

قسم الباثولوجيا  
كلية الطب البيطري - جامعة أسيوط  
رئيس القسم : أ د / حمدي سالم

تحضير وتقييم لقاح زيتي ضد مرض ميكوبلازما الطيور  
٢ - تقييم اللقاح في الوقاية من التهاب الاكياس  
الهوائية في بدارى التسمين

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تمت هذه الدراسة على كتاكيت من أمهات محصنة باللقاح الزيتي وأخرى غير محصنة  
وتم تحصين مجموعات منها عند عمر اسبوعين ثم تمت العدوى الصناعية عند عمر ستة  
أسابيع •

بتقييم المناعة سيولوجيا بالاضافة الى الوقاية من التهاب الاكياس الهوائية ، وأخذ  
الزيادات الاسبوعية في الاوزان ومعامل التحويل الغذائي في الاعتبار اتضح أن المجموعات  
المحصنة الناتجة من أمهات محصنة أعطت أفضل النتائج •

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**EVALUATION OF INACTIVATED MYCOPLASMA  
GALLISEPTICUM OIL-EMULSION BACTERIN  
II. PROTECTION AGAINST AIR-SACCUITIS IN BROILERS**  
(With 3 Tables)

By  
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**SUMMARY**

The usage of *Mycoplasma gallisepticum* oil-emulsion bacterin had a noticeable effect in protection of chicks against air sacculitis. This study was carried out on chicks originating from vaccinated parents. Serum plate agglutination and haemagglutination inhibition titres, the gain in body weight and feed consumption rate were superior in vaccinated broilers from vaccinated dams. It could be concluded that the vaccination of the parents necessitate vaccination of the broilers to attain optimal protection against *Mycoplasma gallisepticum* infection.

**INTRODUCTION**

Transovarian transmission of *Mycoplasma gallisepticum* MG from infected dams to thier progeny has been reported, (FABRICANT, et al. 1959; JERSTAD, 1964; YODER, 1980 and KLEVEN, 1984).

The aim of several workers was to break the cycle of MG infection in breeding flocks, YODER, 1980 and PANIGRAPY, et al. 1981.

Since transovarian transmission complicate the problem of MG eradication program, several reports described inactivated bacterin with or without oil-emulsion for controlling air sacculitis in broilers, YODER, 1980. YODER, et al. 1984 reported that broiler chicks vaccinated at 11 to 15 days of age acquired significant protection against air-sacculitis. Hens vaccinated twice with MG oil-emulsion bacterin before the egg production revealed significant protection against MG egg transmission with a high titre of yolk antibodies, that protect progeny from the infection, (YODER, et al. 1984; GLISSON and KLEVEN, 1984 and 1985; YODER and HOPKINS, 1985).

This work describe further investigations on the effect of MG bacterin on protection against air sacculitis in broilers, in addition its effect on feed consumption and body weight.

**MATERIAL and METHODS**

Bacterin preparation was previously described, SOLIMAN, et al. 1987.

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A.H. BAYOUMI, et al.**Experimental chicks:**

Day-old meat-type chicks were supplied by Kena Governemental farm. 60 chicks originat- ing from vaccinated dans, oil-emulsion bacterin SOLIMAN, et al. 1987, were divided into three groups (A, B, C) and 60 chicks from non vaccinated parents were also divided into three similar groups (D, E, F).

**Challenge:**

Birds were challenged at 6 weeks of age intratracheally by 0.2 ml of virulent R strain of MG approximately  $2 \times 10^7$  colony-forming unit/bird.

**Serological tests:**

Serum plate agglutination SPA test after ADLER and YAMAMOTO, 1956. Haemagglutination inhibition HI test after YODER, 1980.

**Dead and sacrificed birds:**

Dead and sacrificed birds were subjected to post-mortem examination and isolation of MG.

**Evaluation of air-sac lesions:**

The system reported by YODER, et al. 1984, was used for scoring of air-sac lesions.

**Media, strains and antigens:**

For isolation of MG, Brain-heart infusion broth and agar (Oxoid) was prepared and suplem- ented with horse serum, yeast extract, NAD, thallus acetate and penicillen G sodium, SOLIMAN, 1985.

Virulent R strain of MG was kindly supplied by Prof. Dr. E.A. FREUNDT, FAO/WHO, Archus, Denmark.

