

Sensory And Physical Characteristics Of Burger Made From Different Percentages Of Spent Hens Meat

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Abstract

An experiment to study the Sensory and physical characteristics of burger made from different percentages of spent hens meat. The experiment included five treatments in which spent hens meat was introduced in different proportions to the beef burger mixture. The proportions of chicken and beef meat in the burger meat mixture were as T1 beef 100% + 0% spent hens meat . T2 beef 75% + 25 % spent hens meat. T3 beef 50 % + 50 % spent hens meat. T4 beef 25 %+ 75 % spent hens meat .T5 beef 0% + 100 % spent hens meat. the experiment was conducted in the poultry laboratory of the College of Agriculture - Wasit University . To conduct the research, beef and spent hens meat were purchased from local markets in the city of Kut after slaughter and cooling. The burger was cooked by hot air tablets at a temperature of 220 degrees Celsius for a period of 24 minutes. Sensory evaluation scores were determined for the characteristics of flavor, tenderness, juiciness, general acceptability, shape, appearance color, and structure, the sensory and physical properties of a burger made from different proportions of beef and spent hens meat. The results showed that adding spent hens meat can significantly improve the flavor, tenderness and juiciness of the burger. The sample containing an equal proportion of aged beef and chicken meat (50/50) was the most balanced in the properties studied and had the highest overall acceptance.

Keywords: spent hens meat, sensory traits, flavor, tenderness, juiciness, color.

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I. Introduction

The demand for white meat consumption has increased worldwide All over the world due to its cheap prices and increased nutritional value As well as its low cholesterol and acid content Saturated fatty acids that are deposited on the walls of blood vessels(1). The occurrence of serious diseases such as atherosclerosis And coronary heart disease .The poultry industry has witnessed extensive developments to increase the production of eggs in terms of quantity and quality as a result of the increasing demand for them due to their high nutritional value(2). There are approximately 152 million old chickens marketed annually all over the world. Their first productive period has ended when they are 5.5 years old and are called “spent hens”(3). Although there are no significant changes in the amount of vitamins and mineral elements in the meat of old chickens compared to broilers, aging leads to a decrease in moisture and protein levels, an increase in fat levels, a decrease in the ability of the meat to retain water, and a change in the nature of the connective tissues, especially collagen, the fibers of which are connected by cross-links, which gives the meat Fibrous and dry texture.(4)In light of recent developments in the food industry and the continuous increase in the consumption of meat products, understanding the sensory and physical characteristics of burgers made from spent hens meat has become necessary to meet consumer expectations and ensure the quality of the product. Burger is one of the most common and famous foods in many cultures, and its characteristics vary in terms of appearance, taste and texture. It depends on several factors, including the percentage of meat, fat, and other ingredients used in manufacturing(5). So we conducted this experiment to study the Sensory and physical characteristics of burger made from different percentages of spent hens meat.

II. Materials And Methods

This experiment was conducted in the poultry laboratory of the College of Agriculture - Wasit University . To conduct the research, beef and spent hens meat were purchased from local markets in the city of Kut after slaughter and cooling. The process of physical separation of the thighs was carried out to separate the meat from the fat and bone and kept in the refrigerator at a temperature of 4°C until the next day. The meat and fat were cut into small pieces to facilitate the subsequent chopping process when placed. These pieces are placed in polyethylene bags, tightly closed, and kept in the freezer at a temperature of -15 degrees Celsius until they are used in manufacturing meat burgers. spice seeds was purchased from local markets and grounded. It was sorted separately using a laboratory grinder, a mixture was made to suit the consumer’s desire, and it was

stored in a glass container until used. 5.0% pure salt, free of additives and impurities. Weight of the manufactured product and each treatment

Search parameters

The experiment included five treatments in which spent hens meat was introduced in different proportions to the beef burger mixture. The proportions of chicken and beef meat in the burger meat mixture were as T1 beef 100% + 0% spent hens meat . T2 beef 75% + 25 % spent hens meat. T3 beef 50 % + 50 % spent hens meat. T4 beef 25 %+ 75 % spent hens meat .T5 beef 0% + 100 % spent hens meat.

