الجير كمطهر قيم للبيض قبل التحضين

ع . النعسان ، أ . بشندى ، ب . حسنين

أجرى البحث لتحديد كفاءة الجير المطفأ حديثا فى السيطرة على تلوث البيض قبل التحضين .

وقد بين البحث ان معاملة البيض بالجير المطفأ حديثا اعطيت نتائج أفضل من معاملة البيض بالتبخير قبل التحضين ، وذلك حيث ان اقل نسبة وفيات الاجنة ، وأعلى نسبة نفس كانت مرتبطه بمجاميع البيض التى عوملت بالجير .

واستخلص من البحث ان الجير المطفأ مادة رخيصة ذات فاعلية مطهرة يمكن الاعتماد عليها فى المفرخات للسيطرة على مشاكل تلوث البيض ، والأقلال من خسائر التحضين التى قد تتواجد مع استعمال المطهرات الاخرى .

Department of Food Control & Hygiene,
Faculty of Vet. Medicine, Cairo University.
Head of Department, Prof. Dr. M. Abd El.R. Ashoub.

EVALUATION OF LIME AS A VALUABLE DISINFECTANT FOR EGGS BEFORE INCUBATION

(With Two tables)

By

A.A. El-NASSAN, E.Y. BASHANDY

AND F.M. HASSANIEN

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SUMMARY

Investigations were made to determine the efficiency of freshly slaked lime for controlling egg contaminants prior to incubation.

Artificially infected eggs were treated with 2 different methods; slaked lime and fumigation before incubation. The results of hatchability as well as the viability of hatched chicks were evaluated.

It was found that treatment of eggs with the freshly slaked lime gave better results than using fumigation. The lowest percentage of embryonic deaths and the highest percentages of hatchability and healthy chicks were associated with the lime treated groups.

Freshly slaked lime proved to be a valuable cheap agent for using in hatcheries, to control contamination troubles and to lessen hatching losses which may be met with other disinfectants.

INTRODUCTION

Egg shell usually acquires profuse number of microorganisms from different sources. Saprophytic bacteria constitute the majority of these contaminants, beside some other pathogenes which may contaminate the eggs shell from the environment of the laying hens or from the hatchery.

Fumigation of eggs prior to incubation is usually applied as a routine practice for controlling troubles of egg

contamination. In the meantime, several authors showed that fumigation of eggs may produce hatching losses.It may delay the initiation of embryonic development,increase embryonic mortality and adversely affect viability and performance of the hatched chicks(WILSON,1951;CLARENBURG and ROMIJN,1954 ; LANCASTER, 1962; PROUDFOOT and STEWART, 1970; HUTTNER, 1973 and BASHANDY, 1974). The available data of using lime or its preparations for cleaning and preservation of eggs did not show clearly the value of lime for disinifecting eggs before incubation. MORAN and PIQUE (1926) mentioned that lime water deposits a thin film of calcium carbonate on the egg shell and thus partially seals the pores. KNORR and LIPPERT (1936)found that preservation of eggs with lime did not destroy salmonella contamination on the outside of the shell with any degree of certainly. They added that if the organisms are protected by even a thin layer of faeces, they will resist destruction for long periods.

Therefore, this work was undertaken to determine the efficiency of lime (freshly slaked) as a valuable disinfectant for destruction of egg contaminants as well as to detect its effect on hatchability and performance of hatched chicks.

MATERIALS AND METHODS

(A) Used eggs:

One hundred and twenty fayoumi eggs were collected from Poultry Farm of Faculty of Agriculture, Cairo University Giza. All laying hens of the farm proved to be pullorum gallinarum free. The eggs were newly laid, medium size, clean and free from cracks and deformities. They were divided into the following six groups, each of 20 eggs:

Group (1)- Not exposed to any treatment as a control for the remaining five groups.

Group (2)- Treated with freshly slaked lime without exposure to infection.

Group (3)- Treated with freshly slaked lime after exposure to infection.

Group (4)- Fumigated without exposure to infection.

Group (5)- Fumigated after exposure to infection.

Group (6)- Exposed to infection only, as a control for the infected and treated groups.

(B) Culture used:

Stock culture of Salmonella pullorum gallinarum was obtained from Poultry Department, Faculty of Veterinary Medicine, Cairo University. The strain was streaked onto Mac Conkey agar plate and incubated for 24 hours at 37°C. From the obtained growth bacterial suspension was made in normal saline to match approximately Brown's opacity tube No. 4. The suspension was used for artificial infection of eggs.

(C) Infection and treatment of eggs:

The eggs to be infected were dipped into the prepared suspension of Salmonella pullorum gallinarum for few minutes, then left to dry and exposed to disinfection either by slaked lime or fumigation according to the required treatment as follows:

The eggs of group 2 (not infected) and group 3 (infected), were dipped into freshly prepared powder of slaked lime for few minutes. Then they were removed and throughly cleaned with sterile stiff brush to remove excess of lime. The eggs of group 4(not infected) and group 5(infected)were fumigated for 10 minutes in egg cabinet by using 35 ml. formalin and 17.5 gm.Potassium permanganate crystals for

100 cubic feet. Then the eggs were removed for aerification for a few hours to remove the residual formaldehyde from the egg surface (WILLIAMS and GORDON, 1970).

