

## CHAPTER 9

### SUMMARY AND RECOMMENDATIONS

Exotic animal diseases could cause major economic losses to the U.S. and California livestock and dairy industries, to consumers and to governments. Among all exotic animal diseases, FMD has the potential for the highest losses.

The U.S. operates a two-tier system of defense against highly contagious exotic animal diseases. The first tier involves trade restrictions to minimize the probability of infected animals or animal products being shipped to the U.S., as well as border controls to monitor the entrance of travelers and imports from infected countries. However, risk of virus introduction is increasing and border controls have not evolved enough to face this new challenge.

The second tier of defense consists of public federal and state monitoring and surveillance services. In case of an outbreak, these services are also responsible for control and eradication campaigns. These policies cannot succeed without strong cooperation from other agents who are required to provide support at different stages of implementation. The agents include, among others, farmers, private practitioners, processing industries, law enforcement agents, and policy makers.

In the case of a FMD outbreak, Veterinary Services (APHIS) and Animal Health Services (CDFA) would follow a stamping-out policy. The major components of this policy involve:

- Establishment of a quarantine area where all animal movements are restricted for at least 60 days after depopulation of the last infected premise.
- Slaughter and burning or burial of all infected and exposed (even though asymptomatic) susceptible animals.
- Close monitoring of all remaining susceptible animals.
- Cleaning and disinfection of infected premises in the area, including farms, saleyards, slaughterhouses and milk processing facilities.

The chief conclusion of this study is that it is highly likely that implementation of the stamping-out policy would face enormous problems which would seriously compromise its chances of success. The most important of these problems are:

- Producers might not be aware of the urgent need to report vesicular diseases. Additionally, under current regulations, they have incentives not to do so.

- Because the U.S. has been free from FMD for seven decades, it is probable that the first cases will be misdiagnosed.
- The high intensity of production practices in dairies and feedlots, including large herds and considerable movements of services and products, favors rapid spread of the disease.
- The high density of animals within herds and high density of herds in the region facilitates airborne diffusion.
- Enforcing the quarantines would be difficult because of the disruption of activities and extremely high costs imposed on other farmers and sectors of society.
- Depopulation and carcass disposal would face serious difficulties—timely availability of sufficient human, physical and financial resources, availability of burning materials, lack of knowledge of the cost imposed on different social groups by alternative carcass disposal methods, environmental and legal issues, etc.
- The cost of C&D and depopulation of the large production units typical of the South Valley would exceed the financial resources immediately available to face an animal health emergency, and appropriation of additional resources would require legislative action that could cause excessive delays in implementation.
- There is likely to be resistance by producers, politicians and society to the killing of apparently healthy animals, as happens with exposed herds.

The simulations conducted for this study show that a successful stamping-out program in the South Valley would require: (1) depopulation of both exposed and infectious herds, and (2) eradication starting no later than the end of the second week of the outbreak. In that context, “success” is defined as eradication of the outbreak while depopulating less than 40% of the premises in the quarantine area. This study, however, indicates that—given the production conditions of the South Valley, and the limited availability of financial, human and material resources—it is possible that more than 80% of the susceptible animal population in the San Joaquin and Chino Valleys would be infected or exposed even before the first premise is depopulated.

The cost of the stamping-out policy would explode with the number of depopulated premises. Therefore, other policies could become more cost effective when a large number of premises must be depopulated. The alternative policy of vaccination could reduce the number of animals destroyed but would delay the return of the U.S. to the FMD-free market. However, the number of destroyed animals at which stamping-out ceases to be the optimal policy is unknown.

### **Recommendations**

The probability of an outbreak depends on the efficiency of border controls and the bio-security measures implemented by livestock producers. Changes in the travel and trade environment are

modifying the risk posed by the various potential routes of introduction of the FMD virus. Studies should be conducted to elicit the actual risk levels posed by each potential route, in order to prioritize surveillance and control efforts.

The bio-security measures implemented by farmers depend on their awareness of the indications and consequences of a FMD outbreak, and the incentives to take adequate prevention measures. Programs targeted to producers, private practitioners and related industries are needed to increase awareness of the probability of an outbreak, and to reduce the disincentives to report vesicular diseases.

