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Quality of ready to eat chicken meals

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Hygiene and control of meat and its products

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Abstract

The current study was conducted to evaluate the safety of some ready to eat chicken products, chilled and frozen chicken (120 samples, ten for each) in terms of sensory, chemically and bacteriological examinations. The samples were collected from different restaurants and markets in Cairo and Giza Governorate. The collected samples included chicken shawerma, grilled chicken, pane, shish tawoak, fajita, chicken burger, chicken salad, chicken mandy, fried chicken and finally pop chicken. The bacteriological criteria were as follows: Aerobic Plate Count, Enterobacteriaceae, coliforms and Staph. aureus counts. chicken salad was the most contaminated products in terms of APC, Enterobacteriaceae, coliforms and Staph. aureus counts (1.094x106±8.81x105, 1.696x102±4.82x10, 1.183x104±4.65x103 and 30.0±21.34 cfu/g) respectively. On the contrary, the lowest bacterial counts was recorded for pop chicken products which recorded (1.797x104±9.34x103, <3, 2.20x102±72.7 and <10 cfu/g), respectively according to Public Health Laboratory Service (PHLS) (2000) regarding judgment of RTE meals. Chemical characters were within the permissible limits. M PCR technique used for detection of enterotoxigenic Staph. aureus virulent genes on 14 isolate of RTE and 6 isolate of chilled and frozen chicken cleared that the (Sea) gene of Staph. aureus had the highest prevalence followed by (Seb, Sec) and only one (Seb) and (Sec)of virulence genes. Shiga toxin 1 (Stx1) gene could be detected only in one strain (50%) isolated from both of chicken shawerma and chicken salad and in (33.33%) of chicken fajita. Shiga toxin 2(Stx2) could be detected in two isolates of E. coli from chicken fajita and chicken salad. The public health significance of the attained results were discussed.

Keywords:(RTE, APC, Staph aureus enterotoxins producing genes, , shiga toxins, PHLS).

Dedication

To my father

To my mother

To my husband

To my lovely Raghad

To my son Ziad

To my sisters

To my brother

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List of abbreviations

ALOA	**=**	**Agar Listeria according to Ottaviani and Agosti.**
APHA	**=**	**American Public Health Association.**
APC	**=**	**Aerobic plate count.**
RTE	**=**	**Ready to Eat.**
STEC	**=**	**Shiga Toxin producing Escherichia Coli**
SFI	**=**	**Staphylococcal Food Poisoning Intoxication.**
SEs	**=**	**Staphylococcal Enterotoxins.**
STX1	**=**	**Shiga- Toxin 1.**
STX2	**=**	**Shiga- Toxin 2.**
TBA	**=**	**Thio Barbeturic Acid.**
TVB-N	**=**	**Total Volatile Basic-Nitrogen.**

1. Introduction

Chicken and chicken products are an important source for protein, fat, essential amino and fatty acids, minerals and other nutrients (**Biesalski, 2005).** Poultry meat products are highly desirable, palatable, digestible and nutritious for all ages. In addition, they are low in price in comparison to beef and mutton. Quality products are those that meet some need or expectation of consumers and are safe and wholesome as well. Further processing of poultry meat involves conversion of raw poultry carcasses into value added products e.g. reconstructed products, cold cuts or breaded products. Advantages of further processing of poultry meat are improving juiciness and flavor, shelf life and water holding capacity **(Sahoo *et al.*, 1996).**

The presence of microorganisms in foods appeared to be a natural and unavoidable occurrence. Cooking could destroy most harmful bacteria, but undercooked foods, processed ready-to-eat foods, and minimally processed foods might contain harmful bacteria being serious health threats. Meat, dairy, and poultry products could be important reservoirs for many of the food-borne pathogens **(Kaneko *et al.*, 1999)**

According to the United States Department of Agriculture (USDA), ready- to -eat (RTE) foods are refers to food that is in a form that is edible without washing, cooking or heating by the consumers and that is reasonably expected to be consumed in that form. Washed and sliced meat, fruits and vegetables are considered RTE foods. Foods presented for consumption for which further washing or cooking is not

required and from which rinds, peels, husks, or shells are removed are also considered RTE **(DBPR, 2002).**

Ready-to-eat cooked meat products are recognized to be contaminated during slicing which, in the last years, has been associated with several outbreaks **(Perez *et al.*, 2010).**In the last decade, chicken-based meat products have become increasingly popular worldwide due to their high nutritional quality, low cost and are available as either fresh or precooked (fried) chicken and/or microbiological products, which after subsequent packaging are usually stored under refrigeration **(Barbut, 2002).**

Demographic changes related to aging of population and new trends of life style with an increasing demand for minimally processed (RTE) foods has changed the scenario of food-borne diseases worldwide, with important economic and social impacts **(Meng and Doyle, 2002 and Kennedy and Wall, 2007).**

Changed life styles including more convenience foods for consumption had a consequence broad range of emerging microbial issues in food safety, as in food service establishments, in addition to the refrigerated (RTE) foods like sandwiches and desserts which provided to the consumer's, there are also hot held products **(Kennedy, 2000).**

Susceptibility of chicken meat and chicken-based meat products to microbial spoilage, presents a potential health hazard, since poultry meat may harbor pathogenic microorganisms **(Geornaras *et al.*, 1998).** Spoilage is commonly detected by sensory and/or