ENTEROCOCCAL AND STAPHYLOCOCCAL EVALUSTION OF FOOD HANDLERS AND SURFOCES USED FOR MEAT FOOD PRODUCTS IN THE CITY OF TABRIZ

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Background

Enterococci are useful indicators of sanitary conditions during production and processing and possible presence of enteric pathogens. The organism compared with E. coli, are more resistant to freezing, low pH and moderate heat treatment. Furthermore certain strains of some species of this organism are pathogenic (1,2,3,4). In processed foods, the presence of S.aureus usually indicates contamination from the skin, mouth or nose of food handlers. The growth of this organism in foods presents a potential public health hazard since many strains of S.aureus produce enterotoxins which cause food paisoning if ingested (5,6).

Objective

A research has been conducted for the safety evaluation of surface and food hanlers in contact with meat food products for the presence and enumeration of Enterococci and Staphylococci (S.aureus), combined with standard plate count (SPC) in the city of Tabriz.

Methods

Total of 98 swab samples from 49 resturants (Kitchen area) and 26 swab samples from 5 meat product plants (hamburger and sausage plants) were collected from the 50 cm^2 surfaces of equipments and 5 fingers of food handlers in the city of Tabriz. The swab samples were cultured and enumerated for the presence of Entertococci, Staphylococci (S.aureus) and total aerobic mesophilic standard plate count (SPC) using KF Streptococci, Baird parker and Nutrient agar plates, respectively. Confirmatory tests were applied using Deible and Hartman method for Enterococci and Baer et. al method for the presence of of coagulase positive Staphylococci (5).

Results and discussion

The results of microbial evaluation of surfaces of equipments and fingers of food handlers collected from 49 resturants and 5 meat product plants for enumeration of Enterococci, S.aureus and SPC are presented in table 1.

As table # 1 shows, from the total of 98 Resturant samples cultured for the presence of Enterococci 69% and 55.1% were negative for food handlers and surfaces, respectively whereas in meat product plants (26 samples), these were 39.8% and 15.4% respectively. In the case of S.aureus, from the total of 98 resturant samples, 38.8% and 53.1% were negative, whereas in meat product plants these were 53.8% and 69.2% negative for food handlers and surfaces, respectively.

Overall using Enterococci and staphylococci as the indicator of food sanitation in food Stablishments in this study, resturants showed far less contamination of Enterococci than food plants aera, whereas in case of S.aureus, resturants showed more contamination than the food plants area. All of the resturants and food plant samples were positive for SPC count, and the ranges of SPC counts were from 8×10^1 to 2.7×10^6 per 50 cm^2 of the surface samples (table 1). To improve the hygienic condition of the contaminated food stablishments corrective and educational actions are needed to prevent public health hazards.

Pertinent literature

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Table 1. Results of microbial evaluation (Ranges) of food handlers and surfaces used for processing meat food products of 49 resturants and 5 meat food plants in the city of Tabriz.

Organisms	Resturants (Kitchen)		Meat Product Plants		Neg,results (resturans)		Neg. results (plants)	
	Food handlers(1)	surfaces(2)	Food handlers	Surfaces	Food hand.	Surf.	Food hand.	surf.
Enterococci	8.7×10^1–1.9×10^4	0.7×10^1 – 2×10^5	6.2×10^2–1.4×10^5	1.1×10^2–1.9×10^5	69.4%	55.1%	30.8%	15.4%
S.aureus	5×10^1–5×10^4	5×10^1–5×10^3	3×10^2–2.9×10^4	1.5×10^2–1×10^4	38.8%	53.1%	53.8%	69.2%
SPC	1.5×10^2 –1.5×10^6	8×10^1–1.2×10^6	4.6×10^3–6×10^5	2.6×10^2–2.7×10^6	0 %	0%	0 %	0%

1) Numbers in 5 fingers of one hand
2) Numbers in 50 cm^2 of surfaces