

Studying the effect of adding aqueous extracts of lemongrass and bay leaf on the chemical composition and microbial characteristics of frozen camel burger

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ABSTRACT

The current study aimed to study the effect of adding aqueous extracts of lemongrass and bay leaves at concentrations (1-0.5%) on the chemical composition and microbial properties of camel burgers preserved in freezing at (-18°C) and for preservation periods (0-2-4-6) weeks. The results showed that there were no significant differences at the level ($p < 0.05$) when studying the chemical composition of the camel burger preserved in freezing at a temperature of (-18°C) and for periods of preservation (0-2-4-6) a week, as it was noted that the protein content increased. In addition to that when studying the microbial tests, a significant decrease was observed at the level ($p < 0.05$) for the numbers of total bacteria, cold-loving bacteria and colon bacteria for camel burgers preserved in freezing (-18°C) and for preservation periods of (0-2-4-6) a week.

Key words: lemongrass , bay leaves , camel meat .

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INTRODUCTION

Camel meat is a source of vitamin B complex group and some mineral elements such as iron, and this meat is characterized by having a low level of fat and cholesterol, high energy and high protein and glycogen, which turns into glucose important for the nervous system to make cellular energy (1), in addition to that, the use of this meat in making burgers or using it after chopping, it eliminates the difficulty of chewing, and camel meat is rich in protein and low in fat (2), camel meat is subject to damage during storage, resulting from microbial growth and fat oxidation, which are among the most influential factors on the quality of food, as microbial growth affects the events of food poisoning and economic losses resulting from spoilage of meat (3). This study aimed to use natural antimicrobials that are safe to use and more acceptable by the consumer and do not negatively affect human health and are used in food preservation (4), in addition to this, one of the objectives of this study is the manufacture of new products from camel meat because of its high nutritional value.

MATERIALS AND METHODS

Raw materials

Meat

In this study, camel meat was used in the thigh area. The age of the animal was (2.5-1.5) years. The meat was obtained from the markets of Baghdad governorate.

fat

Take the fat from the same source of camel meat from the hump area and add it to the meat by 15%

salt

Salt was added at 1.5% of the weight of the processed meat

Two samples of plants collected from the markets of Baghdad governorate were taken for the purpose of studying their effect on the microbial and Chemical characteristics of camel barkers.

Preparation of the aqueous extract of lemongrass and bay leaves used in the study according to method (5).

Manufacture of burger

The manufacturing process begins by mincing the meat using an electric mincing machine, adding 15% fat from the hump, adding 1.5% salt, and grinding again for the purpose of homogeneity. and bacteriological estimation, chemical estimation during the period of cryopreservation..

Chemical estimation

1-moistuer: The percentage of moisture was estimated according to the (6) method

2-Protein: The percentage of protein was estimated according to the (6) method

3-Fat:- The percentage of fat was estimated according to the Soxhlet method (7)

4-Ash: The percentage of ash was estimated according to the (6) method

Bacteriological estimation

Tests were performed for the total number of bacteria, the estimation of cold-loving bacteria, and the estimation of colon bacteria.

Statistical analysis

The statistical program (8) was used in data analysis to study the effect of plant extracts on the studied traits according to a random design (CRD), and the significant differences between the means were compared by choosing the least significant difference (LSD).

RESULTS AND DISCUSSION

Table No. (1) shows the effect of adding aqueous extract of lemongrass and bay leaf on the chemical composition of camel burger preserved in freeze at (-18°C) and for storage periods (0-2-4-6) a week , , a significant decrease was observed at the level ($p < 0.05$) of the average values of the moisture percentage of camel burger treated with aqueous extracts at concentrations (1-0.5)%, as the values of the average moisture percentage of camel burger treated with these aqueous extracts of plants were as follows:-

(62.02-61.92)% and (61.72-62.67)%, respectively, compared with the average value of the percentage moisture of the control treatment, which was 62.70%. The moisture percentage was at its highest level at the beginning of the storage period and then began to decline with the progression of the freezing period. This is a natural matter, as with the progression of the preservation period, the humidity gradually decreases, and the percentage of dry matter, which includes protein, fat and ash, increases, and these results were in agreement with (9).

