Origional Article

Journal of Food Safety and Hygiene

journal home page: http://jfsh.tums.ac.ir/index.php/jfsh

Evaluation of microbial contamination of pastry cream in Arak city of Iran

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ARTICLE INFO

Article history:
Received 15 October 2013
Received in revised form
15 Dec 2013
Accepted 25 February 2014

Keywords:
Arak,
Confectionery,
Microbial contamination,
Pastries cream

ABSTRACT

Cream and pastry cream are used so much in the confectionary industry. Contaminations of whipped cream are even more than pastry cream. Microbial contaminations causes human to have contagious diseases by the digestive system of converse mentioned diseases depend on methods of making and keeping of cream. Food habits, health care by persons who making pastry cream and primary and secondary contamination of cream. The goal of this study is a prevalence of microbial contamination in pastry cream supplied in Arak. In this study, total of 120 samples were randomly obtained from confectioneries and analyzed for microbial contamination levels, according to Iran's national standards. Results show that among 120 samples which were tested, 115 samples (95.8%) were non-use and contaminated to various microbes. Ninety eight (81.6%) samples were positive to entrobacteriaceaes (>1 × 10^2 CFU/g), 5 (4.2%) samples were positive to mold (>3 × 10^2 CFU/g), and 115 (95.8%) samples were contaminated to yeasts (>1 × 10^3 CFU/g). Thirty six (30%) samples were positive to Escherichia coli and no Salmonella was detected in any samples of pastries cream. It was concluded that health conditions of production for pastries cream is low and it needs to promote the hygiene and safety in the production line of pastry cream.

1. Intoduction

Long time ago, people used confectionery products in festivals and archeologists analyzed containers of persons who lived 3000 ago and concluded humans used chocolate at that time. Also regarding to ancient Iranians hospitable sense, they were skillful in production of kinds of sweet and candy. Confectioneries products are the kinds of meals with extend fans and there is unlikely anything except doctor's prescription can prevent using these (1).

Pastries cream are kinds of confectionery products that have usually soft and spongy constructions and cream, albumin, cream, coca and its products, coffee, jelly, fresh fruit and other materials such as notes, coconut powder, and grains which are used in making them. And regarding to this subject in more cases, the wetness in this product is high so the staying time is limited to and they must be keeping at refrigerator's conditions. Roulette, cream puff, latifeh, napoleon pastry, kinds of fruit pay voter are kinds of pastry cream. Yearly, hundred millions of world people get poisoned with milk, confectioneries, meet and chicken products, pastry cream because of materials, making and keeping conditions (1,2).

The source of these contaminations is hand workers. Materials (milk) or tools that used in the producing process. Bacteria, molds, yeasts are the most important factor of disease which produce by food stuffs and this produces because of milk products and egg are a good place for bacteria's growing and if they have been made or kept at bad conditions, be spoiled. Spoil of confectionery products including microbial, chemical, and physical spoilage (2,3).

Research carried out in different parts of the country on the pastry cream with a high contamination of these products implies. Given the role of these products in different bacterial transmission to consumers, it is necessary to pay more attention to the quality of them. Library survey showed that microbial contamination of pastry cream

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in the Arak city has not done. The goal of this study is a prevalence of microbial contamination in pastry cream supplied in Arak.

2. Materials and methods

2.1. Sample collection

This study is descriptive analytical and a kind of sectional. In this study, sampling is done on 120 samples of pastry cream in which made and distributed in Arak's confectioneries. After buying them, until doing examination, they have been kept at 4 °C and all necessary specifications such as sample name and date of sampling are written. In this research sample preparation, dilution and examinations of enumeration of entrobacteriaceaes, mold, yeast and Escherichia coli, Salmonella identification are done based on instruction of food and drug office institute and Institute of Standards and Industrial Research of Iran (4-7).

2.2. Sample examination and analysis

The examination of samples was done according to specific standard instructions for entrobacteriaceaes, mold and yeast used of McConkey with glucose 1% and YGC agar. Then colony number (based on CFU/g) is recorded and compares with standard limit and acceptance level. To identify Salmonella and E. coli based on institute of standard and industrial researches (8,9), specific biochemical examinations are done at selective environment by linear methods. After collecting data about samples contamination, basic data with statistical methods are analyzed (10-12).

3. Results

After microbial analysis of samples in this study, it was clear that 115 samples (95/8%) of the whole of Arak's pastries cream (120 samples) had microbial contamination. Results show that 98 samples (81/6%) regarding to entrobacteriaceaes enumeration, five samples (4/2%) regarding to mold enumeration and 115 samples (95/8%) regarding to yeast enumeration have too contamination. Thirty six samples (30%) were contaminated with E. coli; there were not any contaminations with Salmonella (Figure 1).

4. Discussion

During this study, 120 pastry cream is selected as sample by chance and moved to laboratory with observance of sterile and health condition and kind and amount of their microbial contamination is considered that 95.8% were contaminated with entrobacteriaceaes (>1 × 10^2 CFU/g), 4.2% with mold (>3 × 10^2 CFU/g), 95.8% with yeasts (>1 × 10^3 CFU/g) and 30% with E. coli (Figure 1). Fortunately, there was no Salmonella in any samples of pastries cream.

In fact, it is discovered that % 95.8 of 120 samples of Arak's pastry cream are contaminated to various and non-use microbes. This fact shows non-health conditions of workshops which produce this food stuff and absence of health observance during cooking and keeping this production. The most contamination is about entrobacteriaceaes and yeasts.