The pieces of meat and fat were chopped in an electric mincing machine with a sieve opening diameter of 1 mm. Then they were mixed for the purpose of homogenizing and distributing the fat with the meat. The manufacturing process was done by making Burger molds weighing 70 grams each. These molds were placed in polyethylene bags, each tablet separated by a piece of nylon. The bags were closed well and placed in the refrigerator at 4°C for 4 hours. The burger was cooked by hot air tablets at a temperature of 220 degrees Celsius for a period of 24 minutes. Sensory evaluation scores were determined for the characteristics of flavor, tenderness, juiciness, general acceptability, shape, appearance color, and structure, based on what Cross mentioned, as the sensory evaluation scores for each flavor characteristic ranged from (1 = completely non-existent flavor.. =5 Excellent flavor (tenderness) 1 =not mushy 5 = high tenderness) and juiciness (1 =very dry 5= high juiciness) and degree of general acceptability (1=Totally unacceptable 5= Very acceptable) and the general appearance (1=Totally unacceptable appearance..... 5= Excellent appearance) and the apparent color (1=Totally unacceptable color..... 5= color Excellent) as people, including faculty members and students at the College of Agriculture / Wasit University, participated in the evaluation and who had the desire and relatively sufficient experience to carry out the sensory evaluation process. The evaluators were also provided with detailed information about the nature of the sensory evaluation. The evaluators were also provided with detailed information about the nature of the evaluation along with the conduct of the evaluation. A preliminary assessment before the main test that was adopted in this study. Uniformity was taken into account in the following variables in order to control the changes that affect the evaluation score, which are: the time of the test at eleven o'clock before noon, the cooking temperature, the time period between cooking and taking the test, and drinking water at 5°C between One test, another, and finally the size of the piece submitted for evaluation, according to Lee Williams. statistical analysis was done be a complete randomized design (CRD) to, using the One-way ANOVA analysis was used by SPSS/PC+ version 27 software to evaluate the data through using the Means and standard error were included in the results of summary statistics (6), and testing the significant differences using the Duncan test.(7)

III. Results And Discussion

Table 1. Effect of different percentages of spent hens meat on the flavor, tenderness and juiciness of burger

Treatment	Flavor	Tenderness	juiciness
1	b 2.875 ± 0.01	b3.625 ±0.001	a3±0.01
2	b2.875 ± 0.01	b3.25 ±0.002	a3±0.001
3	a3.75 ±0.001	a4 ±0.001	a3.62 ±0.001
4	a3.125 ±0.001	a4± 0.001	a3.85±0.002
5	a3.5 ± 0.001	a4.05±0.002	a3.125±0.03

The results show From table 1 the effect of different percentage of spent hens meat on flavor. That the flavor has increased. Significantly By the increase in percent of spent hens meat in the burger. The 25% of spent hen meat Wasn't the fear significantly from the Control treatment But the other percentages (50 , 75 , 100%) of spent hens meat were significantly Higher than the Control treatment .

The same differences was noticed for the tenderness of the burger. At the same replacement Percentage of spent hens meat in the burger. But the juiciness Of the burger hadn't differ significantly between the control and the experimental treatments .The analysis indicates that a certain balance between beef and spent hens meat can improve the quality of the burger in general. However, individuals' preferences and special nutritional needs must be taken into account before making the decision to add chicken meat to the burger. Some people may prefer beef only for preferential reasons, while others may look for diversification and improvement in flavor and tenderness by adding chicken meat.(8)

Table 2. Effect of different percentages of spent hens meat on the Color , Texture and General acceptance of burger

Treatment	Color	Texture	General acceptance
1	b3.125 ± 0.01	a3. 25 ±0.002	b3,35 ±0.02
2	b3.125 ± 0.001	a3.125 ±0.001	b3.25 ±0.01
3	a4 ±0.002	a3.5 ±0.01	a3.87 ±0.002

4	b3.5 ±0.01	a3.8 ± 0.002	a3.62 ±0.001
5	b3.25 ± 0.002	a3.5 ±0.02	b3.5 ±0.001

In table 2 results showed That The treatment of 50% of spent hens meat in the burger had the highest color score between All the treatments And the other replacement percentages of spent hens meat in the burger didn't the differ from the control treatment significantly .

