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Microbial and Sensory Evaluate of Local Minced Chickens Preserved in Polyethylene Bags Processed With Alcohol clove Extract

ABSTRACT

This study was aimed to microbial evaluating and some sensory characteristics of local hens minced meat reserved in polyethylene bags treated with alcoholic clove extract. the experiment include chilled storing of hens meat on 4º C for 10 days

The study contained three different treatments: first one was control the second (B1) alcoholic clove extract 1000mg/ml, the third (B2) alcoholic clove extract 1250 mg/ml. minced hens meat was kept in the treated bags and cooling for (0, 5, 10) days then we made some microbial and sensory tests the results were:

1- Treatment three (B2) conducted low percentage in aerobic bacteria and colon bacteria compared with the control.

2- Treatment two and three (B1) (B2) conducted noticed improvement in the sensory evaluation specially in flavor and juiciness in different storage periods.

3- Treatment three (B2) contributed in extend of shelf-life of preserved meat compared with control.

From the foregoing we could conclude that preserve the meat in bags treated with alcoholic clove extract can make high improvement and low the microbial percentage and also can improve the sensory characteristics in chilled hens meat on 4 ºC.

INTRODUCTION

Poultry meat and its products have a high nutritional value compared with other types of meat and its an important source of essential amino acids, also it is a source of vitamin B complex and some mineral elements like Iron (kalalou et al ,2004). according to microbial and chemical biological nature of hens meat so it is may expose to spoil because of bacteria and other resources so, the using of chemical and industrial materials became important to protect meat and its products from spoil but some of these materials have bad effect on human health (Abdul Sayed,2019) with the increasing of awareness the researches became care about using natural materials have no side effects on human . the polyethylene contained natural anti bacteria became more important for the shelf life of food products and low the risks of bacteria (McCarthy et al, 2001) one of the most important mechanism for bacteria inhibition is using the affective compounds of plants (Gnat et al2017,) this study was conducted on using the clove flowers it is one of the plants that has antibacterial and antifungal affect (Arin and labal,2004) because of antioxidant compound Eugenol and another affective compounds like Kaempferol and Vanillic acid and more affective groups (Wilson et al ,2009) the aim of thisstudy is know the effect of treat the Polly ethylene bags with alcoholic clove extract on meat preservation.

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Material and Methods

Sample collection

clove was collected from the local market in Tikrit it was diagnosed by experts in field crop department in agriculture college in Tikrit university then the clove smashed and kept in a lab – controlled plastic casings till use.

Preparation of clove alcohol extract

50g was taken from clove powder put in the (Soxhelt) added 350 ml of alcohol with 85% concentration , extraction continues for 12 hours 1n 40C^{o} using the Rotary Evaporator Vacuum in 35 C^{o} (Brown and Poxton,1996) , a dense extract was obtained, then complete the drying using a thermal oven to a degree not exceeding 40C^{o}. the solution of was prepared by dissolving 1.5g of the dry extract in 10ml of hot distilled water . chain concentrations and clove extracts of 1500,1250,1000 and 500mg/ml of dietary medium were prepared, The efficacy of the concentrations was determined in initial trials.

Prepare preservation bags

Sealable meat polyethylene bags bearing the brand name (Falcon), a brand of Emirates origin obtained from local markets in Tikrit and treated in different concentrations of alcohol extraction, were then stored in the meat chicken in it according the following sequence :

1-600g of local meat skinned was taken after minced with an electric grinder.

2-The polyethylene bags were prepared and contaminated with a sterile brush with treatment mentioned.

3-200g of minced meat was put in the bags.

4-Microbial and sensory tests were performed on day (0).

5-The meat bags were kept in the refrigerator at 4C^{o}.

6- The microbial and sensory tests were repeated on day (5,10) of conservation respectively.

Sensory evaluation

The sensory evaluation was based on the method mentioned by Cross,others,1978, in which the meat samples were cooked in an electric oven at 165C until the internal temperature of the meat reached 70 C , then the cooked meat sample prepared for a sensory evaluation of the flavor and tenderness characteristics were presented with water during the evaluation and by using ten teaching in in the department of animal production in agriculture college in Tikrit university according to the degrees of snsory evaluation consisting of 5 trait and 5 degrees.

