DETERMINATION OF MICROBIOLOGICAL AND CHEMICAL QUALITY OF BURDUR ŞIŞ KÖFTE COLLECTED FROM THE FAST FOOD RESTAURANTS IN BURDUR, TURKEY

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Abstract – Burdur şiş köfte, which is a grilled meat meal, is served in restaurants in the province of Burdur and cities around Burdur and it is only produced beef or lamb meat, salt and back fat. This study was carried out to determine microbiological and chemical quality of burdur şiş köfte. Burdur şiş köfte was collected from 30 different fast food restaurants in Burdur and microbiological and chemical analysis were conducted in 30 raw and cooked köfte. As microbiological analysis, total mesophilic aerobic bacteria, coliform, yeast-mold, *Staphylococcus aureus*, *Bacillus cereus* and *Salmonella spp.* counts were determined in raw and cooked şiş köfte. As chemical analysis, dry matter, salt, fat, protein, pH and color analysis were determined in raw and cooked samples. According to the findings, microbiological quality of raw şiş köfte samples show differences depending on where şiş köfte taken from. Results indicated that not much attention was given for hijyenic manufacture during preparation of raw şiş köfte dough but when the şiş köfte is cooked, it becomes more reliable product for microbiological perspective.

Key Words – Burdur Şiş Köfte, market research, quality, consumer health

I. INTRODUCTION

Food is defined as safe when its physical, chemical and microbiological properties render it suitable for consumption and it has not lost nutritional value. Hygienic quality problems of foods cause food borne diseases. Worldwide, many people die each year due to food borne diseases. For this reason, food security is emerging as the national and global problem [1]. Food market studies are done for quality and safety control in food production. As a result of these studies, people have information about microbiological and chemical quality of meat products that is sold in markets and fast food restaurants [2]. Meat is the raw material of burdur şiş köfte, so microbiological and chemical quality of meat is important to investigate. This study was carried out to determine microbiological and chemical quality of raw and cooked şiş köfte which is collected from Burdur markets.

II. MATERIALS AND METHODS

To investigate the microbiological and chemical properties of Burdur şiş köfte, product sold in fast food restaurants in the province of Burdur were obtained as 30 raw and 30 cooked samples from 30 different fast food restaurants. Şiş köfte samples were aseptically taken into sterile sampling bags, transported to the laboratory and analyzed for microbiological properties. Aerobic plate counts were measured using the spread plate method on aerobic plate count agar [3]. Mould and yeast counts were measured using the spread plate method on potato dextrose agar [4]. Total coliform bacteria counts were carried out using the spread plate method on eosin methylene blue [5] and *Staphylococcus aureus*, *Bacillus cereus*, *Salmonella spp*. analysis were determined according to American Public Health Association [6]. In order to determine the chemical quality of Burdur şiş köfte, pH [7], salt, dry matter, fat and protein [8] with the color measurement analysis [9] were performed.

III. RESULTS AND DISCUSSION

In this study, microbiological and chemical qualities of raw and cooked Burdur şiş köfte

collected from Burdur markets were investigated. According to the results of microbiological analyzes of raw şiş köfte samples, the minimum and maximum numbers of mesophilic aerobic bacteria, total coliform, yeast and mold, *Staphylococcus aureus* and *Bacillus cereus* were determined as ranging from $4{,}0x10^3$ to $2{,}47x10^8$, $4{,}2x10^2$ to $2{,}62x10^5$, $3{,}5x10^1$ to $2{,}45x10^4$, <10 to $3{,}5x10^2$ and $2x10^1$ to $1{,}2x10^3$ cfu/g, respectively. In cooked şiş köfte samples, the minimum and maximum counts of mesophilic aerobic bacteria, total coliform, yeast and mold, *Staphylococcus aureus* and *Bacillus cereus* were <10 to $2{,}4x10^3$, <10 to $6\ x10^2$, <10 to $4{,}05x10^3$, <10 to $2{,}1x10^2$ and <10 to $8x10^2$ cfu/g, respectively. *Salmonella spp.* was not detected in raw and cooked şiş köfte samples. As a result of chemical analysis of raw şiş köfte samples, the minimum and maximum values of dry matter, pH, salt, protein and fat were determined to be 49,88 to 64,58%, 5,46 to 6,35, 0,95 to 2,98%, 14,06 to 20,91% and 11,5 to 30%, respectively. Dry matter, pH, salt, protein and fat in cooked samples were 54,84 to 65-86%, 5,84 to 6,66, 1,37 to 3,28%, 19,08 to 26,73% and 7,5 to 19,5%, respectively. According to the analysis of color measurement of raw and cooked şiş köfte samples, L*, a*, b* values were in the range of 47,98 to 62,06 and 45,32 to 55,79, 6,81 to 26,93 and 7,64 to 13,428, 2,06 to 8,22 and 6,45 to 11,77, respectively. According to Turkish standards for ground meat, maximum limits for aerobic mesophilic bacteria and *Staphylococcus aureus* $5x10^6$ cfu / g and $5x10^3$ cfu / g respectively, and zero tolerance for salmonella is stated [10]. According to the results obtained from this study, some of the samples exceed the limits specified in the standards for the total mesophilic aerobic and coliform bacteria, but the number of *Salmonella spp.* compatible with the standards.

IV. CONCLUSION

According to the findings, microbiological quality of burdur şiş köfte shows important variability in Burdur markets, some raw şiş köfte samples are hygienically insufficient and may creates risk for consumers. The cooking process has important effect on microbiological reduction in Burdur şiş köfte. In order to protect consumer health, hygienic production is important.

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