

# The U.S.D.A. Veterinarian and Public Health

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THIS discussion of the role of the veterinarian in agriculture in relation to public health is limited to the activities of veterinarians in the Department of Agriculture and for the most part, deals only with the work of those veterinarians who are in the Bureau of Animal Industry of the Department. The success of our work does, of course, depend greatly on the cooperation and the activities of veterinary colleges, experiment stations, state and city health departments, livestock sanitary officials, other scientists in the Department, other Federal agencies such as the Department of Defense, Public Health Service and Food and Drug Administration of the Federal Security Agency, and last but not least, the practitioner of veterinary medicine.

The need for veterinary service to control the disease of animals was recognized by Congress as early as 1879 and again in 1884 when the Bureau of Animal Industry was established for the purpose of stamping out pleuropneumonia and other contagious diseases of domestic animals.

As early as 1861 public health officials expressed concern over the relation of diseases of animals to the health of the human race and of the effect of diseases of animals on the supply of animal food for people living in cities. The cattle commissioners of New York in their report for 1869 stated:<sup>1</sup> "By the 8th of August 1868, it became apparent to the

Metropolitan Board of Health in New York City, that the alarming increase of obstinate and fatal diarrhea in the Metropolitan District was caused by the use of diseased meats. There were revealed to the commissioners such an amount of reckless barbarity toward animals and criminal indifferences to the public health on the part of many who furnished meat to consumers, that one almost wonders how the city has escaped a pestilence."

The work done by Bureau of Animal Industry veterinarians, which led to the recognition of the cattle fever tick, *Boophilus annulatus*, as the carrier of Texas fever, has gone down in medical and public health history as having far-reaching effects on the control of various other diseases of man and animals. The recognition of ticks as vectors in the spread of disease led to the discovery of the mode of transmission of such dreaded diseases as yellow fever, malaria, typhus fever, African sleeping sickness, Rocky Mountain spotted fever, nagana, bubonic plague, and others.

While the veterinarian in disease control activities is charged principally with protecting the health of livestock in this country, this work inevitably results in increased protection to the health of man through the reduction of the amount of disease in animals, in a marked increase in the number of animals available for food purposes and in controlling those diseases of animals which are transmissible to man. It necessarily follows, therefore, that no great distinction can or should be made between the work of the veterinarian engaged in livestock disease con-

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trol and the veterinarian whose interest is principally in the public health field.

Nearly 200 veterinarians are employed by the Poultry Inspection Service of the Production and Marketing Administration of the Department to inspect dressed poultry for wholesomeness. This service is on a voluntary basis with the poultry packer reimbursing the Department for the cost of furnishing the inspection service. During the fiscal year 1950, the Federal Poultry Inspection Service inspected a total of 393,484,761 pounds of poultry, of which over 390,000,000 pounds were inspected and certified for wholesomeness, and nearly 3,000,000 pounds were condemned as being unfit for human food. It is estimated that less than 10 percent of the poultry consumed in the United States receives inspection by the Federal Poultry Inspection Service.

The Federal laws which provide for the control and eradication of livestock diseases by the Bureau of Animal Industry refer both to "domestic animals" and "livestock." Because of this limitation, responsibility for the control of disease of dogs is handled by the U. S. Public Health Service of the Federal Security Agency and those of wild animals by the Fish and Wildlife Service of the Department of the Interior.

### **Tuberculosis**

The work of veterinarians in practically eliminating bovine tuberculosis has had a notable effect on the incidence of this disease in our human population. Reports from some European countries indicate that tuberculosis in cattle is found in as high as 30-50 percent of the cattle population, whereas in the United States, the incidence of this disease has been reduced to less than 0.2 of 1 percent. The largest number of reacting cattle ever found in the United States was 4.9 percent in 1918. During the past 10 years between 8 and 12 million cattle have been tuberculin tested each year.<sup>2</sup>

It is rare, indeed, to see an American child with a hunch back as a result of infection with bovine tuberculosis. Virtual eradication of this disease in cattle has nearly eliminated one very important

source of infection in children and of adults who might be exposed to the infection through direct contact or consumption of milk from tuberculous cattle.

Avian tuberculosis continues to be a problem but real progress has also been made in this field. Avian tuberculosis is readily transmitted from poultry to swine. It is estimated that 95 percent of all swine tuberculosis is due to the avian type of the disease. Under Federal meat inspection, retentions of swine on account of tuberculosis have, however, been reduced from 15.2 percent of hogs slaughtered in 1924, to 5.6 percent in 1949.<sup>2</sup> "Retentions" are those carcasses showing either slight or extensive lesions of tuberculosis for which condemnations are made of parts of carcasses or entire carcasses. This reduction in avian tuberculosis is due largely to educational work done by veterinarians who urged the destruction of all diseased birds and improved poultry husbandry practices whereby hens are kept for only one laying season. Very little avian tuberculosis is found in chickens under 1 year of age. When birds are retained beyond the first year of age for breeding purposes, an annual tuberculin test is recommended by the National Poultry Improvement Plan. All reactors should, of course, be removed from the flock and slaughtered.

