BRUCELLOSIS CONTROL IN OREGON

By O. H. Muth, D.V.M., M.S.

Department of Veterinary Medicine, Agricultural Experiment Station, Oregon State College, Corvallis, Oregon

Brucellosis is of grave concern to all those interested in public health. The inception of brucellosis control in Oregon, however, was originally based on the economics involved in dairy production. While the public health aspect of the disease has given impetus to the control program, the livestock industry of this state is still aware of its economic importance. Like many other states, Oregon is spending more money annually on the control of brucellosis than any other disease affecting livestock.

Oregon does not produce swine in numbers comparable to some other sections of the United States. Brucellosis is occasionally found in these animals, mostly in purebred stock recently imported from other states. Because of the small numbers of hogs produced and the self-limiting nature of the disease, it has not been considered a major problem.

While hair goats are raised in considerable numbers and a few thousand milk goats are also kept, the testing of a considerable sample of these animals has revealed no reactors.

Cattle constitute the chief reservoir of infection; there are about one million cattle in the state. Of this million about 250,000 are milk cows two years or over in age and about 300,000 are beef cows two years or older. Approximately 70 per cent of the dairy cattle are in the area west of the Cascade Mountains, and approximately 90 per cent of the beef cattle are east of that range. In other words, the Cascade Mountains roughly divide the dairy and beef producing area.

Since cattle constitute the chief reservoir of infection, control efforts have been directed largely toward the elimination of the infection in this species. This paper deals with that problem.

Investigations begun at the Oregon Agricultural Experiment Station (1918–1920) resulted in the following conclusions:

1. Infected milk may be fed to young heifers with very little danger of their becoming infected.
2. There is very little danger of spreading the disease by breeding negative females to negative bulls that have served positive females.
3. There is very little danger of spreading the disease through pen exposure of unbred heifers.
4. The common and most serious method of spread of the disease is through pen exposure of pregnant animals.

*Presented at the Second Inter-American Congress on Brucellosis, held in Buenos Aires, Argentina on November 17-26, 1948. Published as Technical Paper No. 550 with the approval of the Director of the Oregon Agricultural Experiment Station. Contribution of the Department of Veterinary Medicine.
5. It is very probable that an infectious abortion-free herd can be built up from an infected herd by adopting management methods that will prevent exposure of any females after they have reached sexual maturity.

6. The disease is not self-eliminating in dairy herds handled according to the management methods usually adopted in the Willamette Valley.

Armed with these basic findings and the blood agglutination test as a method of diagnosis, the next procedure was to attack the problem in the field. This end was accomplished through the cooperation of herd owners who were willing to try a method of eliminating the disease from their herds.

Based on an educational program and testing and elimination of reactors, this project proved very satisfactory and was recognized by the Oregon State Department of Agriculture in 1929 to the extent that it granted accreditation to those herd owners who succeeded in removing the infection from their herds.

The program became popular among herd owners. To secure a greater degree of protection to their clean herds they presented a bill to the Oregon Legislature in 1929 providing for the declaration of a "disease free area" when 80 per cent of the livestock in a described area had proved negative to any infection disease, and making it mandatory for the elimination of the disease in the remaining 20 per cent of the animals. The bill was enacted by the Legislature and became law. During that year 45,562 blood agglutination tests for brucellosis were conducted at the Department of Veterinary Medicine Laboratory, Oregon State College, revealing reactors to the extent of 18.77 per cent.

With excellent cooperation of state and local veterinarians, the Agricultural Extension Service, and herd owners, the program expanded so that in 1934, 95,486 tests were conducted revealing 7.88 per cent reactors.

I wish to emphasize that this progress resulted from the application of sound experimental findings coupled with an extensive educational program and cooperation of the persons concerned. The program was largely voluntary on the part of the herd owners. They received no remuneration other than beef prices for their slaughtered reactors. Vaccines were not used to any great extent during this period.

In 1934 the Bureau of Animal Industry, United States Department of Agriculture, entered into a cooperative program of brucellosis control. This resulted in testing without any direct cost to the herd owner. Indemnification was provided for slaughtered reacting animals. This factor added further stimulus to ridding herds of the infection.

The inclusion of Bureau of Animal Industry Strain 19 vaccine into the program in 1940 had little influence on control measures among dairy herd owners because they had already learned that most herds were quite readily freed from infection by testing and the elimination of
reactors. Calfhood vaccination with strain 19 has since been used to a considerable extent in the case of beef animals operated under semi-range conditions.

At the demand of herd owners, the 1945 Oregon Legislature passed a law relating to control and eradication of brucellosis in cattle. This law was further amended in 1947 and is now the basis of the program in operation.

The principal provisions of the law are as follows:

1. Official testing and vaccination shall be done by county, state, or B. A. I. veterinarians.
2. All female cattle and bulls over 6 months of age must be tested at least once a year. (Beef cattle are exempt from testing, except that, following petition and hearing, a county court may declare that all cattle in all or part of county must be tested.)
3. If infection is found in the herd, reactors must be removed and retesting will be done as determined by an official veterinarian until the herd is pronounced clean.
4. Owner shall elect one of the following programs:
   a. Test and slaughter of reactors.
   b. Test and slaughter of reactors and vaccination of calves between ages of 5 and 8 months.
5. If requested by the county court, a program of calf vaccination without testing may be employed in beef herds.
6. No animals shall be added to any herd except from a disease-free herd.
7. Vaccination of mature cattle is prohibited except by written permission from Oregon State Department of Agriculture.
8. Beef cattle not officially tested must be so kept as to prevent co-mingling with tested cattle.
9. Dairy cattle must be tested and proved free from brucellosis before being allowed to run in community pastures.
10. Reactors shall be slaughtered and indemnity shall be paid if the owner has properly cleaned and disinfected the infected premises, and has complied with other requirements of the law.

