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REPORT

OF THE

Montana Livestock
Sanitary Board

AND

State Veterinary Surgeon



Including Reports of Chemist and Bacteriologist
and Pathologist and Summary of Work

For the Biennium

December 1, 1926 to November 30, 1928

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Montana Livestock Sanitary Board

PERCY WILLIAMSON, President, Miles City

R. F. CLARY, Vice-Pres., Great Falls

W. H. DONALD, Melville

A. M. MOORE, Marion

C. J. McNAMARA, Big Sandy

BERT ORR, Dillon

W. J. BUTLER

Secretary and Executive Officer

State Veterinary Surgeon

Director of Laboratories



Montana Livestock Sanitary Board Laboratories

THE TRIBUNE PRINTING CO.  GREAT FALLS, MONTANA

Letter of Transmittal

Helena, Montana, December 1, 1928.

Honorable J. E. Erickson,
Governor of the State of Montana,
Helena, Montana.

Sir:

In compliance with Section 3292, Revised Codes of Montana, 1921, we transmit herewith the report of the Montana Livestock Sanitary Board and State Veterinary Surgeon for the biennium December 1, 1926, to November 30, 1928.

Respectfully,

MONTANA LIVESTOCK SANITARY BOARD,
W. J. Butler, Executive Officer.

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Report of the Montana Livestock Sanitary Board

Helena, Montana, December 1, 1928.

Honorable Livestock Sanitary Board,
Helena, Montana.

Sirs:

In compliance with Section 3292, Revised Codes of Montana, 1921, I herewith present the report of the State Veterinary Surgeon and Executive Officer of the Montana Livestock Sanitary Board for the biennium December 1, 1926, to November 30, 1928:

MEETINGS OF THE BOARD

There were four meetings of the Livestock Sanitary Board during the year of 1927.

The first meeting was held at Helena, Montana, on January 17, 1927.

The second meeting of the Board was held at Miles City, Montana, on April 8th. At this meeting the Board reorganized. Percy Williamson was elected president and R. F. Clary vice-president.

The third meeting was held at Helena, Montana, on June 27th.

The fourth meeting was held at Helena, Montana, on September 8th.

There were three meetings held during the year 1928.

The first was held at Great Falls.

The second, which was the regular annual meeting, was held at Havre on April 13th, 1928.

The third meeting was held at Helena on July 9th, 1928.

At all of these meetings general sanitary conditions were gone over, and the actions of the executive officer approved. Complete minutes of all meetings are on file at the secretary's office at Helena, Montana.

LEGISLATION

There were no new laws enacted by the 20th Legislative Assembly pertaining to livestock sanitation. The present livestock sanitary laws of Montana are very complete, and drawn up in such a manner that they have been able to meet each and every condition which has arisen. For the confidence that the Legislative Assembly placed in the Livestock Sanitary Board, and for the very complete, elastic and compre-

hensive statutes they have enacted to govern the operation of the Livestock Sanitary Board, we express our sincere thanks.

We desire to call the attention of the 21st Legislative Assembly to the inadequacy of legislation pertaining to dairy licenses. It is financially and physically impossible, under the present statutes, to collect a dairy license from cream producers. The statute requiring a license on cream producers should either be repealed entirely or should provide that no creamery or milk plant should buy milk or cream from a producer that is not duly licensed.

LITIGATION

Again we are glad to report that there is no litigation of importance connected with this department. The length of time this department has been able to operate without being taken into district court is indeed exceptional and extraordinary. This department is commissioned with police powers governing livestock sanitation, and naturally at times must use drastic measures to prevent the spread of livestock diseases. That we have not been in district court for a period of over fourteen years speaks very highly of the regard with which stockmen of Montana hold the laws governing livestock disease control work.

SCOPE OF WORK

This report, naturally, must confine itself to actual work accomplished, and to a general summary of livestock diseases and control work. We feel, however, that it is not amiss to call your attention to the vast scope of work undertaken by this department. It needs no great stress of the imagination to visualize the difficulties which field men encounter.

A study of the pathologist's and bacteriologist's and chemical laboratory's reports reveal that we have investigated livestock poisoning, both malicious and accidental. It will also reveal the fact that we have uncovered unwholesome foods that were intended for human consumption. We have also examined mountain sheep and deer in the mountains during the winter months, to determine disease conditions in both species of animals, and have also investigated and determined the cause of death of various fish in our native streams.

In addition to these activities we have had our routine work of inspecting dairies, tuberculin testing annually all dairy cattle, inspecting and quarantining every sheep shipped into the state, which work also requires a re-inspection of such sheep at the end of the 90-day quarantine period. It is also our duty to quarantine, subject to a 60-90 day retest all cattle other than strictly range cattle.

In co-operation with the United States Bureau of Animal Industry we have tuberculin tested every living cow, calf, bull and steer in Lincoln, Flathead, Lake, Sanders, Mineral, Missoula, Ravalli and Daniels counties, and that part of Roosevelt county lying east of the Muddy

River, as well as tuberculin testing many thousands of cattle in other parts of the state.

A study of the summary of work accomplished will reveal the fact that many horses and swine have been examined and cared for, as well as controlling outbreaks of disease in poultry and dogs.

GENERAL REMARKS

I doubt if Montana stockmen ever had, under normal conditions, more profitable years than the two years just past. They have been exceptionally good growing years, with splendid grain and plenty of grass. We have gone through the biennium without any serious outbreak of disease in our livestock. Prices have been higher than at any time, except during the war period. Our cattle have been better finished, and have been of better quality than they have been in many years, so that our financial returns for the animals shipped have indeed been gratifying. Another year like the past two years and Montana will not only be a Treasure State, but will be a land of milk and honey.

Our livestock are going through the winter in splendid shape, and our ranchmen are well supplied with feed. We are of the opinion that we have as many cattle on our ranches at this time as we did a year ago. It is true that the big outfits are closing out, and the loss of their shipments will be felt, but it is our opinion that the number of small outfits that are now operating in Montana will offset the loss of the large outfits. There is a marked decrease in the number of cattle in the United States, but in the loss of cattle Montana has not suffered as much as many of our sister states, where high land values make a profitable raising of cattle problematical. The time is fast approaching when cattle growers operating on lands enhanced in value by reason of centralization of population cannot compete with cattle growers operating in Montana, where the price of land is nearer the actual value.