Advanced gathering of information to be used in an animal health emergency can accelerate both implementation of the quarantines, and identification of the movements of infected animals. Programs to collect critical information and make it immediately available should be identified.

The eradication effort would require large financial resources. Waiting until such resources are appropriated would delay the beginning of depopulation, and increase the cost of the epidemic. Alternative policies to speed up the appropriation process should be studied. Contributions of the federal and state governments, producers and industry should be explicitly considered.

Finally, additional studies are needed to determine the economic and societal costs of alternative eradication policies.

A complete list of recommendations to increase preparedness to deal with a FMD outbreak follows.

**ADDITIONAL SUGGESTIONS FOR DEALING  
WITH THE THREAT OF FMD**

Implementation of the recommendations of this report, and preparedness in general for an outbreak of FMD, will require a complex mix of specific actions, as indicated by these suggestions:

- Compare the efficiency of maintaining the present U.S. vaccine bank versus the option of joining a larger international bank.
- Identify and create the databases that could help in increasing the efficiency of the first response to an outbreak (e.g., an animal identification and information system to trace animal movements, or a list of trucking companies that may help in following cattle movements).
- Study animal movements in and out of California to assess the resources required to enforce state and federal quarantines.
- Study typical movements in and out of premises with livestock to determine the optimal size of the high risk and buffer zones.
- Study bio-security practices among livestock producers and industries in California to identify the best actions (regulatory changes, education, extension, etc.) aimed at reducing the probability of an outbreak, minimizing risk factors and facilitating eradication.
- Develop a model of airborne diffusion calibrated to the different agroecological areas of the state.
- Develop an expert system to be used in the management of an animal health emergency.
- Analyze the process of resource mobilization in case of an epidemic to identify potential bottlenecks.
- Increase participation of farmers and farm organizations in diffusion of information.
- Create a program to increase participation of private practitioners in developing contingency plans and transfer of information to producers and allied industries.
- Implement an information campaign aimed at elected officials on the value of animal health emergency services and the importance of prompt response.
- Analyze alternative procedures to speed access to emergency public funds.
- Design a self insurance mechanism financed by the dairy and livestock industries to partially

cover the losses caused by a FMD outbreak. This insurance could speed the recovery and reduce the need for public disaster assistance.

- Create a state interagency committee to coordinate the emergency response. The committee should include at least representatives of CDFA, the state EPA, officers of state emergency services, the University of California, National Guard, California Veterinary Medical Association, law enforcement agencies, the Governor's office, the state legislature, the livestock industry and APHIS. Conduct periodic meetings to evaluate preparedness, probably every two years.
- Analyze the cost benefit ratio of alternative methods for carcass disposal to determine the optimal investment in disposal capacity. Evaluate the possibility of developing joint programs with other states, such as portable incinerators owned jointly by several states or the federal government. Particular attention should be given to the cost imposed on farms, processors and counties by each disposal method.
- Increase interaction with animal health services in other states and countries to exchange experiences.
- Designate one or two professionals to follow developments in monitoring and control of FMD in other countries.
- Evaluate the efficiency of present activities conducted by Animal Health Branch and APHIS in California. Activities with low impact and high cost, such as control of low risk garbage feeding operations, should be eliminated.
- Ban garbage feeding in the state.
- Increase control of high risk concentration places, such as fairs, shows and auctions of small animals. The control could be enforced either by the public or private sector.
- Target information campaigns to backyard operators, such as 4H members.
- Prepare cleaning and disinfection plans for complex cases such as milk processing plants and slaughterhouses. Contingency plans also should be developed to deal with non-agricultural carriers, such as urban populations and vehicles.
- Estimate the cost of outbreaks of other reportable diseases. This information should be shared with the industry and contingency plans should be evaluated.
- Discuss with local authorities the possibility of including in applications for new livestock facilities a requirement for a contingency plan for rapid depopulation of the premises—identification of burial sites, determination of groundwater depth, etc.
- Establish minimum standards of an exotic disease emergency preparedness program in California.

