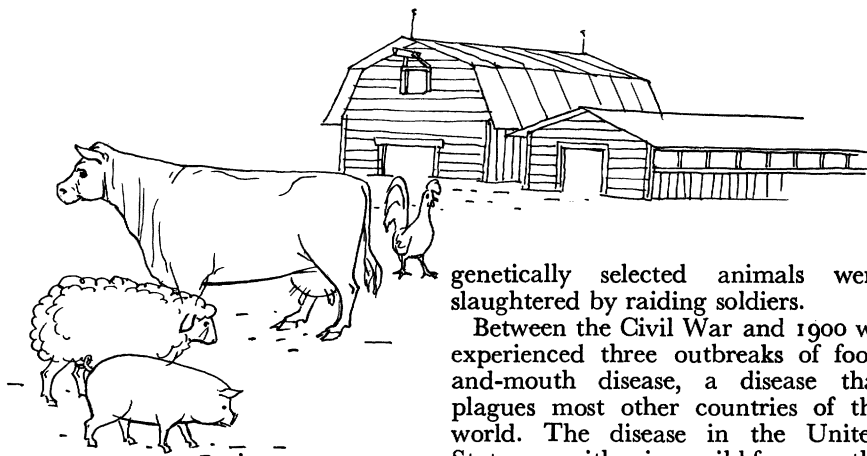


# LIVESTOCK HEALTH

F. J. MULHERN



genetically selected animals were slaughtered by raiding soldiers.

Between the Civil War and 1900 we experienced three outbreaks of foot-and-mouth disease, a disease that plagues most other countries of the world. The disease in the United States was either in a mild form, or the lack of movement of animals assisted in its eradication before it became very widespread.

During the Civil War, land-grant colleges came into being. They provided education for many farm-reared persons who previously had not even considered the possibility of education to assist them in their farming or ranching practices. The land-grant colleges also ultimately produced people who took the newer knowledge to the grass-roots within each county and tried to stimulate farmers to adopt new ideas on farming and livestock raising and recognize the need for prevention, control, and eradication of diseases.

Veterinary education—or formalized study of it—first began in this country on October 2, 1884, at the University of Pennsylvania. Land-grant colleges opened other schools of veterinary medicine, and private schools were started. These schools became the nucleus for developing a professional group that provided the scientific know-how to protect our livestock from disease.

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F. J. Mulhern is *Director*, Animal Health Division, Agricultural Research Service.

“OUR people together with the Indians had the last winter destroyed and kild up all our hoggs insomuch as of five or six hundred (as it is supposed) there was not above one sow that we can heare of left alive; not a henn nor a chick in the fort (and our horses and mares they had eaten with the first).”

This was a report made by Lord Delaware upon his arrival at the Virginia Colony in 1601. Fiske, the historian, reports that after the last basket of corn had been devoured, people lived for a while on roots and herbs and then turned to cannibalism.

GUARDING THE HEALTH of livestock in the early days was generally protecting against exposure and trying to give livestock an adequate diet. Knowledge about disease was so scant even in the human field that most treatments or prevention were rooted in quackery.

After repeated attempts to import and raise livestock, some basic species became established. Isolation helped prevent the spread of disease, and livestock continued to increase until the Civil War when some of the better

SHORTLY AFTER ESTABLISHMENT of the U.S. Department of Agriculture in 1862, the Department launched a national program to eradicate contagious pleuropneumonia. It did so because European countries had barred our animals because of the disease's existence in the United States. The program was successful. It was the first time a disease agent was eliminated from our country, truly a major accomplishment.

Vocational agriculture teachers came into being and gradually they succeeded in enrolling students from farms in their courses. Included in the courses were measures to protect livestock health.

Realizing that education must be applied to be of any use, the Extension Service was established to place educated men in each county with information on all phases of agriculture.

Down through the years vo-ag teachers and county agents increased, and they improved their contribution to the livestock industry and farming generally.

AFTER THE SUCCESS of the first eradication program, the Agriculture Department launched two major programs in the early 1900's.

First, Department researchers discovered that cattle tick fever (bovine piroplasmiasis) was spread by a tick (*Boophilus annulatus*). This was the first confirmed knowledge of how a disease could be spread in this manner and it later led to unraveling the mystery of how yellow fever and malaria were spread.

An eradication program eliminated the tick from the South. Until that time, all attempts to improve breeds of southern cattle by imports from outside were unsuccessful because they died shortly after arrival from the disease spread by ticks. The tick was eliminated from the United States in 1940. Occasional introductions have been promptly eliminated.

The second program was against sheep scabies that in advanced cases was reducing the production of wool

by 75 percent. The disease was becoming well established throughout our major sheep-producing areas and causing great havoc.

