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List of Abbreviations

Abbreviation	Full name
ADD	Atmospheric roller drying
ADH1	ARGININE DIHYDROLASE 1
ADH2s	ARGININE DIHYDROLASE 2
ADMI	American Dry Milk Institute
ADPI	American Dairy Products Institute
AFM1	Aflatoxin M1
AGAL	ALPHA-GALACTOSIDASE
AGLU	ALPHA-GLUCOSIDASE
AIIBP	Association International de l'Industrie des Bouillons et potage
AlaA	Alanine ARYLAMIDASE
AMAN	ALPHA-MANNOSIDASE
AMC	Amino-methylcoumarin.
AMY	D.AMYGDALIN
AOAC	Association Of Analytical Communities
A.P.H.A.	American Public Health Association
APPA	Ala-phe-pro ARYLAMIDASE
AspA	L-Aspartate ARYLAMIDASE
Aw	Water activity
BACl	BACITRACIN RESISTANCE
BAM	Bacteriological Analytical Manual
BcSAB	*Bacillus cereus* Selective Agar Base
BGAL	BETA-GALACTOSIDASE
BGAR	BETA GALACTOPYRNOSIDASSE
BGUR	BETA-GLUCURONIDASE
BGURr	BETAGLUCURONIDASE
BIS	Bureau of Indian Standards
BSTI	Bangladesh Standards and Testing Institution
Ca	Calcium
CBS	Cocoa Butter Substitute
CDC	Centers for Disease Control and Prevention
CDEX	CYCLODXTRIN
CFU	Colony Forming Unit
CIP	Cleaning-in-place
CNS	Central Nervous System
Cyt.	Cytotoxin

DDW	Sterile, double ,distilled endotoxin –free water
dGAL	D-GALACTOSE
dMAl	D-MALTOSE
dMAN	D-MANNITOL
dMNE	D-MANNOSE
dRAF	D-RAFFINOSE
dRlB	D-RIBOSE
Dsor	D-SORBITOL
dTRE	D-TREHALOSE
dxYL	D-XYLOSE
E. coli	*Escherichia coli.*
EAS	East African Community Standards
EFSA	European Food Safety Authority.
ES	Egyptian Standards
ET	Ethiopia
FAO	Food and Agriculture Organization
FCMP	Full cream milk powder
FDA	Food and Drug Admenstration
FDSPM	Fundamentals of Dairy Science Powder Milk
FMP	Full cream milk powder
g./gm.	Gram
GI	Gastro-Intestinal
GMP	Good Manufacturing Practices
GPC	Gram positive cocci.
h./hrs	Hours.
HACCP	Hazard Analysis and Critical Control Point.
HBL	Heat-labile enterotoxin
HDPE	High-density polyethylene
ICMSF	International Commission on Microbiological Specification for Foods
ID	Identification
IJIRSE	International Journal of Innovative Research in Science and Engineering
IMF	Infant Milk Formula
IMP	Infant Milk Powder
ISO	International Organization for Standardization
JECFA	Joint Expert Committee on Food Additives.
Kda	Kilodalton
Kg	Kilogram

L.A.B	Lactic Acid Bacteria
LA	Lactic Acid
LAC	LACTOSE
LeuA	Leucine ARYLAMIDASE
lLATk	L-LACTATE Alkalinization
LRT	Lower Respiratory Tract
MBdG	METHYL-B-D –GLUCOPYRANOSIDE
Mg	Magnesium
Min.	Minutes
MPN	Most Probable Number
MSs	Manufacturers Standardization Society
MU	Methylumbelliferone.
N	Number of Examined samples
NAG	N-ACTYL-D-GLUCOSAMINE
NC6.5	GROWTH IN 6.5% Nacl
Ng	Nano-gram.
NHE	Non-Haemolytic Enterotoxin
NIC	Neonatal Intensive Care
NNIS	National Nosocomial Infections Surveillance
NOVO	NOVOBIOCIN RESISTANCE
O129	O/129 RESISTANCE(comp.vibrio)
OPTO	OPTOCHIN RESISTANCE
PCR	Polymerase Chain Reaction
PHOS	PHOSPHATASE
PIF	Powdered Infant Formula
PIPLC	PHOSPHATIDYLINO SITOL PHOSPHOLIPASE C
POLYB	POLYMIXIN B RESISTANCE
PPb	Part per billion
ProA	L-proline ARYLAMIDASE
PSMP	partial skimmed milk powder
PUL	PULLULAN
PyrA	L-pyrrolidonyl-ARYLAMIDASE
RH	Relative humidity
RSMP	Reconstituted Skim Milk Powder
RV	Rappaport-Vassiliadis
SAC	SACCHROSE/SUCROSE
SAL	SALICIN
SDS	Sudanese Standards
SEA	Staphlococcal enterotoxin A

SEB	Staphlococcal enterotoxin B
SEC	Staphlococcal enterotoxin C
Sec.	Seconds
SED	Staphlococcal enterotoxin D
SEs	Staphylococcal enterotoxins
SFP	Staphylococcal food poisoning
SI	Solubility Index
SMP	Skim milk powder
SNF	Solid not fat
SPP	Species
SSMO	Sudanese Standard and Metrological Organization
SVGNS	Vincent and the Grenadines Bureau of Standards
TBC	Total Bacterial Count
TBE	Tris base, boric acid and EDTA
Temp.	Temperature
TSA	Tryptone Soya Agar
TSI	Triple sugar iron
TyrA	Tyrosin ARYLAMIDASE
UHT	Ultra Heat Treatment
URE	UREASE
US	United States
USA	United States Of Amireca
USDEC	US Dairy Expert Council
UT	Urinary tract
UTIs	urinary tract infections
UV	Ultra Violet
VICAM	Vis International Commercial Abritration Moot
Vit.	Vitamin
V-P./VP	Voges-Proskauer
VRB	Violet Red Bile
WHO	World Health Organization
WMP	Whole milk powder
XLD	Xylose Lysine Deoxycholate
YOPIs	Young, old, pregnant, immunosuppressed persons.

