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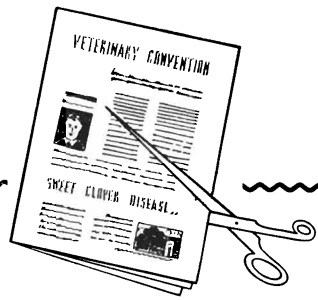
# Abstracts

# ABSTRACTS




**A NEW TRANSMISSIBLE DISEASE OF CATTLE.** This paper deals with an infectious disease of cattle in New York state that is characterized by a severe gastro-enteritis with marked diarrhea. Necropsy failed to provide any definite diagnosis, but early chemical analyses of the grain fed to the cattle affected revealed 1 per cent concentration of ammonium nitrate. However, later analyses failed to reveal even a trace of the chemical. Experimentally 1 per cent ammonium nitrate failed to produce the symptoms.

In the field the symptoms of this disease are characterized by normal or slightly elevated temperature, inappetence, depression and diarrhea early in the course. After 1 or 2 days, ulcers develop in the mouth, nose, and on the muzzle. Salivation may occur early in the disease and again after the ulcers develop. There is a mucus or mucopurulent nasal discharge and in many animals coughing persists throughout the attack. The body extremities are cold, and the body heat is irregularly distributed. The nasal and oral mucous membranes are pink to red in color. Milking cows show decreased milk production, and pregnant animals often abort. Those that aborted were negative to the agglutination test for Brucellosis. Leukopenia often accompanies these clinical symptoms. In each herd where outbreaks occurred some animals had temperatures of 105 to 108° F., pulse rates ranging from 80 to 120 and respirations from 48 to 90 with one up to 120. The mortality rate ranged from 4 to 8 per cent.

Experimentally the disease could be transmitted by drenching cattle with infected fecal material, or by making subcutaneous injections of blood or splenic emulsions collected during the febrile stage of the disease.

Lesions in experimental cases included sunken eyes, gaunt and dehydrated carcasses and ulcerations in the mouth and larynx. The entire mucosa of the oesophagous contained irregular ulcers. The gastric mucosa was reddened, with occasional omasal hemorrhages. In some cases there were hemorrhages in the subcutis, epicardium and vaginal mucosa.

In treating the condition physiological saline and blood transfusions were used. One to 4 liters of blood gave beneficial results. Penicillin therapy proved to be of little value.

[*Peter Olafson, A. D. MacCallum, F. H. Fox: An Apparently New Transmissible Disease of Cattle. Corn. Vet. 36:3, (July, 1946):205–213*].

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**THE EFFECT OF SULFANILAMIDE ON BOVINE SPERMATOZOA.** Experiments proved that the addition of sulfanilamide to fresh bull semen inhibits bacterial growth and increases the longevity of the spermatozoa.

When sulfanilamide was added to fresh bull semen that had been diluted with 10 parts of isotonic sodium citrate solution at levels up to 200 mg. per cent, there was an increase of only 3.6 per cent in the nephelometer readings of samples containing 200 mg. per cent of sulfanilamide after 72 hours incubation, as compared to an increase of 200 per cent in the read-

ings of control samples. Later trials using sulfanilamide levels up to 1,000 mg. per cent showed no increase in the nephelometer readings in samples containing 200 mg. per cent or more.

Using this same dilution method a maximum increase in the period of longevity of spermatozoa was obtained at a sulfanilamide level of 200 mg. per cent.

Fresh bull semen was then diluted 1:9 and 1:49 with yolk-citrate; sulfanilamide was added at levels up to 1,000 mg. per cent, and stored for 20 days at 5° C. Samples containing 300 mg. per cent of sulfanilamide showed the highest rate of spermatozoan motility at the end of this period.

A maximum stimulation of glycolysis was noted when sulfanilamide was added at the rate of 300 mg. per cent in the 1:9 and at 200 mg. per cent for the 1:49 dilution.