Statistical Analysis

The data were statically analyzed by the experimental system in the statistical program (SAS,2001) and using CRD. Means were selected according to the Duncan multi range test (Dancan, 1955) .

To determine the significance of differences between the mean factors affecting the traits studied at (0.05) and variance δ^2e

Results and discussion

Specific chemical detection of some active totals in clove extract

The results showed that clove extract contains many active chemical compounds, including phenolic, recipes soaps, tatin, flavonides, clicoides and alkaloids. These compounds have a significant effect as antibodies to inhibit or reduce the effectiveness of microorganism in food (Nzeako et al,2006) . these results were agree with (Hashim et al2013) and (Jaafar et al 2016) they found the same affective compounds in clove.

Bacterial tests

Bacterial test of samples with different concentration of clove were conducted to study the extent to which they reduce bacterial growth in minced and refrigerated meat for 0,5,10 days.

Total count of aerobic bacteria

The results of table 2 showed that there was no significant effect on the total count of bacteria in treatments B1 and B2 during the 0-day storage period, as the logarithm of the total

number of bacteria reached 4.91 and4.92, respectively, compared with control which reached 4.98 bacterial units/g.

Table (1) The qualitative chemical detection and active compounds of the alcoholic clove extract

Effective compounds	Reagent used	Detection guide	Detection result
Phenols	Iron chloride 1%	Bluish green color	+
Resins	Ethyl alcohol in boiled distilled water+HCL	Orange to yellow color	+
Sabonat	A- Shake the extract B- mercury chloride	Dense foam for a long time The appearance of a white precipitate	+
The Tatins	A- Lead acetate 1% B- Ferric chloride 1%	White gelatinous precipitate And the appearance of a bluish green color	+
Flavonoids	Ethyl alcohol NaOH	yellow color	+
Glycosides	Concentrated sulfuric acid	Reddish color	+
Alkaloids	Walkner's detector	The appearance of a brown precipitate	+

The presence of the active compounds in the alcoholic clove extract

The 5 days storage showed there was a significant decrease ($p<0.05$) between the treatments B1 and B2 reached 5.96 and 5.71 units of bacterial colony/g respectively compared with control which conducted 6.77 bacterial colony units /g.

The 10 days storage period had a significant effect in decreasing control the total count of bacteria in treatments B1 and B2 conducted 8.37, 8.03 bacterial units/g respectively compared with control conducted 9.33 bacterial colony unit/g.

The difference in storage periods 0.5 and 10 days had a significant superiority over the logarithm of the total count of bacteria, as we note that the lowest level was 0-day storage and then began to rise with the increase of the period storage till 10 days. This is due to the phenolic content of clove extract could be as an antimicrobial substance as a results of changing the permeability of microbial cell membrane (Bajpai et al, 2008). These results were agree with AL-hafud (2015), alalwani(2017) and al salmani(2020).

Table (2) The effect of storage periods on the logarithm of the total number of aerobic bacteria

Transaction	Logarithm of the total bacterial number		
	day(0)	day(5)	day(10)
A	a4.98±0.33	a 6.77±0.33	a 9.33±0.57
B1	a4.91±0.66	ab 5.96±0.33	b 8.37±0.33
B2	a4.92±0.33	ab5.71±0.33	b 8.03±0.33

The averages bearing different letters differ significantly with each other at the level of ($P<0.05$) A control treatment without adding (B1 alcoholic clove extract 1000 mg / ml) and B2 (alcoholic clove extract 1250 mg / ml.

Colony bacteria

The results in table (3) showed that there was no significant differences ($p<0.05$) in total count coliform bacteria in treatments B1 and B2 in 0 day storage, as the logarithm of the coliform bacteria reached 2.56 , 2.60 compared with control 2.81 bacteria colony unit /g.

The effect of 5 days storage period also had significant decrease ($p<0.05$) observed in the logarithm of the coliform bacteria count, the lowest value was in treatment B2 3.61CFU/ g compared with control that conducted 4.20 bacterial units/g.

Also there was a significant decrease at the level ($p<0.05$) in treatments B1 and B2 which conducted 6.22, 5.99 units of bacteria colony/g respectively compared with the rest treatments.

As for the effect of the storage period on the logarithm of the bacteria coliform count, the results showed there was a significant effect ($p<0.05$) in the logarithm of bacterial coliform count was in the lowest level in 0 storage the it began to increase with the progression of the storage period till 10 days storage. These results were agree with (AL-Hafud,2017).

