

Live Stock Losses in Saskatchewan Due to Blackflies

By J. L. MILLAR* AND J. G. REMPEL**

ON June 1, 1944, an excessive abundance of blackflies in the Macdowall area, some twenty miles south-west of Prince Albert, Saskatchewan, resulted in a serious loss of animals, especially cattle. An exceptionally heavy flight of blackflies was noticed by residents in the district on Wednesday morning, May 31. Animals began to die late that night and continued to die until Thursday afternoon. A survey of the area immediately following the outbreak (see table 1) revealed that at least 132 animals died, with 95 showing various degrees of swelling. Owing to the fact that some of the animals were pure bred, the total loss sustained has been estimated to be in the neighbourhood of \$20,000.

Excessive outbreaks of blackflies with deleterious effect upon live stock in various parts of the world are not uncommon. One of the most startling outbreaks occurred in south-eastern Europe in 1923. It is claimed that in this outbreak Roumania alone lost over 16,000 domestic animals. Serious losses have also been reported from the Mississippi valley in the United States. In Saskatchewan the Rosthern, Duck Lake and Macdowall areas, located in a narrow strip of land between the two branches of the Saskatchewan river, have had extensive outbreaks in the past years. Cameron (1922) mentioned such an outbreak occurring in 1913 with a loss of about 100 head of cattle. According to Dr. Norman Wright of the Veterinary Department, University of Saskatchewan, a half a dozen heavy outbreaks have occurred in the past thirty years, accompanied with sudden and drastic fatalities in live stock, mostly cattle. It would appear that in every instance the species responsible was *Simulium arcticum* which on occasion breeds in tremendous numbers in rapids of the South Saskatchewan river. In every instance the outbreak disappeared as suddenly as it came.

In the recent outbreaks at Red Deer Hill and MacDowall, blackflies were noticed to be prevalent by a few farmers on Tuesday night, May 30. Most residents, however, were not aware of an exceptionally heavy flight until Wednesday morning. This continued all day Wednesday and animals were noticed to be very restless and severely attacked by these flies. Deaths began to occur late Wednesday night with most of the dead animals discovered Thursday morning, June 1. Live stock continued to die throughout that day, but few deaths occurred after 3.00 p.m. Thursday. The weather turned cloudy and cool that day and few flies were found in the late afternoon. On Friday and Saturday it was cold with intermittent rain and no flies were found on either the living or dead animals. All deaths occurred within the twenty-four hour period following the heavy flight of these flies. When the weather changed and flies were not active, losses immediately stopped.

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The female of this blackfly is a vicious biter of live stock, especially older cattle and horses. The flies commonly aggregate on the less hairy portions of the animal's body, such as under the surface of the belly, the inguinal region, particularly in front of the udder in cows, the scrotum of bulls, just behind the front legs and on the neck region. Losses in sheep were confined to animals which had been sheared, while animals not yet clipped, appeared to suffer little inconvenience. Calves and yearlings were practically immune (table 1).

The most common symptom observed in sick animals was a dropsical swelling in the region of the throat, which later dropped into the dewlap in cattle. In sheep and horses the swellings appeared about the throat and later were quite noticeable in the subcutaneous tissues of the chest and sternum. Several horses showed great swellings under the belly, extending from the inguinal region forward to the front legs.

All animals examined showed evidence of having been severely bitten by flies, particularly the lower parts of the body and those parts lightly covered with hair. In most cases heavy jerky breathing with a distinct trembling of the muscles were the first symptoms, later the animals went down, gasped for breath and died in a few minutes. In most cases death occurred in from fifteen minutes to two hours after symptoms were observed. Animals living for a longer period showed a gradual improvement with almost complete recovery in from twenty-four to forty-eight hours.

In two cattle seen in the acute stages the most prominent symptom was heavy breathing with a jerky action of the body, which vibrated to such an extent that it was almost impossible to count the pulse. A distinct trembling of the muscles was also quite noticeable. When examined twenty-four hours later both animals were almost completely recovered.

All dead animals had a great many reddish purple spots, about two millimeters in diameter, on the skin along the lower and more tender parts of the body. These spots were presumably where blackflies had fed. A small quantity of serous exudate exuded from each of these bites and when dry appeared as small blackish beads, attached to the hair, and gave the skin a roughened feel. The areas severely bitten, could therefore be easily detected even when well covered with hair.

