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COMPARISON OF GOAT, CHICKEN AND BEEF LUNCHEON

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Abstract

Luncheon samples were prepared from goat, chicken and beef meats then goat luncheon was compared to that made of chicken and beef. Ten percent of the blend "or the mix." was defatted soy meal (D.S.M.) which improved the properties of luncheon particularly water binding. From results of chemical composition of goat, chicken and beef luncheon, it was observed that the moisture content was slightly higher for chicken luncheon than for beef and goat luncheon. Protein content was higher for goat luncheon than for chicken and beef luncheon. Fat content was higher for beef luncheon than for goat and chicken luncheon. Ash content was higher for goat luncheon than beef and chicken luncheon. Carbohydrates was higher for chicken luncheon than for goat and beef luncheon. Also, sensory evaluation of luncheon samples found that goat luncheon was acceptable like chicken luncheon, but was preferred than beef luncheon and from scores for taste, odor, color and texture, it was found that goat luncheon had very good sensory properties.

INTRODUCTION

The traditional Egyptian luncheon could be considered according to its final moisture content, a large diameter non fermented cooked semi-dry sausage. One basic character of this product is its slicing ability to very thin slices and high binding property. Moreover the intact product which skillfully manufactured can be kept well at room temperature under reasonable conditions for moderate period (6-8 weeks) . Before the last two decades, the product was made in Egypt from fresh local beef and after that the producers started to shift to the imported frozen beef . Paul and Southgate (1978) analyzed the canned beef luncheon of the U.K., and found that luncheon meat showed the following composition %: moisture 51.5, protein 12.6, fat 26.9, carbohydrates 5.5, ash 3.5; and minerals (mg / 100g): K 140, Na 1050, P 200, Mg 8, Ca 15 and Fe 1.1 , Abd El-Aziz and Ibrahim, (1997) analyzed local packaged beef luncheon and imported canned beef luncheon samples which were obtained from the Egyptian market, found that the moisture, protein, fat, ash and carbohydrates contents were: 54.91 and 58.08 %; 15.45 and 16.88%; 23.26 and 18.72 %; 3.10 and 3.44 %; and 3.19 and 2.88 % respectively .

The FAO / WHO (1977) permit the use of soy protein during preparation of luncheon meat to improve the texture and the water holding capacity and to avoid separation of water indicate the permissible range supplemented proteins. According to Paul and Southgate (1978) essential amino acids (EAA) for soy protein were as follows: leucine 4.95, isoleucine 7.85, lysine 6.28, threonine 4.18, tryptophan 1.19, valine 5.68, methionine + cystine 2.88, and phenylalanine + tyrosine 7.93, therefore soy protein was low only in methionine + cystine in comparison with the FAO pattern .

The objective of the present investigation is to compare luncheon made from using goat meat with luncheon made from chicken and beef meats .

MATERIALS AND METHODS

Materials:

Goat, beef and chicken meats were obtained from local market. Goat and beef meats ,ere minced . The chicken meat of whole carcass was separated from bones and minced . Defatted soy meal (D.S.M.) obtained from the soy plant in the Food Technology Research Institute. D.S.M. was diluted with water at the ratio (1 : 2) D.S.M: water, w / v before being added to the formula.

Luncheon was prepared according to the following recipe: minced meat 65 % + minced fat 15 % + D.S.M 10 % + dry milk 3 % + dry rusk 5 % + salt 1.5 % + spices 0.4 % .

Spices were: 1.5 g black pepper + 1g cloves + 0.5 g ginger + 0.5 g mace + 0.5 g thyme .

Preparation of Luncheon

The ingredients were mixed and homogenised by a laboratory chopper, then luncheon meat was stuffed in impermeable synthetic casings. After filling in casings, sterilization was carried out at 121°C for 35 min.

Methods:

The moisture, protein (T.N.X 6.25; microkjeldahl method), fat, ash and phosphorus contents were determined according to the A.O.A.C. methods (1980). Carbohydrates content was calculated by difference .

Amino acids composition was determined according to the method described by Pellett and Young (1980) using (a LKB 4151 Alpha plus Amino acids Analyzer) and tryptophan acid was colorimetrically determined according to the method of Blauth *et al.* (1963).

Minerals (Potassium (K), sodium (Na), calcium (Ca), magnesium (Mg) and iron (Fe) were determined using an atomic absorption apparatus (Unicum Sp Igovo Atomic Absorption Spectrophotometer) according to Gorsuch (1959).

