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Studying the effect of adding aqueous extracts of lemongrass and bay leaf on the microbial and sensory properties 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 microbial and sensory characteristics of camel burgers preserved in freezing at a temperature of (-18°C) and for periods of preservation (0-2-4-6) weeks. The results showed a significant decrease at the level ($p < 0.05$) for the numbers of total bacteria, cold-loving bacteria, and colonic bacteria for camel burgers preserved in freezing (-18°C) and for storage periods of (0-2-4-6) a week, in addition to that when studying the sensory tests. For camel burger preserved in freezing (-18°C) and preservation periods (0-2-4-6) a week, a significant increase was observed at the level ($p < 0.05$) of the studied traits during the preservation period, except for the color trait, as a significant decrease was observed with the increase in the preservation period.

Keywords---lemongrass, bay leaves, camel meat.

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 In 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 sensory 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 chopping machine, adding 15% fat from the hump, adding 1.5% salt, and grinding again for the purpose of homogeneity. during the storage period.

Bacteriological estimation

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

Sensory estimation

Sensory evaluation was carried out according to the method that was adopted (6)

Statistical analysis

The statistical program (7) 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 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 (8), 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. (1) 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

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 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 (9), who found that the numbers of cryophilic bacteria were decreased in the beef tablets supplemented with onion and rosemary extract and preserved by freezing.

Table No. (2) 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

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) 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 (10), 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. (3) 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)*(						

Table No. (4) shows the effect of adding aqueous extract of lemongrass and bay leaves on the sensory characteristics of camel burgers preserved in freezing (-18°C) and for storage periods of (0-2-4-6) a week, as a significant increase was observed at the level of ($p < 0.05$) For each of the characteristics of flavor, juiciness, tenderness and general acceptance, except for the color characteristic, a significant decrease occurred, as it was noted that the degrees given for the flavor characteristic of camel burger treated with aqueous extracts of lemongrass and bay leaves at concentrations (1-0.5)% were (6.8-6) and (6.2-6.2) and, respectively, comparing the flavor degree of the control treatment, which is 5.6, and that this increase in flavor is attributed to the ability of the added plant extracts to preserve the burger from microbial contamination and to prevent and delay the

oxidation of fats, and these results agreed with (11), as for the character of The highest degree of juiciness in the burger treated with plant extracts is the increase in water carrying capacity in the meat treated with aqueous extracts, and the highest degree of juiciness is (7) compared with the control treatment whose degree of juice was (5.8), and these results are in agreement with (8), in addition to that, Significant increase in the freshness of camel burger treated with extracts Water of lemongrass and bay leaf (1-0.5)% at($p < 0.05$)

The grades given by the assessors to camel burger treated with aqueous extracts for freshness were the highest values of (7.2) and (7), compared with the control treatment whose degree of tenderness was 5, and this increase is attributed to the aqueous extract of lemongrass and bay leaves, which leads to less weight loss. By cooking the camel burger, and these results were in agreement with (12), as for the color trait, there was a significant decrease in the color degree for the camel burger treated with aqueous extracts of lemongrass and bay leaves, as the degrees given to the color by the residents of the samples for the treatment were 3 compared with a sample The control, whose color degree was 4, is attributed to the shift that can occur in the myoglobin pigment with the length of storage period, and this leads to a decrease in the degree of color, and these results are in agreement with (6). Its degree for camel burger to which aqueous extracts of lemongrass and bay leaves were added at concentrations (1-0.5)%, as it reached its highest degree for the treated burger is (7.2-8) compared with the degree of general acceptance of the control treatment, and the reason is due to the role The good food given to each of the characteristics of flavor, juiciness and tenderness, and its positive impact on the residents to give good degrees for the characteristic of general acceptance, and this was in agreement with (13)

Table No. (4) Effect of aqueous extract of lemongrass and bay leaves on sensory evaluation of camel burger preserved in freezing (-18°C)

Type	concentration					general acceptance
		flavor	freshness	juicy	color	
control	0	5.6	5.8	6	4	6
lemongrass	0.5	6	6	6.2	3	7
	1	6.8	7.2	7.2	3	7.2
leaf	0.5	6.2	6.2	6	3	6.2
	1	6.2	7	6	3	7
L.S.D:0.05		1.48*	1.22*	1.18*	1.03NS	1.172*
غير معنوي $P \leq 0.05$) NS:*(						

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