

Nutritional and Microbiological Characteristics of Commercial Chicken Balls and Fish Balls from Hpa-an Township, Kayin State

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Abstract: The aim of this research is to study the chemical composition of chicken balls and fish balls from Hpa-an Township. Chicken balls and fish balls are one of the constituent in our diet as it includes nutritional values. These samples will be collected from Hpa-an Township in Kayin State. pH value were be determined by pH meter. Nutritional characterization (moisture, ash, protein, fat, total titratable acidity and minerals, etc.,) of chicken balls and fish balls were be determined. Microbiological properties (Fungi and bacteria) were also be investigated. Some mineral elements will be carried out by atomic absorption spectrophotometer. The chemical composition of samples were be determined by Association of the Official Analytical Chemist (AOAC) method and modern instrumental techniques. This research work will be benefit for the consumers' health information about the nutrition values.

Keywords: Chicken balls and fish ball, chemical composition, microbiological properties

I. Introduction

Fish Ball

White fish balls are larger in size and made with only fish, no other ingredients are added, and then boiled till done. As a result of this cooking method, these fish balls are white in color. A good fish ball should have an elastic (bouncy) and fluffy texture and a strong taste of fish. Readily available in markets, fish ball are also a popular ingredient for hot pot. They are usually fried or grilled as a snack. They can also be eaten in a Thai curry (Man and Joyce, 2012). In Thai, fish balls are also very popular. They are usually fried or grilled to be eaten as a snack. The consumers also prefer to have real meats than processed meat in the products. Many researchers had been conducted on the nutritional and quality aspects of fish balls (Yu and Yeang ,1993) and (Yamprayoon *et al.* 1991) conducted the effect of ingredient on quality of fish balls.

Ingredients of Fish Ball

The basic ingredients are fish and sometimes flour; flavorings, such as salt and sugar, can also be used. The proportion of fish and flour depends on the quality and type of fish balls to be made (Man and Joyce, 2012).

Chicken Ball

Chicken balls are a food consisting of small, spherical or nearly spherical pieces of chicken. They are prepared and eaten in several different cuisines. They are often served with sweet and sour sauce or plum sauce . They are sold skewered on bamboo sticks as street food. Thai chicken makes for an exotic weeknight dinner that comes together quickly. It features traditional Thai flavors like fish sauce, Sriracha, fresh ginger, coconut milk, and cilantro (Bonom, 2007).

II. Materials and Methods

Collection of Samples

The samples of fish ball and chicken ball were purchased from Myoma market in Hpa-an Township.

Determination of pH

The pH values of chicken balls and fish balls samples were detected by pH meter.

Determination of Moisture Content

The moisture content of chicken balls and fish balls samples were determined by oven-drying method.

Determination of Ash Content

The ash content of chicken balls and fish balls samples were determined by furnace and the temperature of furnace was maintained at 105°C for 20 minutes.

Determination of Protein Content

The protein content of chicken balls and fish balls samples were determined by Kjeldahl digestion method.

Determination of Fat Content

The fat content of chicken balls and fish balls samples were determined by Soxhlet extractor method.

Determination of Total Titratable Acidity Content

Total titratable acidity of chicken balls and fish balls samples were determined by acid-base titration method. (AOAC, 1995).

Determination of Mineral Contents

Trace elements (Pb,Hg,Cd,Mg,Ca and K) in chicken balls and fish balls samples were detected by atomic absorption spectroscopy (AAS) (Lajunen, 1991).

Isolation of Fungus

The isolation of fungus from chicken balls and fish balls samples was performed by using dilution plate method (Lodder and Kreger-Van Rij, 1967).

Isolation of Bacteria

The isolation of bacteria from chicken balls and fish balls samples was performed by using dilution plate method (Lodder and Kreger-Van Rij, 1967).

III. Results and Discussion

pH Values in Samples

The pH values in fish ball and chicken ball samples were measured by pH meter. Food with a pH of 4.6 is termed as high acid food. If the pH is above 4.6, it is a low acid food (Battcock and Azma, 1998). The pH values of fish ball and chicken ball samples were found to be 7 and 6.7 respectively. During food storage and spoilage, changes may occur due to enzymic action and microbiological growth. (Table.1).

Moisture Content in Samples

In this work, Oven Dry method was used for determination of moisture content in samples. It was observed that chicken ball and fish ball were 39.38 %, and 39.83% respectively. (Table.1).