Summary

One hundred samples of whole milk powder were collected from several markets in Mansoura city, Egypt for organoleptic, physical, chemical and microbiological examination.

The obtained results revealed to the following:-

The results showed 82% from examined samples were instantly soluble so, they were comply with Egyptian standard, 2005 but 12% were partially soluble.

During organoleptic examination of samples, the results showed that 12% from examined samples were filled with air, with wet (humid) granules.

Moreover, the results revealed to all samples were free from any objectionable odour, foreign bodies.

After reconstitution of milk powder, 12% were grainy and 88% had normal granules.

The titratable acidity in examined samples lies between (0.10%- 0.24 %) with mean value 0.14%.

The mean total colony count of examined samples was 2.31×10^3 which comply with Egyptian standards, 2005.

Coliforms were found in 5% of examined samples and the count ranged between 0.10×10^2-8.00×10^2. This result revealed to 95% of examined samples is complying with Egyptian standards, 2005.

Coliform isolates were *Citrobacter freundii* and *Enterobacter cloacae*.

All samples were free from salmonella and *E.coli* which comply with Egyptian standards, 2005.

Staph.aureus was present in 44% of examined samples with mean value 0.93 $x10^3$and this result showed that 56% of examined samples were comply with Egyptian standards, 2005.

Other Staphylococcal spp. was found in 2% of examined samples with a mean value 0.13 x 10^3 and it is classified as *Staph. lentus* and identified with VITEK 2 system.

VITEK 2 system was used in identification of a type of gram positive cocci called *Kocurea rhizophila* that present in 3% from examined samples.

B.cereus was present in 19% from examined samples and its count was ranged between 0.10 $x10^3$- 4.2 $x10^3$ .So 81% of examined samples were comply with Egyptian standards, 2005.

Other bacillus species were isolated as follow, *B.subtilus* in 14%from examined samples with a mean value 0.11 $x10^3$ and *B.megaterium* in 6% from examined samples with a mean value 0.06 $x10^3$.

Mold was present in 30% of examined samples and the total count was ranged between 0.10 $x10^2$- 11.00 $x10^2$ and this result revealed to 70% from examined samples were comply with Egyptian standards, 2005.

This study discussed the public health hazard of isolated microorganisms and some recommendations to obtain a safe product.

Conclusion

The obtained results in this study alarm us to be attention for our food that should be of good quality and fit for human consumption because the results revealed that there are percent must be not neglected are contaminated with some microorganisms like *staphylococcus aureus*, yeast and mold and *B.cereus* which constitute a public health hazard besides being responsible for objectionable changes that rendering product to be used, hence cause economic losses.

Because of milk powder is a product of good quality(Physico-chemical and microbiological) according to Egyptian standards which reported that milk powder should be free from pathogenic microorganisms and their toxins, any foreign bodies, the quality of milk powder should be improved through following suggestions to obtain a safe product:-

I-suggestions concerning authorities:-

1- Milk that used in milk powder manufacture should be of good quality.

2- Applying keeping quality tests on milk before using it in milk powder manufacture.

3- Make assurance of manufacture licenses from the government before production.

4- Periodical monitoring of plants from milk hygiene specialist.

5- Healthy workers only with sanitary certificate and pass a periodical medical examination can work in plants.

6- Educational programs of proper personal hygiene practices.

7- Applying strict hygienic measures during milk production, handling and storage.

8- Drying room should be maintained in highly sanitary conditions to prevent the contamination of the powder, filtered air should be supplied for the driers, conveyers, cooling and air sweeping processes.

9- Cleaning-in-place (CIP) processes are chiefly vital process which includes washing out of milk processing lines with cleaning and sanitizing chemicals, with adding antimicrobial substances for an improved performance.

10- Establishment of (GMP), good hygienic practice and HACCP system in dairy plants.

11- Strict hygienic measures should be applied on equipment, surfaces in contact with milk.

12- Dairy plant should be free from flies, insects and pests.

13- Periodical collection of milk powder samples randomly, at each stage of production and examined microbiologically.

14- Examination the final product before storage.

15- Packages should be clean and protected from insects, dust and any contamination.

16- Packaging in closed area and far from air and moisture.

17- Product storage should be in hygienic conditions such as dry, clean place and adjusted temperature and humidity to avoid its spoilage.

II- Suggestions concerning consumer:-

1- Consumer should be aware during purchasing the product.

2- Purchasing the product from safe markets.

3- The product should be of good inspection.

4- The product should not be in direct contact with sun ray.

5- The market should be clean and the product should be stored in dry, clean place and faraway humid environment.

6- Avoid purchasing unpackaged milk powder.

7- Avoid purchasing any opened, operated and improper sealed packages.

8- Avoid packages filled with air.

9- Assurence from production and expiry date and patch number.

10- Visual inspection of product after operation.

11- Observation of any objectionable odour, colour and foreign bodies.

12- Using potable water during reconstitution of milk powder.

13- Consuming milk powder immediately after reconstitution or refrigerated until consuming (not>24hrs).

14- Strict sealing packages after its operating to avoid any contamination (not>24hrs).