

# VETERINARY PUBLIC HEALTH IN ARIZONA AND ALONG THE INTERNATIONAL BORDER

By Dr. OSCAR SUSSMAN

*Veterinary Public Health Consultant, Arizona State  
Department of Health*

In Arizona the Veterinary Public Health Section, as a part of the Preventable Disease Program, investigates all types of animal diseases transmissible to man. This involves the cooperation of the private practicing physicians and veterinarians who come in daily contact with disease conditions of individuals humans and animals. It is through the cooperation of men such as these that diseases of unknown origin and spread can perhaps be minimized.

There are a variety of new diseases, and some as ancient as history, that are transmissible from animals to man and from man to animals. These diseases are looked upon with interest and concern by The State Department of Health in Arizona.

Knowing that the terrain and weather conditions of Mexico, Arizona, New Mexico, California and Texas do not vary a great deal at our border approaches, it would seem that the problems of such disease control should be of mutual interest.

It is my intention to briefly review the work done on some of the problems as they exist in Arizona, noting the recommendation made toward the control of such animal and man diseases.

*Rabies*, a disease that affects all warm blooded animals, is transmissible to man by means of the bite of an infected animal. Last year there were 56 known cases of rabies in animals in Arizona, including dogs, cats, cattle, coyotes, and even one sheep. Nine of our fourteen counties were involved.

Rabies can be eradicated if all pets in endemic areas are vaccinated against rabies annually, and all stray animals (dogs and cats) are eliminated or impounded, eradication can be accomplished. We ask that in the event of a bite by a suspected rabid animal, it not be immediately killed. We suggest the animal be confined and further information be obtained from the local health department. Suspicious animals should be confined, not killed, for the purposes of observation by a competent veterinarian trained to know what to look for clinically. The diagnosis of rabies is possible in our laboratory only after the disease has progressed sufficiently to cause the appearance of *negri* bodies, a diagnostic landmark in the brain. We hope to obtain facilities for the mouse inoculation of *Negri-Negative* heads, as we know 10 to 12 per cent of Rabid Animals are *Negri-Negative*. Our Physicians advise human vaccination on the basis of the clinical history of the biting animal, the

laboratory diagnosis, and the extent of the bite. People bitten are told to consult their physician immediately, as we all know that the proper treatment of the wound is a great aid in all cases. The doctor obtains all the information possible and reports the case of dog bite to his local health department or directly to the State if no local unit is available.

It is important to know that a change in attitude of a family pet, even to being over affectionate, is just as important as increased viciousness, in the event of suspicion of rabies. We try to impress on pet owners that it is their personal duty, as animal lovers, to make sure that their own pet does not get rabies. Vaccination and the elimination of strays are the main points along this path. Additional facilities for impounding stray animals are needed in many communities.

Our department is in close contact with the Arizona and the United States Fish and Wildlife Service in furthering attempts to eradicate this disease from the wildlife. A continuous exchange of information has been arranged and the method of control agreed upon.

Rabies cannot be handled on the basis of state or national boundary lines. An infected animal does not stop when he gets to the Texas California or Mexican border. We feel it is our duty to eliminate rabies in Arizona. Our state law calls for: (1) Vaccination of all dogs. Our law is weak here, as it does not require that cats be vaccinated, and 5 of our 56 cases were in domestic cats; (2) Licensing of all dogs; (3) Elimination of strays.

Another animal disease transmissible to man, *Bovine Tuberculosis*, was at one time rampant in the United States. Case histories of bone tuberculosis in humans revealed that most of them were caused by the bovine type of tuberculosis. Many of you probably recall the not too distant past when hunchbacks and crippled children roamed the streets due to this diseased condition. Today, due to the practical eradication of tuberculosis in cattle, the sights so commonly seen are fast disappearing. Control of bovine tuberculosis was possible only through the whole-hearted cooperation of all concerned. It has resulted in what was thought to be the practical elimination of a once dread disease of cattle transmissible to man. However, due to the war and the shortage of Veterinary personnel to retest animals, Arizona has had 25% increase (1947) and United States a 14% increase (1946). The necessity of annual testing of cattle is essential in milk control work. One-third, or more, of our children in the State Crippled Children's Hospital have tuberculosis of the bone and joint. The Tuberculosis program must still be intensified.

A short while ago our department became interested in Brucellosis in man and animals in Arizona. Brucellosis is a contagious disease caused by an organism that goes by a variety of names and forms as: Undulant Fever, Malta Fever, Goat Herder's Disease and Bangs Disease.

