قسم : الصحة ومراقبة الأغذية ـ كلية الطب البيطرى ـ جامعة القاهرة.
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دراسات عن الفطريات فى البيض المستورد

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أجريت التجارب المعملية على أربعون عينة من البيض المستورد لعزل ماقد يوجد بها من فطريات وقد دلت النتائج على مايلى :

أوضحت الفحوص الظاهرية ان جميع العينات بها أنواع مختلفة من العيون الظاهرية منها ٣٨ بيضة (٩٥٪) خزنت لفترات طويلة تحت ظروف غير ملائمة وعمق الفراغ الهوائى اكثر من ٦ مم ، ٢٢ بيضة (٥٪) بها كسور فى القشرة الخارجية ونسبة ٧ر٥٪ بها شروخ فى القشرة

وقد تم تجارب الفحص الميكرولوجى على البيض الذى ثبت من الفحص الظاهرى أن به بعض المعايب.

ولقد تواجدت الفطريات فى جميع العينات (١٠٠٪) وتبين انها تتبع انواع كلاد وسبوريم هيريجرم (٧ر٥٪) ، ميكور (١٠٪) ، الترناريا (٢ر٥٪) ، باسيلوميسيس (٧ر٥٪) ، اسبرجيلس (٣٧ر٥٪) وبنسليوم (٦٥٪).

وبتصنيف فطرى الاسبرجيلس والبنسليوم تم عزل الأصناف الآتية :-
اسبرجيلس فلافس (١٧ر٥٪) ، اسبرجيلس نيجر (٥٪) ، اسبرجيلس اسلودامى (٧ر٥٪) ، اسبرجيلس فيوميجاتس (٥٪) ، اسبرجيلس ندبولانس (٢ر٥٪) ، اسبرجيلس كلافاتس (٢ر٥٪) ، بنسيلوم سيكلوبيم (٣٥٪) ، بنسياوم كريزوجينم (٢٠٪) ، بنسليوم كاندبدس (٧ر٥٪) ، وبنسيليوم فريكونتانس (٢ر٥٪).

هذا وقد تناولت الدراسة مناقشة أهمية الفطريات المعزولة وعلاقتها بالصحة العامة وكذلك اقتراح السبل الكفيلة بالمحافظة على البيض من التلوث بالفطريات النختلفة حفاظا عليه من الفساد وحماية المستهلك.

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MYCOLOGICAL STUDIES ON IMPORTED HEN'S EGGS

(With 3 Tables)

By

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SUMMARY

A total of 40 imported hen's eggs collected from Giza market were subjected to physical and mycological examinations.The defects met with in this investigation, included faulty shell (100%), aged egg (95%), cracked shell (7.5%) and leakered egg shell(5%), 38 samples showed a sided yolk where 2 only had a spready yolk.

The mycological study revealed that, all the examined eggs were contaminated. Croup analysis of isolates showed that they belonged to 6 different species of molds: Penicillium (65%), Aspergillus (37.5%), Mucor (10%), Cladosporium (7.5%), Paecilomyces (7.5%) and Alternaria (2.5%).

Identification of isolated Aspergillus spp. showed that, the A. flavus Link was the most prevalent constituting (17.5%) while A. nidulans (Eidam) wint, and A. clavatus Des. were the least (2.5%). A. amstelodami (Mangin) Thom and Church and A. fumigatus Fresenius lie in between with a frequency percentage of 7.5% and 5%, respectively. Penicillium verrucosum var.cyclopium (Westling) Samson,Stolk and Hadlok, P.chrysogenum Thom, P.candidus Link and P.frequentans Westling could be isolated from contaminated eggs with an incidence percentage of 35%, 20%, 7.5%, and 2.5% respectively.

Hygienic significance of isolates and the control measures for improving the quality of the product were discussed.

INTRODUCTION

Eggs had been used as food by human beings since early ages. The average number of eggs consumed by the individuals increase, throughout the world, conincides with rise of the standerd of living and according to the flourish of poultry industry.

In Arab Republic of Egypt, although a marked pronounced increase in poultry farms, under different consumer's demand of over population for egg production, yet concerned authorities up till now, has to import a lot of eggs to compansate the deficiency in production.

It is evident that with increased inflow of eggs imported from different producers a keen hygienic measures have to be applied during handling and storage of eggs. Spoilage of imported hen's eggs due to mold growth that find their way to the egg contents as a result of faulty production, handling or storage cause economic losses. Moreover eggs contaminated with molds may at times, conistitute a publik health hazard (FARCHMIN and SCHEIBNER 1973).

Species of Penicillium, Aspergillus, Cladosporium, Mucor, Sporotrichum, Thamnidium, Botrytis, Alternaria and other genera could be isolated from eggs by AHMED et al. (1974), FRAZIAR and WESTHOF (1978), JAMES (1978) and MOURSY (1979).

Studies on the existing molds in deteriorated imported hen's egg in our country is very limited,therefore, this work was planned to investigate the different types of molds prevaling in such hen's eggs.