We again desire to call your attention to the necessity of building up and patronizing our home industries. We are strictly a producing state. As a state we could live and be happy upon what we produce within our own limits. It is an economic waste for us to ship our products, and especially our living animals, some fifteen hundred miles to market centers, and then have the carcasses of these selfsame animals shipped back to us for consumption.

We trust, ere many years roll by, that we will feed and finish our own livestock, so as to furnish our own abattoirs with livestock the year around, and that our people will ask for and consume Montana products. We have cattle, sheep and hogs that are as good as any produced in any country, and we are firmly convinced that their food values are superior to animals grown under abnormal conditions, such as smoke laden air, contaminated water and grass and grains grown on worn-out lands, and matured without an abundance of sunlight, such as we enjoy in Montana.

Montana ships out of the state over one million lambs each year

to be fed and fattened in feed yards in some of the middle western states. These lambs are taken away from their mothers. They lose their milkfat, and are fed grains and grasses that are foreign to them. When put upon the market they are really no longer lambs, but are young mutton. They have been subjected to a complete change of feed. In practically every instance they have lost their milkfat, and in many instances they have been subjected to a shrink that would naturally cause a complete change in the delicious flavor that is natural to a milk fed lamb.

There is a profitable field open to our feeders to fatten Montana lambs on our natural grasses and our grains, together with the milk from the ewe. Lambs of this character, shipped direct to our local abattoirs and sold direct to the people of Montana would not only prove more profitable than shipping such animals to eastern markets, but would furnish our people with a product that would be vastly superior to the lamb shipped in to us from eastern packing centers.

HORSES

There are very few diseases in horses in Montana. Glanders, dourine, and scab, which bothered us some years ago, are practically diseases of the past.

Good utility horses are in demand in the different farming communities. The small range horse has practically no intrinsic value. We are of the opinion, however, that there is, and will be for some time to come, a market for good saddle horses. Camping outfits in our national parks, as well as the many dude ranches that are springing up in Montana, are constantly in the market for sure-footed, hardy saddle horses, of a type that can be easily and profitably grown in Montana. Our range mares bred to Morgan, Thoroughbred or Standardbred sires will produce such a horse.

CATTLE

Tuberculosis

During the past two years Lincoln, Flathead, Lake, Sanders, Mineral, Missoula, Ravalli, Daniels and Sheridan counties, and that part of Roosevelt county lying east of the Muddy river, have been declared modified tuberculosis free accredited areas by the United States Bureau of Animal Industry and the Montana Livestock Sanitary Board co-operating.

Each year our work shows that bovine tuberculosis is being steadily decreased. Outside of one or two southern states, where bovine tuberculosis is a rare disease, there is no other state that we know of that has a smaller percentage of bovine tuberculosis than Montana. Practically every cow in dairies suppling milk and cream has been tuberculin tested, and we found only thirty one-hundredths of one per cent reactors in 1927, and only twenty-nine one-hundredths of one per cent reactors

in 1928. In our accredited herds not one reactor was found, and every accredited herd was tested annually.

One fact of decided interest and importance was disclosed by the testing in 1927, and that was that in our retests of imported cattle shipped into the state subject to a 60-90 day retest, as required by the Montana Livestock Sanitary Board regulations, we found forty-six one-hundredths of one per cent reactors, which is more than we found in our native cattle. This fact shows the value of the regulation requiring this retest, as all these retested cattle were shipped into the state accompanied by an official health certificate and tuberculin test chart.

The total number of cattle tuberculin tested by the Montana Livestock Sanitary Board and the United States Bureau of Animal Industry co-operating, during the biennium 1927-1928 was 214,587, and the percentage of reactors was twenty-nine one-hundredths of one per cent, and speaks most highly of the healthfulness of our cattle. It is to be understood that when cattle are tuberculin tested they are also inspected for any infectious-contagious diseases, and when passed it is an official recognition that they are free from any infectious-contagious disease.

Scab

In 1927 cattle scab was not known to exist in the State of Montana excepting on the Crow Indian Reservation.

In 1928 several shipments of cattle from the State of Washington, and also from Canada, were found to be suffering from scabies upon their arrival in Montana. The regulation requiring the quarantine of cattle, other than strictly range cattle, proved of value in each instance, as the disease was found in these quarantined cattle previous to their being released.

In 1928 scab was found in one small herd of approximately 100 head, in a district which had previously been free from this infection. Only four animals were found to be infected. History of the condition, so far, has failed to reveal where this infection came from.

Anthrax

Anthrax does not exist in the State of Montana at the present time.

Blackleg

There have been fewer cases of blackleg reported in cattle during the past two years than in previous years. Blackleg is a disease that will exist in range states for many years to come, but it is a disease that is very easily prevented by vaccination. The best vaccine is natural blackleg aggressin.

Coccidiosis

This is a disease that is caused by a protozoan that lives in slow running water. It gets onto hay by reason of irrigation. The disease generally makes its appearance in the fall, following a severe break in the weather which causes cattle to be brought in from the range and

thrown into pastures and fed irrigated hays. The disease ordinarily attacks young animals, causes a high fever and bloody diarrhea, followed by considerable prostration.

The prevention is never to suddenly change the feeding conditions of an animal, and gradually work them from the upland feed onto the irrigated hay. A pamphlet has been issued by the Livestock Sanitary Board, giving a description of the disease and treatment, which pamphlet will be forwarded on request to any interested stockman.

Hemorrhagic Septicemia

Hemorrhagic septicemia, oftentimes called stockyard fever, is very often confused with coccidiosis. This condition has been reported to exist from time to time, but most of our investigations have proved the condition to be coccidiosis rather than hemorrhagic septicemia. The disease, however, does occasionally occur in sporadic instances. Ordinarily it is a self-located disease, and quickly wears itself away. Like coccidiosis, this disease attacks mostly young animals, at a time when they have been subjected to a complete change of feed, and under adverse weather conditions.

