Foot-and-Mouth Disease Virus: Stability of Neutralizing Antibody After Freeze-drying and Air-drying

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It is possible to stabilize foot-and-mouth disease antiserum by either freeze-drying in bottles or air-drying on paper for periods of 7 months.

The user of diagnostic sera in the laboratory or in the field is concerned with serum antibody under various conditions of preservation. Several investigators have dried serum or blood on paper in the field and later used it for diagnostic purposes (1–5). In this study, the stability of the virus-neutralizing antibody of foot-and-mouth disease virus (FMDV) in antiserum was compared when air-dried on paper and freeze-dried in bottles stored at various temperatures.

The type A24 FMDV, cultivated in primary calf kidney cells and centrifuged at 10,000 × g for 1 hr, was used. The antiserum came from steers 3-months convalescent from an infection with type A24 FMDV. Frozen serum samples were dried at a partial pressure of 25 μ, condenser temperature of −55 C, and in an elapsed time of 60 hr. The freeze-dried samples were sealed under vacuum.

The serum preparations to be air-dried were prepared with 1 ml of antiserum on a piece of blotting paper (25 cm²). The air drying was accomplished at 23 C at a relative humidity of 30% in 18 hr. The air-dried samples were kept under vacuum. Serum neutralization tests were performed in 7- to 9-day-old unweaned mice by inoculation intraabdominally of mixtures of diluted antiserum and 100 LD₉₀ of virus per mouse. The dilution of antiserum which protected 50% of the mice against the test dose of virus was called the PD₉₀ value of that antiserum.

The results of the tests for stability of antibody are shown in Table 1. For 28 weeks, the antibody titer was stable as compared to the zero-time which was the original value. A possible drop in titer is indicated at 28 weeks at 37 C, at which point a 10-fold loss in concentration of the neutralizing antibody was experienced.

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LITERATURE CITED