It was also noted that there was a significant increase in the average values of the percentage of protein for camel burger treated with aqueous extracts of lemongrass and bay leaves at concentrations of (1-0.5)%, as the average values of the percentage of protein were as follows (23.30-22.77) and (23.47-22.70), respectively, compared with The control treatment that was not treated with aqueous extracts, the average value of the percentage of protein was 22.12%, and the percentage of protein increased by the effect of natural additions to meat and its products, and this increase

in the percentage of protein gives clear evidence that the proteins are not degraded during the preservation period and that these results are in agreement with What was reached (10), in addition to that, it is clear through this table that there is a significant increase at the level ($p < 0.05$) of the average values of the percentage of fat in the camel burger treated with water extracts of plants at concentrations (1-0.5)%, as the values of the average percentage reached Grease the treated burger with aqueous extracts as follows:-
 and (8.85-8.77)%, respectively, compared with the value of the average %(8.75-9.02)

CHEMICAL COMPOSITION	Type	concentration	0 week	2 week	4 week	6 week	the average
moistuer	control	0	64.2	63.2	62.1	61.3	62.7
	lemongrass	0.5	64.1	62.4	61.2	60.4	62.025
		1	63.6	62.7	61.3	60.2	61.95
	leaf	0.5	64.3	63.1	62.2	61.1	62.67
		1	63.1	62.4	61.2	60.2	61.72
	L.S.D:0.05			3.73 NS	3.09 NS	2.98 NS	2.67 NS
protein	control	0	21.4	21.7	22.3	23.1	22.12
	lemongrass	0.5	21.8	22.6	22.8	23.9	22.77
		1	22.3	22.8	23.5	24.6	23.30
	leaf	0.5	21.7	22.5	22.9	23.7	22.70
		1	22.6	23.1	23.7	24.5	23.47
	L.S.D:0.05			2.55 NS	2.83 NS	2.56 NS	2.78 NS
fat	control	0	8.2	8.4	8.6	8.9	8.52
	lemongrass	0.5	8.3	8.6	8.9	9.2	8.75
		1	8.5	8.8	9.2	9.6	9.025
	leaf	0.5	8.4	8.6	8.8	9.3	8.77
		1	8.5	8.7	8.9	9.3	8.85
	L.S.D:0.05			0.79 3 NS	0.603 NS	0.771 NS	0.672 NS
ash	control	0	1.6	1.8	1.9	2.1	1.85
	lemongrass	0.5	1.7	1.9	2.2	2.4	2.05
		1	1.8	2.1	2.4	2.6	2.22
	leaf	0.5	1.8	2.1	2.3	2.4	2.15
		1	1.9	2.3	2.5	2.8	2.37
	L.S.D:0.05			0.30 7 NS	*0.41 6	*0.45 2	0.549 *

*($P \leq 0.05$) NS: غير معنوي

percentage of fat for the control treatment, which is 8.52%. As the storage period progresses, the humidity decreases and the dry matter increases, which includes both

protein, fat and ash. These results are in agreement with (11) In addition, it is noted through this table that there is a significant increase in the percentage of ash for camel burger treated with aqueous extracts of lemongrass and bay leaves, as it was noticed that the percentage of ash increased with the progression of the preservation period and reached its highest level at the end of the preservation period (2.8- 2.6)%, as the preservation period progresses, the humidity decreases, and the dry matter increases, which includes protein, fat and ash. These results are in agreement with (12).