In animals the disease results in many instances in abortion and resultant loss of calf crop, plus a loss in the general milk production of the diseased animals. It is diagnosed by the isolation of the bacteria itself or by means of a serum agglutination test of the animal's blood. In our survey results we found that: (1) like other states, there was some Brucellosis in cattle in Arizona; (2) like other states, there was some Brucellosis in man; (3) and most important, like other states, the transmission of this disease could be limited if certain control measures were put into effect.

A program was suggested calling for the sale of raw milk only from *Brucella* free animals and the controlled sale of infected animals. We realized that contact with diseased animals was important and knew that only elimination of the disease in animals would remove the cases of human Brucellosis due to contact. However, until elimination of the disease could be obtained in animals, good public health practice required our department to insist on the protection of the consumer of raw milk and the buyer of milk cattle for home use and his neighbor's.

We tell our employers, the citizens of Arizona, the following, when they ask about milk and Undulant Fever, "Properly pasteurized milk, whether it be home or commercially pasteurized, is safe. We know of no organism dangerous to humans that can live through the process of pasteurization. We know of no cases of Brucellosis ever traced to properly pasteurized milk. Raw milk is not safe unless you are certain the cattle are free of disease. If in doubt, insist on pasteurization for your health's sake."

*Foot and Mouth Disease*, with which you have recently become increasingly familiar, is a virus disease affecting all cloven hoofed animals such as cattle, sheep, hogs and goats. Our department has been asked—does it affect man? The present strain in Mexico has resulted in 5 cases diagnosed by laboratory procedures and approximately 200 cases clinically with proximity to cattle in all cases. I leave foot and mouth disease with this brief mention, as I understand Dr. Figueroa and Dr. James Steele, of the U.S.P.H.S. Communicable Disease Center, will cover this material in detail.

*Mastitis* in cattle, a streptococcus or staphylococcus infection of the udder, is another disease transmissible to man and may result in septic sore throat and in some instances a thermostabile toxin that may produce a type of enteritis. We acknowledge the problem exists in Arizona; our State Veterinarian and Health Department are viewing it from an economic and public health standpoint.

*Anthrax* is a disease caused by a bacillus that is common to animals such as sheep, cattle, hogs and man. Humans usually get this disease from handling diseased dead animals on the farm or the hides and hair in factories. Several cases have recently been reported from the New

England states. Our physicians are on the alert for such infections and call on our department for epidemiological investigations.

*Glanders*, a disease now practically wiped out in the horses of our country, also affects man. With the constant quick movement of animals in our present way of life, diseases we once were free of may be set loose on our susceptible animal and human populations. Constant vigilance is necessary. A non-immune population is in more danger from a virulent-contagious disease than a population, be it human or animal, that has learned to live with the disease.

*Bubonic plague* is a disease present in wild rodents and transmitted to humans by means of a flea bite. Small areas of such infected rodent population have been found in Arizona and eleven other western states. This is not said to alarm you but to indicate the extent and scope of the watchfulness that must be observed in all health activities. Our State Health Department in cooperation with the United States Public Health Service observes such animal carriers of human disease and keeps a weather eye open for possibility of transmission and outbreaks.

Recent investigations have proven that many cases of food poisoning can be traced to organisms of the *Salmonella* group. These organisms have been found on the eggs of diseased chickens and in the flesh of diseased birds and other animals. We intend to pursue this one factor of dysentery further in our state and to determine control procedures, that would be possible in line with our results.

I have often been asked the question—do humans ever cause animals much trouble in the way of disease transmission? I should like to relate one rather humorous occasion of a Veterinarian in practice who attended to the ills of "Foo Foo", a Pekingese, owned by a lady who could not understand where her dog could continually be picking up supposedly new cases of mange. Her Veterinarian would cure the little fellow, that is "Foo Foo", and in a few weeks he would be scratching again. The client was provoked, and the Veterinarian, disconcerted until he finally hit on the idea of asking the lady to have the skin of her nose checked by her physician for mange mites, the cause of the disease in the dog. The client was indignant, but scientifically inclined and also endeared to her "Foo Foo". The results were not startling, but did prove that, although the lady was experiencing no discomfort, the skin of her nose was harboring the infective agent of her "Foo Foo's" illness.

Not all such man to animal stories of veterinary public health in reverse are that humorous or as inconsequential. We are presently continuing the investigation of the transmission of beef tapeworm in cattle to man in cooperation with Mr. George Marx, Director of our Sanitary Engineering Division. Mr. Marx became interested in this problem on noticing that many of the cattle in one area of Arizona, where sewage waste ran into the fields, were highly infected with en-

cysted stage of this tapeworm. Preliminary results of our fecal sample survey on one farm, from which 10% of the cattle were infected, showed 284 negative fecal samples for ova, and 4 positives in human workers: an irrigation foreman, his daughter and two cowboys. We will watch with interest the results of finding these carriers, and hope to obtain within two years a negative factor for the percentage of such cyst-infested cattle from this ranch.