MATERIAL and METHODS

40 imported hen's eggs collected at random from Giza markets, were subjected to physical and mycological examinations. Physical examination included external inspection for detection of cracks, leakers, loss of bloom and appearance of stained or dirty spots. Also, candling to detect and determin the size of air cell, colour, density and mobility of the egg contents as well as other defects was applied.

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Isolation of molds:

Eggs proved to be abnormal through physical examination, were prepared for mycological examination.

Sufficient area of the shell around the air sac was removed and loopfuls from the inner shell membrane as well as from mixed contents were directly streaked on Malt Extract Agar and Czapeck-Dox Agar media. Inoculated plates were incubated for five days at 25°C before being examined. Suspected colonies were isolated on malt extract agar slopes for further identification according to RAPER and THOM (1949), KULIK (1968) and SAMSON et al. (1976) for genus Penicillium. PAPER and FENNELL (1965) and SAMSON (1979) for genus Aspergillus, and ARX (1967), ZYCHA et al. (1969) and BARNNETT and HUNTER (1972) for other genera.

RESULTS

The results are tabulated in Tables 1, 2 and 3.

DISCUSSION

Egg quality is linked with certain characteristics that affect its acceptability to the consumer. Some of the egg defects are obvious from their general appearance, others are detected by candling, while some defects are showen only in the inner contents after breaking.

The physical examination of eggs is of high practical importance as it gives the first aid in judging the quality of edible eggs. Its importance lies in the fact that it does not only supply evidence on the fittness of eggs for human consumption, but it also gives a valiable index of prevailing conditions in/on the eggs that govern the practical use of examined eggs.

Candling of collected eggs revealed that, all samples showed faulty shell and 38 (95%) were aged (more than 6 mm air cell depth) while only 7.5% of these eggs had a cracked shell and 2.5% had leakered egg shell. Sided yolk, spready yolk, rotten and moldy egg were detected in 95%, 5%, 5% and 62.5% of examined eggs respectively (Table 1). These findings indicate faulty handling and storage.

Mycological examination:

Table (2) pointed out that all eggs examined proved to be contaminated with different types of molds. The frequency distribution of isolated molds revealed that 6 different genera could be identified. Penicillium spp. was the most prevalent (65%) while Alternaria was the least (2.5%) Cladosporium, Mucor, Paecilomyces and Aspergillus lie in between (Table 2). On further identification of genus Aspergillus, 6 species proved to exist with an incidence percentage ranging from 2.5% to 17.5%. Isolated strains, in a dessending manner include: A. flavus, A.amstelodami, A.fumigatus, A.niger, A.nidulans and A.clavatus (Table 3).

From the public health point of view, A.fumigatus has been often incriminated as a causative agent in many infections in man and animals involving the ethamiod maxillary, sphenoid sinuses, the orbit, pulmonary infection and skin infection (ADEM et al. 1965, JANKE 1965 and SKOBEL 1965).

Group analysis of genus Penicillium recorded in Table (3) shows that isolates were belonged to 4 species of Penicillium including: P. verrucosum var. cyclopium, P. chrysogenum, P. candidus and P. frequentans with an incidence percentage of 35%, 20%, 7.5% and 2.5, respectively.

Although the contents of newly laid egg from healthy fowels are usually sterile, yet the shell soon becomes contaminated from different sources by various types of microorganisms including molds, which can grow and penetrate through egg shell contaminating the egg contents. The rate of penetration depends mainly on both humidity and storage temperature at which eggs are produced and stored. From economic point of view, penetration of molds to egg interior lead to economic losses through spoilage of eggs on the market (SHARP and STEWART, 1936; HAINES and MORAN, 1946 and ROMANOFF and ROMANOFF, 1949).

Owing to the continuous consumers demand for fresh eggs, it is exteremely necessary not only to increase egg production, but also to guard against their infection through application of farm hygiene and better handling and storage methods.

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Table (1)

Different faults detected by physical examination

Fault	Frequency	
	No.of samples	%
Faulty egg shell	40	100.00
Sided yolk	38	95.00
Aged egg (large air cell)	38	95.00
Pin spot (mold growth)	25	62.50
Cracked egg shell	3	7.50
Leakered egg shell	2	5.00
Rotting	2	5.00
Spready yolk	2	5.00

Table (2)

Frequency distribution of isolated molds

Isolates	Frequency	
	No. of samples	%
Penicillium spp.	62	65.00
Aspergillus spp.	15	37.50
Mucor spp.	4	10.00
Cladosporium spp.	3	7.50
Paecilomyces spp.	3	7.50
Alternaria spp.	1	2.50

Table (3)

Percentage distribution of Aspergillus and Penicillium species from deteriorated hen's egg

Mold species	Frequency	
	No. of samples	%
A. flavus link	7	17.50
A. amstelodami (Mangin) Thom & Church.	3	7.50
A. fumigatus Fresenius	2	5.00
A. niger V. Tieghem	2	5.00
A. clavatus Desm.	1	2.50
A. nidulans Link	1	2.50
P. verr. var. cyclopium (Westling) Samson, Stolk & Hadlok	14	35.00
P. chrysogenum Thom	8	20.00
P. Candidus Link	3	7.50
P. frequentans Westling	1	2.50