

APPENDIX E

RECENT FMD OUTBREAKS IN TAIWAN AND ITALY

The contagious nature of the FMD virus and the difficulties of dealing with an outbreak can be appreciated through analysis of recent experiences in Taiwan (Shieh, 1997) and Italy (Maragon et al., 1994).

The first case in Taiwan was reported on a farm located in the northwest section of the island on March 14, 1997. By the end of March, 1,300 farms scattered over most of the country were affected. An affected area covering all prefectures and cities in the western part of the main island was declared on March 21. The Central Mountain Range, which runs lengthwise through the main island, provided a natural barrier to the outbreak and initially the disease did not spread to the eastern part of Taiwan; other off-shore islands also were not infected at that time. At the beginning of May, the infected area was extended to cover the whole main island. As the disease spread so widely, nationwide vaccination of all cloven hoofed farm animals, in addition to the depopulation of infected herds, was decided upon.

The Army helped in carcass disposal, including burying, rendering, and incineration or burning. Burying was the most commonly used technique. The choice of the disposal method depended on the location of the infected farms. Farmers were allowed to send their pig carcasses to nearby rendering plants under the supervision of a veterinarian. In water resource protection areas, only incineration using movable incinerators or open field burnings was adopted. At the peak of the eradication campaign, a disposal capacity of 200,000 pigs per day was reached. By June 4, 6,143 farms had been affected. The number of exposed susceptible animals reached 4.66 million head, the number of cases was 1 million and 3.85 million animals were slaughtered (Shieh, 1997).

All FMD-susceptible animals on the eastern side of the island, as well as the dairy cattle and the more valuable breeding pig herds elsewhere, were vaccinated. The first round of vaccination with a polyvalent vaccine was completed by the end of March. Other vaccination rounds with vaccines containing only one strain followed. By May 3 a total of 13 million doses of vaccine were supplied by the government to farmers free of charge.

The vaccination did not slow the spread of the disease in the eastern region of the island, and the proportion of infected animals in the total susceptible population in the eastern provinces did not show any significant difference from provinces in the rest of the island. There was a strong association between the proportion of infected animals in the susceptible population and the number of animals in the region, suggesting that animal density was a major factor in the spread of the epidemic.

The origin of the epidemic is suspected to be smuggled food products introduced through a port about 10 km away from the farm where the first case was reported. The farm was family operated with good management practices. Even though no animals nor other personnel were introduced into the farm during the month prior to the outbreak, large flocks of sparrows flew in and out (Shieh, 1997). After repopulation of previously infected premises was allowed on December 1997, Taiwan suffered new outbreaks of FMD.

FMD was introduced into Southern Italy in 1993 by infected cattle imported from Eastern Europe. By the time FMD was confirmed, the cattle had been distributed to a number of premises both in Northern and Southern Italy (Maragon et al., 1994). The infection spread despite prompt identification and elimination of the infected herds, the absence of animal movements and atmospheric conditions favorable to the eradication efforts. This outbreak was the first in Europe after the cessation of vaccination in 1991.

On March 11 a premise in southern Italy was identified as infected. On the same day, the Veterinary Division of the Ministry of Health informed the health authorities in the Veneto region that a truck laden with beef cattle had left the infected premises on March 3, and had unloaded at a beef fattening facility on March 4. The infection was confirmed there on the same day. At the time of the inspection 93 cattle had lesions and the whole herd of 445 cattle was slaughtered the next day. In the next two weeks another three outbreaks were identified in a limited area close the first outbreak. The second outbreak was identified on March 15 and 376 head of cattle were slaughtered the next day. The only direct contact that could be traced between the two outbreaks was a sugar beet pulp lorry that visited both farms on March 10, the day before the first outbreak was detected. A third outbreak was confirmed on March 22 in a large beef unit. No direct or indirect contacts with the first and second outbreaks could be identified, but the premises were only three km away from the first outbreak and one km from the second.

The fourth outbreak was detected on March 27 in a feedlot located about four km from the second outbreak. The only direct contact that could be traced between those two premises was a feed technician who had visited both on March 11. Two large pig farms, containing altogether about 2,500 pigs, located at a distance of less than one km from the fourth outbreak were depopulated as dangerous contacts.

Investigations revealed that there were no movements of livestock in or out of the infected premises. The only other movements involving a risk of spreading the FMD virus that could be identified were the sugar beet truck and the feed technician. However, all four outbreaks were adjacent to a main road. The European guidelines to deal with a FMD outbreak include the creation of protection and surveillance zones; these normally have radii of three km and 10 km respectively. After the fourth outbreak a protection zone of five km was instituted.

The following measures were applied in the protection zone (Maragon et al., 1994):

- A daily clinical examination of all susceptible herds. Each veterinarian visited a small number of farms each day. Pig units, which posed a far greater risk, were visited by a veterinarian who did not approach any other livestock units.
- Virological examination of bulk milk from all dairy farms in the area in an attempt to detect incubating infections.
- All milk produced in the surveillance and protection areas was collected separately and delivered to a processing plant which produced milk only for human consumption. The milk was treated by ultra high temperature (UHT) to render it safe.
- A whey factory which produced whey to feed 1,800 fattening pigs was closed.
- All agricultural activities such as artificial insemination (AI), mastitis control, milk yield recording, etc. which could involve a risk of indirect transmission of the virus were canceled.
- Several fixed points were organized for the disinfection of feedstuff lorries and other vehicles, and all vehicles visiting farms had to be disinfected before and after each visit.
- Police check points were instituted to avoid uncontrolled movements of animals and vehicles.
- The main highway crossing the surveillance zone was closed to lorries carrying cloven-hoofed animals.

A computer analysis of meteorological data suggested that the airborne spread of infectious particles had been limited by prevailing anticyclonic conditions. Surveillance was therefore concentrated on the 132 livestock units within the protection zone and the infection was prevented from spreading. There were 897 units within the surveillance zone. Because of such a large number of premises, it was beyond the resources of the veterinary services to inspect each of them daily and the authorities had to rely on the stock owners in the surveillance zone to report possible cases of FMD. It was estimated that a veterinarian could inspect a maximum of eight to ten herds each day.