In addition we surveyed 134 Indians of different tribes and found 11 carriers of tapeworms. This survey is incomplete and inconclusive, but it does indicate action is needed. Cyst-infected or "Measly beef" is both economically a loss to the cattle raiser and a public health hazard to all raw steak and rare hamburger addicts. We know that one man harboring this tapeworm liberates thousands of eggs daily in his excreta, and if this excreta is not properly disposed of these eggs may be washed by streams and irrigation ditches to many cattle, thus infecting them. Humans eating the cysts of infected meat may then become harborers of this tapeworm, unless the meat has been thoroughly cooked or previously inspected. It is a vicious cycle which may be broken and corrected by proper sanitary facilities and the searching out and treatment of infected humans. Here also enters another branch of veterinary public health, the inspection of such meat by a veterinarian trained to detect the diseased conditions of meat animals that are known to be transmissible to man. This inspector eliminates diseased carcasses and has proper treatment made of those fit to eat by various methods of freezing and sterilizing to destroy parasites and bacteria.

There are a number of other diseases transmissible from animals to man, which I will just briefly mention: Psittacosis and Ornithosis of parrots, paraquets, chickens and other birds; *Equine encephalomyelitis* or sleeping sickness, of horses and wild birds; *leptospirosis* in dogs. *Equine infectious anemia*, or swamp fever of horses; *Trichinosis* of hogs, which is transmissible to man through the eating of insufficiently cooked pork products. In this connection, it is wise to remember the phrase, "cook pork thoroughly"; *Tularemia* in rabbits; *Swine erysipelas* (*Erysipelothrix rhusiopathiae*), or diamond skin disease, of hogs; Tapeworms, of dogs, cats and swine all may affect man; *Creeping eruption*, a disease of man, found in the southern portion of the United States, has been connected with a stage in the life cycle of hookworm of dogs and cats; *Actinomycoses*, or "lumpy jaw", affects both cattle and man and is usually contracted by direct contact. *Coccidioidomycosis*, or valley fever, affects both cattle and man in certain areas of Arizona, Texas and California; *Rocky Mountain Spotted Fever*; "Q" Fever, is a disease caused by *Rickettsia burnetti*. The California State Department of Health and the United States Public Health Service have been doing considerable work on this problem in Los Angeles, California, and a rather

interesting summary of the work done there may be found in United States Public Health reports of February 13, 1948, by Drs. Huebner, Jellison and Beck. They found 10 to 20% of raw milk had the organism present.

In Arizona we have definitely had two human cases of "Q" diagnosed both clinically and by means of laboratory diagnostic procedures. We have had positive complement fixation tests on two cows and three dogs. Our department is cooperating with the National Institute of Health in Washington, the "Q" Fever laboratory in California and the Rocky Mountain Spotted Fever Laboratory in Montana. At present we are waiting for the results of: (1) Samples of raw milk, from our milk supply, that had been guinea pig inoculated; (2) Guinea Pig inoculations of tick specimens collected locally; (3) Dog blood specimens for inoculation, from what appears to be in canines, a disease that is not distemper and may bear watching insofar as Rickettsial and virus infection is concerned.

The methods by which transmission of animal diseases to man may commonly occur, are: (1) Direct contact with infected secretions and excretions of infected animals. This may occur post-mortem and ante-mortem. As dog bites—handling anthrax carcasses—slaughter houses; (2) Ingestion of raw milk and infected meat and eggs not sufficiently cooked to kill all pathogens and parasite forms; (3) Intermediate vectors, and hosts, such as arthropods, lice and ticks, and also by means of mechanical carriers as flies.

I hope you now see veterinary public health as a wide field of endeavor calling on a variety of allied professions to make life safer and healthier, both for animals and man. There is a definite place and need for a liaison agent between the private practicing physicians and veterinarians, the livestock industry and the health departments. A Veterinary Public Health Consultant on the State Department of Health level may fill this need and keep contact with these allied professions to make life safer and healthier for all.

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#### SANIDAD VETERINARIA EN ARIZONA Y A LO LARGO DE LA FRONTERA (*Sumario*)

Se presenta un resumen de las actividades realizadas por la Sección de Sanidad Veterinaria del Estado de Arizona con respecto al control de ciertas enfermedades transmisibles de animales al hombre y *vice versa*. Debido a la similitud de la topografía y condiciones climatológicas en México, Arizona, Nuevo México, California y Texas, a lo largo de la frontera, es natural que los problemas del control de tales enfermedades se consideren como de interés común.