Brucellosis is another disease of domestic animals readily transmitted to man. The importance of this disease is further emphasized when it is realized that eradication of the disease from domestic animals would eliminate the only source of infection to man.

### **Quarantine**

Laws have been passed<sup>3</sup> which provide for the quarantine of diseased animals to prevent the spread of disease. This control has been more effective than with our human population. For example, a person with tuberculosis in the transmissible stage may travel from New York to California, eating in the dining car, visiting in the club car and sleeping in the same bed which will be used by someone else the next night, all of this without being followed by adequate cleaning and

disinfection. If however, a tuberculous cow were to travel from one state to another, she would be in strict quarantine and the car in which she traveled would be thoroughly cleaned and disinfected under the supervision of a Department of Agriculture veterinarian or his assistant. The control which veterinarians have over the movement of diseased livestock probably accounts in great part for the success we have had in controlling animal diseases. Animals which move from state to state are inspected to assure freedom from communicable diseases. In cooperation with the Veterinary Livestock Services of the various states, very effective procedures have been established to prevent the spread of diseases of animals.

Animals brought into this country from foreign countries, in addition to being accompanied by health certificates, are given a rigid inspection and those from most countries of the world are required to remain in quarantine until such time as we have assurance that no communicable diseases are being carried by the animals. On a recent shipment of camels from Egypt which were intended for distribution to 20 zoological parks in this country, ticks were found which are known to be carriers of East Coast fever and other diseases transmissible to man. These ticks, non-existent in North America, were destroyed at the port of entry before the camels were released from quarantine.

### Breaking the Cycle

Internal and external parasites of animals cause great economic losses. Department of Agriculture veterinarians are constantly on the alert to detect those parasites which are known to effect our livestock economy seriously. Some of these parasites, notably the cystic form of the tapeworms of man, *Taenia solium*, and *Taenia saginata*, are frequently found in the muscles of hogs and cattle respectively. Breaking the cycle from man to animal, and animal to man, leads to effective control of this parasite in man. Erysipeloid infection in man is caused by the same organisms that cause erysipelas in hogs. Vaccines have been pre-

pared and are permitted to be used under licenses to control this serious disease of hogs.

### Foreign Restrictions

As early as 1879<sup>1</sup> certain foreign countries began to place restrictions on the entry of animals and meat from the United States. That year Great Britain put into effect a restriction that American cattle be slaughtered within 10 days upon the docks where they were landed and Italy and Austria-Hungary prohibited the importation of American pork alleging the presence of trichinae. In the years that followed, several other countries joined in placing restrictions on the importation of American meat. In order to meet the objections of these countries, Congress enacted the first meat inspection legislation which was approved August 30, 1890.<sup>1</sup> This legislation provided for the inspection of salted pork and bacon intended for export and the inspection of export cattle, sheep, swine, and other ruminants. Since this law did not provide for the post mortem inspection of meat animals, it was not acceptable to several foreign countries, and the law of March 3, 1891<sup>1</sup> was enacted which provided also for post mortem inspection.

The laws of 1890 and 1891 afforded little protection to the American meat consuming public. As the result of a great public clamor for protection against the appalling conditions reported to exist in meat packing plants, President Theodore Roosevelt directed a thorough investigation of conditions in the meat packing industry. This was followed by passage of the Meat Inspection Act of 1906<sup>4</sup> which provided that all meat and meat food products for sale in interstate or foreign commerce must be prepared in establishments inspected by inspectors appointed for that purpose. This law authorized the Secretary of Agriculture to have all animals examined and inspected before being sent to slaughter as well as providing for a thorough post mortem inspection of all animals which had been passed on ante mortem inspection. This law also provided for sanitary controls and for examinations which would assure the sale of

only such meat as is clean, sound, wholesome, free from adulteration, and truthfully labeled.

The Federal control does not extend to meat packing plants that confine their sales to the state in which the product is prepared. During the last fiscal year,<sup>5</sup> however, over 77 percent of all cattle, calves, sheep, and swine slaughtered commercially were under the supervision of the Federal Meat Inspection Service. Some of the 23 percent of animals slaughtered commercially, but not under Federal inspection, do receive ante mortem and post mortem inspection by veterinarians, but there are still many sections of our country where there is no inspection whatsoever or the inspection is inadequate. This constitutes a real challenge to public health officials and those officials concerned with the health of animals.

### Condemnations

A review of the annual report of the Federal Meat Inspection Service reveals the wide range of conditions which may cause meat to be unfit for human food. Many of the conditions found would be unnoticed by the untrained person. Time will not permit mention of all of these conditions but some of the outstanding observations are worthy of mention. During the past year,<sup>5</sup> over 300,000 animals were condemned in their entirety as being totally unfit for human food. Among the degenerative and dropsical conditions observed, emaciation causes the condemnation of thousands of carcasses each year. The conditions causing the largest number of condemnations are pleurisy and pneumonia. For reporting purposes, these conditions are not separated. Over 63,000 animals were condemned last year on post mortem inspection for pleurisy or pneumonia. Malignant neoplasms also cause a large number of condemnations, particularly in cattle. Over 7,000 cattle carcasses were condemned on post mortem inspection because of malignant neoplasms. Nearly 2,000,000 parts of carcasses such as heads, hams, and shoulders were condemned during the year because of conditions which would make them unfit for human food. Over 1,600,000

cattle and calf livers were condemned and destroyed. In addition to this product, several million hog and sheep livers were also condemned.

