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Research Article

Evaluation of Microbial Load from Canned Soya Milk Drinks in Malaysia

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ABSTRACT

Objective: Owing to the habit of consuming ready food among the citizens of Malaysia a study was conducted to evaluate 20 samples of canned soya milk for the presence of possible microbial content. The samples were collected randomly from shopping malls, restaurants and kiosk in Ipoh Malaysia.

Methods: All samples collected across Ipoh, were subjected to test for presence bacteria in nutrient agar, blood agar and macConkey media. The possible microbial load was swabbed from surface and soya milk content with a sterile cotton and streaked on nutrient agar, blood agar and macConkey culture media. The streaked petri plates were incubated for 48 hours at 37°C.

Results: The study revealed negative microbial growth in all except two samples from the surface and soya milk content collected from a restaurant in nutrient agar and blood agar medium. The presence of microbes was confirmed as gram positive *staphylococcus sp.* through gram staining. The positive growth may be imputed to poor storage condition at the restaurant.

Conclusion: It can be computed from the study that the majority of the samples were free from bacterial growth, suggesting strong in house quality control mechanism at the processing unit and exquisite storage conditions in malls and kiosk suggesting that soya milk available in malls and kiosk are fit for human consumption.

Keywords: Microbes, nutrient agar media, blood agar media, macConkey media, soya milk

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INTRODUCTION:

There are a growing prevalence due to urbanization, rising incomes and long working hours of consuming convenient packaged food products both at and away from home. Malaysian people have the habit of taking a variety of canned beverages along with food at restaurants. Malapropos storage of food items may contribute to health risks and therefore chances of contamination with microbes would be higher as the frequency of people using canned food is increasing rapidly [1]. Since the human food supply consists basically of plants and animals or products derived from them, it is possible that our food supply may contain microorganisms in interaction with the food, which may be critical to a public health such as food poisoning [2]. Though the incidence of spoilage in canned foods is low, but it may occur following leakage, improper storage, metal can defects, punctures, or rough handling [3].

Studies have reported incidence of contamination, mainly by spore forming bacteria of the genera *Bacillus*, *E. Coli*, *Clostridium* [4,5]. If the contaminant is a pathogen and the food is capable of supporting its growth, a health risk may exist [6]. Reports of contamination of canned tomato juice with *B. coagulans* and *B. stearothermophilus*, and milk products with *B. cereus* and *B. licheniformis* have been published [7-9]. Tinned meat and fish items have been contaminated with thermophilic or heat resistant bacteria such

as *C. thermosaccharolyticum* and *C. thermoaceticum*, [10,11]. Studies have also revealed contamination of soft drinks with gram positive cocci. *S. aureus*, *Enterococcus* and *Micrococcus* [12]. The present research is therefore to assess the microbial load on the surface of the cans and consumable content of soya milk within their expiry period, with a view of educating the public on food safety and storage.

Materials and Methods:

20 different branded samples of soya milk drinks were collected for study from a shopping mall, kiosk and restaurant. Samples collected were within their expiry period in random order and stored in refrigerator for further study. The sample was collected from an orifice, the top cover of cans and consumable soya milk content using a sterile cotton swab. Cotton swabs were streaked across agar plates. Additionally, another plate was streaked with a clean swab as control agar plates further subjected to incubate for 48 hr. The samples were checked for bacterial growth and identification was done using gram staining [13, 14]. A similar procedure was repeated with blood agar and MacConkey medium. The samples were subjected for incubation at 37°C for 48 h.

Results and Discussion:

Physical inspection revealed no blown, leaky or damage in metal cans for all the samples analyzed. Of 20 samples tested for surface contamination only two reported microbial colonies in nutrient agar medium (Figure 1a). These samples were collected from a restaurant. The sterility of the media was also confirmed to rule out the possibility of default growth (Figure 1b). Consumable soya milk content results validated no growth in nutrient agar medium, confirming excellent storage condition. The result also supported the availability stringent quality control facility at the processing

unit (Figure 1c). However, two of the surfaces can sample and soya milk content showed the presence of bacterial colonies in a blood agar medium which later was confirmed to be *Staphylococcus warneri* through gram staining (Figure 1d,e). The samples collected were from a restaurant, the growth suggests improper storage condition at the restaurant. Absence of bacterial colonies in differential macConkey agar medium confirmed that the samples were free from harmful gram negative bacteria such as *S. aureus* (Figure 1f).

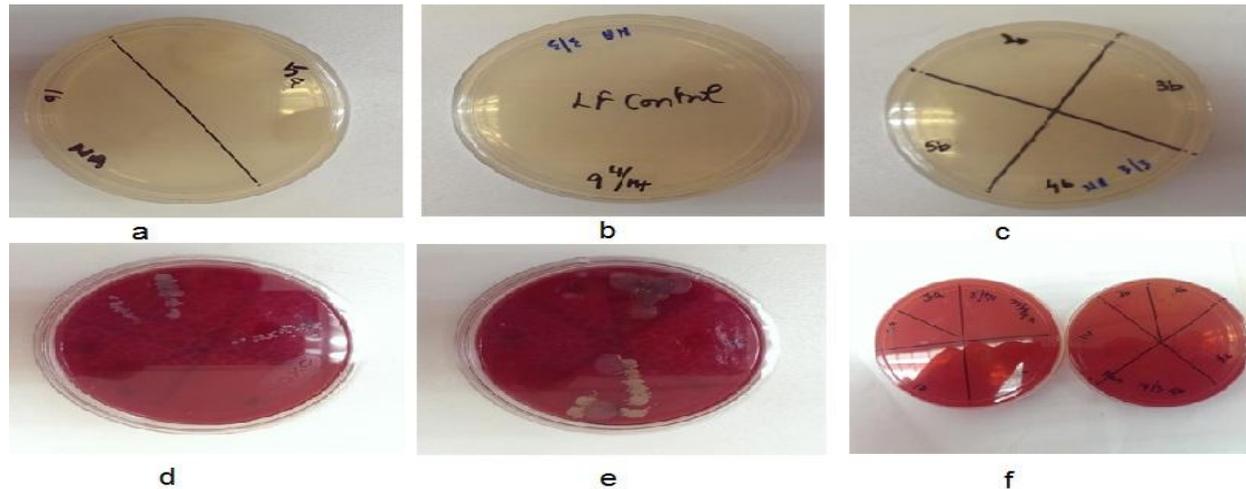


Fig.1: (A) Bacterial growth in nutrient agar media form surface of the cans (B) No colonies in control nutrient agar media (C) No bacterial colonies in soya milk content (D) Presence of bacterial colonies in blood agar media form surface of the cans (E) Presence of bacterial colonies in in 2 samples of soya milk content in blood agar medium (F) No colonies in macConkey agar media.

Conclusion:

The absence of blown and leaky cans suggests that all the samples analyzed were of acceptable quality and fit for human consumption. The surface samples of soya milk cans had no or very low microbial colonies confirming maintenance of superlative storage conditions. The soya milk was tested negative for the presence harmful pathogenic gram negative bacteria. Hence it can be concluded the soya milk available in the market is suitable for human consumption. However, storage condition at restaurant needs to be improved to avoid any health hazards.

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