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PREVALENCE OF CAMPYLOBACTER IN FRESH AND FROZEN MEAT

(With One Table)

By

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تواجد الكامبيلوباكتر في اللحوم الطازجة والمجمدة

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أجريت هذه الدراسة على عدد ٥٠ عينة من اللحوم الطازجة والمجمدة بواقع خمسة وعشرون عينة من كل نوع لمعرفة مدى تواجد ميكروب الكامبيلوباكتر جيوجيناى في هذه العينات ، ولقد تم جمع عينات اللحوم الطازجة من كل من الصفراء والكبد واللحوم من كل ذبيحة لدراسة توزيع ومدى انتشار هذا الميكروب في هذه الأماكن وكذلك اللحوم المجمدة من المحلات العامة والسوبر ماركت . وقد ثبت من الفحص الميكروبيولوجي للذبائح تواجد ميكروب الكامبيلوباكتر جيوجيناى بنسبة ١٢٪ في ذبائح الجاموس. وقد وجد أن الكامبيلوباكتر يتواجد في الصفراء والكبد بنسبة ١٢٪، ٨٪ على التوالي. ولم يستدل على وجود الميكروب في لحوم الذبائح التي تم فحصها. ومما هو جدير بالذكر أن الميكروب وجد في كل من الصفراء والكبد في ذبيحتين من الذبائح. ووجد ميكروب الكامبيلوباكتر جيوجيناى في عينة واحدة فقط من اللحوم المجمدة . وقد تم مناقشة خطورة هذا الميكروب على صحة الانسان من تداول مثل هذه اللحوم.

SUMMARY

50 fresh and frozen meat samples (25 of each) were examined bacteriologically for the presence of Campylobacter coli/jejuni. Intact gall bladder, liver and muscle samples were obtained from each slaughtered animal. The incidence of the isolated organisms from gall bladder and liver samples were 12% and 8%, respectively. While the organism could not be detected in any of the examined muscle samples. The two positive samples of liver for Campylobacter were from animals with positive gall bladder for the organism. One isolate of the organism was obtained from frozen meat samples. The significance of Campylobacter as a food-borne pathogen was discussed.

INTRODUCTION

The primary habitat of Campylobacter jejuni, Campylobacter coli and Campylobacter laridis is the intestinal tract of warm blooded animals (KWIATEK et al., 1990). Campylobacter jejuni and C.coli are commonly found in healthy as well as diarrheic animals and the organisms can be easily isolated from gall bladders and intestinal

contents of pigs, sheep and cattle (BRYNER et al., 1972; BLASER et al., 1980 and GARCIA et al., 1985).

During slaughter and meat processing these organisms can, and do, contaminate meat products. C.jejuni is recognized as a major cause of acute bacteriological gastroenteritis in humans, and consumption of adulterated foods containing Campylobacter spp. has been associated with many of these illnesses. Studies performed in various countries have shown that between 2 and 14% of the patients manifesting acute gastroenteritis are infected by C.jejuni with a frequency comparable to that of Salmonella or Shigella spp. (SKIRROW, 1977; BLASER et al., 1979; SVEDHEM & KAIJSER, 1980; TAUXE et al., 1985 and KWIATEK et al., 1990).

Campylobacter coli and C.laridis are also recognized as causes of gastroenteritis, but less frequently than C.jejuni. Furthermore, a number of studies have shown that c.jejuni are responsible for more than 99% of Campylobacter enteritis (DOYLE, 1981). The presence of these Campylobacter spp. in foodstuffs represents a potential hazard to human health (KWIATEK et al., 1990).

Recently, it has been shown that carcasses of most animals providing meat can be contaminated by C.fetus subsp. jejuni. The incidence varies with animal species, but generally, the degree of contamination of carcasses seems to be low. Such contamination is of concern for public health and this depends in part upon the survival of the organisms during storage and their ability to grow on raw meats or in any prepared dishes to which they may be inadvertently transferred (STERN, 1981; SVEDHEM and KAIJSER, 1981; GILL & HARRIS, 1982a and GILL & HARRIS, 1982b).

The study conducted by KHALAF ALLA (1985) revealed that the incidence of Campylobacter subspecies jejuni is (18%) in sheep, followed by buffaloe (16%), cattle (12%) and camels (4%). While C.fetus subsp. intestinals could be isolated from buffalo and sheep carcasses.

While STERN et al. (1985) reported that 1% of red meats at retail distribution were contaminated with the organism and the contamination rate of raw red meat by C.jejuni is, in general, very low.

