

## **Foot-and-mouth control in the 21st century: regrettable precaution or senseless slaughter?**

**By Vijay Cuddeford**

**THERE ARE PROBABLY FEW NEUTRAL OPINIONS AMONG LIVESTOCK OWNERS ON HOW SOCIETY SHOULD CONTROL OUTBREAKS OF FOOT-AND-MOUTH DISEASE.** At the outset, it should be understood that foot-and-mouth disease (FMD) is a global phenomenon. Since January 1, 2000, there have been FMD outbreaks in 38 countries in Asia, Europe, Africa and South America.<sup>1</sup> Foot-and-mouth is considered endemic in Africa, much of Asia and parts of South America.

The debate on how to manage FMD takes on a serious tone considering the latest statistics from the U.K. As of May 14, 2001, over three million animals had been slaughtered, including approximately 500,000 cattle, over two million sheep, 118,000 pigs, and 2,000 goats. Half a million animals are awaiting slaughter.<sup>2</sup> It has been estimated that 95% of slaughtered animals were healthy and uninfected.<sup>3</sup>

### Description and symptoms

Foot-and-mouth disease (FMD) is an acute and highly contagious viral infection of cloven hoofed animals. Cattle, sheep, goats, pigs, and wild ruminants are susceptible; horses are resistant. Clinical signs in cattle are salivation, depression, anorexia and lameness caused by the presence of painful blisters. Symptoms in pigs, sheep and goats are similar to those in cattle, but milder. To differentiate FMD from other diseases, laboratory diagnosis is required.<sup>4</sup>

### Persistence

The FMD virus is quite persistent—it can remain active in an infected area for over a year, for 10-12 weeks on clothing, and for a month on hair. Most strains of the virus are destroyed by heating to 56°C for 30 minutes. The virus is also destroyed by sunlight, and by solutions of sodium hydroxide, sodium carbonate, acetic and citric acid.

### Epidemiology

FMD spreads by direct contact between infected and susceptible animals, and by indirect contact with contaminated animal products (meat, raw milk, hides), feed, bedding and animals which are carriers. The virus is present in the milk, blood, semen, urine and feces of infected animals, before the onset of symptoms. Pigs are extremely significant in the spread of the disease—one pig may spread as much virus as one thousand cattle. Dense concentrations of pigs can generate airborne plumes of some strains of FMD which may spread more than 10 km over land and up to 200 km over water. However, most of the recent outbreaks, including those in Europe, are due to the O or pan-Asian strain, which does not appear to spread far via this method.<sup>5</sup> Whereas pigs are usually infected by eating infected feed, cattle are mainly infected through inhaling the virus.

Mortality in adult animals is low (5%), but in suckling pigs and lambs, rates may approach 75%. Deaths are often associated with cardiac lesions. FMD has seven distinct strains. The O-serotype or pan-Asian strain currently affecting animals in the U.K. emerged ten years ago from India.

### Prevention and control

There are two kinds of prevention and control strategies: sanitary treatment and medical treatment.<sup>6</sup> Sanitary treatment involves:

- Protecting disease-free zones by monitoring and restricting animal movement

- Slaughter of infected, recovered, and FMD-susceptible animals in, and around, infected sites
- Disinfection of premises and all infected material (implements, cars, clothes, etc.)
- Destruction of carcasses, litter, and susceptible animal products in the infected area.

Medical prophylaxis involves vaccination with an inactivated virus. An animal is considered immune if it is disease-free six months after it has received two vaccinations, one month apart.

### Human health

FMD is not a human health concern. The human viral disease called Hand, Foot and Mouth is unrelated to FMD.

### Distribution

In Canada, FMD was last reported in 1952 in Saskatchewan. The outbreak is believed to have been caused by infected sausage meat imported from Europe and fed to swine. The outbreak was limited and quickly brought under control. However, the cost of eradication was nearly one billion dollars (over \$30 billion in 2000 dollars). Many farm families lost their herds and their livelihoods.<sup>7</sup>

### To vaccinate or not to vaccinate

The Canadian Food Inspection Agency's website lists several reasons why Canada's policy is not to vaccinate unless there is an 'overwhelming outbreak':<sup>12</sup>

1. It is not possible to predict which strain of FMD Canadian animals may be exposed to;
2. Animals exposed to the virus shortly after vaccination may become carriers and spread the virus without showing clinical symptoms;
3. Vaccination is not effective in a small percentage of animals;
4. Most animals require two vaccinations at prescribed intervals;
5. Blood tests cannot distinguish vaccinated from infected animals;
6. Producers and veterinarians would not become aware that the disease had entered the country as quickly as they would, had every animal been susceptible and showed signs of the disease.

