قسم الصحة ومراقبة الأغذية
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نسبة وجود الكلوستريديم ببيرفرينجز
في منتجات اللحوم في مدينة أسوان

حسين يوسف

تم فحص عدد 44 عينة من اللحم المفرى، السجق، اللاشون والبسطرة بكاريولوجيا. وقد تم عزل الكلوستريديم ببيرفرينجز بنسبة 22% من اللحم المفرى، 25% من السجق، 38% من اللاشون، بينما لم يتمكن الباحث من عزل ميكروبات الكلوستريديم ببيرفرينجز من البسطرة. و كان احتمالات الديد الكلي للكلوستريديم ببيرفرينجز تتراوح من 11 إلى 2 لكل جرام من اللحم المفرى، بينما كان العدد الكلي في كل من السجق واللاشون ضئيل. ويعتبر اللحم المفرى مصدر خطورة للمستهلك إذا لم يحضر بطريقة صحية ومتعمقة لدرجة حرارة غير كافية لقتل ميكروبات الكلوستريديم ببيرفرينجز. كما اقترح التوصيات لرؤى الأخطار وحماية صحة المستهلك.
INCIDENCE OF CLOSTRIDIUM PERFRINGENS
IN MEAT PRODUCTS IN ASSIUT CITY
(With 2 Tables)

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SUMMARY
A total of 104 specimens of raw manufactured minced meat, fresh sausage, lunchon meat and cured meat were bacteriologically examined for Clostridium perfringens. The results revealed that C. perfringens was more frequently detected in raw manufactured minced meat (77.1%) followed by fresh sausage (25%) and lunchon meat (8.3%). C. perfringens cannot be detected in cured meat. Most probable number (MPN) of C. perfringens ranged from 11 to 20/g in largest number of raw manufactured minced meat; while in fresh sausage and lunchon meat MPN was significantly low. Raw manufactured minced meat if improperly handled and treated with insufficient heating, provide a mean for transmission of C. perfringens to the consumer.

INTRODUCTION
C. perfringens exist in soil, dust, spices as well as intestinal tract of man and other animals. Evidence to implicate food as a potential sources of C. perfringens has been presented by number of workers (SELMAN, 1971, DOBBERTIN and SIEMS, 1975, EL-BASSIONY, 1980 and BOUERHERZBERGER 1982).

Investigation of C. perfringens in raw meat and meat products was recorded by many investigators. HOBBS et al. (1953) detected heat-resistant strains of C. perfringens in 14-24% of samples obtained from veal, beef and pork; STRONG et al. (1963) recorded the isolation of C. perfringens from 16.4% raw meat, poultry and fish. HALL and ANGELOTTI (1965) succeeded in isolating C. perfringens from 58% of meat and 19.8% of meat dishes. LADIGES et al. (1974), registered that the incidence of C. perfringens in ground beef was 47.4%, while SHOUP and OBLINGER (1976) stated that less than 50 C. perfringens were found in 30 samples of retail ground beef. FOSTER et al. (1977) pointed that raw ground beef contained 56% C. perfringens with a mean value 55 organism/g., FRUIN (1977), was able to isolate C. perfringens more frequently from veal (82%) and lambs (32%) than from lunchon meat (1%).

This study was planned to determine the incidence and enumerate C. perfringens in raw manufactured minced meat, fresh sausage, lunchon meat and cured meat common available in Assiut City (Upper Egypt).

MATERIAL and METHODS
A total of 104 samples of raw manufactured minced meat; fresh sausage; lunchon meat and cured meat, in retail package were collected from the Assiut City markets.
Raw manufactured minced meat usually prepared by mincing the meat after mixing with onion, spices and other greens where there after is exposed to drying process.

The method adopted in this work was carried out according to BEERNES et al. (1980).

Enumeration of *C. perfringens* was determined by referring to the combination of positive tubes to MPN table consulted by DE MANN (1977).