As in the treatment of coccidiosis, hemorrhagic septicemia is also best treated by the removal of the animals to upland pastures and feeding upland hay, with plenty of salt.

There is a vaccine and serum for the prevention and treatment of hemorrhagic septicemia, but only in exceptional cases do we recommend the vaccination of an entire herd.

SHEEP

Lip and Leg Ulceration

Lip and leg ulceration has been of minor importance during the past two years. There have been one or two cases where this condition was reported in a non-virulent form. We have had no reports of this condition in a virulent form during the past two years.

Foot Rot

Due, undoubtedly, to our very wet springs and summers, and to the practice of lambing out in damp and insanitary sheds, and in some cases to the holding of sheep on damp lands and damp pastures, as well as feed lots, foot rot has made its appearance in a number of bands of sheep the past year. In one or two instances it assumed a very virulent form. It is a difficult condition to cure.

The organism that causes foot rot lives in damp ground, and especially around manure piles and bed grounds. The cure necessitates the trimming of the foot of the affected animals and exposing all diseased tissue, and subjecting them to a foot bath of a 20% solution of copper sulphate. Badly infected animals should be cut out of the band and subjected to this foot bath and have their feet trimmed as often as

necessary. In slightly infected animals two treatments, about a week apart, will generally effect a cure.

The prevention of this condition depends mainly on handling sheep on dry ground, and in not using damp sheds, corrals and pastures. One important factor is to immediately cut out and isolate from the band any animal showing symptoms of foot rot, and never to handle healthy animals in wet pastures, corrals or sheds that have contained infected animals.

Lungers

Lungers, or chronic progressive pneumonia, still causes considerable loss in our sheep. We are of the opinion that the instance of this disease has been materially reduced by improved methods of handling and feeding our sheep.

Investigations have led us to the belief that possibly the embryonic stage of one of the lung worms plays a very important role in the cause of chronic progressive pneumonia. We trust, ere long, that investigations will clear up the etiology of this baffling condition.

SWINE

We have had individual losses in swine herds in various parts of the state during the past two years, but no epidemic of disease. Hog cholera was reported in twenty-one herds in 1927, and in thirty-eight herds in 1928. This is a remarkably small percentage of herds infected with this disease, compared with our sister states.

There are many sections and a number of counties in Montana where hog cholera has never existed. We believe in, and permit, the double vaccination of hogs in vicinities where hog cholera exists, but we do not believe in, and do not permit, the double vaccination of hogs in districts where hog cholera has never been known to exist. This is for the reason that in double vaccination the actual virus of hog cholera is used, and when used in such a district may be the means of causing an outbreak of hog cholera in that district.

A number of our feeders have gone to St. Paul and other markets for their pigs. We realize the necessity of having pigs in the state to be fed our products, and especially in pea fields that are improperly harvested, but we deeply deplore the fact that our swine growers and feeders go to central markets for their pigs. If this practice is continued, even though we guard against the importation of disease by quarantining such pigs, the chance of bringing disease into the state is very materially increased.

CHICKENS

This department has continued to assist in every way possible in the control of chicken diseases and diseases of other poultry, although not specifically required to do so by the legislature. We again very respectfully call the attention of the Legislature to the fact that there

is no department specifically commissioned with the duty of controlling diseases of poultry.

That we have been of some material assistance to the poultry growers is evidenced by the fact that we have, in our co-operative work, inspected 238,589 fowls during the past two years.

DOGS

We are extremely glad to report that rabies has not existed in Montana during the past two years.

DAIRY INSPECTIONS

The milk products of Montana continue to improve each year. We are of the opinion that this department has very materially aided in the production of clean, wholesome milk. At this time we officially express our appreciation to the dairymen of Montana for their ever ready and hearty co-operation with this department in their effort to supply the public with clean, wholesome milk.

We also desire at this time to express our very positive opinion that there is no more wholesome or more nutritious food than pure milk and cream. It has been proved beyond any question of a doubt that a pure, wholesome milk supply gives to the human body an added disease resisting power, as well as giving to the growing child an abundant supply of vitamins and mineral salts, such as phosphorus and calcium, necessary for the development of sound bones and teeth.

During the past two years we have issued 4,162 dairy licenses. As we have stated in our previous reports, the money obtained from these licenses goes to the General Fund, and is not allotted in any way to this department.

MILK PLANTS

During the past two years we have issued 44 milk plant licenses. The fees collected for these licenses also go into the General Fund.

SLAUGHTER HOUSES

During the past two years we issued 259 slaughter house licenses. As is the case with all license fees collected by this department, this money also goes into the General Fund.

UNITED STATES BUREAU OF ANIMAL INDUSTRY CORPS

The United States Bureau of Animal Industry Corps of Montana is deserving of exceptionally high praise. Their work has been efficient and effective. They have at all times rendered a very excellent service to the stockmen of Montana during the past two years and co-operated

with the Montana Livestock Sanitary Board in a sincere and conscientious effort to serve the livestock interests.

LIVESTOCK SANITARY BOARD CORPS

The veterinarians of Montana, practically all of whom are commissioned deputy state veterinary surgeons, have rendered an excellent and conscientious service to the stockmen of Montana during the past two years. We extend to them our very sincere thanks and appreciation of their work.

VETERINARIANS

The problem of securing adequate veterinary service in Montana is becoming a very acute one. Including the entire Montana Livestock Sanitary Board corps, but not including the federal veterinarians, there are only 37 veterinarians in the State of Montana. A number of these veterinarians are no longer practicing their profession. This is rather an alarming condition. The assessed value of livestock in Montana was, according to the latest report of the State Board of Equalization, \$69,003,313.00.

We have been fortunate in reducing infectious-contagious diseases in our livestock and keeping out of the state many dangerous diseases, but even under the best of conditions Montana should support at least 100 veterinarians. We may not always be as fortunate as we have been during the past ten years. Our livestock interests should take cognizance of this and endeavor to have located and supported in their respective communities competent graduate veterinarians.

