SALMONELLA SEROTYPES ISOLATED AND IDENTIFIED FROM LOCALLY WHITE SOFT CHEESE

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ABSTRACT

Fourty locally white soft cheese random samples were collected from different markets of Baghdad Algadeda city in order to investigate the presence of *Salmonellae Spp.* in cheese which produced and consumed locally in Baghdad. The samples were collected during the period from December 2011 to March 2012.

The samples were directly transferred to the laboratory and analyzed immediately without further storage.

The isolation and identification methods include: (pre-enrichment) culture stage by peptone water then (Selective enrichment) culture stage by selenite broth after that culturing on sold (Selective media) which was Bismuth Sulphate agar. The biotyping by using API strip according to the API 20E miniaturized identification system for *Salmonella SPP*.. The isolated Salmonella strains were transferred on Triple Sugar Iron agar to undergone stereotyping at the Institute of Public Health,Baghdad,Iraq.

Data revealed that 2 out of the total 40 (5%) of the cheese samples were contaminated with *Salmonella spp. Salmonella typhimurium* was the only serotype that have been found.

INTRODUCTION

Cheese is a generic term for a diverse group of milk-based food products(1). Cheese is one of the most consumed milk products (2).it's produced throughout the world in wide-ranging flavors, textures, and forms(1). It is an ancient food whose origins predate recorded history. There is no conclusive evidence indicating where cheese making originated. Cheese is valued for its high content of protein, fat, calcium, iron and phosphorus and it's an excellent source of vitamins and essential amino acids therefore it's an important food in the diet of both young and old people (3). White Soft cheese produced by coagulation of casein(1).It is fermented by the addition of starter culture such as lactic acid bacteria which are responsible for the production of lactic acid from lactose that gives the product it is characteristic flavor(2). A number of food safety agencies around the world have warned of the risks of raw-milk cheeses. The U.S. Food and Drug Administration states that soft raw-milk cheeses can cause "serious infectious diseases like salmonellosis (4).

Salmonellosis is a worldwide health problem; *Salmonella* infections are the second leading cause of bacterial foodborne illness . Approximately 95% of cases of human salmonellosis are associated with the consumption of contaminated products such as meat, poultry, eggs, milk, seafood, and fresh produce. *Salmonella* can cause a number of different disease syndromes including gastroenteritis, bacteremia, and typhoid fever, with the most common being gastroenteritis, which is often characterized by abdominal pain, nausea, vomiting, diarrhea, and headache. Typically the disease is self-limiting; however, with more severe manifestations such as bacteremia, antimicrobial therapy is often administered to treat the infection (5).

However, in some cases the diarrhea may be so severe that the patient becomes dangerously dehydrated . In severe cases, the *Salmonella* infection may spread from the intestines to the blood stream, and then to other body sites, and can cause death. The elderly, infants, and those with impaired immune systems are more likely to develop severe illness. Some people afflicted with salmonellosis later experience reactive arthritis, which can have long-lasting, disabling effects (6).

The typhoidal form of *Salmonella* can lead to typhoid fever. Typhoid fever is a life-threatening illness. It is carried only by humans and is usually contracted through direct contact with the fecal matter of an infected person. Typhoidal *Salmonella* is more commonly found in poorer countries and can affect as many as 21.5 million persons each year, where unsanitary conditions are more likely to occur (7).

Symptoms are usually gastrointestinal, including nausea, vomiting, abdominal cramps and bloody diarrhea with mucus. Headache, fatigue and rose spots are also possible. These symptoms can be severe, especially in young children and the elderly. Symptoms last generally up to a week, and can appear 12 to 72 hours after ingesting the bacterium. After bacterial infections, reactive arthritis (Reiters syndrome) can develop (8).

The type of *Salmonella* usually associated with infections in humans, nontyphoidal *Salmonella*, is usually contracted from sources such as:Infected tainted fruits and vegetables, meat, egg products, and milk products when not prepared, handled, or refrigerated properly (6).During cheese processing stages microbes can be introduced by cross contamination from raw milk or from infected humans handling the food (9, 10).

