

SEROLOGICAL RESPONSE OF BUFFALOES AND CALVES VACCINATED WITH OIL ADJUVANT HAEMORRHAGIC SEPTICAEMIA VACCINE

Rashid Ahmad,

*Livestock Production Research Institute, Bahadurnagar, Okara***ABSTRACT**

Forty buffaloes (group A) and 40 buffalo calves of either sex between 3 to 6 months age (groups B and C) were inoculated with oil adjuvant Haemorrhagic septicemia vaccine. The calves of group C were given a booster dose of vaccine after 90 days. The immunity conferred by oil adjuvant vaccine against *Haemorrhagic septicaemia* lasted for one year in adult buffaloes whereas, it lasted for seven months in calves. In calves which were injected booster dose, the immunity conferred persisted for more than one year.

Key Words: Immunity, oil adjuvant vaccine, *Haemorrhagic septicaemia*, booster dose.

INTRODUCTION

Haemorrhagic septicemia (HS) has been reckoned as a major disease causing heavy economic losses both in cattle and buffaloes. Alum precipitated formalized HS vaccine induced immune response is short lived (Alwis, 1986). In the recent past, an oil adjuvant vaccine, which is likely not only to give higher but also a prolonged immune response, has been introduced. However, the efficacy of this vaccine is required to be evaluated under field conditions especially in young calves. Present study was planned to conduct a field trial of this vaccine in buffaloes and their young ones.

MATERIALS AND METHODS

The animals from Livestock Experiment Station, Bahadurnagar and from project area around Bahadurnagar, Okara were included in the study. Oil adjuvant *Haemorrhagic septicaemia* vaccine (HSV) was obtained from Veterinary Research Institute, Lahore. Forty buffaloes from different localities were inoculated with oil adjuvant HSV and designated as group A. In addition, two groups of buffalo calves (B and C) each comprising of 20 calves (3-6 months old) were also inoculated with oil adjuvant HSV. Calves of group C were given booster dose of oil adjuvant HSV at 90 day interval at a dosage rate (3 ml) recommended by Veterinary Research Institute, Lahore.

The blood samples were collected on day zero i.e., before vaccination and then on monthly intervals till depletion of titres or one year. The serum samples were

dispatched to Veterinary Research Institute, where these samples were subjected to Indirect Haemagglutination (IHA) test to record the antibody titres against HS (Bain *et al.*, 1982).

RESULTS AND DISCUSSION

The geomean antibody titres (GMT) for animals of all the three groups are given in Table-I. The antibody titres in oil adjuvant HSV group A were observed upto one year and upto seven months in calves (Group B), whereas, in group C calves the immunity lasted for over one year.

Vaccination is acknowledged internationally as the best method for controlling HS (Carter *et al.*, 1991). Various types of vaccines used include antigens, bacterins and attenuated live organisms and are used with variety of adjuvants. Plain bacterins and adjuvant bacterins are now replaced by oil adjuvant bacterins, which provide the most effective immunization method (Muneer and Afzal, 1989).

HS has been reported to claim a very high number of calves especially that of buffalo species every year (Ahmad and Naz, 2000) but with the use of oil adjuvant HSV its outbreaks have greatly been controlled (Anonymous, 2001). The immunity induced by oil adjuvant HSV in adult buffaloes in the present study lasted approximately for one year, an increasing trend in post vaccination geomean antibody titres was observed with peak at 5 months (64.0), while protective immune titres persisted for upto 12 months post vaccination (Fig.1). These results are in line with the findings of Butt *et al.*, (1990), Carter *et al.*, (1991),

Table:1 Geomean antibody titre of animals of three groups at different intervals after vaccination

Groups	Titre	Months post inoculation												
		0	1	2	3	4	5	6	7	8	9	10	11	12
A	4	0	1	2	3	4	5	6	7	8	9	10	11	12
	8	10	5	5	5	10	10	10	5	5	5	5	5	5
	16	15	5	5	5	10	10	10	5	5	5	5	5	5
	32	15	20	10	15	10	10	10	15	5	10	10	10	10
	64	5	0	10	10	10	10	10	10	25	20	15	15	15
	128	5	10	5	10	5	5	5	5	5	5	5	5	5
	256	5	10	5	10	10	10	10	10	5	5	5	5	5
512	5	10	5	10	10	10	10	10	5	5	5	5	5	
Total	8.72	41.49	9.35	53.81	64.0	64.0	53.81	53.81	49.35	49.35	38.05	38.05	29.34	
B	0	10	5	5	5	5	5	5	5	5	5	5	5	5
	4	10	5	5	5	5	5	5	5	5	5	5	5	5
	8	25	5	5	5	5	5	5	10	10	10	10	10	10
	16	5	5	5	5	5	5	5	5	5	5	5	5	5
	32	20	20	20	20	30	15	15	15	5	5	5	5	5
	64	15	0	0	10	30	10	5	10	5	5	5	5	5
	128	5	5	5	5	10	5	5	5	5	5	5	5	5
256	5	5	5	5	10	5	5	5	5	5	5	5	5	
512	5	5	5	5	10	5	5	5	5	5	5	5	5	
Total	3.08	38.05	41.49	41.49	49.90	53.81	41.49	32.00	14.25					
C	0	15	5	5	5	5	5	5	5	5	5	5	5	5
	4	10	5	5	5	5	5	5	5	5	5	5	5	5
	8	5	5	5	5	5	5	5	5	5	5	5	5	5
	16	5	5	5	5	5	5	5	5	5	5	5	5	5
	32	10	10	10	10	10	10	10	10	10	10	10	10	10
	64	10	25	25	25	10	10	10	20	15	15	15	15	15
	128	5	5	5	5	5	5	5	5	5	5	5	5	5
256	5	5	5	5	5	5	5	5	5	5	5	5	5	
512	5	5	5	5	5	5	5	5	5	5	5	5	5	
Total	1.83	41.49	45.25	45.25	53.81	64.0	64.0	49.35	45.25	41.49	41.49	41.49	38.05	