Type	concentration	number of weeks				the average
		0	2	4	6	
control	0	67.24	61.41	58.63	56.72	61
lemongrass	0.5	63.72	57.61	45.31	37.62	51.06
	1	63.42	55.72	44.35	36.64	50.03
leaf	0.5	62.31	54.23	41.56	35.71	49.20
	1	61.73	53.45	43.41	33.62	48.05
L.S.D:0.05		*5.87	*6.02	*5.98	*7.36	*6.29
*(P≤0.05)						

Table No. (2) shows the effect of adding aqueous extract of lemongrass and bay leaves on the total number of bacteria for camel burgers preserved in freezing (-18°C) and for preservation periods of (0-2-4-6) a week, as a significant decrease is observed at the level of (p<0.05)) in the number of total bacteria when the camel burger was treated with aqueous extracts of lemongrass and bay leaves at concentrations of (1-0.5)%, respectively. With the control treatment, the average value of the total number of bacteria was (61) , and these results were in agreement with (13) , which stated that the number of bacteria was decreased in the tablets of camel and beef meat supplemented with plant extracts of thyme, flax and mustard. Table No. (2) Effect of aqueous extract of lemongrass and bay leaves on the total number of bacteria of camel burr frozen (-18°C) for different storage periods Cfu/g103x.

Table No. (3) shows the effect of adding aqueous extract of lemongrass and bay leaves on the cold-loving bacteria of camel burgers preserved in freezing (-18°C) and for preservation periods of (0-2-4-6) a week, as a significant decrease was observed at the p<0.05 level.)) in the preparation of cold-loving bacteria when treating camel burgers with aqueous extracts of lemongrass and bay leaves at concentrations (1-0.5)%, as the average value of the numbers of cold-loving bacteria for burgers treated with aqueous extracts was as follows:-

(33.42-33.58) and (38.56-39.08)Cfu/g103x, compared with the value of the average number of cryophilic bacteria for the control sample not added to the plant extracts, which was the value of the average number of cryophilic bacteria as follows (Cfu/g103x 66.82), and these results were in agreement With (14), who found that the numbers of cryophilic bacteria were decreased in the beef tablets supplemented with onion and rosemary extract and preserved by freezing.

Type	concentration	number of weeks				the average
		0	2	4	6	
control	0	65.31	66.26	66.82	68.91	66.82
lemongrass	0.5	58.22	34.56	21.34	19.56	33.42
	1	58.10	35.67	21.75	18.81	33.58

leaf	0.5	59.42	41.56	32.34	23.30	39.08
	1	58.56	41.72	31.45	22.53	38.56
L.S.D:0.05		*5.79	*5.82	*6.73	*6.97	*6.67
*(P≤0.05)						

Table No. (3) Effect of aqueous extract of lemongrass and bay leaves on cold-loving bacteria of camel burgers preserved in freeze (-18°C) for different storage periods Cfu/g103x.

Table No. (4) shows the effect of adding aqueous extract of lemongrass and bay leaves on colon bacteria to camel burgers preserved in freezing (-18°C) and for preservation periods of (0-2-4-6) a week, and a significant decrease was observed at the level of (p<0.05) in bacteria The colon of all samples of camel burger treated with aqueous extracts of lemongrass and bay leaves at concentrations of (1-0.5)% when preserved by freezing. With the average number of coliform bacteria for the control treatment 13.81 Cfu/g103x, and these results are close to what was found (15), where it was found that the numbers of coliform bacteria decreased in Awassi lambs supplemented with rosemary and ginger and stored in freezing.

Table No. (4) Effect of aqueous extract of lemongrass and bay leaves on colon bacteria of camel burgers preserved in freeze (-18°C) for different storage periods Cfu/g102x

Type	concentration	number of weeks				the average
		0	2	4	6	
control	0	16.78	14.23	13.14	11.10	13.81
lemongrass	0.5	8.31	0	0	0	2.07
	1	5.12	0	0	0	1.28
leaf	0.5	8.20	0	0	0	2.05
	1	6.31	0	0	0	1.57
L.S.D:0.05		*3.72	*2.88	*2.72	*2.08	*3.18
*(P≤0.05)						

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