Organoleptic evaluation of color, odor, taste, texture, aid overall acceptability was carried out by aid of 10 panelists according to Molander (1960) . Statistical analysis of organoleptic evaluation are not significantly different at 0.05 level.

RESULTS AND DISCUSSION

Table 1. Chemical composition of goat, chicken and beef luncheon. (%).

Parameters	Goat luncheon	Chicken luncheon	Beef luncheon
Moisture	52.47	54.31	53.97
Protein	20.84	19.98	17.81
Fat	18.08	16.89	19.85
Ash	3.71	3.58	3.65
Carbohydrates	4.90	5.24	4.72

Data in table 1 show the chemical composition of goat, chicken and beef luncheon. It was observed that the moisture content was slightly higher for chicken luncheon than for beef and goat luncheon, but moisture content for all samples was less than moisture content (55 %) from (EOS, 1985). Protein content was higher for goat luncheon than for chicken and beef luncheon. According to (EOS, 1985), protein content was reported to be in excess to 15 % . It was observed from the three tested luncheon samples that the protein content was higher than from (EOS, 1985). Fat content was higher for beef luncheon than for goat and chicken luncheons, but was still less than 30 % according to the American Federal Inspection Regulations (Kramlich, *et al.*, 1975) and also was less than 20 % as reported by (EOS, 1985). Ash content was higher for goat luncheon than beef and chicken luncheon . Carbohydrates was higher for chicken

luncheon than for goat and beef luncheon . The chemical composition of all luncheon samples of this work was ranged as reported by Khazbak (1983) who analyzed 13 samples of commercial beef luncheon and found that the moisture, protein, fat ash and carbohydrates contents from 45.71 to 57.80 %; 15.88 to 26.89 %; 15.72 to 22.19 %; 4.11 to 7.49% and 1.32 to 5.82% respectively .

Data in table 2 show the amino acids composition of goat, chicken and beef luncheon. It was observed that there was no significant differences in the amounts of amino acid between the three luncheon samples. According to El-Desoky, *et al.*, (1988) amino acids composition of canned chicken luncheon containing 10 % defatted soy meal were (g/16 g N): leucine 8.65, isoleucine 5.12, lysine 8.48, methionine 1.62, phenylalanine 3.92, threonine 4.38, valine 5.07, tryptophan 1.26, arginine 6.72, histidine 2.25, tyrosine 4.10, cystine 1.72, proline 5.43, alanine + glutamic 20.35, glycine + asparatic 15.87 and serine 3.66. El-Desoky, *et al.*, (1989) reported that the amino acids composition of canned beef luncheon containing 5 % defatted soy meal were (g / 16 g N): leucine 8.53, isoleucine 5.21, lysine 9.40, methionine 2.20, cystine 1.36, phenylalanine 4.54, tyrosine 3.36, threonine 4.55 , tryptophan 1.15 , valine 5.61 , arginine 7.02 , histidine 2.85, alanine + glutamic 22.12, glycine + asparatic 15.95 + proline 5.07 and serine 4.25, while Khazbak (1991) who analyzed goat meat sausages found that the amino acids composition were (g/ 16 g N): leucine 7.43, isoleucine 5.18, phenylalanine 4.73, valine 4.30, methionine 3.17, tyrosine 3.79 proline 2.80, alanine + glutamic 22.39, threonine 3.91, glycine + asparatic 12.69, serine 3.27, arginine 7.22, histidine 3.50, lysine 6.78, cystine 0.79 and tryptophan 1.31.

Data in table 3 show the minerals content of goat , chicken and beef luncheon. It was observed that K, Na, Mg, Ca and Fe contents were higher for goat luncheon than for beef and chicken luncheon, while P content was higher for chicken luncheon than for goat and beef luncheon. According to El-Desoky *et al.*, (1988) K, Na, Ca, Mg, P and Fe contents (as mg/100 g sample) of canned chicken luncheon containing 10 % defatted soy meal were : 372.10, 58.55, 16.23, 43.74, 215.20 and 1.78 respectively, and El-Desoky (1989) also found that the K, Na, Mg, P, Ca and Fe contents (as mg /100g sample) of canned beef luncheon containing 5 % defatted soy meal were 395.3, 112.83, 69.23, 176.00, 20.61 and 2.17 respectively.