[*C. E. Knodt, and G. W. Salisbury: The Effect of Sulfanilamide on the Livability and Metabolism of Bovine Spermatozoa. J. Dairy Sci., 39, (May, 1946):285–291*].

**CAROTENE UTILIZATION IN THE NEWBORN CALF.** Experiments were conducted to gain some knowledge regarding the ability of the newborn calf to utilize carotene as a source of vitamin A. Male calves of the Holstein, Guernsey and Jersey breeds were fed skimmilk from birth with a low carotene grain ration composed of ground oats, ground barley, wheat bran, linseed oil meal, dicalcium phosphate and salt fed ad libitum. This was supplemented with adequate daily doses of vitamin D, ascorbic acid, alpha-tocopherol, thiamine, riboflavin, pyridoxine, niacin, calcium pantothenate and choline chloride in capsule form to guard against other vitamin deficiencies. Dried beet pulp was fed for roughage.

Carotene was then supplied as oily solutions of crystalline carotene, alfalfa leaf meal and a commercial concentrate containing 3.3 mg. of carotene per gram derived from vegetable sources. The calves were weighed weekly, and the carotene intake was adjusted with weight changes.

The plasma carotene and vitamin A level in the blood plasma were determined at birth and at least twice weekly.

In early experiments all but 1 or 11 calves died at about 7 days of age from severe enteritis, and/or septicemia and pneumonia. It was discovered that the enteritis, even in older calves, reduced the absorption of carotene from the digestive tract.

In succeeding experiments 4 to 8 gms. of sulfathalidine were administered daily to each calf during the first week to successfully control the diarrhea.

These experiments indicate that the young calves were able to utilize carotene as a source of vitamin A as was evidenced by an appreciable store of vitamin A in the livers at slaughter when 60 days old. At 1 to 2 days of age the blood plasma vitamin A levels were equal to or above the 0.1 microgram per milliliter level which has been set as the minimum level below which deficiency symptoms occur.

[*A. A. Spielman, J. K. Loosli, J. W. Thomas, C. L. Norton, and K. L. Turk: Carotene Utilization in Newborn Calf. J. Dairy Sci. 29:6 (June, 1946):381–391*].

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**CARDIAC FAILURE IN CATTLE ON VITAMIN E-FREE RATIONS.** During the past 8 or 10 years several animals maintained on vitamin E-free rations have died suddenly at ages ranging from 18 months to 5 years without evident gross cause. The manner of death strongly suggested cardiac involvement, so the electrocardiograph was used.

Four electrocardiograms were obtained from 1 heifer before her death. The sire and dam of this calf were both raised on a vitamin E-free ration. She calved normally when less than 17 months old and died suddenly at 21 months of age.

A study of the series of electrocardiograms revealed a gradual and progressive cardiac abnormality. The first change noted was an increase in the PR, QRS, and QT intervals, and a decrease in the potential of deflection of the QR complex. In the last recording there were extra systoles indicating dissociation of the atrial and ventricular impulses and probably damage to the conducting tissue.

Microscopic studies of cardiac sections are being made and although this work is not complete, definite abnormalities have been noted. Among the changes observed are atrophy and scarring of the cardiac muscle fibers and an increase in the cellular elements.

[*T. W. Gullickson, and C. E. Calverly: Cardiac Failures in Cattle on Vitamin E-free Rations as Revealed by Electrocardiograms. Science, 104:2701, (Oct. 4, 1946):312–313*].

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**TYROTHRICIN FOR TOPICAL APPLICATION.** This work was conducted to determine the value of tyrothricin as an antibiotic agent for topical application since the widespread indiscriminate use of the sulfonamides and penicillin by the population at large might produce sensitization of the body as well as drug-fast strains of bacteria to these latter drugs.

Tyrothricin, a mixture of gramicidin and tyrocidin, possesses an antibacterial action against a large number of organisms. Gramicidin does not have its action affected by serum albumin. However, this is not the case with tyrocidin. Gramicidin inhibits the multiplication of sporulating bacteria.