The appropriation from the general fund allotted to the Livestock Sanitary Board for the past four years has been approximately \$12,000.00 less than it was six years ago. Additional work is continually placed upon the Livestock Sanitary Board, and this, together with the fact that approximately sixteen practicing veterinarians have left the state during the past six years, is a condition that may be fraught with danger if unfortunate disease conditions make their appearance in livestock.

NECROLOGY

It is with deep sorrow that we record the death of J. E. Morse. J. E. Morse was appointed a member of the Livestock Sanitary Board in 1921. He was elected president in 1923, and continued as president until early in 1927.

We have worked with many stockmen, and never have we had a more loyal supporter in the work of controlling and eradicating livestock diseases than we found in J. E. Morse. We miss his counsel and friendship. We miss his kindly word when the path of proper procedure is dim and difficult to follow. We know that his efforts on behalf of the livestock interests of Montana will prove of inestimable value.

We cherish the memory of his friendship, and trust that his efforts and counsel will continue to bear fruit in the years to come.

Respectfully submitted,

W. J. BUTLER,
Executive Officer
Montana Livestock Sanitary Board.

REPORT OF THE CHEMIST
of the
MONTANA LIVESTOCK SANITARY BOARD
for the Biennium
December 1, 1926, to November 30, 1928

There is in the state a considerable sale of commercialized feeding mixtures for sheep, cattle and hogs, some of which are put on the market with claims not always consistent with scientific investigation and facts, and such claims are in some instances misleading. The time must come when such traffic has to be controlled through some regulation or law in order to protect stockmen and farmers from spending their money for worthless feeding mixtures.

Poisoning of livestock due to carelessness and negligence could be greatly reduced or even entirely eliminated if proper care of poisoned baits left over from using for destroying insects and other pests would be exercised. This is particularly true with reference to arsenical and strychnine preparations, which have caused the largest amount of livestock losses. In some instances oats poisoned with strychnine had been stored in the same place with unpoisoned oats and was fed by mistake to livestock with fatal results. Such practice is very thoughtless and dangerous and should never take place.

It is equally dangerous and careless to throw unused arsenical poison on places where livestock can have access to it. Several instances of this kind have come under our observation and have caused unnecessary economic losses to stockmen. The indiscriminate disposal of poisonous material is always causing trouble and losses of livestock and therefore such material should be put away in such a manner that livestock can no longer get access to it.

It has always been the aim of this department to assist the stockmen and farmers in every possible way without charges to solve some of their problems, and it is highly gratifying to state that constant and increasing use of the laboratory facilities has been made in the past years. Many times the prompt investigation by this department has prevented heavy losses to livestock owners and thereby proved its great value to them.

Following is a list of the material analyzed by the chemist during the period from December 1, 1926, to November 30, 1928:

Lab. No.	Specimen and Nature of Examination	Result
478	Stomach contents of cow for poisons.....	Negative
479	Sample of water for watering stock.....	
480	Alfalfa screenings for poisons.....	Negative
481	Cottonseed cake for fat and protein.....	
482	Molasses for impurities.....	

Lab. No.	Specimen and Nature of Examination	Result
483	Liver of cow for nicotine poisoning.....	Negative
484	Sample of butter for metallic impurities.....	
485	Urinary calculi from steer.....	
486	Dog biscuits.....	
487	Stomach contents of horse for poisons.....	Positive
488	Stomach contents of dog for poisons.....	Positive
489	Stomach contents of cattle for poisons.....	Positive
490	Sample of water for watering stock.....	Positive
491	Sample of oats for poisons.....	Negative
492	Sample of feeding salt for impurities.....	
493	Sample of oats for smut.....	Positive
494	Sample of cream for thickening agents.....	Negative
495	Sample of straw for poisons.....	Positive
495A	Sample of sulphur salt for poisons.....	Negative
495B	Stomach contents of cattle for poisons.....	Negative
496	Intestines and blood from horse for poisons.....	Negative
497	Stomach contents of horse for poisons.....	Positive
497A	Grain and bran for poisons.....	Negative
498	Stomach contents of calf for poisons.....	Negative
499	Powder found in feed bin for poisons.....	Positive
500	Sample of water from Burnett Creek for impurities..	
501	Sample of water from Burnett Creek.....	
502	Sample of water from Hofstetter Ranch at Lewis- town	
503	Sample of stock salt for poisons.....	Negative
504	Stomach contents of cow for poisons.....	Positive
505	Powder found on ranch for poisons.....	Positive
505A	Paste-like material for poisons.....	Positive
506	Stomach contents of hog for poisons.....	Positive
507	Sample of water for poisons.....	Positive
508	Bones for phosphoric acid.....	
509	Sample of arsenic for percentage strength.....	
510	Stomach contents of cattle for poisons.....	Positive
511	Rumen and liver of cattle for poisons.....	Positive
512	Sack of hay for poisons.....	Negative
512A	Hay for poisonous plants.....	Negative
513	Sample of water for arsenic.....	Negative
514	Stomach contents of heifer for poisons.....	Positive
515	Molasses for impurities.....	
516	Stomach contents of cow for poisons.....	Positive
517	Sample of milk for gelatine.....	Negative
518	Stomach contents and organs of steer for poisons....	Negative
519	Sample of hay for poisons.....	Negative
520	Mice for arsenic.....	Negative
521	Stomach contents of calf for poisons.....	Negative
522	Arsenical dip for strength of arsenic.....	
523	Stomach contents of hog for poisons.....	Positive

