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Study of Newcastle Disease Vaccination One to Four Times a Year in Native Chickens Raised in the Village

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Study of Newcastle Disease Vaccination One to Four Times a Year in Native Chickens Raised in the Village[1]

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Summary

Native chickens raised in the village from 24 families were divided into 4 groups. Group 1 were vaccinated with Newcastle disease vaccine (NDV) once a year by using F strain for the chickens under 2 months of age and M.P. (Mukteswar) strain for those over 2 months of age. Group 2 were vaccinated with the same vaccines and at the same age as Group 1 but twice a year. Group 3 and 4 were vaccinated with NDV F strain three and four times a year respectively. In addition, a group of chickens from 30 families were also used as unvaccinated control. Postvaccination mortality, immune response and mortality due to diseases were recorded. Mortality after vaccination with NDV F strain were 7.69% in Group 1, 13.04 and 4.67% in Group 2, 10.71, 28.97 and 0% in Group 3 and 22.22, 17.54, 0 and 2.41% in Group 4 (average for all group was 10.43%) while mortality after vaccination with NDV M.P. strain were

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8.11% in Group 1 and 26.90 and 0% in Group 2 (average 11.68%). HI titers in one year round were highest in Group 1 and lower in Group 2 and 4 and lowest in Group 3. Mortality due to diseases in Group 1, 2,3 and 4 were 1.38, 4.80, 4.83, and 2.86% per month respectively compared to 15.95% in the unvaccinated control group.

Introduction

It was estimated that 65-85 million native chickens are raised extensively by 4.3 million farm families in Thailand (Chantalakhana, 1979). The owners do not provide either feed, housing, medication or vaccination against infectious diseases. These native chickens play an important role in the economy of the country as a source of meat and also they are preferred by people due to their taste, as game bird and petti cash. Newcastle disease is number one killing disease of native chickens in Thailand and it causes a great loss economically (Ratanasethakul *et al.*, 1981). Outbreak occurs most frequently among native chickens as native chickens are not vaccinated.

It is an urgent need of vention of the disease in the native chickens in order to increase the chicken population as well as increase in the total chicken consumed in the rural areas. This can be achieved by mass vaccination and the use of various types of Newcastle disease vaccines.

The purpose of this investigation was to study the optimum number of Newcastle disease vaccination per year for native chickens raised in the village as well as mortality after vaccination, immune response and mortality due to diseases.

Materials and Methods

In this study 24 farm families were sampling from Hinlard village, Khon Kaen and divided into 4 groups. Number of families and chickens in each group were as follow :

Group	No. of families	No. of chickens		
		> 2 Mo.	< 2 Mo.	Total
1	6	48	16	64
2	7	52	41	98
3	6	54	33	87
4	5	12	46	58

Experimental design

Group 1 were vaccinated with Newcastle disease vaccine (NDV) once a year by using F strain administered by eyedrop for the chickens under 2 months of age and M.P. (Mukteswar) strain administered by wingweb stab for the birds over 2 months of age.

Group 2 were vaccinated with the same vaccines and at the same age as Group 1 but twice a year.

Group 3 and 4 were vaccinated with NDV F strain administered by eyedrop for the birds of all ages three and four times a year respectively.

In addition, a group of chickens from 30 farm families in the same village were also used as unvaccinated control.

Mortality after vaccination, immune response and mortality due to disease were recorded for one year. Hemagglutination (HA) and hemagglutination-inhibition (HI) tests were conducted as described by Allen and Gough (1974) and the HI titers were expressed as Log_2.

Results

Mortality after vaccination

Mortality after vaccination with NDV F strain were 7.69% in Group 1, 13.04% and 4.76% in Group 2, 10.71, 28.97 and 0% in Group 3 and 22.22, 17.54, 0, and 2.41% in Group 4 (average for all groups was 10.43%), while mortality after vaccination with NDV M.P. strain were 8.11% in Group 1, 26.92 and 0% in Group 2 (average for all groups was 11.68%).