Post mortems on three of the dead cattle revealed typical lesions with little variation in the findings in each animal. It should, however, be pointed out that all animals had been dead approximately twenty-four hours, were undergoing decomposition, and therefore were not good subjects for a careful post mortem. Two of the carcasses were badly distended with gas in the subcutaneous tissues, likely due to putrefactive changes. Well marked dropsical swellings were found in the subcutaneous tissues extending from the throat to the sternum with hemorrhagic areas about the elbows and flanks which had the appearance of typical bruises, the latter being particularly noticeable on the underside of one carcass. All body cavities contained a large quantity of either clear or blood stained serous fluid, the abdomen approximately two gallons, thorax one gallon, and pericardium one quart. The lungs were very heavy and infiltrated with serous fluid, this edema no doubt was the cause of the sudden deaths by suffocation. There was some evidence of pleurisy with flakes of fibrin adhering to the chest wall and surface of the lungs. The mucous membrane of the nasal passages, trachea and bronchi were slightly congested and contained no foreign matter other than a small quantity of blood stained

exudate. Small petechia were observed on the pericardium, endocardium and heart valves.

The omentum and visceral peritoneum were oedematous and infiltrated with serous fluid. Small well marked inflamed areas were also found on the peritoneum with numerous flakes of coagulated fibrin adhering to the surface of all the abdominal organs. A generalized inflammation of the mucous membrane of the digestive tract was quite noticeable with a well marked gastritis of the abomasum. These inflammatory changes continued throughout the small intestine with what could be termed a severe enteritis involving the ileum, ileocecal valve and caecum, little change being noted in the colon. In one instance deep coloured well marked petechiae were visible on the inflamed mucous membrane of the ileum, the bowel containing a blood stained exudate. All lymphatic glands were enlarged and congested. The spleen was congested and full of dark tarry blood but not much enlarged. Kidneys and liver congested, bladder normal. Blood dark and did not clot readily.

A sample of blood with sections of the lung and intestine were forwarded to Dr. J. S. Fulton, Department of Veterinary Science, University of Saskatchewan, for a bacteriological examination. Dr. Fulton reported that cultures of these specimens proved negative as far as disease producing bacteria were concerned.

The death of these animals has been variously attributed to tick paralysis, plant poisoning, a disease organism, mechanical suffocation caused by inhaling blackflies, toxemia, and anaphylactic shock as a result of black fly bites. Space does not permit a full analysis of these various factors, but

TABLE 1
STATISTICS OF LOSSES IN BLACKFLY ATTACK

Type of Animal	Calves	Yearlings	Cows	Bulls	Horses	Sheep	Hogs	Type not recorded	Total
Total number recorded in survey. With few exceptions all bitten.	287	225	619	25	301	550	799		2806
Total number recovered	2	2	40	1	30	20	0		95
% recovered	.70%	.88%	6.46%	4.00%	9.47%	3.64%	—		
Total number dead.	1	4	46	7	3	11	1		73
% dead	.35%	1.78%	7.43%	28.00%	1.00%	2.00%	.13%		
Additional records of dead animals			34	1	7	5	1	11	59
Total number of recorded dead	1	4	80	8	10	16	2	11	132

After J. G. Rempel and A. P. Arnason.

the investigation carried on so far has eliminated the four former suggestions as the possible cause.

We are inclined to the belief that deaths in this outbreak occurred as a direct consequence of an acute toxemia, caused by extensive bites of blackflies. The evidence collected would indicate that cattle, sheep and horses in this area were all exposed to attack by these flies on Wednesday, May 31, and that all deaths occurred within twenty-four hours of the time of the attack. When, owing to inclement weather conditions, late Thursday, all of Friday and Saturday, the flies ceased to be active, the losses immediately stopped.

The possibility that these deaths were a result of anaphylaxis is, however, not ruled out. It is quite possible that calves were not affected because of the fact that they had never previously been attacked by blackflies, and so had not been sensitized to the material injected by the flies into the host at the time of feeding. On the other hand the older animals had, some time in previous years, been sensitized by light attacks and suffered an anaphylactic shock upon subsequent infections in large doses of the same protein. The fact that few yearlings were affected would also fit into this picture.

References

- CAMERON, A. E. (1922): *The Morphology and Biology of a Canadian Cattle-Infesting Black Fly, Simulium simile* Mall. Dept. Agri. Dom. of Canada, Bull. No. 5, n.s.
- REMPEL AND ARNASON. *An excessive abundance of the blackfly Simulium arcticum in Saskatchewan and its effect upon live stock.* In press.



The Science Round Table

THE SCIENCE Round Table was formed as a group for discussion by the B. C. Veterinary Association about a year ago. Several meetings have already been held at which various members presented papers dealing with some subject of veterinary science.

The object of the Science Round Table is to bring veterinarians in British Columbia together, and results from the ever changing methods of treatment are discussed freely by the veterinarians and each talk is subject to a free for all questioning and discussion period.

The members of the B. C. Veterinary Association are unanimous in acclaiming this Science Round Table venture as a most beneficial procedure and they are enthusiastic to continue such discussions at frequent intervals.

It is gratifying to note that veterinary officers from both the Dominion and Provincial Services in this Province unite with the veterinary practitioners in these Association activities—*F. W. B. Smith, president, B. C. Veterinary Association.*

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