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STUDY OF *CLOSTRDIA* BACTERIA COUNTS FOR THREE KINDS OF CANNED MEAT

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Abstract

This study was carried out at the college of veterinary medicine, University of Baghdad, for two months. The aim of the present study was to evaluate some bacteriological for canned beef (corned beef, mortadella, luncheon beef) Data obtained revealed the following results: that means of anaerobic total bacterial count were ranges (0.55 – 1.26) cfu/g meat total coliform were ranges (0 – 0.86) cfu/g with Differences significant in other marks, and count of bacteria staphylococcus aureus were not founds in canned beef samples.

Among the three kinds of canned beef there were significant differences in the *Clostrdia* count observed, while high especially in luncheon beef in mark Syria above 1.25 cfu/g meat. Therefore it is necessary to make Microbial Evaluation cautiously to keep a good nutritional value of the Meat and Safe public Health..

Key words : Corned beef, mortadella, luncheon beef and Clostrdia bacterial counts.

Introduction

The fresh meat was one of the foods quick spoilage if we keeping under badly storages, therefore we keep the meats if we don't eat its directly, the keep of meats were its essential necessary at transport the meats and meat products (Taher,1990; Inou and Ishikawa1997) contents the kept of meats were protects from exchanges of shelf life of meats or some of characteristics quality, bacteriological and chemicals (Gahfir, 2008). We can storages the meat for short period in cooling 4°C (3 - 5) days. But if long period of storage (6- 12) months, under freezing at (-32 °C), or canning the meat for a long time (2-4 years) (FSIS, 1995; Fallah,2008; USDA, 2009). Canned meat is called the product of meat in closed sterilized cans with saline solution (curing) to save it from deterioration (FSIS, 1995; USDA, 2003; Mohammed, 2013). Canning is an art of preserving foods and the industry expanded based on trial and error basis and skill of individual canners. During the 1990's, this method received much scientific scrutiny and has now developed into a sound and established technology to produce commercially sterilized safe foods having an almost infinite shelf life (Marth, 1998; Ismil and Dincer, 2002; Abdullah, 2007). Anaerobic bacteria constitute an important group of micro-organisms responsible for many of the health hazards which may threaten the consumer from consumption of processed canned meat. *Clostrdia* are one of the most frequently anaerobes associated with food (Alobaidi, 2012). Appling meat safety standards on a product are very important because it relates closely to human's health. Good food products have a high nutritional quality, as well as being free from physical, chemical and biological contaminations (ICOSQC,1992; Lee and Yoon,2001; Toldrá, 2010; Abed all and AL-obaidi, 2018).

They are of interest in meat because they also cause meat spoilage and some species cause food-borne disease, one of indictors to effect on shelf life and microbiological quality of meats and meat products was growth of total coliform bacteria with

Staphylococcus aerus cause the toxin (Al-Rubeii, *et al.*,2000; Bennette and Gayle, 2001; Taman, 2003; Bosilevac *et al.*, 2007)

The canned meat industry were you go through with many of processing treated, high of heat treated with keep materials such as nitrites add to canned meat very

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high of limited allowance (ICOSQC,1988; Al-obaidi, 2005; Heinz and Peter, 2007; Khafagy *et al.*, 2008). Nitrites affect the growth of microorganisms in food through several reactions including: reacting with alpha-amino groups of the amino acids at low pH levels, blocking sulfhydryl groups which interferes with sulfur nutrition of the organism, (Sindelar and Houser, 2009; Anandh *et al.*, 2011; Hamasalim, 2012). The aim of this work is to determine the microbial profile (*Clostrdia*) in some canned beef within expiry date, with a view of educating the public on food safety.

Materials and Methods

Samples canned meat

The samples of canned meat :- corned beef (3X3) divided four origins from Brazil (A) (B) Lebanon (C) UAE and luncheon (3X3) divided four origins from Holland (A) (B) Lebanon (C) Jorden, mortadella (3X3) divided four origins from Brazil (A) (B) Lebanon (C) and Syria were collected from super market of Baghdad city.

