LETTER TO THE EDITOR

SEROMONITORING OF NEWCASTLE DISEASE – A FIELD STUDY

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Since the first report on the occurrence of Newcastle disease (ND) in Madras, Tamilnadu, India (*1*), this disease has kept threatening the poultry farmers in this part of the country. An extensive vaccination has been practiced in the field to control the disease, but it continued to be recorded in various age groups of chickens in different parts of Tamilnadu (*2–4*). A sero-monitoring following vaccination is important for evaluation of its efficacy. This report describes the sero-conversion following vaccination of chickens against ND and its possible relation to a reduced egg production in commercial poultry flocks reared in Namakkal, Tamilnadu, India.

Namakkal is the largest poultry-producing region in Tamilnadu, where approximately 3000 small- and medium-sized layer farms keep about 15 million chickens. The birds are mainly Babcock and Bovans layers maintained in cages, except for some small farms where the birds are maintained on a deep litter system.

The usual vaccination schedule practised in Namakkal included live lentogenic F strain administered oculonasally to chickens at the age of 1 week, live lentogenic LaSota strain given in drinking water on the 4th week, live mesogenic Komarov or R2B strain given subcutaneously on the 8th–12th week, repetition of the mesogenic strain on the 18th–20th week and lentogenic strain in drinking water on the 35th–40th and the 60th–65th week.

Blood samples (35,160) were collected at random from 586 flocks of various age groups. The flock size ranged from 5,000 to 20,000 chickens. Sixty blood samples were collected from each flock on Whatman No. 1 filter paper. Briefly, the paper was cut into strips of approximately 1.3 x 10 cm size. Three strips were stapled together at the middle to form a cluster that was used to collect blood samples on the end of each strip following venipuncture as described earlier (*5, 6*). After air-drying, the paper clusters were packed in polypropylene bags and brought to the Avian Disease Laboratory, Namakkal, where they were eluted according to Roy *et al.* (*6*). Two discs of 5 mm diameter were cut out from the sample area of each strip using a hand punch. Each disc was placed in a well of a flat-bottom microtiter plate (Tarson, India) with 100 µl of 0.1% Brij-35 (LOBA, India), a nonionic detergent prepared in saline. The elution was complete after about 2 hrs, as indicated by light coloration on both sides of the disc.

Antibody titration was done by a micro-hemagglutination-inhibition (HI) test (*7*), using 4 HA units of NDV LaSota strain (obtained from the Institute of Veterinary Preventive Medicine, Ranipet, India) and 1% chicken erythrocytes. The eluate from the filter paper was considered a 1:16 dilution of whole serum (*6*). The HI titers were calculated as geometric means.

The chickens of various age groups showed different HI titers (the table): out of 586 flocks, 58.5% had titers of <32, 37% had titers of ≥32 but <128, and 4.43% had titers of ≥128. The number (percentage) of flocks with a reduced egg production in different HI titer groups is shown either.

This study was undertaken to assess the levels of NDV antibodies in vaccinated commercial flocks with the aim to control production losses due to ND. These antibodies were found to occur mostly in low levels only. It has been reported

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Abbreviations: HI = hemagglutination-inhibition; ND = Newcastle disease; NDV = ND virus

Age (weeks)	No. of flocks						
	HI titers						
	<16	16–(<32)	32–(<64)	64–(<128)	128–(<256)	256–(<512)	512–1024
≤19	5	4	1	1	–	1	–
20–30	26	22	14	9	5	–	–
31–40	39	51	26	17	3	–	2
41–50	26	39	18	10	3	1	–
51–60	11	28	34	14	3	–	1
61–70	16	35	27	14	4	1	–
71–80	9	20	14	7	1	–	–
81–90	3	9	7	4	1	–	–
Total	135	208	141	76	20	3	3
Percentage	58.5%		37%			4.43%	
No. (%) of flocks with a reduced egg production	114 (87.17%)	185	41 (29%)	10 (13%)	0	0	0

that HI titers of 16 are associated with 100% mortality, HA titers of 16–32 with 10% mortality, HA titers of 16–64 with no mortality but with a reduced egg production, while HA titers of 256–2048 with no mortality but with a normal egg production (*8*). In this study, only six flocks had HI titers of >256. Low HI titers values were also reported in field studies earlier. Chickens which had received one or two doses of a lentogenic vaccine and more than one dose of a mesogenic vaccine had HI titers between 2^4 and $2^{7.6}$ (*9, 10*). Low titers may be due to various reasons such as the use of a poor quality vaccine, faulty vaccination, poor management of the flocks, contamination of feed with toxic substances or immunosuppressive agents. The reasons for low titers in this study are not known, but a low egg production was not observed in the flocks having HI titers ≥128. About 58.5% of flocks had HI titers of <32 and the egg production was reduced in 87.17% of these flocks. Virulent NDV is prevalent in that area (*3, 4*). A large number of flocks are maintained in close proximity to an open house system, and it is difficult to eliminate virulent NDV from that area, as the virus may survive for more than 8 weeks in a dry tropical temperature of 40°C (*11*). It has also been documented that virulent virus may infect the mucosal surface of intestine in vaccinated birds and be excreted in droppings, so that it poses a threat to susceptible birds (*12*). Because of intensive vaccinations in Namakkal, the virulent strains may be lurking in the digestive tract and be excreted NDV poses a threat to the susceptible birds. A marginal drop in egg production was seen in 29% of the flocks having HI titers of 32–(<64) and in 13% flocks having HI titers of 64–(<128). It is known that the birds with HI titers of <256 suffer from low egg production, and in this study it was also observed that birds with HI titers of ≥128 did not suffer from a reduced egg production. This study was helpful in monitoring the post-vaccinal immune response and in case of low titers it has been advised to vaccinate the birds. The choice of vaccine depended on titer values. When the HI titers were >32 and <128, the use of a live vaccine was not suggested, as it would lead to a poor immune response (*8*). A reduced egg production could be due to several factors, but in endemic areas of ND it is always advisable to monitor the post-vaccinal immune response and control the production loss by vaccination and re-vaccination, if required.

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