Thermal sensitivity would not allow the C.jejuni to survive even in moderate cooking. Storage of meat at room or chilling temperature resulted in comparatively rapid and ultimately complete die-off, whereas freezing substantially reduced the total numbers of the bacterium (GILL and HARRIS, 1982).

The purpose of this study was to determine the prevalence and distribution of C.jejuni among various sites of the digestive tract of slaughtered buffalo and to estimate the recovery rate from the fresh and frozen meats.

MATERIAL and METHODS

Fresh meat: 25 fresh meat samples (buffalo carcasses) were collected from different slaughter houses in Assiut Governorate and sampled for isolation of C.jejuni.

A total of 75 specimens were collected under sterile conditions in sterile plastic bags and transferred directly to the laboratory for processing. The specimens obtained from each animal included intact gall bladder, liver and muscle samples.

Frozen meat: 25 frozen meat samples were collected from different shops and supermarkets in Assiut City and the samples were thawed by over-night refrigeration.

The surfaces of liver and muscles were sterilized by means of hot spatula. A clean, deep incision was made with a sterile scalpel and a sterile swab was then rubbed along the incision and placed in screw capped tubes containing 5 ml of brucella broth (Difco).

Isolation of C.jejuni from the gall bladder was done by inserting sterile swab through its steriiized surface and then placed in screw capped tubes containing 5 ml of brucella broth (Difco).

The inoculated brucella broth tubes were incubated at 37°C in a Gas-pak jar containing one injected envelope of Campylobacter microaerophilic system (Difco) for generating hydrogen and carbon dioxide inside the jar. Incubation was carried out for 72 hours, after which a loopful was taken from each tube and spread onto clean dry slide, covered and then examined under dark ground microscope for detection of motility. Tubes containing motile M.os. having the characteristic cork-screw motility of Campylobacters, were subcultured onto Campylobacter selective media plates (SKIRROW, 1977) and incubated at 37°C in a Gas-pak jar at microaerophilic atmosphere for 72 hours. The plates were examined for growth and characters of Campylobacter colonies. Further identification was carried out according to the techniques of BATES (1981).

RESULTS

The results of the examined samples are summarized in table (1).

Table (1): Frequency of isolation of C.jejuni from fresh and frozen meat samples.

Animals	Fresh samples			Frozen meat samples
	gall bladder	liver	muscle	
3/25(12%)	3/25(12%)	2/25(8%)	0/25	1/25(4%)

DISCUSSION

The results recorded in table (1), revealed that 3 out of 25 slaughterd buffalo (12%) were contaminated by C.jejuni. This figure agrees with that previously reported by HEFNAWY et al. (1989). On the other hand, higher findings were reported by BOLTON et al. (1982) GARCIA et al. (1985) and KHALAF ALLA (1985).

STERN et al. (1984) found that liver samples have higher level of C.jejuni prevalence when compared to other tissues. He added that this is quite interesting and may require further investigation.

The examination of liver samples resulted in the recovery of C.jejuni from 2 out of 25(8%) samples (Table 1). this figure is lower than that reported by GARCIA et al. (1985).

The high rate of Campylobacter isolation from the gall bladder, bile duct and the liver may be partly attributed to the presence of bile, which improves the growth of C.jejuni (OOSTEROM et al., 1981).

The recovery rate of C.jejuni from gall bladder was 12% of the examined animals, this can be considered as an indication that the organism is a potential inhabitant of the gall bladders. The obtained results are in a close agreement with those reported by BRYNER et al. (1972). KHALAF ALLA (1985) and HEFNAWY et al. (1989). However higher findings were recorded by GARCIA et al. (1985).

C.jejuni could not be detected in any of the examined muscle samples. This is in agreement with the finding of OOSTEROM et al. (1982); KHALAF ALLA (1985) and HEFNAWY et al. (1989). Other studies have shown that the contamination rate of raw red meat by C.jejuni is very low (TURNBULL & ROSE, 1982: STERN et al., 1985 and KWIATEK et al., 1990). Moreover, it has been stated that there are many factors affecting the isolation rate of C.jejuni from beef carcasses, including herd, seasonal, processing, animal age, feeding regimen, crowding conditions within the pen and geographical variations (STERN, 1981 and CARCIA et al., 1985).

Results in Table (1) reveal that only one frozen meat sample was positive for C.jejuni. This figure is similar to that previously reported by STERN et al. (1984). This differences between the prevalence of C.jejuni in fresh and frozen tissues is a strong indicator that freezing or frozen storage is not deleterious to C.jejuni survival and subsequent laboratory isolation (STERN et al., 1984).

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