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MICROBIOLOGICAL QUALITY OF SUSPECTED CORNED BEEF IN ASSIUT (PART, I : AEROBIC NON SPOREFORMING MICROORGANISM) (With 2 Table)

By

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(Received at 22/11/1992)

دراسة ميكروبيولوجيه على معلبات اللحم البقري والمشتبه فى سلامتها / كورنيد بيف)

(الجزء الاول: الميكروبات الهوائية الغير متحوصلة)

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تم فحص ٣٠ عينة من معلبات اللحم البقرى المشتبه فى سلامتها والتى تم جمعها من محلات أسيوط المختلفة. وتم تقدير العد الكلى للميكروبات الهوائية، الميكروبات المعوية والميكروب المكور العنقودى الذهبى والتى تراوحت ١٠x٢ الى ١٠x٢ /جم، ١٠x٣ الى ١٠x٢ /جم و ١٠x٢ الى ١٠x٤ /جم على التوالى. ومتوسط العدد لهم على التوالى ١٠x٩ر٤ /جم ١٠x٢ر٨ /جم و ١٠x٥ر٢ /جم.

وقد امكن عزل الميكروبات الاتية:-

Klebsiella spp., Enterobacter spp., Proteus spp. and Hafnia alvei.

وتم مناقشة الاهمية الصحية ومدى خطورة هذه الميكروبات على الصحة العامة.

BACTERIOLOGICAL QUALITY, CORNED BEEF IN ASSIUT

SUMMARY

Thirty random samples of corned beef cans were collected from different shops and supermarkets in Assiut City. The samples were examined for aerobic plate count, Enterobacteriaceae and Staph. aureus counts as well as for detection of Salmonellae and Shigellae; the aerobic plate count ranged from < 3 x 10^2 to 2 x 10^5/g with a mean value 9.4 x 10^3. The count of Enterobacteriaceae and Staph. aureus rannged from 3x10^2 to 2 x 10^4/g and 2 x 10^2 to 4 x 10^3/g with a mean value of 2.9 x 10^3 and 5.2 x 10^2/g, respectively. The Enterobacteriaceae which could be isolated from the examined samples were: Klebsiella spp., Enterobacter spp., Proteus spp. and Hafnia alvei. Salmonella and Shigella could not be detected in the examined samples.

INTRODUCTION

The informathion about the behaviour of bacteria and particulary their spores, in such specific products as canned pasteurized meats which contain curing salts is rather limited *(KAFEL and JOZWIK, 1987).*

Microbial spoilage of commercially canned food can be divided into five categories: incipient, gross under-processing, leakage, thermophilic and insufficient heat treatment *(SEGNER, 1979).*

TOMLINSON (1965) reported 175 outbreaks of food borne disease caused by Low-acid canned foods during the years 1954 to 1963. The organisms identified in the outbreaks included 13 cases of Salmonella, 114 of Staphylococcus aureus, and 4 Clostridium perfringens.

MATERIAL and METHODS

Collection of samples: Thirty random samples of corned beef cans were collected from different shops and Assiut City.

Preparation of sample: Each can was opened under sterile conditions. 25 gm of each samples were added to 225 ml of sterile 0.1% peptone water in a sterile blender. The sample was blended for 3 min. At a high speed. Serial dilutions from 10 to 10^{-7} were made and then the Bacteriological analyses were performed.

Bacteriological analyses: Aerobic plat count: Standard plate count agar was used for the aerobic plate count accoring to *A.P.H.A. (1972).*

Enterobacteriaceae count: 0.1 ml of each dilution was plated on violet red bile glucose agar according to *Mercuri and COX (1979).* The plates were incubated at 37°C for 18-24 hr. All purplish-red colonies surrounded by a red zone of precipitated bile acid were counted. Biochemical tests were done on the isolated colonies according to *EDWARD and EWING (1972).*

Enumeration of coagulase positive Staphylococci: 0.1 ml from each of the previously prepared dilutions was transferred and evenly spread over a dry surface of Bird-Parker medium plates *(THATCHER and CLARK, 1975).* Inoculated plates were incubated at 37°C for 48 H. Suspected colonies were counted (black and shiny colonies, greater than 1 mm in diameter showing clear hallow zone of opacity around or beneath the colonies).

Coagulase test was carried out according to Cruickshank et al. (1975).

Detection of Salmonella and shigella organisms: 10 g portion of each sample were inoculated into 200 ml selenite cystine broth and incubated at 37°C for 18-24 hr. A loopfull from incubated broth was streaked on S.S. agar (Difco). Suspected Salmonella or Shigella colonies were further indentified biochemically and serologically to *CRUICKSHANK et al. (1980).*

RESULTS

The obtained results are recorded in Tables 1 and 2.

DISCUSSION

This part of the research constitute only the aerobic spoilage as well food poisoning microorganism storing perishable canned meats at low temperatures creates a chance for partial or complete elimination of C. Perfringens and some other bacteria according to *(KAFEL and JOZWIK, 1987).* The aerobic plate count ranged from $< 3x10^2$ to $2x10^5$/g with a mean value of $9.4x10^3$/g.

POWERS et al. (1981) reported that there was no way to determine if the counts reported represent contamination during processing or growth in the cans during storage.

The count of Enterobacteriaceae in the cans samples ranged from $3x10^2$ to $2x10^4$/g with a mean value of $2.8x10^3$/g.

SEGNER (1979) reported that all the leaker spoilage caused by typical non-sporeforming bacterial floar. In most cases mixed bacterial flora of bacilli and cocci of varying morphological forms was seen in direct smears and recovered from incubated subcultures at 30°C. With few exceptions of these spoilage lots showed swelled containers.

Type of enterobacteriaceae isolated from the examined cans were Klebsiella spp., Enterobacter spp., proteus spp. and Hafnia alvei. E.Coli could not be detected in the examined samples.

COCKBURN (1960) reported 278 outbreaks of food muoxication or food infection due to spoilage of low-acid canned foods. Seventy one percent of the outbreaks were due to Staphylococcus aureus, while one outbreak was associated with Salmonella typhi and one with Salmonella newport.

Coagulase positive Staph. Aureus conts ranged from $2x10^2$ to $4x10^3$/g with a mean value of $5.2x10^2$/g.

RICHARDSON (1972) reported on 175 cases of canned food spoilage investigated in Astralia. The causes for spoilage included 46 cases (26.3%) of under processing, 64 cases (36.6%) of post- process contamination, 4 cases (2.3%) of pre-process spoilage and 61 cases (34.8%) of non microbial spoilage.

DAVIDSON et al. *(1981)* reported that leakage is a major cause of microbiological spoilage of canned food. Since colling water is the primary source of microorganisms causing leaker spoilage and container damage is the primary cause for leakage more research needs to be done on the causese and effects of these problems.

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Table 1: Aerobic plate, Enterobacteriaceae and staph. aureus counts in examined samples.

	Minimum	Maximum	Mean
Aerobic plate count	$< 3x10^2$	$2x10^5$	$9.4x10^3$
Enterobacteriaceae count	$3x10^2$	$2x10^4$	$2.8x10^3$
Staph.aureus count	$2x10^2$	$4x10^3$	$5.2x10^2$

Table 2: Enterobacteriaceae organisms detected in examined samples.

No.of exami. sample	+ve samples No.	%	No.of strains isolated	Types of Enterobacteriaceae organisms							
				Klebsiella spp.		Enterobacter spp.		Proteus spp.		Hafnia alvei	
				No.	%	No.	%	No.	%	No.	%
30	17	56.6	85	40	47.1	20	23.5	15	17.7	10	11.8