Sample dilution and plating

Ten grams of meat were extracted aseptically and added to 90ml of buffered peptone water (0.1%)(wt/v) and homogenized for 5 minutes in a stomacher, then 1ml sample was taken and serially tenfold diluted to 10^{-6} in a sterile 0.1% buffered peptone in autoclave 121C° for 15 minutes and plated in duplicates by pour plating method using a sterile nutrient agar and then incubated an aerobically in anaerobic jar at 37C° for 48hours and Plate count of viable *C*L. Using aseptic technique, place 25 g meat sample in sterile blender jar. Add 225 ml peptone dilution fluid (1:10 dilution). Homogenize 1-2 min at low speed. Obtain uniform homogenate with as little aeration as possible. Using 1:10 dilution prepared above, make serial dilutions from 10^{-1} to 10^{-6} by transferring 10-90 ml peptone .

Bacteriological tests

Total bacterial anaerobic count or total plate count (T.A.B.C.) described by (CFIS,2004) Count of bacteria (CFU)/gr meat= mean colony culture X dilute factor $^{-1}$

Total coliform count (T.c.c.): total coliform count (T.c.c.) described by (BAM.1998) similar to total bacterial count but different that plating method using a sterile violet red bile agar (VRBA). Plate count of viable *CL*. was used Tryptose-sulfite-cycloserine (TSC) agar plates in upright position in anaerobic jar, BBL Gas Pak. Establish anaerobic conditions and place jar in 35°C incubator for 20-24 h (AOAC, 1995; BAM, 1998).

Statistically of analysis

The results were analyzed statistically, determining using completely randomized design (CRD). The significance of differences between groups were verified by the Duncan multiple range test; Levels of significance: $p < 0.05$ = non-significant (ns), using SAS program (SAS, 2012).

Results and Discussions

The microbiological evaluation of the three trademarks of corned beef (A, B and C) is shown in table 1 we found a significant difference ($p<0.05$) in the means of Total anaerobic bacteria with range (0.55 – 0.98) cfu/ gm, but no significant differences ($p<0.05$) were found in the means of total coliform bacteria counted ranges and staphylococcus bacteria were not founds in all corned beef samples (ND). This rate is situated within the limits allowed in the standard specification of Iraq. (The Central

Agency for Standardization and Quality Control 1992) identified between 10^1 to 10^4/ gram (ICOSQC,1988; ICOSQC,1992). The cause of low numbers of bacteria indicates the preparation of this meat and canned correctly and possibly to add some preservatives to it, especially nitrates, which have an important role in reducing the growth of anaerobic bacteria (ICOSQC,1988; AL-Obaidi, 2005; AL-Obaidi, 2012). According to my results, the process of canning was scientifically occurs and the handling and transporting were correctly occurred so we have not any contamination or means indictor do not aerobic bacteria.

The means of total bacterial counts evaluation of the three trademarks of mortadella samples are shown in Table 2 there were significant deference ($P<0.05$) between the trades marks, the counts of aerobic total bacterial were range (0.95 -1.07) cfu/gram meat and we founds growth of total coliform the range (0 - 0.40)cfu/ gram meat and staphylococcus bacteria were not founds in all mortadella beef samples (ND) (as well as being free from physical, chemical and biological contaminations (ICOSQC,1992 ; Lee and Yoon,2001; Toldrá, 2010; Abed all and AL-obaidi, 2018).

The means of total bacterial counts evaluation of the three trademarks of luncheon canned beef samples are shown in table 3 there were significant deference ($P<0.05$) between the trades marks, the counts of aerobic total bacterial were range (1.14 -1.26) cfu/gram meat and we founds growth of total coliform the range (0.40-0.86)cfu/gram meat, and staphylococcus bacteria were not founds in all luncheon canned beef samples (ND) (as well as being free from physical, chemical and biological contaminations (ICOSQC,1992; Lee and Yoon, 2001;

Table 1: Means of total anaerobic bacterial counts and total coli forms and *Staphylococous aureus* with standard error (SE ±) in corned beef.

Kinds of meat samples	Origin and marks	Frequency	Means of total anaerobic bacterial countCfu/g meat	Means of total coliform cfu/g meat	Means of staphylococcus aureus cfu/g meat
Corned beef	Brazil	3	0.55^{c}±0.02	ND	ND
Corned beef	Lebanon	3	0.78^{b}±0.01	ND	ND
Corned beef	UAE	3	0.98^{a}±0.01	ND	ND

Table 2: Means of total anaerobic bacterial counts and total coliforms and *Staphylococous aureus* with standard error (SE ±) in mortadella beef.