Mortality rates after vaccination are shown in Table 1.

Table 1 Mortality after vaccination.

Group	% Mortality after vaccination	
	F	M.P.
1	7.69	8.11
2	13.04, 4.67	26.90, 0
3	10.71, 28.97, 0	
4	22.22, 17.54, 0, 2.41	
Average	10.43	11.68

Immune response after vaccination

Group 1. The average HI titers at 1, 2, 4, 6, 8, 10 and 12 months post-vaccination (p.v.) were 2.40, 4.80, 4.33. 5.00, 3.00 and 4.00 respectively.

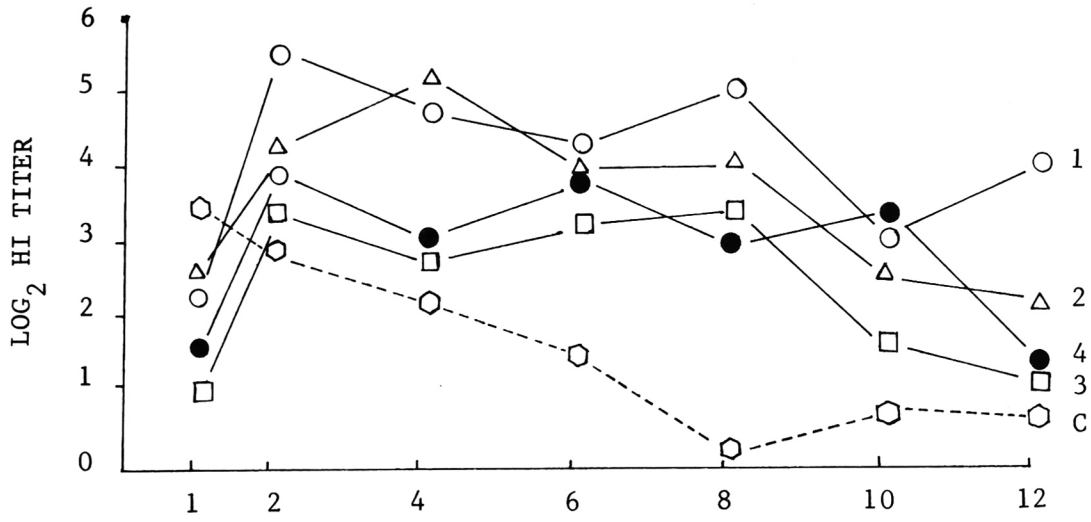
Group 2. The average HI titers at 1, 2, 4, 6, 8, 10 and 12 months p.v. were 2.67, 4.33, 5.20, 4.00, 2.50 and 2.00 respectively.

Group 3. The average HI titers at 1, 2, 4, 6, 8, 10 and 12 months p.v. were 1.25, 3.50, 2.80, 3.20, 3.40 and 1.71 respectively.

Group 4. The average HI titers at 1, 2, 4, 6, 8, 10, and 12 months p.v. were 1.80, 4.00, 3.00, 4.00, 3.00, 3.32 and 0.80 respectively.

The average HI titers of the control groups at 1, 2, 4, 6, 8, 10 and 12 months p.v. were 3.00, 2.20, 1.60, 0, 0.83 and 0.75 respectively.

The average HI titers in all groups of birds after vaccination are shown in Fig 1.



Months After Vaccination

Fig. 1 HI Titers After Vaccination.

Mortality due to diseases

Mortality due to diseases in Group 1, 2, 3 and 4 were 1.38, 4.80, 4.83 and 2.86% per month respectively, compared to 15.95% in the unvaccinated control group.

The main diseases which cause mortality were Newcastle disease, fowl pox, Marek's disease, and fowl cholera. Mortality due to diseases are shown in Table 2.

Table 2. Mortality due to diseases.