There are also powerful economic pressures which act to discourage vaccination. For example, when FMD occurs in countries where vaccination is not practiced (such as Canada), countries must wait for three months after the last infected case (where stamping-out and serological surveillance are in place) before they can be considered FMD-free. If emergency vaccination is used, they must wait for three months after the slaughter of the last vaccinated animal. However, most industrialized countries, including the U.S., will not import livestock products from countries that practice FMD vaccination, even if these countries can prove that they do not have FMD.<sup>13</sup> To regain 'FMD free without vaccination' status, all vaccinated animals must be slaughtered or prove that the country has not had an outbreak of FMD for at least two years and has not vaccinated for at least 12 months.<sup>14</sup>

While, for the U.K. and North America, vaccination is considered the third line of defence, after prevention and slaughter, vaccination has been successfully employed in other countries in recent years. For example, in 1996, an emergency vaccination strategy (with slaughter of infected cases), eliminated outbreaks in Albania and Macedonia in twelve and three weeks, respectively.<sup>15</sup> In 1999, an outbreak of the type O virus which rapidly spread from Algeria to Tunisia and Morocco was controlled by emergency vaccination in cattle and small ruminants. The virus was controlled in less than six weeks.<sup>16</sup> It has been suggested that had a similar vaccination program been introduced in the U.K., the outbreak could have been controlled in three weeks.

Why wasn't vaccination used in the current outbreak in the U.K.? The answer, according to the Elm Research Centre<sup>17</sup> is primarily trade-related. If a country decides to vaccinate its herds or flocks, it loses its disease-free status and is unable to export its livestock. Once an animal is vaccinated, it develops antibodies to the virus, similar to antibodies arising in infected animals. Consequently, it is difficult to establish whether the animals have been vaccinated or infected. The non-vaccination policy currently in place throughout North America and Europe has the objective of creating a herd which is without evidence of antibodies to FMD virus.

Although there are at least five valid tests that distinguish between antibodies resulting from vaccination from those arising from infection, these tests are not internationally accepted. According to Elm Farm Research Centre, if the U.K. had vaccinated, exports would have been curtailed for a maximum of one year after the first case, given effective surveillance.<sup>18</sup> If the European Commission were to recognize the use of the post-vaccination surveillance system, FMD-free status could be rapidly regained by vaccinated herds without a need for culling, unless shown to be infected. This decision would completely change the economic arguments (effect on livestock trade) against vaccination.<sup>19</sup>

Some groups in the U.K. have spoken out against the slaughter policy. The Soil Association recommended that all livestock in the 1-3 km 'firebreak' zone (which are now being slaughtered) should be vaccinated, with only the livestock in infected herds and exceptionally 'at risk' farms slaughtered.<sup>20</sup> They argue that the mass cull has to stop for four reasons:<sup>21</sup>

1. There is no technical case for it—it did not work.
2. There is no economic case—the amount of money likely to be saved, even if the disease-free export status can be protected, pales into insignificance compared to the losses related to other economic activities in the countryside.
3. There is no moral case—killing vast numbers of perfectly healthy livestock for an economic motive is quite a different moral matter from the taking of animals' lives that we might eat.
4. A viable alternative strategy exists—vaccination, combined with the slaughter of infected animals only, has proved to be an effective method of control in other countries. Many organic farmers raise rare breeds of livestock; vaccination is the only way of ensuring their protection in FMD restricted areas.

The National Trust, Soil Association, Wildlife Trusts and many smaller organizations, including university departments, companies, research institutions and preservation groups, have set up a group called Farmers for Voluntary Vaccination.<sup>22</sup>

#### Alternative treatments/alternative views

Some groups in the U.K. argue that FMD should be accepted as endemic. For example, the Biodynamic Agricultural Association (BAA)<sup>23</sup> states that, from nature's point of view, FMD will continually recur until the underlying causes for its outbreak are addressed. Allowing FMD to become endemic in the U.K. would permit progress and raise the possibility of treating individual cases. According to the BAA, anecdotal evidence suggests that nursing animals through the disease builds up resistance and makes them immune to further infection. While organic or bio-dynamic practices cannot confer guaranteed immunity, efforts to encourage these practices alongside a recognition of the efficacy of alternative treatments, would go a long way toward rendering the current policy of wholesale slaughter unnecessary.