Kinds of meat samples	Origin and marks	Frequency	Means of total anaerobic bacterial countCfu/g meat	Means of total coliform cfu/g meat	Means of staphylococcus aureus cfu/g meat
Mortadella	Brazil	3	0.95^{b}±0.08	0.0^{b}±0.02	ND
Mortadella	Syria	3	1.0^{a}±0.01	0.20^{b}±0.03	ND
Mortadella	Jordan	3	1.07^{a}±0.01	0.40^{a}±0.01	ND

Table 3: Means of total anaerobic bacterial counts and total coliforms and *staphylococous aureus* with standard error (SE ±) in luncheon canned beef.

Kinds of meat samples	Origin and marks	Frequency	Means of total anaerobic bacterial countCfu/g meat	Means of total coliform cfu/g meat	Means of staphylococcus aureus cfu/g meat
Luncheon canned beef	Holland	3	1.14^{b}±0.02	0.40^{b}±0.02	ND
Luncheon canned beef	Lebanon	3	1.20^{ab}±0.01	0.80^{b}±0.03	ND
Luncheon canned beef	Syria	3	1.26^{a}±0.01	0.86^{a}±0.01	ND

Table 4: Means counts of *Clostrdia* in corned beef, mortadella and luncheon samples with standard error (SE±).

Kinds of meat samples	Origin and marks	Frequency	Means of counts of Clostrdia cfu/g meat
Corned beef	Brazil	3	0.57^{f} ± 0.01
Corned beef	Lebanon	3	0.72^{ef} ± 0.01
Corned beef	U.A.E	3	0.81^{de} ± 0.01
Mortadella	Brazil	3	0.96^{cd} ± 0.01
Mortadella	Syria	3	0.98^{cd} ± 0.01
Mortadella	Jordan	3	1.03^{cd} ± 0.01
Luncheon canned	Holland	3	1.15^{c} ± 0.01
Luncheon canned	Lebanon	3	1.19^{b} ± 0.01
Luncheon canned	Syria	3	1.25^{a} ± 0.01

Toldrá, 2010; Abed all and AL-obaidi, 2018).

The means of counts of *Clostrdia* in corned beef, mortadella and luncheon samples are shown in table 4 the means counts of Clostrdia in corned beef there were significant difference ($p<0.05$) and range between (0.57 – 0.81) cfu/g, the means of counts of Clostrdia in mortadella samples were ranges (0.96 – 1.03) cfu/g. The means counts of Clostrdia in luncheon beef there were significant difference ($p<0.05$) and range between (1.15 – 1.25) cfu/g. This results were similar and agree with the studied results according to counts of Clostrdia in corned beef were means low compared with other canned meat, mortadella and luncheon samples (ICOSQC,1988 ;Al-obaidi, 2005; Heinz and Peter, 2007; Khafagy *et al.*, 2008; Alobaidi, 2012).

Discussion

The bacteriological evaluation of the trademarks of corned beef samples were low limited of total anaerobic

bacteria, means range (0.55 – 0.98) cfu/gm, but total coliform bacteria and staphylococcus bacteria were not founds in all corned beef (Table 1).

The bacteriological evaluation of the trademarks for mortadella and luncheon samples counts of aerobic total bacterial increasing in trademarks were range (0.95 – 1.03) cfu/g, (1.14 -1.25) cfu/g to luncheon samples total coliform bacteria increasing in trademarks were range (0 - 0.40) cfu/g, (0.40 - 0.80) cfu/g to luncheon samples but staphylococcus bacteria were not founds in all mortadella and luncheon beef (Table 2 and Table 3). The cause of low numbers of indicates the preparation of this meat (Al-obaidi, 2005). evaluation of the *Clostrdia* counts in trademarks of corned beef, mortadella and luncheon samples were high limited in luncheon beef were range (1.15 -1.25) cfu/g compare with other canned beef (table 4), its possibly to add some preservatives especially nitrates, which have an important role in reducing the growth of *Clostrdia* (Alobaidi, 2012) (ICOSQC, 1988; Al-obaidi, 2005; Heinz and Peter, 2007; Khafagy, *et al*., 2008). According to my results, the process of canning was scientifically occurs and the handling and transporting were correctly occurred so we have not any contamination or means indictor do not aerobic bacteria (Sindelar and Houser, 2009; Anandh *et al*., 2011; Hamasalim, 2012)

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