Group	% Mortality/month
1	1.38
2	4.80
3	4.83
4	2.86
Control	15.95

Discussion

Newcastle disease vaccine F strain caused some mortality in the chickens especially those under 2 months of age. This may be due to some factors of native chickens raised in the village such as predisposing diseases, parasitic infestation and inadequate feed. The same results were also observed in the birds vaccinated with M.P. strain. This agreed with the work of Ratanasethakul *et al.* (1985). These results indicated that Newcastle diseases vaccine M.P. strain was too virulent for native chickens under 2-month-old and should used as a booster in the over birds 2-month-old after first vaccination with F strain.

It is interesting to noted that vaccination only one or two times a year (Group 1 and 2) resulted in a high HI titers all year round, while vaccination three or four times a year (Group 3 and 4) caused moderate HI titers and lower than those in Group 1 and 2. In addition, the mortality due to diseases in all groups were quite low compared to those in the unvaccinated control group. These suggested that vaccination one or two times a year with F strain for birds under 2-month-old and with M.P. strain for birds over 2-month-old were better that vaccinated three or four times a year with F strain for birds of all and ages were suitable for native chickens raised in the village.

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บทย่อ
การศึกษาการให้วัคซีนนิวคาสเซิลหนึ่งถึงสี่ครั้งต่อปี ในไก่พื้นเมืองที่เลี้ยงในชนบท(1)

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ไก่พื้นเมืองที่เลี้ยงในสภาพหมู่บ้านใน 24 ครัวเรือนถูกแบ่งออกเป็น 4 กลุ่ม กลุ่มที่ 1 ให้วัคซีนเพียงครั้งเดียวต่อปี โดยให้วัคซีนนิวคาสเซิลเอฟแก่ลูกไก่อายุต่ำกว่า 2 เดือน และให้วัคซีนนิวคาสเซิลเอ็มพีแก่ไก่ที่อายุตั้งแต่ 2 เดือนขึ้นไป กลุ่มที่ 2 ให้วัคซีน 2 ครั้งต่อปี โดยให้วัคซีนนิวคาสเซิล เช่นเดียวกับกลุ่มที่ 1 กลุ่มที่ 3 และ 4 ให้วัคซีนนิวคาสเซิลเอฟชนิดเดียวแก่ไก่ทุกอายุ โดยให้ 3 และ 4 ครั้งต่อปี ตามลำดับ นอกจากนี้มีไก่พื้นเมืองจาก 30 ครัวเรือนที่ไม่ได้ให้วัคซีนเป็นกลุ่มควบคุม มีการบันทึกการตายเนื่องจากแพ้วัคซีน การตอบสนองในการสร้างภูมิคุ้มกัน และการตายเนื่องจากโรค ผลปรากฏว่า การตายหลังจากให้วัคซีนนิวคาสเซิลเอฟในไก่ กลุ่มที่ 1; 7.69%, ในกลุ่มที่ 2; 13.04 และ 4.67%, ในกลุ่มที่ 3; 10.71, 28.97 และ 0% และในกลุ่มที่ 4; 22.22, 17.54, 0 และ 2.41% (ค่าเฉลี่ยของทุกกลุ่มคือ 10.43%) ส่วนการตายหลังจากให้วัคซีนนิวคาสเซิลเอ็มพีในกลุ่มที่ 1; 8.11%, ในกลุ่มที่ 2; 26.90 และ 0% (ค่าเฉลี่ยของสองกลุ่มคือ 11.69%) HI titers ในรอบหนึ่งปีสูงที่สุดในกลุ่มที่ 1 รองลงมาในกลุ่มที่ 2 และ 4 และต่ำสุดในกลุ่มที่ 3 การตายเนื่องจากโรคต่าง ๆ ในกลุ่มที่ 1, 2, 3 และ 4 คือ 1.38, 4.80, 4.83 และ 2.86% ต่อเดือนตามลำดับ เปรียบเทียบกับ 15.95% ต่อเดือนในไก่กลุ่มที่ไม่ได้วัคซีน

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(1) เสนอในที่ประชุมวิชาการ First International Conference of the Impact of Viral Diseases on the Development of Asian Countries. Ambassador Hotel, Bangkok, Thailand. December 7-13, 1986.

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