Lab. No.	Specimen and Nature of Examination	Result
524	Sample of arsenical dip for strength of arsenic.....	
525	Sample of water for fitness of raising fish.....	
526	Stomach contents of cattle for poisons.....	Positive
527	Cream for impurities.....	
528	Arsenical dip for strength of arsenic.....	
529	Sample of water for fitness of watering stock.....	
530	Sample of arsenical dip for strength of arsenic.....	
531	Sample of cottonseed cake for protein and fat.....	
532	Stomach contents of cow for poisons.....	Negative
533	Sample of milk for impurities.....	
534	Sample of arsenical dip for strength of arsenic.....	
535	Sample of arsenical dip for strength of arsenic.....	
536	Sample of water for impurities, Burnett Creek.....	
537	Sample of water for impurities from overflow of refinery	
538	Sample of water for impurities, Burnett Creek.....	
539	Stomach contents of sheep for poisons.....	Negative
540	Meat (pork) to be tested for poisons.....	Negative
541	Sample of cream for impurities.....	
542	Stomach contents of dog for poisons.....	Negative
543	Stomach contents of sheep for poisons.....	Negative
544	Feeding mixture for cattle, general analysis.....	
545	Stomach contents of steer for poisons.....	Negative
546	Disinfecting fluid, general analysis.....	
547	Stomach contents of cow for poisons.....	Positive
548	Stomach contents of horse for poisons.....	Positive
549	Sample of condition powder, general analysis.....	
550	Sample of arsenical dip for strength of arsenic.....	
551	Stomach contents of dog for poisons.....	Negative
552	Two samples of nitrates for purity.....	
553	Sample of stomach contents of cow for poisons.....	Positive
554	Stomach contents of pig for poisons.....	Negative
555	Stomach contents of calf for poisons.....	Negative
556	Stomach contents of cow for poisons.....	Positive
557	Sample of well water for fitness of watering stock..	
558	Disinfecting fluid.....	
559	Stomach contents of horse for poisons.....	Negative
560	Sample of arsenical dip for strength of arsenic.....	
561	Stomach contents of calves for poisons.....	Negative
562	Stomach contents of horses for poisons.....	Negative
563	Organs of dog for poisons.....	Negative
564	Organs of chicken for poisons.....	Negative
565	Stomach and contents of cow for poisons.....	Positive
566	Sample of oats for poisons.....	Positive
567	Sample of water for watering stock.....	
568	Stomach contents of steer for poisons.....	Positive
569	Stomach contents of cow for poisons.....	Negative

Lab. No.	Specimen and Nature of Examination	Result
570	Sample of wild hay for arsenic.....	Negative
571	Sample of water for arsenic.....	Negative
571A	Sample of meat for poisons.....	Negative
572	Stomach contents of horse for poisons.....	Positive
573	Oats to be tested for poisons.....	Positive
574	Sample of milk for impurities.....	
575	Three samples of milk for hypochlorites.....	
576	Horse fat, general analysis.....	
577	Stomach contents of cattle for poisons.....	Positive
578	Straw and dirt for poisons.....	Positive
579	Sample of bone meal for feeding purposes.....	
580	Sample of arsenic for purity.....	
581 & 582	Two samples of liver, spleen, etc., of hogs for poisons	Negative
583	Stomach of horse for poisons.....	Positive
584	Stomach contents of hog for poisons.....	Negative
585	Sample of water for stock.....	
586	Intestinal contents of a mink for poison.....	Negative
587	Stomach contents of a hog for poisons.....	Negative
588	Coyote poison, chemical analysis.....	
589	Urine of a cow for chemical analysis.....	
590	Stomach contents of a cow for poison.....	Negative
591	Stomach contents of a dog for poison.....	Negative
592	Stomach contents of a calf for poison.....	Negative
593	Sample of a cow's urine for chemical analysis.....	O. K.
594	Two samples of skim milk for chemical analysis.....	
595	Sample horse liver for chemical analysis.....	
596	Horse blood for chemical analysis.....	
597	Stomach contents of a horse for poison.....	Negative
598	Sample of liquid soap for purchasing department....	
599	Sample of skim milk for fat per cent.....	O. K.
600	Stomach contents of horse for poisons.....	Negative
601	Milk for foreign matter.....	Negative
602	Worm medicine for animal for chemical analysis.....	
603	Sample of coyote poison for chemical analysis.....	
604	Ken-L-Ration for chemical analysis.....	
605	Flour for chemical analysis.....	O. K.
606	Water for stock use for chemical analysis.....	
607	Two samples of urine from sheep for chemical analysis	
608	Stomach contents of a dog for poisons.....	Positive
609	Urine from a cow for chemical analysis.....	
610	Liver and stomach contents of sheep for poisons.....	Negative
611	Stomach contents of a heifer for poisons.....	Positive
612	Stomach contents of a sheep for poisons.....	Negative
613	Water for stock use for chemical analysis.....	
614	Stomach contents of a horse for poisons.....	Positive

Lab. No.	Specimen and Nature of Examination	Result
615	Sample of hay for arsenic.....	Negative
616	Stomach contents of a horse for poison.....	Negative
617	Sample of water for stock use for chemical analysis	
618	Sample of crude oil for fitness in dipping cattle.....	
619	Ground feed for horses for poison.....	Positive
620	Stomach of a dog for poison.....	Positive
621	Ewe's milk for chemical analysis.....	
622	Arsenical dip for strength of arsenic.....	
623	Arsenical dip for strength of arsenic.....	
624	Stomach contents of a hog for poison.....	Negative
625	Arsenical dip for strength of arsenic.....	
626	Arsenical dip for strength of arsenic.....	
627	Arsenical dip for strength of arsenic.....	
628	Wheat and soil for poisons.....	Negative
629	Arsenical dip for strength of arsenic.....	
630	Arsenical dip for strength of arsenic.....	
631	Sample of wheat for arsenic.....	Negative
632	Sample of wheat for arsenic.....	Negative
633	Milk for chemical analysis.....	
634	Stomach contents of a mink for poison.....	Negative
635	Stomach contents of a lamb for poison.....	Positive
636	Arsenical dip for strength of arsenic.....	
637	Urine of a cow for chemical analysis.....	
637A	Water for stock use for chemical analysis.....	
638	Arsenical dip for strength of arsenic.....	
639	Stomach contents of a dog for poison.....	Positive
640	Chicken feed for poisons.....	Negative
641	Stomach contents of a horse for poison.....	Negative
642	Stomach contents of a cow for poison.....	Positive
643	Stomach contents of a steer for poison.....	Negative
644	Skim milk for fat per cent.....	O. K.
645	Sample of oats for poisons.....	Positive
646	Stomach contents of cattle for poison.....	Positive
647	Stomach contents of cattle for poison.....	Positive
648	Feeding material for poison.....	Positive
649	Stomach contents of cattle for poison.....	Negative
650	Stomach contents of a heifer for poison.....	Positive
651	Stomach contents of a cow for poison.....	Negative
652	Arsenical dip for strength of arsenic.....	
653	Stomach contents of sheep for poison.....	Negative
654	Feeding material for poison.....	Negative
655	Stomach contents of heifer for poison.....	Negative
656	Material forwarded for poisons.....	Positive
657	Stomach contents of a cow for poisons.....	Positive
658	Water for fitness for raising fish.....	
659	Stomach contents of a cow for poison.....	Positive
660	Stomach contents of a cow for poison.....	Negative

