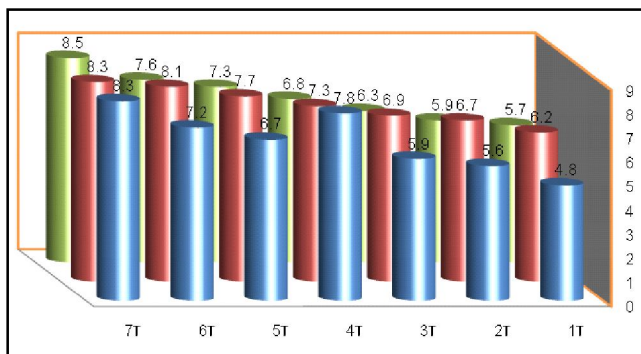


Fig. 2: Shows the characteristics of color, texture, general receptivity

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