The Oregon State Department of Agriculture, in cooperation with the United States Department of Agriculture, Bureau of Animal Industry, is charged with the administration of this and other laws pertaining to the control of brucellosis in livestock. It is accomplished through county, state, and B. A. I. veterinarians.

At the present time there are 66 county veterinarians and 15 United States Department of Agriculture, Bureau of Animal Industry veterinarians conducting the field work. All blood samples are tested by the plate agglutination test in a central laboratory conducted by the United States Department of Agriculture, Bureau of Animal Industry.

It will be noted that the program has been more intensively applied to dairy cattle than to beef cattle. There are several reasons for this. Because of the nature of dairy herd management where cattle are handled at least twice daily, the dairy operator has been more cognizant
of the ravages of the disease than is the case of the beef producers some of whom infrequently see their cattle. The human health problem, in relation to the consumption of infected dairy products as previously mentioned, has stimulated the control in dairy cattle. This of course has not been a factor concerning beef production. Beef cattle, most of which are produced under semi-range conditions, are more difficult to test at regular intervals, and it is only when the calf crop is markedly diminished that some beef cattle producers become interested in eliminating the infection from their herds.

While the dairy producer has found the plan of testing and elimination of reactors most suited to his operation, this method has been used to somewhat more limited extent by beef producers, many of whom have preferred calfhood vaccination with strain 19 vaccine as a method of control. In the past this difference in practice, i.e., eradication of the disease on the part of the dairy industry and control of the disease through calfhood vaccination on the part of the beef industry, has caused some friction in those areas in which both dairy cattle and beef cattle are produced. At times it has been somewhat difficult to promote a program which was popular with both dairy and beef interests, and to obtain laws and regulations that were entirely satisfactory.

Beef cattle producers, however, are gradually favoring eradication. During the past year one of the counties east of the Cascade Mountains, where beef cattle predominate, decided to test both beef and dairy cattle and to eliminate all reactors.

It is evident that much has been accomplished in Oregon during the past twenty years in the control and elimination of brucellosis from cattle, the chief reservoir of infection. The results of tests conducted during the past year indicate that the incidence of reactors has been reduced from the original 18.77 per cent in 1929 to 1.8 per cent at the present time. Of the 36 counties in the state approximately one-half now have an incidence of less than 1 per cent reactors. It is significant that these counties now approaching the elimination of the disease, originally contained the greatest percentage of infected animals.

With the continued cooperation of state, federal, and local veterinarians, the Agricultural Extension Service, and the herd owners, brucellosis in Oregon cattle should be largely eliminated during the next few years.

CONTROL DE LA BRUCELOSIS EN EL ESTADO DE OREGON (Sumario)

El control de la brucelosis en Oregon fue basado originalmente en los aspectos económicos de la producción lechera, destinando grandes sumas al control de la enfermedad en el ganado vacuno, que constituye el principal reservorio de la infección. Las investigaciones iniciadas en la Estación Experimental de Agricultura de Oregon (1918–20) mostraron resultados que condujeron al programa edu-
cativo basado en el examen y eliminación de reactores positivos. Fue aprobada una Ley declarando que una zona está libre de la enfermedad cuando el 80% del ganado resulta negativo a toda enfermedad infecciosa, estableciendo la obligación de eliminar la enfermedad en el 20% restante. En 1934 se obtuvieron sólo 7.88 reacciones positivas entre 95,486 pruebas practicadas. El programa cooperativo emprendido en ese año por la Oficina de Industria Ganadera del Depto. de Agricultura de Estados Unidos, hizo posible el examen del ganado sin costo directo al dueño, disponiendo indemnizaciones para los dueños de reactores positivos sacrificados. La vacunación con la cepa 19 viene practicándose en gran escala en el ganado de sacrificio. La Legislatura de Oregon aprobó una ley en 1945 sobre control y erradicación de la brucelosis en el ganado, ley enmendada en 1947 y que constituye actualmente la base del programa. El Depto. de Agricultura del Estado de Oregon, junto con la Oficina de Industria Ganadera de Estados Unidos es el encargado de la administración de dicha ley y de otras relativas al control de la brucelosis en el ganado. En la actualidad los condados cuentan con 66 veterinarios y 15 de la Oficina de Industria Ganadera del Depto. de Agricultura de Estados Unidos, dedicados a esa labor. Todas las muestras de sangre son examinadas por la prueba de aglutinación en láminas en un laboratorio central mantenido por dicha oficina de Industria Ganadera. El programa se ha aplicado más intensamente al ganado lechero que al de sacrificio. Para el productor de ganado lechero el plan de examinar y eliminar los positivos es el más adecuado a sus intereses, en cambio los productores de carne prefieren el método de vacunación de terneros con la cepa 19, lo que ha hecho algo difícil la promoción de un programa aceptable a ambos intereses. Las pruebas realizadas arrojan una reducción en la incidencia de reactores positivos de 18.77% en 1929 a 1.8% en la actualidad, habiendo alcanzado aproximadamente la mitad de los 36 condados del Estado una incidencia de reactores inferior a 1%. Es de notar que los condados que se van acercando a la eliminación de la enfermedad son los que originalmente tenían mayor porcentaje de animales infectados.