



**SPRAY VACCINATION AGAINST DISTEMPER IN PINK**

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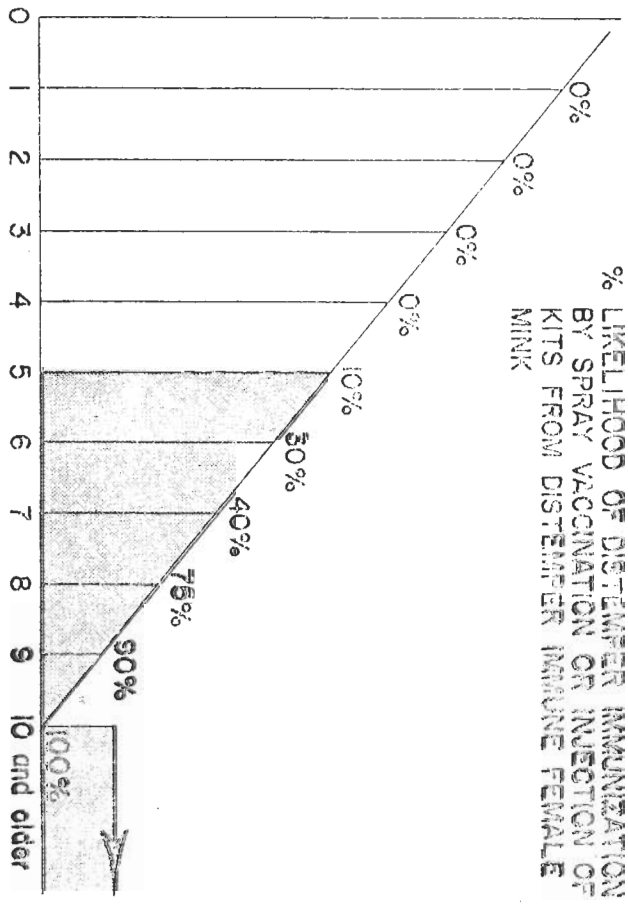
Perhaps the most logical and practical way to vaccinate is to use a live virus vaccine and administer it by the route its virulent counterpart sneaks into its victim. The principle of airborne vaccination is well known. The Chinese in the fifth century first recorded the idea when they attempted to vaccinate against

smallpox by taking a bamboo straw, dipping it into infected vesicle fluid, then blowing the fluid up the nose of a patient.

In 1943, the Australian Nobel Prize winner, Sir MacFarlane Burnet, reported on the first large-scale immunization programme using a live virus influenza vaccine as an intranasal spray. This finding was largely overlooked until the poultry pathologists decided to bathe America's flocks in virus. Indeed, Newcastle disease vaccines have been sprayed, dusted and added to the drinking water.

In 1954, we immunized pink with a live virus vaccine in the form of an artificially created spray (aerosol); however, our laboratory equipment was not practical for use on mink farms. Before mink could be spray

LEVEL OF IMMUNITY CONFERRED BY THE DAM TO HER KITS



**% LIKELIHOOD OF DISTEMPER IMMUNIZATION BY SPRAY VACCINATION OR INJECTION OF KITS FROM DISTEMPER IMMUNE FEMALE MINK**

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vaccinated on a large scale, the vaccine manufacturers had to develop a convenient apparatus that was not only portable, but also produced a sufficient cloud (dose) of vaccine to fill nest boxes long enough to allow the mink to become immunized. A United States company and a German company now produce such equipment.

### MATERNAL ANTIBODY AND VACCINATION

Female mink that are immune to distemper pass this immunity on to their kits in the form of maternal antibodies. The process is beneficial to the kits for it protects them from distemper at a time when their own immune system is underdeveloped. The amount of maternal antibody present in kit serum is highest at birth, after which it steadily declines to almost zero at about 10 weeks of age.

If a mink farmer vaccinates by subcutaneous injection before the kits are 10 weeks of age, the maternal antibody present in the kits destroys all or a part of the live virus in the vaccine before it can induce protective immunity. This is why ranchers are advised to wait until the kits are 10 weeks of age before vaccinating. The commercial availability of spray distemper vaccine prompted us to examine whether spray vaccination could be performed before the kit is 10 weeks of age.

### AN EXPERIMENT INVOLVING MATERNAL ANTIBODY

We have found by previous experimentation that we can substitute ferrets for mink in this type of a distemper trial. The number of ferrets used in the present experiments and the results obtained were originally published in *Research in Veterinary Science*, Volume 12, pages 392-393 (1971).

Kits from distemper-vaccinated female ferrets were vaccinated at 4-14 weeks of age. All kits from a given female were vaccinated at the same time: roughly half were spray vaccinated and the other half were injected in the usual manner. When the kits were about 4½ months of age, they were all exposed to virulent distemper virus. Those that

developed clinical distemper after this exposure were considered unprotected.

We found that as the level of the immunity conferred by the dam to her kits decreases, the percentage of likelihood of successful distemper immunization by spray vaccination or by injection increases (gray area on the accompanying figure). In other words, only 10 per cent. of the kits from distemper-vaccinated females would be immunized at 5 weeks of age, whereas, at 10 weeks of age or older, all of the kits would be immunized, regardless of the method of vaccination.

Mink farmers must also understand that exceptions to the rule occur in all practical situations. There are occasional kits that can be immunized effectively earlier than at 4 weeks of age and others that may not be immunized at any age.

### COMMENTS

The duration of immunity obtained by spray vaccination should be effective for the economic life-span of the mink. Even though spray vaccines have been used for only about 2 years, we know of no instance where there was a decline of immunity to a point when the mink were again susceptible.

Apparently spraying has no particular benefit over injection insofar as the age of vaccination. The use of spray vaccine offers other advantages, however, in that it is convenient to administer and its use minimizes disease spread. If the same needle or gloves are used, virulent virus could be passed from one animal to the next. Furthermore, in distemper outbreaks, farmers usually notice a flurry of cases within a few weeks after conventional vaccination. This is caused by handling of the mink at the time they are taken from the pens and carried to the vaccinator. The animals are excited, struggle, sneeze, and spread virulent virus to susceptible mink in their immediate vicinity.

We anticipate that the airborne vaccine will continue to gain widespread acceptance because of labour and cost economy. In 1972, farmers spray-vaccinated about 2 million mink in Western Europe and North America.