Foot-and-mouth disease struck the country six times after 1900. The 1914 outbreak spread to 22 States and the District of Columbia.

All these outbreaks were successfully eradicated.

These successful campaigns inspired State and Federal Governments to tackle other disease problems considered insurmountable at the time they occurred.

Another major step in protecting our food supply was establishment of a meat inspection system designed primarily to assure wholesome meat for consumers. Besides eliminating unwholesome meats from the food supply, meat inspectors assisted campaigns against communicable diseases of livestock. Inspectors were able to detect indications of infection at the time of slaughter, and to advise disease control officials who could investigate promptly and quarantine premises where needed.

Based on condemnation rates, the major disease in our cattle in 1917 was tuberculosis, with 200,000 carcasses withheld from markets each year because of it.

This disease was largely responsible for the human hunchbacks that existed at that time since the disease agent itself had an affinity for the human spine. Tuberculosis, or TB, could be transmitted through milk and from handlers of live or slaughtered animals, and was a major disease problem. In some counties more than 85 percent of cattle were infected.

Due to the successful efforts to eradicate diseases like contagious pleuropneumonia and foot-and-mouth disease, and the dramatic reduction in cattle tick fever, the Agriculture Department embarked in 1917 on a cattle tuberculosis eradication program. This program had great success, particularly in the early stages, and the incidence or number of cases found annually was reduced dramatically.

Besides the TB eradication program

for cattle, milk pasteurization was being initiated rapidly in a number of States. Pasteurization was eliminating spread of TB and many other diseases through contaminated milk.

WHEN THE GREAT DEPRESSION hit during the 1930's, the loss in individual income reduced demand for animal byproducts. Consequently, milk and dairy products in some cases were in oversupply, causing strong fluctuations in product prices and very low prices at livestock sales.

At the same time it was recognized that with the reduction of TB in our cattle, brucellosis or "Bang's disease" was the number one cattle disease problem in this country. Losses were estimated at \$100 million a year. This figure was based on the number of animals that had to be replaced because of sterility as a result of the disease, the reduced number of calves produced due to brucellosis-caused abortion, and the reduction of milk supply in animals affected with brucellosis. In addition, brucellosis was the cause of undulant fever in the human population.

Congressional interest in the total picture was responsible for developing a national eradication program. Congress felt the program would eradicate a major disease, in so doing eliminate some of the unsatisfactory dairy type cattle, and at the same time help provide a more satisfactory price for dairy cattle.

Because of the low price of dairy cattle and milk, many producers were leaving farms feeling that dairy income would continue to be substantially reduced.

A brucellosis eradication program was initiated in 1937. By the end of 1964 the losses had been reduced 75 percent a year below what they were before the program started. Incidence of the disease in humans has decreased accordingly.

FOOT-AND-MOUTH DISEASE (FMD) was introduced into Mexico in the late 1940's. Because of the threat of FMD

entering our own country, the United States decided to participate in an international cooperative effort to eliminate the disease in Mexico. It was believed that if the disease entered our country, it would cost at least \$100 million a year for vaccination alone to prevent epidemics. The disease was successfully eradicated in Mexico.

In 1952 vesicular exanthema (VE) broke out of California and spread to 41 other States before it was brought under control. Even though we previously had outbreaks of foot-and-mouth disease and trichinosis as a result of feeding uncooked garbage to swine, State and Federal Governments were not able to enforce a ban on uncooked feeding until this VE epidemic occurred.

As a result of the epidemic, laws were passed in all States requiring that garbage fed to hogs must be cooked first. This was a vital protective step against the introduction and spread of many diseases through garbage feeding. Since the incidence of trichinosis was much higher in swine fed raw garbage, cooking garbage before feeding it to swine helped protect our human population against this disease.

The outbreak in Mexico of foot-and-mouth disease and the spread of VE in the United States indicated the need for a well-established, well-understood animal disease defense organization. Such an organization has been established within each State. Periodic practice alerts keep the organization active and modifying its plan to changing times.

TODAY WE FIND a direct contrast between the circumstances that existed decades ago when isolation and restricted movements to markets provided a degree of protection to the livestock population from epidemics of disease. Now we find a multimillion livestock population in every species and daily movements of hundreds of thousands of livestock throughout the country in normal marketing practices.

Specially trained veterinary diagnosticians are strategically located to

investigate any suspicion of a foreign disease being introduced. They and their laboratory support work around the clock when an investigation is underway. For each working day last year, two investigations on the average were being made somewhere in this country.