Ash Content in Samples

In this investigation, the samples were ignited in a crucible using a hot plate keeping the temperature as low as possible. Ashing in the furnace at 550°C was done until constant weight was attained after cooling in a desiccator The ash content of chicken ball and fish ball were 7.96%, and 7.13% respectively.(Table.1)

Protein Content in Samples

Protein contents were measured by Macro kjeldahl's method. The main work of protein is to build the body and to repair the worn out tissue, but any protein eaten in excess of the amount required by the body can be used to provide energy (Ruth, 1977). The protein contents of chicken ball and fish ball were found to be 12.08 and 15.31% respectively. (Table.1)

Fat Content in Samples

Fat contents were measured by Soxhelt extraction method using PE (boiling point 60 °C-80°C). The contents of fat were found to be 7.82 and 1.67% in chicken ball and fish ball samples respectively. (Table. 1)

Total Titratable Acidity Content

In this study, total acidity is calculated based on citric acid equivalence. Total titratable acidity content of chicken ball and fish ball are 4.16 and 3. 21% respectively.

Mineral Contents of Samples

In the present work, the mineral contents in chicken ball and fish ball were determined by atomic absorption spectrophotometer. Pb, Hg, Cd, Mg, Ca and K were determined in these samples but Pb, Hg and Cd were not detected. These data are shown in (Table 2)

Isolation of Fungus from Samples

The isolation of fungi from chicken ball and fish ball was performed by dilution plate method. Potato Dextrose Agar was used because this is a relatively rich medium for growing wide range of fungi. The enumerations of fungi are shown in (Table 3).

Table1. Nutritional Values of Chicken Ball and Fish Ball

Samples	pH	Moisture content (%)	Ash content (%)	Protein content (%)	Fat content (%)	Total titratable acidity content (%)
Chicken ball	7.0	39.38± 0.02	7.96 ± 0.02	12.08	7.820	4.16 ± 0.05
Fish ball	6.7	39.83±0.02	7.13± 0.02	15.31	1.674	3.21 ± 0.04

Isolation of Bacteria from Samples

Bacteria were isolated from chicken ball and fish ball by dilution plate method. Serial dilutions of a solution containing an unknown number of bacteria were carried out and then plated the diluted solution on Nutrient Agar medium that supports the growth of the micro-organisms. The enumerations of bacteria are shown in (Table 3).

Table 2. Mineral Values of Chicken Ball and Fish Ball

No	Minerals	Chicken ball	Fish ball
1	Pb	ND	ND
2	Hg	ND	ND
3	Cd	ND	ND
4	Mg	0.139 ±0.001	0.035±0.007
5	Ca	0.510 ±0.022	0.286±0.014
6	K	1.553 ±0.054	1.461±0.046

Table 3. Enumeration of Total Fungi and Bacteria Count of Chicken Ball and Fish Ball

No.	Samples	Total fungi count (CFU/g)	Total bacteria count (CFU/g)
1	Chicken ball	3×10 ⁵	40×10 ⁵
2	Fish ball	29×10 ⁵	22×10 ⁵

IV. Conclusion

Samples (chicken ball and fish ball) were purchased from Myoma market in Hpa-an Township. Comparative studies on the nutritional and microbiological characteristics of samples were carried out. The pH value of chicken ball and fish ball were found to be in the range of 7.0 to 6.7 respectively. The moisture contents in chicken ball and fish ball were found to be 39.38 ± 0.02 and $39.83 \pm 0.02\%$ respectively. The ash content of chicken ball is greater than fish ball. The protein content of chicken ball and fish ball were found to be of 12.08 and 15.31%. The fat content of chicken ball is higher than fish ball. Total titratable acidity content of chicken ball and fish ball were found 4.16 ± 0.05 and 3.21 ± 0.04 (%). In the determination of mineral values of chicken ball and fish ball, the Pb, Hg and Cd were not detected in these samples. The enumeration of total fungi colonies in chicken ball and fish ball were 3×10^5 CFU/g and 29×10^5 CFU/g respectively. The contaminations of samples by fungi reduce their qualities. The enumeration of bacteria colonies in chicken ball and fish ball were 40×10^5 CFU/g and 22×10^5 CFU/g respectively. Thus, the growth of fungi and bacteria colonies in chicken ball and fish ball to be reduced after frying. So that all these samples were not harmful effect for human.

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