The texture of burger didn't differ between the experimental treatment . The general acceptance was higher was significantly higher, uh for the third and fourth treatment, (50% and 75%) of spent hens meat respectively, but it didn't differ in the full replacement and 25% of spent hens meat from the control treatment.

Table 3. Effect of different percentages of spent hens meat on the Weight loss of burger

Treatment	Weight before cooking	Weight after cooking	Weight loos gm	Weight loss %
1	70	a64 ±0.01	c6±0.01	c8.57± 0.01
2	70	b60 ±0.01	b10 ±0.01	b14.28±0.02
3	70	c58 ±0.01	a12 ±0.01	b15.14±0.05
4	70	c59 ± 0.01	b11±0.01	b15.71±0.04
5	70	c58 ±0.01	a12 ±0.01	a17.14±0.01

In table 3 we can notice that. There are a significant variation in weight loss of burger after cooking. We can see that. The lowest Weight loss percentage was recorded by the control treatment. Was Succeeded by followed by the treatments of 25 , 50 and 75% of spent hens meat but the weight loss was significantly higher in the full replacement of beef meat with spent hens meat . So by the increased percentage of replacement of beef meat with spent hens meet , the weight loss was higher.

Reasons for weight loss can be the result of multiple factors, like , Loss of moisture, during cooking, meat loses water that was trapped in its tissues. Fat loss,Some fats melt and are lost during cooking.(9)

From the table, we note that weight loss during cooking varies between samples, which can affect tenderness, juiciness and flavor.(10)

Samples that have lost a greater amount of weight (especially sample B, T2) may be drier and less juicy, which can negatively affect sensory properties.(11)

Based on the results of sensory and physical analysis of burger samples consisting of different proportions of beef and aged chicken, it is recommended to use a mixture of 50% beef and 50% aged chicken. The T3 sample with this ratio showed an ideal balance of flavor, tenderness and juiciness, and was the best in overall acceptance. The flavor, tenderness and juiciness of the burger can be significantly improved by adding spent hens meat. For producers seeking to improve the sensory quality of their products additional experiments can be conducted to determine the specific preferences of certain demographic groups(12). It is recommended to study the effect of other additives such as spices, herbs, and fillers to improve the taste, texture, and overall acceptability of blended burgers. These additives may contribute to further improvement of sensory properties.

Adding spent hens meat can be a healthier option thanks to its lower fat content compared to beef. It is recommended to highlight health benefits in product marketing to motivate health-conscious consumers to try them.(13) . Producers must conduct a detailed cost analysis to determine the economic feasibility of producing burgers mixed with different proportions of beef and spent hens meat. This can help determine the most cost-effective options.(13)

Extended taste tests involving a larger number of consumers are recommended to confirm the results of the current study and ensure that the results are replicable across a wide range of people. (14) Blended burgers can be marketed as the perfect combination of the taste and flavor of beef and the tenderness and juiciness of chicken meat. This combination can be especially attractive to people looking for a new, distinct flavor in a traditional burger.

By following these recommendations, burger quality can be significantly improved and a product can be provided that meets the preferences and needs of a wide range of consumers.14 . In this study, we analyzed the sensory and physical properties of a burger made from different proportions of beef and spent hens meat. The results showed that adding spent hens meat can significantly improve the flavor, tenderness and juiciness of the burger. The sample containing an equal proportion of aged beef and chicken meat (50/50) was the most balanced in the properties studied and had the highest overall acceptance.(8, 9)

These results suggest that combining spent hens meat with beef could be an effective strategy to improve burger quality and provide a product that meets consumers' expectations and preferences. However, individual differences in dietary preferences must be taken into account when developing and promoting these products. We recommend conducting additional studies to test the effect of other additives and flavors on the sensory and physical characteristics of burgers, in addition to studying the economic feasibility of applying these ratios in commercial production.(9, 12)

This study provides valuable insights to food processing producers and researchers on how to improve their products and meet diverse market needs. We look forward to seeing further innovations in the burger industry build on these findings, enhancing the quality and variety of products available to consumers.(13)

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