In general, it can be concluded thatmore pollution in pastries cream in Arak is a serious problem and needs further investigation to reach the standards. So it must be reduce to zero the amount of nutrient pollution by use of appropriate measure in order to guarantee the health of the community.. The same results by Nikniaz in Tabriz show creampuff samples were contaminated 48.6% to E. coli, 38.8% to coliforms and 70% to yeasts (13). Soltan Dalal reports the amount of various contaminations of pastry cream samples of south Tehran based on percent

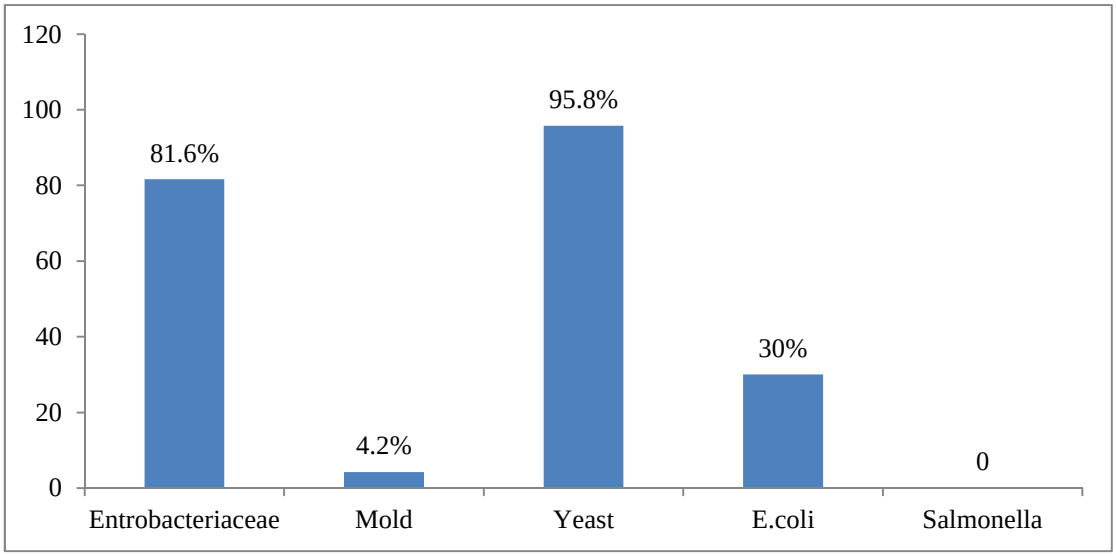

Figure 1. Contamination of pastry cream (%)

contaminations: entrobacteriaceaes 40%, yeasts 33%, Bacillus cereus 8%, Staphylococcus aureus 12%, E. coli 2%, Salmonella 0% (14). A survey conducted by Fazlara in Ahvaz, 95% of the samples exceeded the coliform and E. coli of 75/88%; the samples were isolated (15). Study by Hosseini (1999) shows that 83% from 216 Tehran's pastry cream samples, were non-use important factors of this contaminations were entrobacteriaceaes. In the study done by Khezri in Mashhad (16), amount of pastries cream contaminations to coliforms bacteria and E. coli were in the order 69% and 26% (17). Poisoning resulting from the consumption of confectionery products have been reported in many countries. Todd reported 35–47% food borne illness in Sweden, Bulgaria, Poland, and Portugal caused by the consumption of contaminated confectionery products (18). A research was done by Ministry of Halth of Italy at 1999 and it was republished, main reason of acute poisoning at one party. That persons had Gastroenteritis signals, was Salmonella that it caused by using contaminated eggs that used for pastry cream (19). According to studies conducted within and outside the country, it was shown that infection with entrobacteriaceaes towns Tabriz, Mashhad, and Tehran will have less pollution than Arak while Ahvaz reported contamination above. E. coli contamination of Ahvaz, Tabriz lowers than Arak but Mashhad and Tehran higher than reported Arak. Count mold, yeast in Tehran, higher and lower, respectively, were Arak. Salmonella contamination in pastries cream of Iran is not reported but in a report issued by the Health Ministry of Italy in 1999, pastries cream have been tested were contaminated with Salmonella. Concerning to results of this research and same considerations inside and abroad, we can say, pastries cream contamination to gram-negative bacilli of entrobacteriaceaes is high, so this contamination relates to persons who work at confectioneries. Also persons who candy these foods tuffs can transfer microbes to materials. The second most prevalent factor is yeast. It shows that too long staying of pastry cream at confectionery's and incorrect conditions of keeping and transportation could cause these problems.

5. Conclusion

Studies show high contamination of pastries cream that caused by absence of health observance and non-health distribution in Arak and it depend on materials such as milk, unsuitable cream, ignores of environmental health and health principles, non-washed tools, refrigerator in producing and distributing centers. So regarding to mentioned data and importance of pastries cream in bacteria transferring which lead to infections food poisoning, to control microbial spoilage of these products, there are several ways, including using pasteurized whipped cream to pastry production, using hat, suitable clothes, special boot or shoe, mask and on-time cleanness by confectioners, promotion of quality and quantity of supervising of observer in maker and distributive pastry cream centers, health education for society informing specially persons who directly relate to foodstuffs, keeping cool chain in healthy way until products will used, paying attention to source of pure and healthy water and observance environment and personal health.

Conflict of Interests

Authors have no conflict of interest.

Acknowledgements

This project has been supported by Arak University of Applied Sciences.

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