IN RECENT YEARS some disease programs established originally as eradication programs were not really out to accomplish complete eradication. They were designed rather to reduce the disease to an insignificant level. When today's low incidence of some of these diseases is compared with the original incidence, the programs have certainly been worth while. However, the low incidence allows a source of infection that threatens the entire population. Besides it requires a continuous, costly expenditure to deal with the disease even at these low levels.

In the old days chronic diseases like brucellosis and tuberculosis were primarily dealt with on a premises-to-premises basis. Today we must investigate the complete epidemiology of the outbreak on the premises, the potential spread to other premises, and the contamination of facilities used, and why some diseases persist under certain circumstances.

In recent years specialists have been assigned to premises where the last remnants of a disease exist so it can be entirely eradicated.

These specialists identify areas blocking eradication. Research is then launched to find a solution.

It takes great skill to examine all the factors that may be responsible for perpetuating a disease and to identify the factors responsible. Yet this is being done more frequently as our proficiency in this area develops.

**THE RECORD** of livestock and poultry disease eradication in this country indicates the great effort underway.

Incidence of brucellosis has been reduced to less than 1 percent in the 107 million cattle population in over 87 percent of the counties in our coun-

try. We expect to reduce it to less than 1 percent of the cattle in all counties of the United States by 1968.

The United States is expected to be free of cattle brucellosis by 1972, and to be rid of swine brucellosis by 1975.

Since these species are the primary sources of brucellosis—or undulant fever—in people in the United States, the sources of infection for the human population will be eliminated. More than 44 million cattle are being screened or tested for brucellosis annually.

Cattle tuberculosis has been reduced to 0.08 of 1 percent. This is an extremely complex and chronic disease. At the present rate we will eliminate evidence of TB at the time of slaughter in our cattle population by 1994. Our efforts are directed at eliminating it even sooner. This requires tracing the origin of all outbreaks and the screening or testing of 9 million cattle annually.

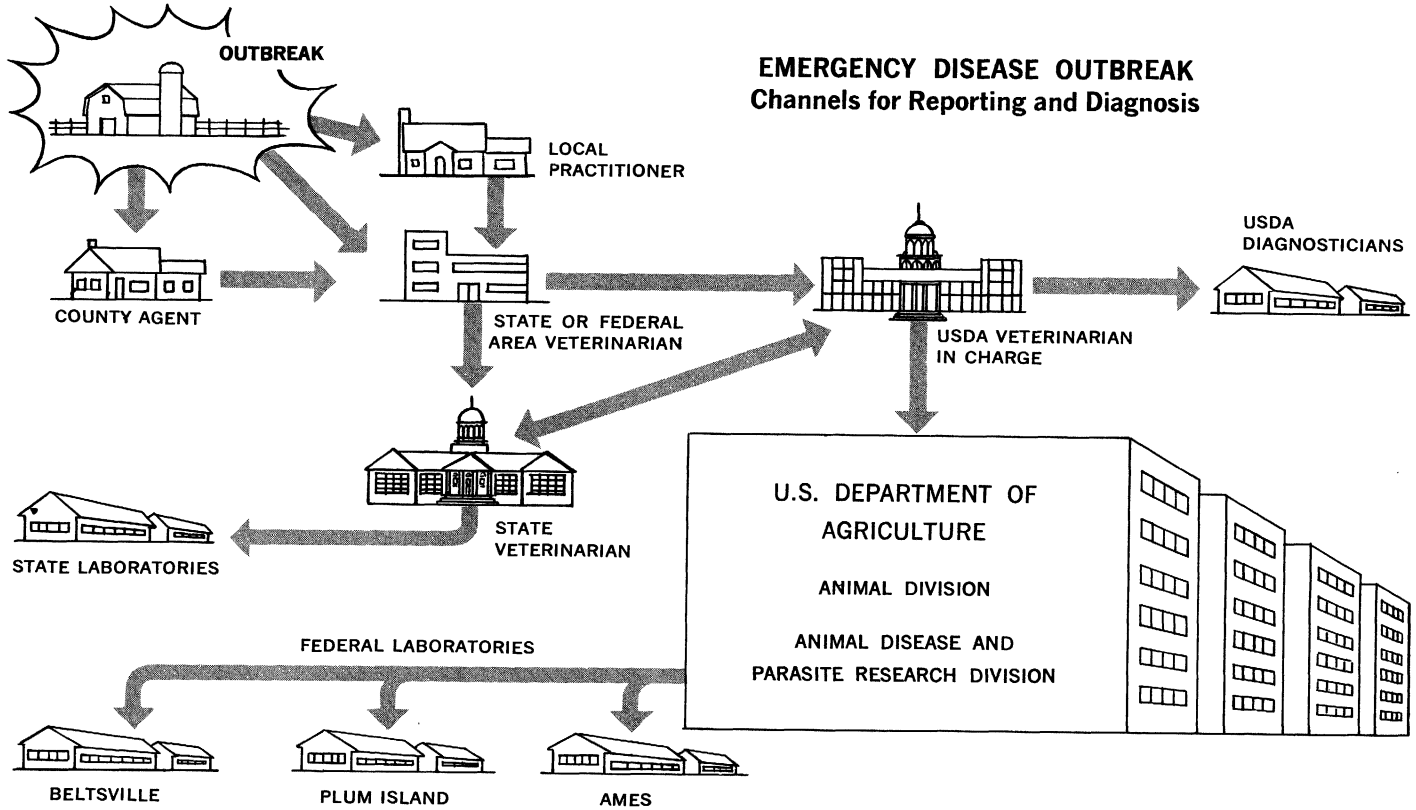
To free cattle of the devastating effects of the screw-worm fly, this country has produced and sterilized over 19½ billion flies. The result is eradication of the fly in the Southeast and most of the Southwest. It is an outstanding example of a peaceful use of atomic energy, and eradication of a pest without using pesticides.