Table (3) The effect of storage periods on the logarithm of the coliform bacterial count

Transaction	Logarithm of coliform number		
	day(0)	day(5)	day(10)
A	a2.81±0.33	a4.20±0.33	a 6.61±0.33
B1	a2.56±0.33	ab3.89±0.57	a 6.22±0.57
B2	a2.60±0.33	b3.61±0.33	a 5.99±0.33

The averages bearing different letters differ significantly with each other at the level of ($P <0.05$) A control treatment without adding B1) alcoholic clove extract 1000 mg / ml) and B2 (alcoholic clove extract 1250 mg / ml)

Yeasts and Molds

The difference between the treatments and the yeast and mold numbers was explained in table 4 were the results showed the effect of storage no growth of yeast and molds in the 0 and 5 period storage at 4C. for the 10 days storage, a significant decrease ($p<0.05$) in the numbers of yeasts and molds in treatments B1 and B2 which reached the logarithm of number of yeasts and molds at 2.84 , 2.59 unit of colony/g compared with control which conducted 3.62 units colony /g.

The volatile oils in clove have two different direction of action against fungi , as fungal inhibitor and a fungal killer (Wilson et al,2009) also the affective compound of clove have the inhibitor ability towards fungi by reacting to cell membrane proteins causing changes in the permeability of the membrane and disruption of respiratory activity within the fungal filament (AL-Mashhadi,2011).

Table (4) The effect of storage periods on the logarithm of the number of yeasts and molds

Transaction	Yeasts and molds		
	day(0)	day(5)	day(10)
A	0±0 a	0±0 a	a 3.62± 0.33
B1	0±0 a	0±0 a	b2.84±0.33
B2	0±0 a	0±0 a	b2.59±0.33

The averages bearing different letters differ significantly with each other at the level of ($P <0.05$) A control treatment without adding B1 alcoholic clove extract 1000 mg / ml and B2 alcoholic clove extract 1250 mg / ml

Sensory evaluation

Tenderness

We noticed from table 5 the effect of the different storage periods on tenderness the results showed a significant increase ($p<0.05$) in tenderness between B1 and B2 it was 4.00 , 3,75 respectively compared with control it was 3.5 for 0 day storage.

For 5 day storage the results showed a significant effect in addition treatments it was 4 compared with the control was 3.5. and for the 10 days storage the results showed a significant increase in tenderness in treatments B1 and B2. It was 3/25 , 3.25 respectively compared with treatment was 3.00.

The results of the statistical analysis indicated that there was a significant effect between the treatments in tenderness the rating was better during 0 and 5 days storage the it decreased with the period storage until it reached its lowest degree in 10 days storage.

Table (5) The effect of storage periods (0,5and10) on the degree of evaluation of freshness of chilled minced chicken

Transaction	Freshness		
	Today(0)	Today(5)	Today(10)
A	3.50	3.50	3.0
B1	3.75	4.00	3.25
B2	4.0	4.00	3.25

Flavor

The results in table 6 showed the effect of different period storages on flavor there was a significant affect in treatment additions B1 and B2 it was 4.00 , 3.5 respectively compared with control which conducted 4.5 in 0 day storage. For 5 days storage the results showed a significant affect in B1 it was 4.5 compared with control was 4.00. and for 10 days storage we noticed a high significant affect in treatments B1 and B2 it was 4.2 , 3.00 respectively compared with control was 1.75.

The reason may be due to the use of clove extract containing phenolic compounds, which are highly effective as antioxidants and have the ability to suppress free radicals, protect cell membrane, prevent oxidation and storage and thus to prevent flavor (Nahar,2020,AL-Salmani,2020).

Table (6) The effect of storage periods (0,5and10) on the degree of flavor evaluation in chilled minced chicken

Treatment	The flavor		
	Today(0)	Today(5)	Today(10)
A	4.50	4.0	1.75
B1	4.00	4.50	4.2
B2	3.50	4.00	3.0

Juiciness

Table 7 show the difference between period storage on juiciness B1 and B2 conducted significant affect was 3.5 compared with control was 3.2 in 0-day storage. For 5 days storage the results showed significant affect in B1 3.75 compared with the control was 3.25. and for 10 days storage the significant affective was appeared in B1 and B2 was 3.25, 3.25 respectively compared with control was 2.50.