Lab. No.	Specimen and Nature of Examination	Result
661	Stomach contents of a steer for lead.....	Positive
662	Stomach contents of a sheep for poison.....	Negative
663	Stomach contents of a cow for arsenic.....	Positive
664	Water for fitness for livestock for chemical analysis	
665	Stomach contents of a sheep for poisons.....	Negative
666	Water, chemical analysis for poisons.....	Negative
667	Stomach contents of a cow for poisons.....	Positive
668	Stomach contents of a calf for poisons.....	Positive
669	Stomach contents of a sheep for poisons.....	Negative
670	Stomach contents of a sheep for poisons.....	Negative
671	Weeds to be tested for arsenic.....	Positive
672	Stock salt for chemical analysis.....	
673	Stock salt for chemical analysis.....	
674	Stomach contents of a calf for poisons.....	Positive
675	Stomach content of a cow for poisons.....	Negative
676	Stomach contents of a cow for poisons.....	Positive
677	Salt for chemical analysis.....	
678	Water for livestock use for chemical analysis.....	
679	Milk for chemical analysis.....	
680	Stock salt for chemical analysis.....	
681	Water for livestock use for chemical analysis.....	
682	Sample of water and tailings for chemical analysis..	
683	Microscopical analysis of sediment in water.....	
684	Milk, chemical analysis.....	
685	Bones for chemical analysis.....	
686	Skim milk powder, chemical analysis.....	
687	Stomach contents of a dog for poisons.....	Positive
688	Liver and spleen of cattle for poisons.....	Negative
689	Stomach contents of a horse for poisons.....	Negative
690	Worm medicine for sheep, chemical analysis.....	
691	Stock condition powder, chemical analysis.....	
692	Stomach contents of a sheep for poison.....	Negative
693	Stomach contents of a sheep for poison.....	Negative
694	Stock food for sheep, chemical analysis.....	
695	Stomach contents of a sheep for poisons.....	Negative
696	Coyote poison, capsules, for chemical analysis.....	
697	Stomach contents of a steer for arsenic.....	Negative
698	Stomach contents of a hog for poisons.....	Negative
699	Milk chemical analysis.....	
700	Stomach content of horse for poisons.....	Negative
701	Stomach contents of a steer for poisons.....	Negative
702	Stomach contents of a dog for poisons.....	Negative
703	Stomach contents of a hog for poisons.....	Negative
704	Stomach contents of a heifer for poisons.....	Negative
705	Stomach contents of a steer for poisons.....	Negative
706	Fourteen samples of water for algae, etc.....	
707	Stomach contents of a hog for poisons.....	Positive

708	Feed for hogs to be tested for poisons.....	Positive
709	Feed for hogs to be tested for poisons.....	Negative
710	Stomach contents of a calf for poisons.....	Positive
711	Stomach contents of a calf for poisons.....	Positive
712	Stomach contents of a cow for poisons.....	Negative
713	Stomach contents of a pig for poisons.....	Negative
714	Stomach contents of a pig for poisons.....	Negative
715	Liver and kidney from a cow for poisons.....	Negative
716	Oats for hydrocyanic acid or other poison.....	Negative
717	Meat to be tested for strychnine.....	Negative
718	Stomach contents and liver of cow for arsenic.....	Negative
719	Stomach contents and organs of a steer for arsenic.....	Negative
720	Stomach contents of a hog for poisons.....	Negative
721	Stomach and contents of a hog for poisons.....	Positive
722	Sample of cream for adulteration.....	
723	Sample of cream for general analysis.....	

During the two year period 485 official and 55 unofficial samples of milk and cream have been examined by the chemist for butterfat, solids, preservatives, thickening agents and visible dirt. These samples were taken by inspectors from the retail dairymen's wagons and supply depots. While there is always room for improvement and bettering of existing conditions, yet it must be said that the retail milk supply in our state is up to a very creditable standard of quality. With very few exceptions, the milk and cream samples were found to be in conformity with the required standards of purity and quality as prescribed by the Montana Livestock Sanitary Board.

Respectfully submitted,

EMIL STARZ, Chemist.

THE REPORT OF THE PATHOLOGICAL AND BACTERIOLOGICAL LABORATORY for 1927 and 1928

During the two-year period ending November 30, 1928, the work of the pathological and bacteriological laboratory has continued along the lines which have been followed since the laboratory was opened in 1919. The primary function of this department has been that of laboratory diagnosis on specimens received from veterinarians and stockmen, for the purpose of increasing the efficiency of the Livestock Sanitary Board in the control of diseases of livestock, and of assisting the veterinarians in arriving at correct diagnoses.

From December 1, 1926, to November 30, 1928, 1947 specimens have been examined, consisting of tissues, blood serum, pus, skin scrapings, feces, internal parasites, poisonous plants, feeds, meat, milk, cream, and water. The species of animals represented are horses, cattle, sheep, swine, chickens, turkeys, ducks, cats, foxes, rabbits, mink, beaver, raccoon, marten, antelope, mountain sheep, brant, fish and man. In making the examinations the methods used have included cultures, animal inoculations, direct microscopical examination, serological tests, and histological examination.

