Microbial Quality and Safety of Ready-Made Cooked Foods Catered at Ambo Town Street

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Abstracts-*Ready to eat foods are arranged, fitted or placed for immediate use causing no delay for lack of being prepared and usually consumed after preparations by removing non edible parts. The main objective of this study was to determine microbial quality and safety of ready-to -eat cooked foods vended at street of Ambo town. For this study a total of 60 samples of street foods comprising 20 each of meat based sandwich, lentil based sambussa and oil based biscuits were collected from different sales near-by street. Microbial quality and safety of collected food samples were* analyzed using selective media: *Mannito Salt Agar, Nutrient Agar and Violet Red Bile Agar were used for Staphylococcus, Aerobic Mesophilicand Coliform Counts, respectively. The result indicated that microbial load of lentil based sambussa during Aerobic Mesophilic Count was the highest (2.6x10^{3}cfu/g) as compared to Staphylococcus and coliform counts. In coliform count, the lowest microbial load was indicated on lentil based sambussa (3.5 x 10^{2}cfu/g).*

Keywords: *Microbial load, Quality, Safety, Staphylococcus count, Coliform count*

INTRODUCTION

The Food and Agriculture Organization (FAO) defines street foods as "ready-to-eat foods and beverages prepared and sold in streets and other similar public places" [1]. While, ready to eat foods are foods that are arranged, fitted or placed for immediate use causing no delay for lack of being prepared and usually consumed after preparations by removing non edible parts. Ready to eat food may be prepared from different food items. Food that looks good, smell good, even tastes good can contain millions of bacteria. The microbial quality of foods was also to refer the degree of excellence of the various characteristics that influence consumer acceptance as well as consumer safety [2]. But the different degree of cooking reduces the number of bacteria present in foods [3].

The study on the street vended foods indicated that, under normal circumstances, cooked food should not contain vegetative form of microorganism; particularly gram negative rods which not withstand cooking temperature [4]. But cooked foods are contaminated later during handling, process for preparation. The primary function of microorganisms within the food is for self-perpetuation and leads to foods spoilage [2]. Besides, the magnitude of microorganisms can reflect the origin and spoilage of foods [5].

According to Endrias and Medhin[6], food is the general term for what is eaten by man and other creatures for the sustenance of life. Microbial quality of food; is refer to the process whereby food become unsafe to use because of contact with microorganism and chemical agent or physical agent. It make something impure unclean or polluted especially by making harm full impurities in to it or by putting it in to contact is harm full. Carelessly human handling of foods will provides as a source of contamination with different types of microorganisms [7]. The consumer also cannot easily judge the nutritional quality of food and the presence or absence of contaminant pathogens, toxins and chemical additive food in foods unless laboratory analysis is take place. Thus, consumer safety requires the microbial quality which can affect the chemistry of nutritional quality [8]. The lack of hygienic food handling and sanitation potential carries pathogenic microorganism and bring about food borne diseases [9].

The street foods should be of major concern as it is vended in unsafe place and poor sanitation which can expose to microbial contamination. Street food in some African countries has been tasted for various microorganisms of public health concern, including fecal coliforms. Staphylococci and *E.coli* were recovered in different food items. World health organization, reported that of 511 street food items in

Accra, 69.7% contained *mosophilic*bacteria, 5.5% contained *Bacillus cereus*, 31.9% contained *Staphylococcus aureaus* and 33.7% contained *entero-bacteriaceae*[9]. In Ethiopia also there are several food items that commonly used to sale on streets [4]. Similar food items were sold at street of Ambo town. Therefore, this study was designed to analyze the microbial load of common street foods catered at Ambo town.

OBJECTIVES OF THE STUDY

The study aimed to investigate the microbial quality and safety of ready-made cooked foods catered at Ambo Town Street and determines the total amount of microbial loads, staphylococcus and coliform.

MATERIALS AND METHOD

Study area

The study site was located in West Shoa zone of Oromia National Regional State, central Ethiopia. Ambo town located at 116 km West of Addis Ababa. Samples were analyzed at Ambo University biology laboratory which is located in Ambo town.

Study Design and Sample Collection

A total 60 samples were taken from sale street foods of Ambo town. Common sale street foods: Oil based biscuits, lentil based sambussa and meat based sandwich were selected for this study and analyzed using selective media: mannitol salt agar (MSA), violet red bile agar (VRBA) and nutrient agar (NA) for staphylococcus, coliform and aerobic mesophillic counts, respectively.