Incidence of hog cholera has been reduced since the State-Federal eradication program began in February 1962, and it is expected that this disease will be eliminated by 1972.

**SCABIES IN SHEEP** is expected to be eradicated by 1968. Efforts are being made to inspect sheep throughout the country, concentrating on heavy infection areas in the Midwest. In the eradication campaign, over 21 million sheep are inspected annually, and more than 100,000 were dipped during the 1965 fiscal year.

Scrapie in sheep, which has an unusually long incubation period of 42 months, presents a different type of disease with more challenging aspects in its eradication. The objective is to prevent its spread within three breeds

# EMERGENCY DISEASE OUTBREAK Channels for Reporting and Diagnosis



of sheep in which it is known to exist, and prevent its spread to the other 18 breeds of sheep and the different goat breeds where it is not known to exist. This requires surveillance of 300,000 to a million sheep annually, and an extensive investigation covering all movements for the preceding 42 months once a lesion is observed.

All known cases of scrapie have been eliminated as they were found. Investigations to find new cases, research, and field studies are carried out simultaneously as we proceed to eradicate a disease with an unusually long incubation period and where the genes plus a transmissible agent appear to be involved.

PILOT STUDIES conducted on poultry diseases may provide a basis for dramatic elimination of these diseases in the future. Current studies are being conducted on air sacculitis, leukosis, causes for condemnations at time of slaughter, and a special project to raise chickens free of six highly contagious diseases.

Over 53 million animals are inspected annually at stockyards having Federal inspection in order to monitor the health on the 2.5 million premises where livestock are raised in this country. Any suspicious cases are reported to the State of origin and investigated. This inspection system provides a method of disease control during the marketing process.

Agriculture Department personnel have been sent to study the effects of radioactive fallout. These personnel are stationed throughout the country and have the responsibility of monitoring fallout that may occur on livestock from time to time. They provide an arm to our civil defense effort.

A SAYING GOES that if during the next 10 years the veterinary graduate of today doesn't have some means of continuing his education, he will be 50 percent as effective as a graduate of today that does. The practitioner of today and tomorrow will be advo-

cating preventive medicine and eradication of diseases that exist. The veterinarian provides professional skill at the grassroots level and is the first line of defense in guarding our livestock food supply. He has behind him the newer knowledge concerning disease and surgical techniques and treatment that develop daily as the result of millions of dollars spent on medical research.

Advances in treating and preventing diseases that affect our animal population would not exist without a progressive, energetic, highly competitive, and competent biologic and pharmaceutical industry.

This industry has met the challenge of producing the products needed to protect our animal populations. Its desire to produce a better product has been responsible for continuously giving us the most advanced or improved drugs or vaccines to combat or prevent disease.

As newer knowledge develops, professionals in allied fields have joined forces to pool this knowledge and apply techniques. Today the physician, veterinarian, entomologist, radiologist, statistician, chemist, virologist, pathologist, bacteriologist, and serologist may all be engaged in eradicating a livestock or poultry disease.

In summary, we have reviewed the development of our efforts to guard the health of our livestock and poultry from its humble beginnings. Today we can proudly say that this is one of the safest countries in which to raise livestock and poultry, so far as disease is concerned. And besides we have the most wholesome meat supply of any country in the world. The constant challenge facing all groups mentioned is to "Keep it that way."

If the President made an inventory of livestock today, as Lord Delaware did in 1601, he would report the following: A cattle industry worth over \$12 billion, a swine industry worth over \$1.5 billion, a \$3.4 billion poultry industry, a \$4 billion horse industry, a \$425 million sheep industry, and a \$28 million goat industry.