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List of Abbreviations

APC: Antigen presenting cell

AGR: Accessory gene regulator

a_w : Water activity

B-PA: Baird -Parker Agar medium

CoNS: Coagulase negative *Staphylococcus*

CPS: Coagulase positive *Staphylococcus aureus*

d NTP: Deoxynucleotide triphosphates

ds DNA: Double stranded DNA

Egc: Enterotoxin gene cluster

EIA: Enzyme immunoassay

ET: Exfoliative toxin

ETA: Exfoliative toxin A

ETB: Exfoliative toxin B

FAME: Fatty acid modifying enzyme

FBD: Food borne disease

kDa: Kilo Dalton

LTA: Lipo-teichoic acid

MHC: Major Histocompatibility Complex

m RNA: Messenger RNA

MSA: Mannitol Salt Agar

ORF: Open reading frame

PCR: Polymerase chain reaction

PFGE: Pulsed field gel electrophoresis

pI: isoelectric point

PTs: Pyrogenic toxins

PTSAg: Pyrogenic toxin superantigen

RPLA: Reverse Passive Latex Agglutination

SAGs: Superantigens

S. aureus: *Staphylococcus aureus*

Sar: Staphylococcal activity regulator

SDS-PAGE: Sodium dodecyl sulphate-polyacrylamide gel electrophoresis

SEs: Staphylococcal enterotoxins like toxins

SEs: Staphylococcal enterotoxins

SFP: Staphylococcal food poisoning

TCR: T –cell receptor

TEMED: Tetramethylene-ethylenediamine

TSS: Toxic shock syndrome

TSST-1: Toxic shock syndrome toxin-1

WTA: Wall teichoic acid

Conclusion&Recommendations

The results obtained from this work allow to conclude that:

- A large proportion (50%) of raw milk and some dairy products (kariesh cheese and ice-cream) exposed for sale in Assuit City, Egypt are contaminated with coagulase positive *S. aureus*, especially the products which are consumed raw or received insufficient heat treatment to kill the organisms as kariesh cheese which actually showed the highest percentage among the examined samples (65%).

- About 50% of coagulase positive *S. aureus* isolated from the milk and its products and from the nasal swabs of food handlers were toxigenic, and the highest percentages were observed in milk taken directly from the animals (68.7%) and in kariesh cheese from street distributors (65.8%).

-The major classical enterotoxin type was SEA which was detected separately in 29.3% of toxigenic isolates from milk and its products and in 40% of toxigenic isolates from nasal swabs of food handlers. This type is known to be less common in animal strains which suggests that human carriers are a major source for contamination of milk and dairy products. SEB was not detected in any of the samples. Other enterotoxin types (C,D,G and H) were detected in comparable percentages. 23% of the toxigenic isolates showed mixed types of SEA, C, D, G and H.

- The presence of *S. aureus*, its toxins and its toxin genes in milk obtained directly from animal indicated that a high proportion of animal showed subclinical mastitis which could be a main source of further contamination of bulk tank milk of dairy farms and consequently

contamination of dairy products especially made of raw milk or unpasteurised milk. Furthermore, the presence of *S. aureus*, its toxins and its toxin genes in nasal swabs of human food handlers indicated that nasal carriage is considered a primary source of contamination of manually handled food

So the presence of *S. aureus* and its toxins in raw milk and its products constitutes a public health hazard. Therefore, to improve the bacteriological quality of raw milk and its products and to safeguard consumers from infection, the following suggestions should be taken into consideration:-

- Educational programs should be imposed for producers and handlers to improve the quality of the produced milk and to ensure a maximum safety to consumers.
- Raw milk should be collected and maintained in good hygienic condition.
- Regular examination of animals even animals which are apparently healthy for mastitis tests to avoid contamination of bulk tank milk.
- The milk should be pasteurized by full pasteurization or by an equivalent process to avoid hazards from pathogens.
- Good hygienic condition should be maintained throughout manufacture, distribution and storage until consumption.
- A hygienic practices among workers sharing in the production and handling of milk should be provided.

-Only healthy persons who have a keen sense of hygiene should be employed and they should pass a periodical medical examination.

-Adequate control through periodical inspection on farms by specialists to insure those errors are corrected.

In conclusion, it seems necessary that concerned authorities should impose regulation and bacteriological standards and take active part in the control of produced milk and its products to ensure a maximum of safety to the consumers.