The reason may be due to the using of clove extract which are highly effective as antioxidants and have the ability to suppress free radicals, protect cell membrane, prevent oxidation and storage and thus reducing liquid, increasing moisture and water holding capacity of meat (Jordi,et al,2015, AL-Salmani ,2020).

Table (7) The effect of storage periods (0,5 and10) on the grades of juiciness in chilled minced chicken

Transaction	Juiciness		
	Today(0)	Today(5)	Today(10)
A	3.25	3.25	2.50
B1	3.50	3.75	3.25
B2	3.50	3.25	3.25

General acceptance

It is noticed from table 8 that there were no significant affect between treatments in palatability in 0 day storage. For 5 days storage treatment B1 conducted a significant affect 4.25 compared with control was 3.50. while the results of palatability in 10 days storage refers that there were a significant differences in treatments B1 and B2 was 3.25, 3.25 respectively compared with control was 2.50.

he reason may be due to the using of clove extract which had the effect of reducing the process of fat oxidation and preserving the cell membrane as well as improving the sensory traits such as flavor, tenderness and juiciness of minced meat. All this was reflected on palatability and this agree with AL-Alwani (2017) and (AL-Salmani 2020).

Table (8) The effect of storage periods (0,5 and 10) on the general receptivity of chilled minced chicken

Transaction	General acceptance		
	Today(0)	Today(5)	Today(10)
A	3.75	3.50	2.50
B1	3.75	4.25	3.25
B2	3.75	4.00	3.25

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التقييم الميكروبي والحسي للحم الدجاج المحلي المثروم المحفوظ باغلفة البولي اثيلين والمعامل بمستخلص القرنفل الكحولي

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الخلاصة

هدفت هذه الدراسة الى التقييم الميكروبي وبعض الصفات الحسية للحم الدجاج المحلي المفروم والمحفوظ بأغلفة البولي اثيلين المعاملة بمستخلص القرنفل الكحولي، وتضمنت التجربة خزن لحم الدجاج المفروم بالتبريد بدرجة حرارة 4مْ لمدة 10 ايام. وشملت الدراسة ثلاث معاملات اضافة مختلفة عوملت بها اكياس البولي اثيلين بها: المعاملة الاولى ((Aمعاملة السيطرة (بدون أضافة)، والمعاملة الثانية ((B1 مستخلص القرنفل الكحولي بتركيز 1000 ملغم/مل، والمعاملة الثالثة ((B2مستخلص القرنفل الكحولي بترك يز1250 ملغم/مل، تم حفظ لحم الدجاج المحلي المفروم في الاكياس المعاملة كل على حدة وخزنت بفترات (10,5,0) يوم بالتبريد واجريت بعد ذلك بعض الاختبارات الميكروبية والحسية لها، وكانت نتائج هذه الدراسة على النحو التالي:1-سجلت معاملات الاضافة بمستخلص القرنفل الكحولي بتركيز (1250) ملغم أقل قيمة في لوغاريتم العدد الكلي للبكتريا الهوائية وبكتريا القولون مقارنة مع معاملة السيطرة للحم الدجاج المحلي المفروم والمخزون بالتبريد.2-حققت معاملتي الاضافة تحسن ملحوظ في الصفات الحسية كالنكهة والعصيرية مما انعكس ايجابيا على التقبل العام للحم الدجاج المفروم في فترات الخزن المختلفة.
3-ساهمت معاملات الاضافة بمستخلص القرنفل الكحولي بتركيز (1250) ملغم في اطالة العمر الخزني الى لحم الدجاج المحلي المفروم والمخزون بالتبريد مقارنة بعينة السيطرة. وفي ضوء هذه الدراسة يمكن الاستنتاج ان حفظ اللحم بأكياس البولي اثيلين المعاملة بمستخلص القرنفل الكحولي حقق فعالية عالية في الحفاظ على العينات وتثبيط الحمل الميكروبي وكذلك كان له تأثير فعال في تحسين الصفات الحسية للحم الدجاج المفروم والمخزون بالتبريد بدرجة حرارة 4 مْ

الكلمات المفتاحية: مستخلص القرنفل الكحولي , لحم الدجاج المفروم ,التلوث الميكروبي