This study was to inquire the contamination of locally white soft cheese with salmonella serotypes.

MATERIAL AND METHODS

A total of 40 sample of locally white soft cheese were collected randomly from local markets in Baghdad Aljadeda area during the period from December 2011 to March 2012. The samples were directly transferred to the laboratory and analyzed immediately without further storage .Twenty five grams of cheese were suspended in 225 ml of peptone water and incubated for 24 hour at 37°C for pre-enrichment. One ml of pre-enrichment broth was transferred to 10 ml of selenite broth (Selective enrichment) and

incubated for 48 hour at 43°C.One loop-full of selenite broth was streaked on to Bismuth Sulphate agar (Selective media)after 24,48 hour of incubation and incubated at 37°C for 24 hour(11) . one large colony inoculated into 5 ml 0.85% NaCl solution to inoculate the API strip according to the API 20E miniaturized identification system for *Salmonella SPP*. for biotyping (12,13). The isolated Salmonella strains were transferred simultaneously to Triple Sugar Iron agar by stabbing and streaking and incubated at 37°C for 24 hour to undergone stereotyping at the Institute of Public Health, Baghdad, Iraq.

RESULT AND DISCUSSION

Data revealed that (5%) of the cheese samples were contaminated with *Salmonella spp*. This may be due to the low quality of raw milk used in cheese producing or due to unsanitary conditions during processing and handling of cheese (14). Pasteurization decreases the number of pathogenic organisms, prevents transmission of pathogens, and has been determined to improve the safety of milk more than other measures, including certification of raw milk (15,16). Since this type of cheese produced from unpasteurized milk therefore Salmonella contamination was expected, in addition the bad hygienic condition through the manufacturing, handling and distributing of this product in our local markets increase this ability for contamination (17).

Salmonella typhimurium was the only serotype that have been found in this study. Currently, there are over 2,500 identified serotypes of Salmonella. A smaller number of these serotypes are significantly associated with animal and human disease like Salmonella typhimurium. Increasingly, isolates from this serotype is being detected that demonstrate resistance to multiple antimicrobial agents, including third-generation cephalosporins, which are recommended for the treatment of severe infections. Many of the genes that encode resistance are located on transmissible elements such as plasmids that allow for potential transfer of resistance among strains. Plasmids are also known to harbor virulence factors that contribute to Salmonella pathogenicity. this serotype of medical importance, including is known to harbor virulence plasmid containing genes that code for fimbriae, serum resistance, and other factors. Additionally, it's contain pathogenicity islands scattered throughout their genomes that encode factors essential for bacterial adhesion, invasion, and infection. Salmonella typhimurium have evolved several virulence and antimicrobial resistance mechanisms that allow for continued challenges to our public health infrastructure (5).

الخلاصية

اجريت هذه الدراسة على اربعين عينة عشوائية من الجبن المحلي (الطري) ، بهدف التحري عن وجود جراثيم السالمونيلا في الجبن المصنوع والمستهلك محليا في بغداد .وقد جمعت النماذج من اسواق مدينة بغداد الجديدة خلال أربعة اشهر ابتداء من كانون الاول 2011 ولغاية أذار 2012. نقلت العينات مباشرة الى المختبر لغرض اجراء الإختبارات اللازمة وبدون اي خزن اضافي للعينات . كما اعتمدت خطوات معينة في عملية عزل وتشخيص السالمونيلا والتي شملت مرحلة الإغناء الأولي بالزرع في ماء الببتون يليها مرحلة الإغناء الانتقائي بالزرع في مرق السلينيت ثم الاستنبات على الأوساط الانتقائية الصلبة بالزرع على وسط البزموث سلفيت. أجري التنميط المصلي النهائي للعزلات التي أعطت النتائج المطلوبة مع الاختبارات الكيموحيوية على شريط 201 م وقد أظهرت النتائج ان عينتين من هذه العينات كانت ملوثة بجراثيم السلمونيلا وبنسبة (5%) .وقد تم عزل نمط مصلي واحد وهو Salmone العينات كانت ملوثة بجراثيم السلمونيلا وبنسبة (5%) .وقد تم

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