After completion of the various treatments all the eggs of six groups were incubated. The results of incubation and hatchability are recorded in table (1). The hatched chicks were observed for two weeks and the results of observation are recorded in table (2).

RESULTS AND DISCUSSION

From the results of incubation and hatchability (table 1) it is clearly shown that the lowest percentages of embryonic deaths were met with the lime treated groups. The percentages were 5.88 and 6.67 in the non infected and infected groups respectively, during the first and last two weeks of incubation. While in the same periods, the percentage was 11.11 in the both fumigated groups (not infected and infected).

Moreover, the best results of hatchability were obtained only from the lime treated groups. The percentages of hatchability were 82.35 and 80 in the non infected and infected groups respectively. While in the fumigated groups the percentages were 77.78 and 72.22 in the non infected and infected groups respectively.

The results of post-hatching observation of the hatched chicks (table 2) showed that during the first period of observation the percentage of healthy chicks was higher (91.67) in the infected and lime treated groups than that in the infected and fumigated groups(84.62). The percentage of sick chicks was lower (8.33) in the former group than in the later (15.38).

During the second period of observation the highest percentage of healthy chicks (100) was met with the non

infected and lime treated group. Infected and lime treated group gave also a higher percentage of healthy chicks (91.67) than the infected and fumigated group (67.92). Sick birds were observed only in the later group (beside the control). The percentage of deaths was lower in the infected and lime treated group (8.33) than that in the infected and fumigated group (15.38).

During the third period of observation; the highest percentage of healthy chicks (100) was obtained only from the lime treated groups.

From the aforementioned results it can be noticed that treatment of eggs before incubation with the freshly slaked lime gave better results than fumigation. The lowest percentages of embryonic deaths and the highest percentages of hatchability and healthy chicks were associated with the lime treated groups. These results disagree with the findings of MORAN and PIQUE (1926) and KNORR and LIPPERT(1936). However, it is worth to mention that the eggs used in this work were free from faeces and after they were cleaned with stiff brush to remove excess of lime.

It can be concluded that lime has a high germicidal effect against egg contaminants without marked adverse effect on hatchability. Moreover, it has a beneficial effect on the performance of the hatched chicks. Accordingly, freshly slaked lime can be recommended as a valuable cheap agent for using in hatcheries to control contamination troubles as well as to lessen hatching losses which may be met with other disinfectants such as formaldehyde.

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Table 1 : Results of incubation and hatchacility.

Number	Group	Total number of eggs	Number of infertile eggs	Number of fertile eggs	Embryonic death at				Hatchability			
					0-7 days		8-22 days		Unhatched eggs		Hatched eggs	
					No.	%	No.	%	No.	%	No.	%
1	Control (not infected)	20	1	19	3	15.78	2	10.52	1	5.26	13	68.42
2	Lime treated (not infected)	20	3	17	1	5.88	1	5.88	1	5.88	14	82.35
3	Lime treated (infected)	20	5	15	1	6.67	1	6.67	1	6.67	12	80.00
4	Fumigated (not infected)	20	2	18	2	11.11	2	11.11	nil	nil	14	77.78
5	Fumigated (infected)	20	2	18	2	11.11	2	11.11	1	5.56	13	72.22
6	Control (infected)	20	3	17	5	29.41	4	23.53	2	11.76	6	35.29

Table 2 : Results of post-hatching observations of the hatched chicks.

No.	Group	POST - HATCHING OBSERVATIONS																	
		1st period (0-5 days)							2nd period (5-10 days)							3rd period (10-15 days)						
		Total	Healthy		Sick		Dead		Total	Healthy		Sick		Dead		Total	Healthy		Sick		Dead	
		No.	No.	%	No.	%	No.	%	No.	No.	%	No.	%	No.	%	No.	No.	%	No.	%	No.	%
1	Control (not infected)	chick 13	13	100	nil	nil	nil	nil	chick 13	10	76.92	2	15.38	1	7.69	chick 12	9	75.00	2	16.67	1	8.33
2	Lime treated (not infected)	14	14	100	nil	nil	nil	nil	14	14	100	nil	nil	nil	nil	14	14	100	nil	nil	nil	nil
3	Lime treated (infected)	12	11	91.67	1	8.33	nil	nil	12	11	91.67	nil	nil	1	8.33	11	11	100	nil	nil	nil	nil
4	Fumigated (not infected)	14	14	100	nil	nil	nil	nil	14	13	92.86	nil	nil	1	7.14	13	12	92.31	1	7.69	nil	nil
5	Fumigated (infected)	13	11	84.62	2	15.38	nil	nil	13	10	76.92	1	7.69	2	15.38	11	10	90.91	1	9.09	nil	nil
6	Control (infected)	6	3	50.00	2	33.33	1	16.67	5	1	20.00	2	40.00	2	40.00	3	nil	nil	1	33.33	2	66.67