Animal Health Research Laboratory, Assiut.
Head of Lab. Prof. Dr. S.M. Nashed.

OCCURRENCE OF CAMPYLOBACTER IN POULTRY CARCASSES

(With One Table)

By

BAHY El-GAMAL GALAL; R.S. REFAIE and A.A. ABOU EL-AILLA

(Received at 4/11/1991)

تواجد الكامبيلوباكتر في ذبائح الدواجـــــــن

باهي الجمال جـــلال ، رمضـــان رفاعـــي ، عبد الحكيم أبو العلا

تم الفحص الميكروبيولوجي لعدد خمسة وعشرون من ذبائح الدواجن المتواجدة بالمحـــلات المختلفة بمدينة أسيوط لمعرفة مدي تواجد ميكروب الكامبيلوباكتر ولدراسة مدي إنتشـــار وتوزيع هذا الميكروب في ذبائح الدواجن ، ثم أخذ مائة عينة من هذه الدواجن والتي اشتملـــت علي لحوم الدواجن والكبد والصفراء والكلية · وأثبتت النتائج وجود ميكروب الكامبيلوباكتـــر جيوجيناي بنسبة ٨٪ في ذبائح الدواجن · وقد وجد أن ميكروب الكامبيلوباكتر يتواجـــد في لحوم الدواجن بنسبة ٤٪ بينما وجد في كل من الكبد والصفراء والكلية بنسبة٨٪، ١٢٪،٨٪على التوالي · وقد تم مناقشة الشروط الواجب اتباعها من إعداد وتجهيز وطهي لمنع خطورة ميكـــروب الكامبيلوباكتر علي صحة المستهلك

SUMMARY

A total of 100 chicken meat, liver, gall bladder and kidney samples obtained from 25 poultry carcasses collected from different shops in Assiut city were investigated for Campylobacter jejuni. 8 out of 100 chicken samples (8%) were positive for Campylobacter. Campylobcter. Campylobacter isolates were recovered from the chicken meat (4%), while from the liver, gall bladder and kidney samples were 8%, 12% and 8% respectively. Sanitary conditions and control measures for avoidance of campylobacteriosis is discussed.

INTRODUCTION

Campylobacter jejuni has been recognized as an important causative agent of food-borne illness. The literature strongly associates foods of animal origin in the transmission of the disease to humans. Poultry is one such food with high carriage rates ofCampylobacter contamination. Consequently, reduction or elimination of this potential pathogen from poultry products would decrease human exposure (STERN et al., 1985).

In recent years, reports from around the world have demonstrated beyond doubt the importance of C.jejuni and C.coli as a source of human enteritis. There has also been an increasing concern over the role of food animals as reservoirs of these organisms with the implication that Campylobacter diarrhea is a zoonotic infection. However, the organisms were isolated from the most common domestic animal species, so it has been inferred that direct transmission of the disease to human might occur

via consumption of animal products (BUTZLER & SKIRROW, 1979 and GARCIA et al., 1985).

Investigation of chicken processing plants in different countries have shown that large contamination with Campylobacter jejuni can exist in birds, equipment, hands of processing-line worker and in air samples from the processing facilities (OOSTEROM et al., 1983 and WEMPE et al., 1983). However, Campylobacter jejuni was found wide spread in different poultry slaughter houses and slaughtering of heavily contaminated flocks and that may result in Campylobacter jejuni contamination rate up to 100% for end products and seems to be urelated to the type of slaughtering (HARTOG et al., 1983).

SVEDHEM et al. (1981) isolated Campylobacter jejuni from 6 of 10 frozen chickens and from 11 of 24 samples from the 8 fresh chickens, also were isolated from all 9 samples of minced meat, it is shown that Campylobacter jejuni is a common or regular finding in chickens and minced meat for sale in ordinary grocery stores.

MATERIAL and METHODS

25 broiler chickens were purchased from different shops in Assiut city and brought to the laboratory under sterile conditions. Samples of chicken meat (breast and thigh), liver, gall bladder and kidney were obtained from each poultry carcase.

The surfaces of the samples were sterilized by means of hot spatula and inserting sterile swab through its sterilized surfaces and then placed in screw capped bottles containing 5 ml of brucella broth (Difco).

The inoculated brucella broth bottles 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 bottle and spread onto clean dry slide, covered and then examined under dark ground microscope for detection of motility. Bottles 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 isolation results of C.jejuni from poultry carcasses are presented in table (1).

DISCUSSION

Since C.fetus subsp. jejuni has been implicated as an agent of food-borne disease, it is important that individuals involved with production, processing or preparation of food be aware of the food-borne disease potential of this organism (DOYLE, 1981).

Table 1: Isolation rates for Campylobacter jejuni from examined poultry carcasses.