The following is a classified list of the examinations made, giving the number of positive and negative diagnoses for each condition:

	Positive	Negative
Abortion, infections, bovine	276	799
Abortion, infectious, swine	0	5
Abortion, vibrionic, sheep	1	10
Abortus infection, man	1	9
Actinomycosis	6	0
Anthrax	1	5
Apoplectiform septicemia, chicken	1	0
Arsenic poisoning	1	1
Arthritis, infectious	1	0
Bacillary white diarrhea	6	43
Blackleg, cattle	11	8
Blackleg, sheep	0	3
Botulism	0	4
Cephenomyiasis, deer	1	0
Coccidiosis, cattle	4	3
Coccidiosis, chickens	3	0
Coccidiosis, dog	2	0
Coccidiosis, rabbit	1	0
Coccidiosis, sheep	2	0
Dysentery in lambs	6	0
Enteritis, chicken	1	0
Enteritis, necrotic, swine	3	0

	Positive	Negative
Entero-hepatitis	7	3
Fibrillar muscle rupture	1	0
Fibro-sarcoma	1	0
Fluke infestation in trout	1	0
Fowl cholera	1	0
Fowl typhoid	1	0
Glanders	1	2
Goitre	1	0
Hemorrhagic septicemia	2	4
Hepatitis	1	0
Hog cholera	4	0
Liver abcess	1	0
Lymphatic leukemia	1	0
Malignant edema	4	1
Malnutrition	1	0
Mammitis, infectious	2	3
Necrobacillosis	13	2
Nephritis	1	0
Oestrus ovis infestation	2	0
Papilloma	1	0
Pediculosis	3	0
Pneumonia, non-specific	5	0
Pneumonia, B. pyogenes	9	0
Pneumonia, progressive, in sheep	6	0
Pneumonia, verminous	7	0
Preparturient paresis	1	0
Rabies	0	7
Ringworm	4	1
Roup	4	1
Sarcoma	4	0
Sarcosporidiosis	1	0
Scabies, chorioptic, cattle	2	0
Scabies, psoroptic, cattle	6	18
Scabies, psoroptic, sheep	0	2
Scabies, psoroptic, mountain sheep	5	1
Scabies, sarcoptic, cattle	4	5
Scabies, sarcoptic, horse	0	3
Scabies, sarcoptic, swine	1	2
Scabies, fox	0	1
Scabies, raccoon	0	1
Scurvy	1	0
Seborrhea	1	0
Strychnine poisoning	1	0
Tick paralysis	1	0
Trichinosis	0	1
Tuberculosis, avian	14	4
Tuberculosis, bovine	42	19
Tuberculosis, porcine	4	2

	Positive	Negative
Urethral calculi	1	0
Urticaria	1	0
White muscle disease in lambs	1	0
Worms, intestinal	65	17
Miscellaneous		70
	<hr/>	<hr/>
Totals	569	1060
Milk, for bacterial count		258
Milk, for pathogenic bacteria		41
Milk, chemical		1
Cream, bacterial count		2
Meat, for fitness for food		7
Water, bacteriological		4
Plants, for identification		5
		<hr/>
		318
Total specimens		1947

In addition to the routine diagnostic work, a number of special field and laboratory investigations have been made, which have helped to clear up a number of problems in connection with livestock disease. One of these investigations of particular interest was a trip into Glacier Park in January, 1927, to determine the cause of losses among mountain sheep. The results of this investigation have an important bearing on our study of diseases of domestic sheep.

In cooperation with the field veterinarians several special tuberculin tests have been made on large herds, in an attempt to clear up some unsolved questions pertaining to this test. This was in connection with so-called skin lesion cases of tuberculosis, on which laboratory investigations have been in progress for several years, and which have produced certain definite results.

The experimental work on blackleg in sheep, carried out in cooperation with the Experiment Station at Bozeman, has been completed, and a report has been submitted to the Journal of the American Veterinary Medical Association for publication in the December, 1928, number.

A joint paper by E. V. Cowdry, of the Rockefeller Institute for Medical Research, and H. Marsh, on sheep pneumonia was published in the Journal of Experimental Medicine.

A bulletin on "lunger" sheep has been published jointly, by the Montana Experiment Station and this office.

A paper on sheep diseases was read at the 1928 meeting of the American Veterinary Medical Association.

W. F. Cashmore, assistant in this laboratory, did the bacteriological work for a milk survey made by the American Child Health Association in Montana.

Respectfully submitted,

HADLEIGH MARSH,
Pathologist and Bacteriologist.

SUMMARY OF WORK, 1927-1928

Including Co-operative Work with the United States Bureau of Animal Industry.

INVESTIGATIONS SYNOPTICALLY ARRANGED**HORSES****Dourine, 1927**

Number horses blood tested	1,919
Number reacting to test	22

Dourine, 1928

Number of horses blood tested	1,627
Number reacting to test	18

Glanders, 1927

Number of horses reported and suspected of being affected with glanders, mallein tested	128
Number reacting to test	3

Glanders, 1928

Number of horses reported and suspected of being affected with glanders, mallein tested	15
Number reacting to test	None

Miscellaneous Inspections, 1927

Number of horses inspected for miscellaneous diseases	1,876
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Miscellaneous Inspections, 1928

Number of horses inspected for miscellaneous diseases	714
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Scabies, 1928

*Number of horses inspected for scabies	31,455
*Number of horses dipped for scabies, 1st, 2d, and 3d dippings.... (*Blackfeet Indian Reservation)	30,490

Importation Inspections, 1927

Number of horses clinically inspected and mallein tested at destination	148
Number reacting to test	None

Importation Inspections, 1928

Number of horses clinically inspected and mallein tested at destination	154
Number reacting to test	None

Inspections for Interstate Shipment, 1927

Number of horses inspected for interstate shipment	11,291
Number of horses clinically inspected for shipment	1,430
Number reacting to test	None

Inspections for Interstate Shipment, 1928

Number of horses inspected for interstate shipment	8,388
Number of horses clinically inspected for shipment	2,277
Number of horses inspected, 1927	16,792
Number of horses inspected, 1928	85,785
TOTAL NUMBER HORSES INSPECTED, 1927-1928	102,577