Data in table 4 show the sensory evaluation scores of goat, chicken and beef luncheons. It was observed from the results given by the panelists that goat luncheon was as acceptable as chicken luncheon, but was preferred to beef luncheon. The scores for taste, odor, color and texture revealed that goat luncheon had very good sensory

Table 2. Amino acids composition of goat, chicken and beef luncheon. (g /16 g N).

Amino acids	Goat luncheon	Chicken luncheon	Beef luncheon
Leucine	7.83	8.62	7.55
Isoleucine	5.28	5.09	5.19
Lysine	8.89	8.45	8.87
Methionine	3.55	2.01	2.25
Cystine	1.79	1.70	1.41
Phenylalanine	4.63	3.98	4.53
Tyrosine	4.11	4.09	3.38
Threonine	4.32	4.38	4.59
Tryptophan	1.43	1.28	1.18
Valine	4.58	5.21	5.71
Arginine	7.97	6.72	7.09
Histidine	3.15	2.78	2.83
Alanine + glutamic	21.40	20.99	21.16
Glycine + Asparatic	13.24	15.79	14.87
Proline	4.31	5.41	5.10
Serine	3.52	3.62	4.29

Table 3. Minerals content of goat, chicken and beef luncheon. (mg /100 g sample).

Minerals	Goat luncheon	Chicken luncheon	Beef luncheon
K	408	365	383
Na	129	67	101
Mg	75	45	58
P	189	218	165
Ca	29	17	20
Fe	3.15	1.81	2.85

Table 4. Statistical analysis of organoleptic evaluation

Treatment	Colour	Odor	Taste	Texture
Goat luncheon	$8.^{a}000$	$8.^{a}000$	$9.^{a}000$	$9.^{a}000$
Chicken luncheon	$6.^{b}000$	$7.^{b}000$	$9.^{a}000$	$9.^{a}000$
Beef luncheon	$7.^{c}000$	$6.^{c}000$	$8.^{b}000$	$9.^{b}000$
L.S.D.	0.706	0.706	0.432	0.432

Means within the same followed by the same letter are not significantly different at 0.05 level.

properties. El-Desoky *et al.* (1989) found that color, aroma, taste, texture and overall acceptability scores for canned beef luncheon containing 5 % defatted soy neal were: 8, 7, 6, 6 and 7 respectively.

It is observed that luncheon manufactured from goat meat is excellent and acceptable like luncheon made from chicken meat and is more preferable of luncheon made from beef meat.

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مقارنة لانشون الماعز والدجاج واللحم البقرى

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تم تصنيع لانشون من لحوم الماعز والدجاج واللحم البقرى. قورن اللانشون المصنع من لحم الماعز باللانشون المصنع من لحم الدجاج ومن اللحم البقرى.

أضيف إلى خلطة اللانشون ١٠٪ من فول الصويا منزوع الدهن وكان لها أكبر الأثر فى تحسين خصائص اللانشون وعلى الأخص ربط الماء.

وجد من نتائج التحليل الكيميائى فى لانشون الماعز والدجاج واللحم البقرى أن نسبة الرطوبة فى لانشون الدجاج كانت أعلى قليلاً من لانشون اللحم البقرى ولانشون الماعز حيث كانت (٣١ و٥٤ ٪). أما نسبة البروتين كانت أعلى فى لانشون الماعز عن لانشون الدجاج واللحم البقرى فكانت (٢٠,٨٤ ٪) وكانت نسبة الدهن فى لانشون اللحم البقرى أعلى من لانشون الماعز والدجاج. وبلغت (١٩,٨٥٪). أما نسبة الرماد (فى لانشون الماعز أعلى من لانشون الدجاج واللحم البقرى وكانت (٣٠,٧١٪). وبلغت نسبة الكربوهيدرات (٥,٢٤) وكانت فى لانشون الدجاج أعلى من لانشون الماعز واللحم البقرى.

كانت نتائج التقييم الحسى فى عينات لانشون الماعز والدجاج واللحم البقرى مقبولة من حيث الطعم والنكهة واللون وسهولة القطع. ووجد أن لانشون الماعز مفضل عن لانشون اللحم البقرى حيث كانت درجات تقييم لانشون الماعز من حيث الطعم والنكهة واللون وسهولة القطع أعلى من لانشون اللحم البقرى.