Various natural and homeopathic remedies have proven to be successful at preventing infection and/or treating the FMD virus. For example, the feet and mouth of infected animals can be washed with borax or a solution of salt and water. After the blisters burst, the feet of cattle can be treated with Stockholm tar. The Fulani, North African pastoralists, move cattle upwind of infected herds to prevent spread of FMD. They also occasionally move herds downwind in order to contract a mild case that would confer immunity. Aware that fluid from blisters on the tongue are infectious, the Fulani collect the fluid, dip a tree thorn in it and scratch the tongue of healthy animals to vaccinate.<sup>24</sup>

#### Underlying reasons for the mess

The massive slaughter in the U.K. in 2001 has triggered intense soul-searching and sometimes acrimonious debate. Commentators have questioned why a disease that is harmless to humans, and from which the vast majority of animals recover in a matter of weeks, has resulted in massive funeral pyres, and shut down the British countryside, crippling the tourist industry and arguably causing far more economic damage than that which it is supposed to prevent. According to Elm Farm Research Institute,<sup>25</sup> the value of lost sales from livestock and livestock products is estimated at about £310M. In contrast, it was estimated in March that lack of access to the countryside was costing Britain about £270M a week, and, if continued into April, this figure would rise to £410M a week! The slaughter policy has been criticized as “designed to preserve the myth of cheap food and protect the interests of an elite of large-scale farmers.”<sup>26</sup>

While the immediate cause of the current outbreak in the U.K. is thought to be imported feed or meat used for pigswill, many producers acknowledge that globalization may well be causing, or at least exacerbating, FMD problems. According to Digby Scott of the U.K. National Pig Association, “Supermarket greed and the drive for globalization at all costs has turned this country into a cesspit for the world’s cheapest meat and meat products.”<sup>27</sup> The export of FMD from U.K. to Europe may have been accomplished by illegal export of infected sheep.<sup>28</sup> In Italy, 55 FMD outbreaks in 1993 followed what are called “imports of cattle of obscure origin.”<sup>29</sup>

According to Vandana Shiva (a prominent environmental academic and activist), the obsession with export markets leads to a blindness to the welfare of both animals and farmers. Millions of livestock and hundreds of farmers are considered expendable in order to maintain the ‘vaccine free’ status of exports.

The issue of FMD is complex. It is undeniably true that, under present policy, Canada’s farmers, whether organic or not, would have no choice if an FMD outbreak were to occur here. Slaughter and the *cordon sanitaire* would be the order of the day. Regardless of the rigour of our preventive measures, there are those who think that it may be only dumb luck that we have escaped an outbreak thus far.

Surely now is the time to publicly scrutinize Canadian policy. There appear to be not only political and philosophical, but also technical grounds upon which to criticize the ‘stamping-out’ policy, and to suggest alternatives. Further public debate is required on this issue, before we, like the U.K., are facing a crisis.

#### BOX 1

##### Preventive action for Canadian farmers

If you farm in Canada: 8, 9, 10

- Prevent farm or ranch visits by those who have visited countries infected by FMD in the last two weeks. While humans are not susceptible to the disease, they can carry the virus on their bodies and belongings.
- If visitors must come to the farm (or if you are returning to your farm after visiting a country infected by FMD), take thorough sanitary precautions before arrival, including washing and disinfecting all personal effects and equipment. It is especially important to clean and disinfect footwear. To disinfect clothes, wash in hot water, or dry clean. To clean and disinfect footwear and other items, try these options:
  - A mixture of 50% water and 50% vinegar for 30 minutes
  - Sodium carbonate (washing soda), 100 grams per litre of water for 30 minutes
  - Citric acid powder (2 grams per litre of water) for 30 minutes

Canada's policy in the event of an FMD outbreak is, like the U.K. and U.S., to follow a 'stamping-out strategy.'<sup>11</sup> This involves:

- severely restricting movements in the vicinity of infected premises;
- slaughter and disposal of all susceptible species on premises confirmed to be infected (preferably by burial or burning) followed by cleaning and disinfection of the premises;
- monitoring movements of animals, animal products, people and substances capable of harbouring the virus on or off known infected premises since the estimated introduction of the FMD virus on the farm. Generally, a period of two weeks is thought to suffice.;
- issuing Infected Place Declarations for premises exposed to sources of infection or thought to be a possible source of infection; and
- pre-emptive slaughter of high-risk animals.

In addition, Canadian policy allows for emergency vaccination under highly restricted circumstances. If it is perceived that stamping-out alone is incapable of eliminating the presence of FMD, vaccination may be used as a supplement, to temporarily limit virus production and spread.

## BOX 2

### Sir Albert Howard on foot-and-mouth<sup>29</sup>

It may be instructive to consider the experiments of the organic pioneer, Sir Albert Howard, on foot-and-mouth disease. Sir Albert's prescription for healthy animals included suitable housing with fresh green fodder, silage, and grain, all produced from humus-rich soil. Also important were ample time for chewing the cud, for rest and for digestion, access to clean fresh water and a floor of beaten earth, which he considered much more restful than cement or brick floors. Sir Albert allowed the animals under his care to interact with cattle infected with foot-and-mouth over a period of many years in various locations in India, including grazing on common pasture with infected animals, without his animals ever becoming infected. Sir Albert's diagnosis: "Foot-and-mouth outbreaks are a sure sign of bad farming."

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