*Rabia:* En 1947 se registraron en Arizona 56 casos de rabia, en perros, gatos, ganado vacuno, coyotes, y en una oveja, distribuidos entre nueve de los catorce condados que forman el Estado. Como medidas de control, se recomienda la vacunación anual de los animales domésticos en las zonas endémicas, y la eliminación o encerramiento de los animales sin dueño, manteniéndose bajo observación por veterinarios competentes a los animales sospechosos. En sus

esfuerzos para controlar la rabia entre la fauna silvestre, la Sección de Sanidad Veterinaria trabaja en estrecha colaboración con los Servicios de Caza y Pesca del Gobierno Federal, y con la del mismo Estado de Arizona. *Tuberculosis bovina*: Esta enfermedad había prácticamente desaparecido en todo el país, pero debido a la Segunda Guerra Mundial y la consiguiente escasez de veterinarios, se observó un aumento de 25% en el Estado de Arizona en 1947. *Brucelosis*. En una encuesta llevada a cabo en el Estado, se encontró que la brucelosis existe en los animales y en el hombre, sugiriéndose un programa para controlar la venta de animales infectados y de la leche cruda proveniente de ellos. *Fiebre aftosa*: La cepa de esta enfermedad en México ha sido aislada de 5 casos diagnosticados por métodos de laboratorio, y reconocida clínicamente en 200 casos, existiendo en todos el factor de proximidad al ganado. *Mastitis*: La mastitis en el ganado es causada por infección estreptocócica o estafilocócica de la ubre. Siendo transmisible al hombre, se puede manifestar como garganta séptica, resultando en algunos casos en la formación de una toxina termoestable capaz de producir una forma de enteritis. Este problema existe en Arizona, y los Departamentos de Veterinaria y de Salubridad Pública lo estudian desde los puntos de vista económico y sanitario. *Carbunco*: Se mantiene una vigilancia cuidadosa contra esta infección, ya que se han comunicado varios casos humanos en los Estados de Nueva Inglaterra. *Muermo*: Prácticamente eliminado en los caballos de los Estados Unidos. *Peste bubónica*: Existen en Arizona y en once estados más del Oeste, pequeñas zonas con población roedora infectada, lo que hace necesaria una vigilancia sobre los animales portadores. *Salmonelas*: Se han encontrado microorganismos del grupo *Salmonella* en los huevos de gallina y en la carne de aves y otros animales. Este factor de las disenterías será investigado más detenidamente, a fin de poner en práctica métodos de control adecuados. *Parasitosis*: Se continúan las investigaciones sobre la transmisión de *T. saginata* (hombre-ganado-hombre). Este problema se suscitó al observarse un alto índice de parasitación en una parte de Arizona donde las aguas servidas inundaban los pastos. En el examen de muestras fecales en una granja donde el 10% del ganado se hallaba parasitado se obtuvieron 284 muestras negativas y 4 positivas para huevos, en trabajadores humanos. Además se realizó un estudio entre 134 indios de diferentes tribus, 11 de los cuales resultaron ser portadores de tenias. Esta encuesta es parcial y no pueden hacerse conclusiones, pero indica la necesidad de acción, pues el ganado infectado representa una pérdida económica para el ganadero y un riesgo para la salud de aquellas personas adictas a la carne cruda o mal cocida. El ciclo de transmisión puede ser interrumpido y controlado disponiendo de facilidades sanitarias apropiadas y mediante la búsqueda y tratamiento de personas infectadas, recomendándose además la debida inspección veterinaria del ganado para reconocer oportunamente posibles infecciones transmisibles al hombre.

Otras zoonosis transmisibles al hombre son: psitacosis y ornitosis, de los loros, gallinas y otras aves; encéfalomiелitis equina, de los caballos y las aves silvestres; leptospirosis, en los perros; anemia infecciosa de los caballos; triquinosis y erisipela (*Erysipelothrix rhusiopathiae*), en los cerdos; tenias, entre los perros, gatos y cerdos; turalemia; *larva migrans*; actinomycosis; coccidioidomycosis; fiebre de las Montañas Rocosas, y fiebre "Q". En relación con esta última, causada por *Rickettsia burnetti*, se han encontrado en Arizona dos casos humanos y cinco en animales, dos vacas y tres perros, comprobados por fijación de complemento. El Departamento de Salubridad de California, en colaboración con el Instituto Nacional de Higiene y sus laboratorios de fiebre "Q" y de fiebre de las Montañas Rocosas, en Los Angeles y Hamilton, Montana, respectivamente, ha venido realizando extensas investigaciones sobre esta rickettsiasis, esperándose con gran interés el resultado de las experiencias.