شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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HANAA ALY

ROLE OF LACTIC ACID BACTERIA IN QUALITY AND SAFETY OF TRADITIONAL BARAMILY CHEESE

By

AHMED MOSTAFA ALI HASSAN
B.Sc. Agric. Sc. (Dairy Sci.& Tech.), Fac. of Agric., Ain Shams Univ., 2013

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ABSTRACT

Ahmed Mostafa Ali: Role of Lactic Acid Bacteria in Quality and Safety of Traditional Baramily Cheese. Unpublished M.Sc. Thesis, Department of Food Science, Faculty of Agriculture, Ain-Shams University, 2021

Although, Egyptian standards require different cheese varieties must be made from pasteurized milk, traditional cheese including Baramily cheese are widely manufactured from raw milk without adding Starter.

Therefore, the study aimed to assess the role of lactic acid bacteria (starter and NSLAB) in physiochemical, textural and microbiological characteristics of traditional Baramily cheese; isolate, identify and characterize NSLAB strains from traditional Baramily cheese; and study the quality and safety effects of added NSLAB cultures in Baramily cheese along ripening period.

Thirty-three samples of Baramily cheese randomly collected from retails in Cairo metropolitan area. The cheese samples were characterized by physiochemical, textural profile and microbiological analysis. Ninety presumptive NSLAB (35 Rods and 55 cocci shape) strains were isolated on MRS and KF Streptococci media; and were characterized for growth temperature, salt tolerance and milk coagulation. Based on results, 11 representative isolates with potential technological features were genetically identified using 16S rRNA technique, then confirmed for growth and acidity development in skim milk within 48 h and tested for antimicrobial activity against some food spoilage and pathogenic microorganisms.

Ninety presumptive NSLAB (35 presumptive *Lactobacillus* spp. and 55 presumptive *Enterococcus* spp. isolates) were isolated. All isolated strains were salt tolerant (6.5 % NaCl), but 40 isolated strains were tolerant to 10.0 % NaCl salt (16 presumptive *Lactobacillus* spp., and 24 presumptive *Enterococcus* spp. isolates).

Selected eleven isolates with potential technological features were identified as *Ent. durans* (NSLAB 1 strain), *Ent. faecalis* (NSLAB 5 strains), *Lb. paraplantarum* (NSLAB 1 strain), *Lb. plantarum* (NSLAB 3 strains) and *Lb. rhamnosus* (NSLAB 1 strain).

In the second part, five identified NSLAB isolates were used in manufacturing of four Baramily cheese trials from pasteurized milk inoculated with 2 % cultures (S1= *Lb. plantarum*, *Lb. paraplantarum* and *Lb. rhamnosus*; S2= *Ent. durans* and *Ent. faecalis*; S3= S1 + S2; S4= S1 + a commercial starter of *L. lactis subsp. lacti*s and *L. lactis subsp. cremoris).*

A control trial (C) was manufactured from raw milk without cultures. Also, similar trials were manufactured to investigate survival of inoculated certain food pathogens including *Staphylococcus aureus*, *Salmonella typhimurium* and *E. coli*. The cheese treatments were ripened at 5 ^{o}C for 90 days and sampled at 0, 15, 30, 60 and 90 days. The samples were assessed for physiochemical, textural microbiological and sensory profiles.

Generally, Lactobacilli, Enterococci and Lactococci counts increased among all treatments as the ripening period proceeded. The highest significant counts of lactobacilli, Enterococci and Lactococci were found in cheese S3, cheese S2 and cheese S4, respectively. Significant decrease in *Staphylococcus aureus* and *E. coli* counts were determined in all cheese treatments. *Salmonella typhimurium* was eliminated after 60 days of ripening in all treatments, but was survived in the control Baramily cheese sample C.

The results suggested using the identified NSLAB isolates to standardize and improve quality and safety of Baramily cheese and other related Domiati cheese types.

Keywords: Baramily; Cheese; NSLAB; Isolation; *Enterococcus* and *Lactobacillus*; 16s rRNA and Identification.

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