INCIDENCE OF AEROMONAS HYDROPHILA IN SOME SELECTED FROZEN MEAT PRODUCTS IN ASSIUT CITY
(With Two Tables)

By
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SUMMARY

45 frozen burger, minced meat and sausage samples (15 each) were examin-
ed for the presence of Aeromonas hydrophila by using enrichment and
plating procedures. Aeromonas hydrophila was found in all of the examined
samples with average count $30 \times 10^3$, $21 \times 10^4$ and $29 \times 10^4$ in the examined
burger, minced meat and sausage samples respectively. A. hydrophila species
was/were identified into A. hydrophila, Asobria and A. caviae group, where
the percentage of their presence in examined samples was 33.33, 40 and

INTRODUCTION

Aeromonas hydrophila was recognized as an opportunistic pathogen of low virulence, but recently, it is accepted as a primacy pathogen (LITTEL, et al. 1986). Although the potential of the organism to induce outbreaks of such magnitude is unknown, gastro-enteritis caused by A. hydrophila is being recognized more frequently. It has been recognized as a spoiler (LERKE, et al. 1965 and ALUR, et al. 1971) as well as enteric pathogen (BUCHANAN and PALUMBO, 1985).

The organism is capable to grow at refrigerated temperature and has been observed as a part of microflora of fish, milk, poultry, and meat (PALUMBO, et al. 1985 a,b). Increasing interest concerning the possible role of species of the A. hydrophila group (A. hydrophila, Asobria, and A. caviae) as a cause of human gastroenteritis; both clinical and laboratory investigations have suggested that the species is a significant enteric pathogen (HAZEN, et al. 1978; GRACEY, et al. 1982 and BURKE, et al. 1983). The spoilage potential and pathogenicity of the organism have been correlated to its ability to secrete several extracellular virulence factors including enterotoxins, cytotoxins, haemolysis, lipase and proteases (TRUST and CHIPMAN, 1979 and LJUNGH & WADSTROM, 1983).

ENFORS, et al. (1979) recovered A. hydrophila at $10^6$/cm² from pure nitrogen-packaged pork cuts but failed to recover the organism from packages with a pure carbon dioxide atmosphere, while PALUMBO, et al. (1985 a) found the organism, often in high numbers, on almost all products of animal origin at the retail level. LIKewise, OKREND, et al. (1987) isolated A. hydrophila from all poultry and beef samples and seven of ten pork samples tested.

STERN, et al. (1987) found that the incidence of Aeromonas detected from feces of beef, pig, sheep and turkey was one of 32, none of 22, none of 24 and three of 21 respectively, while TERNSTROM and MOLIN (1987) reported that the percentage of A. hydrophila isolated from raw pork, beef and chicken was 33, 27 and 24 out of 45 samples examined of each respectively.

In the present study a brief survey of some selected retail frozen meat products was conducted for the presence of A. hydrophila.

MATERIAL and METHODS

45 frozen meat products samples were collected from different local retail markets in regular consumer packages in Assiut City, 15 samples from each burger, minced meat and sausage. The samples were analyzed by using enrichment method, where
AEROMONAS HYDROPHILA IN MEAT PRODUCTS

25 g sample were aseptically transferred to 255 ml of Trypticase soy broth containing 10 μg ampicillin/ml and blended for 2 min., then incubated at 28°C for 5 and/or 24 h. After incubation the enrichment cultures were serially diluted up to 10⁻⁶ in Butterfield's phosphate diluent and spreaded on MacConkey manitol ampicillin agar with a bent glass rod and incubated at 28°C for 18-24 h. The numbers of isolated Aeromonas were estimated and the typical red colonies were picked to triple sugar iron agar and nutrient agar slants. After overnight incubation at 28°C, a few drops of a 1% solution of N, N-dimethyl-p-phenylene-diamine monohydrochloride were added to the growth on the nutrient agar slant to determine the oxidase reaction.

Aeromonas hydrophila species was/were identified into A. hydrophila, A. sobria and A. caviae group (PALUMBO, et al., 1985 a) and differentiated by their glucose fermentation and esculin hydrolysis reactions and according to OKREND, et al. (1987).

RESULTS

The recovery and differentiation of Aeromonas hydrophila from retail frozen burger, minced meat and sausage are given in Tables (1 & 2).

DISCUSSION

Increasing recovery of A. hydrophila as a food-borne and human pathogen was detected. In recent years, investigations into the cause of human gastroenteritis have resulted in increased concern about A. hydrophila as a possible cause of diarrheal disease in man. At the same time, the role of A. hydrophila as a food-borne pathogen is not fully understood, whereas present information suggests that because of its ubiquitous nature and psychrotroph characteristic, this organism is a common contaminant on numerous foods (FAGHR, et al., 1984 and HOOD, et al., 1984).

The present results demonstrated that all examined burger, minced meat and sausage samples were harboured A. hydrophila with average of 30x10⁷, 21x10⁷ and 29x10⁷ respectively. The obtained results are higher than the results reported by OKREND, et al. (1987) who recorded that the indicated numbers of Aeromonas in 10 examined ground beef samples were ranged from 4.44x10⁷ to 7.44x10⁷/g, and appeared to be slightly higher than the obtained results by PALUMBO, et al. (1985 a) who found that the count of A. hydrophila in sausage, ground beef, ground veal and ground lamb was 2.5x10⁷, 5.0x10⁷, 2.1x10⁷ and 2.4x10⁷ after 7 days at 5°C respectively.

Concerning classification of A. hydrophila, the present results are lower than those reported by OKREND, et al. (1987) who isolated A. hydrophial from all 10 ground beef
samples; Asobria, from four samples and A. caviae from six samples; higher than the results recorded by Ternstrom and Molin (1987) who isolated A. hydrophila from 27% out of 45 examined raw beef samples.

Most studies into sources responsible for A. hydrophila gastro-enteritis have concentrated on its transmission in water supplies (Rippey and Cabelli, 1979) but Buchanan (1984) alternatively suggested that the species may present a significant "new" food-borne pathogen and hypothesized that foods may be important in the dissemination of microorganism.

The public health significance of Aeromonas hydrophila in frozen meat products must still be evaluated.

REFERENCES


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Table (1): Incidence of Aeromonas hydrophila recovered from frozen meat products.

<table>
<thead>
<tr>
<th>Type of samples</th>
<th>No. of samples examined</th>
<th>Positive samples</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burger</td>
<td>15</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Minced meat</td>
<td>15</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Sausage</td>
<td>15</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>

Table (2): Differentiation of Aeromonas hydrophila isolated from frozen meat products.

<table>
<thead>
<tr>
<th>Type of samples</th>
<th>No. of samples examined</th>
<th>Classification of isolated spp./%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burger</td>
<td>15</td>
<td>A. hydrophila 5/33,33 A. sobria 6/40 A. caviae 1/26.67</td>
</tr>
<tr>
<td>Sausage</td>
<td>15</td>
<td>A. hydrophila 4/26.67 A. sobria 10/66.67 A. caviae 1/6.66</td>
</tr>
</tbody>
</table>