

قسم مراقبة الأغذية
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البكتريا المحبة للبرودة والمفسدة لمنتجات اللحوم

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اشتمل البحث على فحص عدد خمسون عينة من اللحوم المفرومة والمعرضة للبيع فى مدينة أسيوط ولقد وجد أن متوسطات البكتريا المحبة للبرودة كانت 2266×10^4 ، 3827×10^4 وباستخدام البيئات المختلفة المخصصة لذلك فى العزل والتصنيف والتي تسبب فساد المنتج كانت على الوجه التالى :-

Flavobacter spp., *Acinetobacter anitratus*, *Alcaligenes faecalis*, *E.coli*, *Klebsiella spp.*, *Enterobacter spp.*, *Citrobacter spp.*, *Proteus rettgeri*, *Proteus mirabilis* and *Pseudomonas aeruginosa*.

وبالاضافة الى ذلك تم مناقشة الأهمية الصحية لوجود هذه الميكروبات على الصحة العامة للمستهلك وعلى اللحوم المحفوظة على درجة الحرارة المنخفضة والتي تكون سببا فى فساد منتجاتها .

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SPOILAGE PSYCHROTROPHS IN MINCED MEAT (With 3 Tables)

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SUMMARY

Fifty samples of minced meat from retail shops in Assiut were examined for the presence as well as the level of contamination by predominant psychrotrophic microbial flora. The mean values of psychrotrophic count on plate count agar with and without crystal violet were 22.66×10^4 and 38.27×10^4 per gram respectively. The identified strains were *Flavobacter* spp., *Acinetobacter anitratus*, *Alcaligenes faecalis*, *E.coli*, *klebsiella* spp., *Enterobacter* spp., *Citrobacter* spp., *Proteus rettgeri*, *Proteus mirabilis* and *Pseudomonas aeruginosa*.

INTRODUCTION

Minced meat provides a favourable environment for the growth of bacteria. Bacteria normally found on the meat surface are distributed throughout the entire product during the grinding and mixing processes performed during processing of minced meat (EMSWILER *et al.* 1976).

Surface bacteria normally encountered on meat include *Pseudomonas* spp., *Achromobacter* spp., *Micrococcus* spp., *Streptococcus* spp., *Sarcina* spp., *Lactobacillus* spp., *Clostridium* spp., *Escherichia* spp., *Salmonella* spp., *Klebsiella* spp., and *Streptomyces* spp., (AYERS, 1960).

On the other hand, JAY (1972) and LIBBY (1975) revealed that the mentioned organisms can develop on beef under refrigeration temperature. However, foods stored at chill temperatures, will, in due course be spoiled as a result of the proliferation of psychrotrophic organisms (MARTH and FRAZIER, 1957; FRAZIER and WESTHOFF, 1978).

The present study was conducted to estimate the psychrotrophic bacterial population of minced meat in Assiut City.

MATERIAL and METHODS

The total psychrotrophic plate counts were counts were determined by plating appropriate dilutions on standard plate count agar and incubating duplicate plates at 10 C° for 7 days (THATSCHER and CLARK, 1968).

Also, volumes of 0.1 ml. of suitable dilutions were spread onto standard plate count agar containing crystal violet 2 mg/litre as reported by SMITH and WITTER (1979). After incubation at 10 C° for 7 days, all nonpin-point colonies were counted.

Identification of the isolated strains was done according to the procedures adopted by COWAN and STEELS (1974), and BAILEY and SCOTT (1978).

RESULTS

Obtained results are summarized in tables (1), (2) and (3) respectively.

DISCUSSION

The summarized results given in table (1) pointed out that the mean psychrotrophic count was 38.27×10^4 with a minimum of 35×10^2 and a maximum of 90×10^5 . While crystal violet at 2 mg/litre as recommended by SMITH and WITTER (1979) inhibited the non psychrotrophs which resulted in a psychrotrophs count of 10^3 as a minimum and 63×10^5 as a maximum with a mean value of 22.66×10^4 per gram. Correlation between psychrotrophic bacteria counts on plate count agar with and without crystal violet revealed a variance which was significant at $P = 0.05$.

Estimation to the psychrotrophic bacterial population in meat products as ground beef, hamburger and fresh sausage was conducted by several authors such THIEULIN et al. (1966), DITSCHAUVER et al. (1973), AL-DELAIFY and STILLES (1975), EMSWILER et al. (1976), HEFNAWY (1980) and EL-KHATEEB (1982) who recorded counts of 10 millions, 3.4×10^6 , 10^6 , 58.17×10^5 and 1.8×10^7 per gram of the examined samples respectively.

However, when raw meat is held at refrigeration temperatures, the included microbial flora can grow favourably without any restriction. The presence of any level of bacteria cannot be considered as a measure of sanitary quality but rather a measure of microbial quality. Microbial quality becomes important if there is a demonstrable change in the organoleptic properties or wholesomeness of a product (SILKER, 1963).

Results recorded in table (2) revealed that the identified psychrotrophic bacteria were *Flavobacter* spp. 18(20.22%), *Acinetobacter anitratus* 13(14.61%), *Coliforms* 40(44.94%), *Alcaligenes faecalis* 4(4.49%), *Pseudomonas aeruginosa* 6(6.47%), *Proteus rettgeri* 5(5.60%) and *Proteus mirabilis* 3(3.37%).

Although aerobic psychrotrophic bacteria are generally non pathogenic to man they are considered by different investigators the most responsible causative organisms of refrigerated food spoilage (THIEULIN et al. 1966 and DITSCHAUVER et al. 1973).

It is evident from the summarized results given in tables (2&3) that coliform organisms were present in 40 out of 175 isolates and identified as *E.coli* 9(22.5%), *klebsiella* spp. 13(32.5%), *Citrobacter* spp. 14(35%) and *Enterobacter* spp. 4(10%).

In processed food, coliforms, do indicate inadequate processing or post-processing contamination; most probably from workers, dirty instruments, machinery or surfaces; or surfaces; or from raw food before precessing which might drive their contamination from various sources as human contact, polluted water, soil or manure (THATSCHER and CLARK, 1968).

Because of deterioration due to the development of psychrotrophic spoilers most fresh foods of animal and vegetable origin will not keep much than the two weeks at refrigeration temperature, although commodities of changed chemical composition will (MOSSEL, 1977).

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Table (1): Total psychrotrophic bacterial count per gram of examined minced meat

	Psychrotrophs count/gram	
	Without addition of crystal violet	With crystal violet
Minimum	35×10^2	10^3
maximum	90×10^5	63×10^5
Mean	$38,27 \times 10^4$	$22,66 \times 10^4$

Table (2): Frequency distribution of isolated psychrotrophic bacteria

Isolates	Frequency	
	No. of isolates	Percent
Flavobacter spp.	18	20.22
Acinetobacter anitratus	13	14.61
Coliforms	40	44.94
Alcaligenes faecalis	4	4.49
Pseudomonas aeruginosa	6	6.47
Proteus rettgeri	5	5.60
Proteus mirabilis	3	3.37
Total	89	100.00

Table (3): Frequency distribution of isolated coliform organisms

Isolates	Frequency	
	No. of isolates	Precent
E. Coli	9	22.5
Klebsiella spp.	13	32.5
Citrobacter spp.	14	35
Enterobacter spp.	4	10
Total	40	100