When applied to chronic ulcers of the body extremities which were infected with *Streptococcus hemolyticus, Staphylococcus aureus, or Streptococcus fecalis,* tyrothrycin produced sterilization and healing. Encouraging results were obtained upon application of this substance to mastoid cavities following surgery. Streptococcic empyemas responded dramatically to the drug, while staphylococcic and pneumococcic empyemas showed little response. In a series of 93 cases of ulcers only 17 failed to heal after the use of tyrothricin topically. A case of an ulcer infected with a sulfonamide-fast strain of *Strepococcus pyogenes* responded readily to tyrothricin application.

Russian investigators reported rapid elimination of bacteria from 573 cases in-

cluding gunshot wounds, empyema, and osteomyelitis when Gramicidin S, a less refined product, was used.

A 2 year survey showed acute otitis media, acute and chronic sinusitis to yield better to tyrothricin than to any other treatment. It has also been effective against mixed infections of the vagina.

When applied to a gauze bandage where it can become moistened the tyrothricin readily goes into solution in the tissue fluids in practically optimal concentrations. The bactericidal action of tyrothricin is not affected by autoclaving hence such packs can be sterilized after the application of the tyrothricin.

Tyrothricin possesses a low tissue toxicity but it does have a hemolytic action when administered parenterally. Studies, as yet, have been unable to demonstrate any developing sensitivity of body tissues to tyrothricin.

[*John Henderson:The Status of Tyrothricin as an Antibiotic Agent for Topical Application. J. Am. Pharm. Assn., 35:5, (May, 1946):141–147*].

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The Bureau of Animal Industry conducted studies on the relative tenderness of different cuts of beef. The carcasses tested were 8 cows 4 to 12 years old, 3 heifers 3-years old, 21 steers 15 to 18 months old and 1 calf. In all cases the tenderloin was the most tender cut, followed by the rib, short loin, loin end, chuck cuts, round, neck and foreshank in decreasing order of tenderness. The steer meat was more tender than the meat from the cows. Histological study showed that increasing diameter of muscle fiber was associated with decreasing tenderness.

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According to reports received from the Bureau of Animal Industry skim milk or whey when fed once daily, instead of grain, or fed exclusively for 3 consecutive days at intervals of 2 weeks, offers effective protection for pigs against the acquisition of large roundworms, nodular worms and whipworms. The pigs so fed made satisfactory gains and remained in good condition.

## The Iowa Veterinary Diagnostic Laboratory

For the past 18 years, laboratory diagnostic service to the livestock industry of Iowa has been provided by the Division of Veterinary Medicine, Iowa State College, through its Department of Veterinary Pathology. The laboratory has been housed in the Veterinary Pathology Building which also houses the Department of Veterinary Hygiene. The crowded conditions have interfered with the most effective operation of the laboratory and there seemed to be no possibility of expanding the present facilities. A careful study of building facilities within the Veterinary Division indicated that the only way to meet the increased statewide demand for laboratory service for animal disease control is through provision of a new modern building.

Through a joint arrangement with the Division of Animal Industry, Iowa Department of Agriculture, the diagnostic laboratory was reorganized and established within the Veterinary Division as the Iowa Veterinary Diagnostic Laboratory as of July 1, 1946. Plans are in preparation for a new building, which will be constructed at the earliest possible time. The site for the new laboratory building will very likely be where the old military barracks building is now located.

The present staff of the diagnostic laboratory consists of Dr. E. A. Benbrook, supervisor, Drs. Sam G. Kenzy and Leon Zlotnick, diagnosticians, with Donald T. Mason and Jean Persson, technicians.

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Furacin, a yellow powder derived from the hulls of oats, is a new chemical which has been discovered for the treatment of skin infections. It not only checks the growth of organisms but actually kills them.

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Pyridoxine, vitamin $B_6$, is reported by Cantor and Scott of the University of Alberta to be effective in the treatment of sulfathiazole, aspirin and thiouracil poisoning.