**RESULTS**

The results are tabulated in tables I and II. As shown from table I, *C. perfringens* were detected in 58 (55.8%) out of 104 samples of meat products including 70 raw manufactured minced meat, 12 fresh sausage, 12 luncheon meat and 10 cured meat.

**DISCUSSION**

The incidence of *C. perfringens* in raw manufactured minced meat, fresh sausage and luncheon meat was 77.1%, 25% and 8.3% respectively. On the other hand, *C. perfringens* failed detection in any of the cooked meat samples. Similar results were previously recorded by many other workers as LADIGES et al. (1974), and FOSTER et al. (1977). On the other hand, a lower incidence of such pathogen was obtained by STRONG et al. (1963) and HALL and ANGELOTTI (1965). However the high incidence of *C. perfringens* in the examined raw manufactured minced meat may be partly attributed to infection of meat itself (HOBBS et al. 1953, STRONG et al. 1963, HALL and ANGELOTTI 1965, BRYAN and KILPATRICK 1971, LADIGES et al. 1974, FOSTER et al. 1977 and FRUIN 1977). Moreover, the addition of spices which is suspected to be heavy loaded with spores of *C. perfringens* might also be considered as a source of contamination of the meat products with such pathogen (STRONG et al. 1963 & DE BOER and BOOT 1981).

*C. perfringens* was recovered from fresh sausage and luncheon meat representing 25% & 8.3% respectively. Such incidence was lower than that previously recorded by HALL and ANGELOTTI (1965) who registered the isolation of *C. perfringens* in 47.6% of various sausages. However the low incidence of *C. perfringens* in our meat products may be partly attributed to the method adopted in preparing such products.

As shown in tables I and II, *C. perfringens* failed detection in any of the cooked meat samples examined, the finding may related to the high salt content and low water activity of such products. The high temperature used in processing this product may also be sufficient to destroy vegetative cells.

The highest number samples of raw manufactured minced meat had MPN ranging from 11 to 20/g. The highest number detected was 50/g. (Table 2). The findings agree more or less with that previously reported by HALL and ANGELOTTI 1965, LADIGES et al. 1974, SHOUP and OBLINGER 1976 and FOSTER et al. 1977.

Consequently isolation of *C. perfringens* from meat products is of great hazardous. The probability of food borne illness may occur to human being due to consumption of such products (JAY 1978 and BOUER-HERTZBERGER, 1982). However, contamination of raw manufactured minced meat with *C. perfringens* may be controlled by applying good basic food hygiene through, minimizing contamination, by cleaning and maintaining raw manufactured minced meat below the temperature at which *C. perfringens* growth occur. The heat preparation (time-temperature factor) may also be suitable for retarding the multiplication of *C. perfringens*.
CLOSTRIDIUM PERFRINGENS IN MEAT PRODUCTS

REFERENCES


Boer, E. de & E. Boat (1981): De Vergelijking Van media Voor de isolatie van Clostridium perfringens uit specerijen en kruiden. De Ware (n)- Chemicus 11, 98-104.


Table (1)
Incidence of C. perfringens in meat-products

<table>
<thead>
<tr>
<th>Product</th>
<th>No. of samples</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Raw manufactured</td>
<td>70</td>
<td>54</td>
<td>77.1</td>
</tr>
<tr>
<td>minced meat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh Sausage</td>
<td>12</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>Lunchon meat</td>
<td>12</td>
<td>1</td>
<td>8.3</td>
</tr>
<tr>
<td>Cured meat</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
</tbody>
</table>

Table (2)
Range of MPN of C. perfringens in meat products

<table>
<thead>
<tr>
<th>Number of samples containing C. perfringens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw manufactured minced meat</td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Below 0.3</td>
</tr>
<tr>
<td>0.3 - 10</td>
</tr>
<tr>
<td>11 - 20</td>
</tr>
<tr>
<td>20 - 29</td>
</tr>
<tr>
<td>29 - 50</td>
</tr>
</tbody>
</table>