Serial dilution preparation and determining of microbial load

The procedures were performed by a spastically adding 20g of each sample to180ml of sterilized people water and mixed very well. A formed dilution factor of ($10^{-1)}$ was transferred to first test tube among the five test tubes each containing 9ml of sterilized peptone water. The same volume was transferred to the next test tubes to form $10^{-2,}$ $10^{-3,}$ 10^{-4} and 10^{-5} dilution factors. From each dilution factors a volume of 0.1ml was transferred to. MSA, VERBA and NA media for *Staphylococcus, coliform* and *Aerobic mesophilic*counts, respectively. The inoculums were spread over the surface of solidified media and incubated in 37. The grown bacterial colonies were counted after 48 hours.

RESULTS AND DISCUSSION

Average aerobic mesophlic count

Different numbers of colonies were recorded during the *aerobic mesophilic* counts. The counted numbers of colonies were varied from sample to sample as well as dilution to dilutions. The counted average of microbial load in lentil based sambussa, were the highest ($2.6x10^3$cfu/g); when compared to meat based sandwich ($1.6x10^3$cfu/g) and *oil based biscuit* ($8.4x10^2$cfu/g). All the three street food samples were tested with significant number of microbial loads which can be due to unhygienically preparation and way of food storage. Thus, the bacteria can be passed from the hands of the food vendors or by the unhygienic way they prepare and serve the food. This result suggested that, it is important to identify if the counted microbial loads in each food items can be affect the healthy conditions of the users (Table 1).

Table 1: Average aerobic mesophlic count

Sample	Total no. of samples	*Average cfu/g
Meat based sandwich	20	$1.6x10^3$
lentil based sambussa	20	$2.6x10^3$
Oil based biscuit	20	$8.4x10^2$

*cfu/g=colony forming unit

Average staphylococcus count

The highest numbers of staphylococcus microbial load were ($6.4x\ 10^2$cfu/g) recorded in meat based sandwich as compared to lentil based sambussa ($4.9x10^2$cfu/g) and Oil based biscuit ($4.4x10^2$cfu/g). Even though the maximum staphylococcus microbial loads were recorded on meat based sandwich, presences of staphylococcus were recorded on all tested food items. This may indicated meat based sandwich were one of the contaminated food than the two food items (Table 2).

Table 2. Average staphylococcus count

Sample	Total no of samples	*Average cfu/g
Meat based sandwich	20	$6.4x10^2$
lentil based sambussa	20	$4.9x10^2$
Oil based biscuit	20	$4.4x10^2$

**cfu/g=colony forming unit*

Average coliform count

The highest coliform microbial load was encountered on meat based sandwich ($4.5x10^2$cfu/g.About ($3.8x10^2$ /) and ($3.5x10^2$) cfu/g

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coliform colonies were recorded in oil based biscuit and lentil based sambussa, respectively. Even though the maximum staphylococcus microbial load were recorded on meat based sandwich, all the three street food samples were tested with significant number of coliform loads which can be due to unhygienically preparation and way of food storage. Thus, meat based sandwich was contaminated food than the two food items (Table 3).

Table 3. Average coliform count

Sample	Total no of samples	*Average cfu/g
Meat based sandwich	20	$4.5x10^2$
lentil based sambussa	20	$3.5x10^2$
Oil based biscuit	20	$3.8x10^2$

*cfu/g=colony forming unit

From analyzed common Street foods, the highest aerobic mesophillic counts were recorded in lentil based sambussa ($2.6x10^3$cfu/g) as compared to oil based biscuit ($8.4x10^2$cfu/g) and meat based sandwich ($1.6x10^3$cfu/g). While, the highest coliform load was encountered on meat based sandwich ($4.5x10^2$cfu/g) when compared with oil based biscuit ($3.8x10^2$cfu/g/). In contrast, the lowest coliform load was encountered on lentil sambussa ($3.5x10^2$cfu/g) (Table 3). In another way, the highest numbers of staphylococcus microbial load ($6.4x\ 10^2$cfu/g) were recorded in meat based sand wich, is in line with other findings [4]. This was probably confirmed with un-proper way of handling meat foods in un-proper places susceptible to microbial contaminations [9]. From identified microbial load of Ambo town's street foods, average coliform count load were less in most sample items of which confirmed with previous report in Uk [10].

CONCLUSION AND RECOMMENDATION

Totally, the tested of all samples were resulted in different microorganisms' load. The quality and safety of Ambo town's street foods can be improved if at least the sellers will be trained in related to food preparation and handling. This study did not cover, the microbial load of raw materials used for the studied food items. As well, it is recommended if the chemistry of nutritional quality in relating to the microbial load of each food items will be tested.

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