MG stained antigen produced by Intervet. Lab. Holland.

MG HI antigen was locally prepared, SOLIMAN, 1982.

**Experimental design:**

Birds of group A&D were vaccinated by MG bacterin at 2 weeks of age, then challenged 4 weeks later. Birds of group B&E served as challenged non vaccinated birds, while those of group C&F were non vaccinated, non challenged controls.

Birds of all groups were weighed weekly and food consumption was recorded. All experi- mental birds were sacrificed at 8 weeks of age.

**RESULTS**

Air sacculitis was carefully examined and scored as in table 1 according to the following critiria observed in affected birds. Transparent, thin, and clear was registered as normal (0), slight thickening and opacity (1), naked eye thickening associated with yellowish exudation in more than one portion (2), marked and extensive thickening involving the abdominal and thoracic air sacs (3), but severe, generalized and diffuse thickening of all air sacs (4).

## MYCOPLASMA VACCINATION IN BROILERS

There was a marked difference between the incidence of air sacculitis in the unvaccinated controls (group B, and E), and that in the vaccinate birds (group A&D). Insignificant difference in the incidence and severity of air sacculitis was observed between the unvaccinated challenged chicks originating from vaccinated parents (30%) and those from unvaccinated dams (35%). In addition two cases died from each group during the eighth week with severe lesions of air sacculitis. Unvaccinated, unchallenged groups (C&F) showed moderate lesions of air sacculitis (20%).

Our serologic findings revealed a detectable antibodies in sera of examined birds by serum plate agglutination test.

Relatively higher haemagglutination inhibition titres were observed in baby chicks originated from vaccinated parents. The highest haemagglutination inhibition titres were observed in group A and D as shown in table 2.

Regarding the results of body weight and feed conversion rate as shown in table 3, the vaccinated birds revealed superior results.

## DISCUSSION

HAYATSU, *et al.* 1974, 1975 confirmed that protection against respiratory tract infection could not be relatively attained but protection against the development of air sacculitis was possible and practical.

In this study, our findings showed that the challenge with virulent strain of *Mycoplasma gallisepticum* resulted indifferent grades of air sacculitis depending upon the immune status of the birds. Higher incidence and marked severe air sacculitis were observed in non vaccinated birds. Similar findings were also reported, YODER, *et al.* 1984.

According to the results of serological tests, incidence and severity of air sac lesions, it was clear that chicks hatched from vaccinated parents showed higher antibody titres. The titres declined by age affording no durable protection. On the other hand vaccinated broilers from vaccinated parents showed a markable higher rate of protection in comparison with those originating from non vaccinated dams.

The results in this investigations shown in table 3 pointed out that not only the gain in body weight but also the feed conversion rate were correlated to the incidence and severity of air sacculitis, .... RETERSON, 1980.

Although the vaccination of parent flock resulted in high haemagglutination inhibition titre in the progeny as reported by many workers, optimal and constant protection of broilers could be attained by their vaccination.

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Table (1)  
Results of Air sac lesions ASL in different groups at 8 weeks of age

Group	A	B	C	D	E	F
ASL score	0.1	1.2	0.8	0.3	1.4	0.9
Air Sacculitis	1/20-5%	6/20-30%	4/20-20%	2/20-10%	7/20-35%	4/20-20%

## MYCOPLASMA VACCINATION IN BROILERS

Table (2)  
Serological response in vaccinated and challenged broilers

Group	Mean HI titers			
	Age			
	1 day	2 week	4 week	8 week
A	80	22	75	280
B	75	24	7	110
C	75	10	9	6
D	22	10	36	216
E	25	7	5	80
F	21	9	7	5

Table (3)  
Weight of experimental birds and feed conversion rate

Group	Age in weeks								feed conversion rate
	1	2	3	4	5	6	7	8	
A	145 <sup>+</sup>	340	618	920	1210	1590	1910	2290	2.41 <sup>++</sup>
B	142	332	580	875	1105	1310	1600	1880	2.9
C	143	330	590	870	1130	1410	1750	2110	2.6
D	140	310	600	890	1180	1530	1840	2200	2.54
E	145	300	550	830	1055	1245	1520	1790	3.05
F	145	305	570	840	1070	1300	1610	1950	2.78

+ weight in grams.

++ Total feed conversion = Feed : Live weight.