* = Booster dose

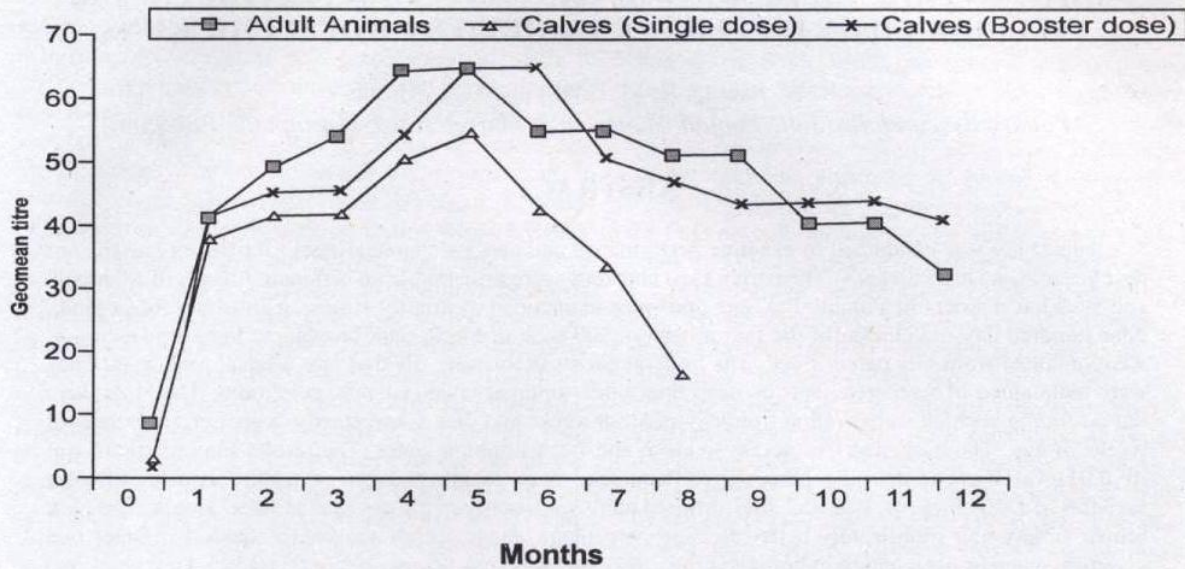


Fig. 1. Pattern of geomean antibody titre of animals

Alwis and Alwis (1992), Ahmad and Naz (2000) and Anonymous (2001). However, in sucklers given single dose, the immunity lasted only for 7 months with highest GMT (53.8) at 5 months post vaccination, whereas, in calves inoculated with booster dose at 90 days interval, the duration of immunity was more than one year, a sharp increase (Fig-I) in GMT (from 45.25 to 53.81) was noticed with a peak at 6 months post vaccination (Table-I). This observation is also in line with Muneer *et al.*, (1994), who suggest booster dose at 90 days interval of the first inoculation for better and prolonged immunity. It is concluded from the present study that oil adjuvant HSV is a good choice for prolonged and satisfactory antibody titres. However, in calves less than one year age booster dose at 90 days interval is indicated for desired results.

REFERENCES

- Ahmad, R. and N.A. Naz, 2000. Incidence and therapy of Pasteurellosis in buffalo calves. *Pakistan Vet. J.* 20(2): 101-102.
- Alwis, M.C.L. de, and M.C.L., de Alwis, 1992. *Haemorrhagic septicaemia*: a general review. *British Vet. J.*, 148(2): 99-112
- Alwis, M.C.L. de, 1986. Epidemiology of *Haemorrhagic septicaemia* and the economics of control of the disease. *Livestock production and diseases*. Proc. 5th, Conf. Inst. Trop. Vet. Med. Kuala Lumpur, Malaysia, pp- 133-136.
- Anonymous, 2001. Report on health status of the animals during the year. Annual Report of Livestock Production Research Institute., Bahadurnagar (Okara). pp-42-53.
- Bain, R.V.S., M.C.L. De Alwis, G.R. Carter and B.K. Gupta, 1982. *Haemorrhagic septicaemia*, FAO Animal Production and Health Paper No. 33 pp: 1-54.
- Butt, I.A., U.I. Qamar, T.M. Butt and T. Farooq, 1990. *Haemorrhagic septicaemia* oil adjuvant vaccine prepared from dense culture of *Pasteurella multocida* Robert type-I. *Pakistan J. Vet. Res.*, 3(1): 49-54
- Carter, G.R., A. Myint, R.V. Khar, A. Khin and R.V. Khar, 1991. Immunization of cattle and buffaloes with *Haemorrhagic septicaemia* vaccine. *Vet. Rec.*, 129(9): 203.
- Muneer, R. and M. Afzal, 1989. Preliminary studies on improved oil adjuvant vaccine for *Haemorrhagic septicaemia* in buffalo calves. *Revue, Sci. Tech. Int. Epiz.*, 8(4): 999-1004.
- Muneer, R., S. Akhtar and M. Afzal, 1994. Evaluation of three oil adjuvant vaccines against *Pasteurella multocida* in buffalo calves. *Revue-Sci. Tech. Int. Epiz.*, 13(3): 837-843