

COMPARISON OF OIL ADJUVANTED VACCINES PREPARED WITH ARLACEL A AND MONTANIDE 80

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BRIEF COMMUNICATION

In recent years important progress has been made regarding the preparation and use of oil adjuvanted foot-and-mouth disease (FMD) vaccines (1) using mineral oil Marcol 52² and emulsifier Arlacel A³ which is monooleate of manitol.

Recently, we received samples of another monooleate of manitol marketed under the name Montanide 80⁴ which according to the manufacturer's specifications has the same physical-chemical characteristics and degree of purity for biological use as Arlacel A.

Since the Pan American Foot-and-Mouth Disease Center has been requested by several laboratories interested in an eventual industrial production of this type of vaccine to indicate alternative sources of emulsifier we compared both products with regard to toxicity using the test of Berlin (2) and with regard to their co-adjuvant effect in FMD vaccines in young cattle.

Both Arlacel A and Montanide 80 proved non-toxic for adult mice (2). There was no difference in weight during a 15-day observation period with groups of mice inoculated intraperitoneally with the products. Also, at post-mortem examination there was no peritonitis or any abnormality.

For the present experiment 2 batches of inactivated FMD vaccine were prepared (1) from a trivalent aqueous suspension containing FMD strains O₁ Campos, A₂₄ Cruzeiro and C₃ Resende. Each batch was emulsified with Arlacel A or Montanide 80.

Two groups of 10 cattle 8-15 months old were used. These cattle had no previous history of exposure to the virus and were free of FMD antibodies. One group of cattle was vaccinated with the batch containing Arlacel, the other with the vaccine containing Montanide. Both vaccines were applied in 5-ml dose intramuscular at the side of the neck. Sera from the cattle were collected before vaccination and at 30-day intervals up to 180 days post-vaccination (DPV).

No undesirable side effects were observed in the vaccinated cattle.

Table 1 lists the levels of circulating antibody as determined by the mouse protection test and expressed as arithmetic means of the mouse protection indices (MPI) and the expected percentages of protection (EPP) according to Gomes and Astudillo (3). There were no significant differences between the antibody response induced by the vaccines containing Arlacel A or Montanide 80 at 30, 90 and 180 DPV for the strains O₁ Campos, and A₂₄ Cruzeiro. At 90 DPV a significant difference was observed between the 2 groups with regard to the response to strain C₃ Resende, which likely has no practical importance since the trend did not continue at 180 DPV.

Since there were not observed undesirable side effects of the two batches of Arlacel A and Montanide 80 tested, and since the long-term immune response was similar for the 2 emulsifying substances, both products could be successfully used for the formulation of oil adjuvanted FMD vaccine.

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TABLE 1. *Circulating antibody levels after vaccination of cattle with oil adjuvanted FMD vaccines containing Arlcel A or Montanide 80*

Virus	Emulsifier	D P V ^a		
		30	90	180
O ₁	Arlcel A	4.0 ^b 99 ^c	3.68 ± 0.53 98 ± 1.9	2.82 ± 0.83 91 ± 10.8
	Montanide 80	3.75 ± 0.63 97 ± 5.7	3.57 ± 0.49 98 ± 2.6	2.91 ± 1.07 89 ± 16.2
A ₂₄	Arlcel A	3.84 ± 0.21 99	3.99 ± 0.02 99	3.83 ± 0.35 99
	Montanide 80	3.39 ± 1.10 92 ± 21.4	3.55 ± 0.88 95 ± 21.4	3.92 ± 0.16 99
C ₃	Arlcel A	3.57 ± 0.95 94 ± 14	3.74 ± 0.54 98 ± 26	1.38 ± 0.54 64 ± 15.5
	Montanide 80	3.20 ± 0.86 88 ± 24	1.77 ± 0.86 71 ± 21	1.41 ± 0.68 62 ± 15.2

^a Days post-vaccination.^b Confidence limits at 95% from the arithmetic mean of SPI.^c Expected percentage of protection - calculated by Gomes and Astudillo (3) at 30 days after vaccination.

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