When carcasses or parts of carcasses are condemned for being unfit for human food, they are destroyed for food purposes. This is usually accomplished by thorough cooking in specially separated inedible product rooms and the cooked product decharacterized. The condemned material may be incinerated or thoroughly slashed and decharacterized with such materials as crude carbolic acid. The destruction of such diseased materials is assurance that the disease organisms have come to the end of the road and will not be spread to man or other animals.

### Trichinosis

The existence of trichinae in pork has long been recognized. Sensational and exaggerated reports concerning the extent of trichinosis in the United States in the late 19th century served to limit the acceptance of our pork in foreign countries. From 1890 to 1906 trichinoscope examinations were made of pork prepared for export. Because a negative finding could not be accepted as assuring freedom from trichinae, this system of inspection has not been used since that time. Such products as fresh unsmoked sausage containing pork muscle tissue and other products, such as ham and bacon which are well cooked in the home or elsewhere before being served, are not required to be treated to destroy possible live trichinae. All products containing pork muscle tissue including pork hearts and pork livers, which are of a kind which may be eaten without further cooking are required to be treated by one of the methods which are known to destroy any possible live trichinae. Pork cuts, such as hams and pork shoulder picnics which are subjected to heating at sufficiently high temperature to impart a partially cooked appearance to the meat and such products as bologna and frankfurters fall in the category of products which are made safe. While heating to at least 137°F. is the most commonly

accepted method used for making the pork safe, many pork products are made safe by freezing the pork at definitely prescribed temperatures and for periods of time which are known to make the produce safe. The minimum time and temperature accepted is 5°F. for 20 days.<sup>4</sup> For such products as dry sausage and certain types of pork cuts, such as capocollo and certain dry cure hams and loins processes including curing and drying, have been established which will also kill any possible live trichinae. The methods which have been prescribed in the Federal meat inspection regulations have been carefully checked and are rigidly enforced in establishments operating under the inspection. The incidence of trichinosis in pork is very slight in those areas where uncooked garbage is not fed.

Under the system of education found in the United States, the veterinarian is the only one trained and qualified to judge the health of animals. Since the beginning of Federal meat inspection in the United States, the inspection in slaughtering establishments has been done by veterinarians often assisted by specially trained meat inspectors.

Poorly nourished, parasitized or diseased herds and flocks produce little acceptable meat, milk or eggs. The veterinarian engaged in disease control activities must remain alert to preventing the entrance of new or foreign diseases into this country and to control or eradicate those diseases which are a threat to our livestock economy. The removal of diseased or otherwise unfit meat animals and poultry from our food supply ties in with the animal disease control program, and by the combined efforts of these veterinary groups the public is assured of a continued ample supply of meat, milk, eggs, and poultry from healthy animals and birds.

#### References

1. Houck, U. G.; The Bureau of Animal Industry of the United States Department of Agriculture, Its Establishment, Achievements, and Current Activities (1924); pages 27, 10, 255.
2. Report of the Chief of the Bureau of Animal Industry, Agricultural Research Administration, 1949; pages 88 and 89.

3. BAI Order 309—Regulations Governing Interstate Movement of Livestock.
4. Regulations Governing the Meat Inspection of the United States Department of Agriculture (1947); pages 162 and 94.
5. Summary of Activities, Meat Inspection Service, Fiscal Year 1950.

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## Brucella Vaccine

Continuing research with the lyophilized or dried form of *Brucella abortus* strain 19 vaccine has shown conclusively that the vaccine is able to withstand temperatures up to 100°F. for at least six weeks and more moderate temperatures for months. Because of its resistance to the injurious effect of higher temperatures, it is possible to use lyophilized *Brucella abortus* vaccine almost anywhere in the world, and Brucella immunization programs for cattle can be carried on in areas where they were previously considered to be impractical.

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Before the days of veterinarians animals that were "stupid" or had staggers were treated by repeating a charm three times, once while in front of, and while on each side of the animal, all the while stroking its back:

The incantation began: "Blood, forget thy motion," and ended with three mysterious words, supposed to replace the unmentionable names of God, such as "Ofano, Oblamo, Ospergo."

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The fan mail Fala received while Roosevelt was President is now preserved at the Hyde Park Memorial.

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A 2½-year-old male canary which had never emitted more than a feeble chirp a week, was administered 0.1 cc. doses of a testosterone propionate solution containing 10 mg. per cc. A 1 cc. tuberculin syringe equipped with a 26 gauge needle was used and injections were made subcutaneously in the breast region. After 5 injections, the bird began to sing in clear, loud, vigorous tones and has been doing so with normal intervals of rest ever since (3 weeks).