CATTLE**Tuberculosis, 1927**

Number of dairy cattle inspected for tuberculosis, 1927	100,803
Number reacting to test	331
Percentage of reactors, dairy cattle	0.33

Tuberculosis, 1928

Number of dairy cattle inspected for tuberculosis, 1928	90,251
Number reacting to test	287
Percentage of reactors, dairy cattle	0.30

Accredited Tuberculosis Free Herds, 1927

Number of cattle tested for accredited herd	7,623
Number reacting to test	None

Accredited Tuberculosis Free Herds, 1928

Number of cattle tested for accredited herd	4,831
Number reacting to test	None

Retests of Imported Cattle, 1927

Sixty-ninety day retests of cattle imported	860
Number reacting to test	4
Percentage of reactors	0.46

Retests of Imported Cattle, 1928

Sixty-ninety day retests of cattle imported	1,290
Number reacting to test	2
Percentage of reactors	0.10

Tests of Cattle Tested at Port of Entry, 1927

Number of cattle tested at Port of Entry	5,059
Number reacting to test	6
Percentage	0.10

Tests of Cattle Tested at Port of Entry, 1928

Number of cattle tested at Port of Entry	1,344
Number reacting to test	3
Percentage of reactors	0.022

Tests for Interstate Shipment, 1927

Number of cattle tested for shipment	748
Number reacting to test	None

Tests for Interstate Shipment, 1928

Number of cattle tested for shipment	1,778
Number reacting to test	5
Percentage of reactors	0.03

TOTAL NUMBER OF CATTLE TESTED FOR TUBERCULOSIS, 1927, 1928	214,587
TOTAL NUMBER OF REACTORS	638
PERCENTAGE OF REACTORS, 1927	0.30
PERCENTAGE OF REACTORS, 1928	0.29

Cattle Scabies, 1927

Number of cattle inspected for scabies	95,879
Number of cattle inspected and dipped, including first and second dippings	33,621
Total number of cattle inspected for scabies	129,500

Cattle Scabies, 1928

*Number of cattle inspected for scabies	92,592
*Number of cattle inspected and dipped, first and second dippings	19,034
Number of cattle inspected for scabies, exclusive Crow Indian Reservation	47,165
Number of cattle inspected and dipped, exclusive of Crow Indian Reservation, including first and second dippings	1,180

Miscellaneous Cattle Inspections, 1927

Number of cattle inspected for miscellaneous diseases	9,468
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Miscellaneous Cattle Inspections, 1928

Number of cattle inspected for miscellaneous diseases	24,737
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Importation Inspections, 1927

Number of cattle clinically inspected upon arrival in State	5,018
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Importation Inspections, 1928

Number of cattle clinically inspected upon arrival in State	6,662
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Inspections for Interstate Shipment, 1927

Number of cattle clinically inspected for interstate shipment	5,683
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(*Crow Indian Reservation)

Total Number of Cattle Inspected, 1927	264,762
Total Number of Cattle Inspected, 1928	265,168
TOTAL NUMBER OF CATTLE INSPECTED, 1927-1928	529,930

SHEEP

Scabies and Miscellaneous Diseases, 1927

Number of sheep inspected for scabies and miscellaneous diseases	155,649
Number found affected with scabies	None

Scabies and Miscellaneous Diseases, 1928

Number of sheep inspected for scabies and miscellaneous diseases	383,223
Number found affected with scabies	None

Importation Inspections, 1927

Number of sheep inspected and quarantined	130,323
Number of sheep dipped and quarantined, including first and second dippings	4,332
Re-inspections of imported sheep	72,853

Importation Inspections, 1928

Number of sheep inspected and quarantined	144,181
Number of sheep dipped and quarantined, including first and second dippings	2
Re-inspections of imported sheep	139,028

Inspections for Interstate Shipment, 1927

Number of sheep inspected for interstate shipment	390,354
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Inspections for Interstate Shipment, 1928

Number of sheep inspected for interstate shipment	472,793
Number of sheep inspections, 1927	753,511
Number of sheep inspections, 1928	1,139,165

TOTAL NUMBER OF SHEEP INSPECTED, 1927-1928.....	1,892,676
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SWINE, 1927

Number of swine inspected for various diseases, including hog cholera	12,700
Number of premises infected with hog cholera	21
Number of swine inspected for interstate shipment	1,019

Swine, 1928

Number of swine inspected for various diseases, including hog cholera	9,971
Number of premises infected with hog cholera	38

Number of swine inspected for interstate shipment	1,793
Total number of swine inspected, 1927	13,719
Total number swine inspected, 1928	11,802
TOTAL NUMBER SWINE INSPECTED, 1927-1928	25,621

POULTRY, 1927

Number of fowls inspected for tuberculosis and various diseases..	115,892
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Poultry, 1928

Number of fowls inspected for tuberculosis and various diseases..	122,697
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DOGS, 1927

Number of dogs inspected for various diseases	858
Number suffering from rabies	None
Number of dogs inspected for interstate shipment	175

Dogs, 1928

Number of dogs inspected for various diseases	806
Number suffering from rabies	None
Number of dogs inspected for interstate shipment	260

GRAND TOTALS

TOTAL NUMBER OF ANIMALS INSPECTED, 1927	1,165,709
TOTAL NUMBER OF ANIMALS INSPECTED, 1928	1,625,656
TOTAL NUMBER OF ANIMALS INSPECTED, 1927-1928	2,791,365

NUMBER OF MILES TRAVELED BY DISTRICT DEPUTIES AND SHEEP INSPECTORS, 1927—

	Auto	Railway	Foot	Horseback	Team
	76,469	9,833	33	177	212
Estimated number of miles traveled by resident deputies					12,100
Number of Miles Traveled, 1927					98,824

NUMBER OF MILES TRAVELED BY DISTRICT DEPUTIES AND SHEEP INSPECTORS, 1928—

	Auto	Railway	Foot	Horseback	Team
	91,175	9,361	15	32	192
Estimated number of miles traveled by resident deputies.....					15,300
Number of Miles Traveled, 1928					116,075
TOTAL NUMBER OF MILES TRAVELED, 1927-1928.....					214,899