Samples	Positive/total No. of samples	% positive
Chicken meat	1 / 25	4
Chicken liver	2 / 25	8
Chicken gall bladder	3 / 25	12
Chicken kidney	2 / 25	8
Total	8 /100	8

The intestinal tracts of domestic and wild animals and birds appear to be the major reservoirs of C.jejuni, while foods of animal origin play an important role in the transmission of the agent from animals to humans (BLASER, 1982 and GENIGEORGIS et al., 1986). Poultry has been incriminated as being responsible for several food-borne outbreaks of Campylobacter enteritis. Furthermore, other associations have been demonstrated between Campylobacter enteritis and poultry (GENIGEORGIS et al., 1986).

In this study, the C.jejuni contamination rate of chicken meat samples appeared to be low (4%). This figure agrees with the data of BLASER (1982) and HEFNAWY et al. (1989). On the other hand, higher findings were reported by OOSTEROM et al. (1983); STERN et al. (1984) and KWIATEK et al. (1990).

The available report of BLASER (1982) indicated that poultry meat has been implicat epidemiologically only in a very few outbreaks of campylobacteriosis.

The recovery rate of C.jejuni from gall bladder and liver samples were 12% and 8% respectively. Higher findings were reported by OOSTEROM et al. (1983) and STERN et al. (1984).

BAROT et al. (1983) reported that contamintion of chicken livers with C.jejuni was limited to the surface of the samples.

The examination of chicken kidney resulted in the recovery of C.jejuni from 2 out of 25 (8%) samples.

OOSTEROM et al. (1983) reported that out of 120 carcasses investigated, 59(49%) yielded C.jejuni, whereas 50 to 73 of internal organs were contaminated.

Campylobacter jejuni contamination in chicken processing plants is almost exclusively of intestinal origin. This contamination is not sufficiently eliminated during processing and results in contamination of poultry end-products. Both the process and end-products resulting from processing may be hazards to public health (OOSTEROM et al., 1983).

REFERNCES

Barot, M.S.; Mosenthal, A.C. and Bokkenheuser, V.D. (1983): Location of Campylobacter jejuni in infected chicken livers. J. Clin. Microbiol. 17: 921-922.

Bates, P.G.J. (1981): Isolation and identification of Campylobacters. Medium 14 (5): 8-17.

Blaser, M.J. (1982): Campylobacter jejuni and food. Food Technol. 36: 89-92.

Butzler, J.P. and Skirrow, M.B. (1979): Campylobacter enteritis. Clin. Gastroenterol. 8: 737-765.

Doyle, M.P. (1981): Campylobacter fetus subsp. jejuni: An old pathogen of new concern. J. Food Prot. 44: 480-488.

Garcia, M.M.; Lior, H.; Stewart, R.B.; Ruckerbauer, G.M.; Trudel, J. R.R. and Skljarevski, A. (1985): Isolation, characterization and serotyping of Campylobacter jejuni and Campylobacter coli from slaughter cattle. Appl. Environ. Microbiol., 49: 667-672.

Genigeorgis, C.; Hassuneh, M. and Collins, P. (1986): Campylobacter jejuni infection on poultry farms and its effect on poultry meat contmination during slaughtering. J. Food Prot. 49: 895-903.

Hartog, B.J.; Wilde, G.J.A. and Boer, E. (1983): Poultry as a source ofCampylobacter jejuni. Archiv für Lebensmittelhygiene, 34: 116-122.

Hefnawy, Y.; Moustafa, S. and Fathi, S. (1989): Frozen poultry as a potential source of Campylobacter. Assiut Vet. Med. J., 22: 100-105.

Kwiatek, K.; Wojton, B. and Stern, N.J. (1990): Prevalence and distribution of Campylobacter spp. on poultry and selected red meat carcasses in Poland. J. Food Prot. 53: 127-130.

Oosterom, J.; Notermans, S.; Karman, H. and Engels, G.B. (1983): Origin and prevalance of Campylobacter jejuni in poultry processing. J. Food Prot. 46: 339-344.

Skirrow, M.B. (1977): Campylobacter enteritis: A new disease. Brit. Med. J. 2: 9-11.

Stern, N.J.; Green, S.S.; Thaker, N.; Krout, D.J. and Chiu, J. (1984): Recovery of Campylobacter jejuni from fresh and frozen meat and poultry collected at slaughter. J. Food Prot. 47: 372-374.

Stern, N.J.; Rothenberg, P.J. and Stone, J.M. (1985): Enumeration and reduction of Campylobacter jejuni in poultry and red meats. J. Food Prot. 48: 606-610.

Svedhem, A.; Kaijser, B. and Sjogrer, E. (1981): The occurrence of Campylobacter jejuni in fresh food and survival under different conditions. J. Hyg. Camb. 87: 421-426.

Wempe, J.M.; Genigeorgis, C.A.; Faver, T.B. and Yusufu, H.J. (1983): Prevalence of Campylobacter jejuni in two California chicken processing plants. Appl. Environ. Microbiol., 45: 355-359.