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THE UNIVERSITY OF NEBRASKA
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Losses From Cornstalk Disease in Custer County, Nebraska, During the Winter of 1906-1907

BY F. J. ALWAY AND A. T. PETERS

"Cornstalk disease" is the name given to the cause or causes of death of cattle allowed to run in fields of standing cornstalks from which the ears have been gathered. It is probable that "many different maladies have been included under this name." In Nebraska, however, there is such a similarity in the symptoms reported by the farmers that it seems probable that the great majority of the losses attributed to cornstalk disease are really due to some common cause. As to the exact nature of this cause nothing is known. However, various theories have been advanced, and methods of prevention or treatment based upon these theories have been described.

A theory of the cornstalk disease is valuable in so far as it enables the person acting upon it to avoid losses or to make progress in the study of the cause, prevention or cure of the malady. Judged from this standpoint, all the theories of the cause of cornstalk disease hitherto advanced are worthless, and some of them are even dangerous in that they induce farmers to pasture their stalk fields in the belief that acting on a particular theory they may count upon meeting with no loss.

In some parts of Nebraska the loss of cattle, attributed to cornstalk disease, has been very small. The eastern counties report the least and the central counties the greatest loss. The small loss in the western part of the state may be due to its small acreage of corn. For the past four years the losses have been especially severe in one group of four counties, viz., Custer, Buffalo, Dawson and Howard. Custer has experienced the heaviest losses and has been selected as the field for a detailed investigation of the circumstances under which cattle die of the malady.

In the month of February, 1907, we spent some time in Custer county investigating the losses from cornstalk disease. From the school teachers, the directors of school districts and some 450 cattle owners we obtained lists of the names of farmers in the county who were reported to have experienced losses from the disease during the winter. From only 34 of the 262 school districts did we fail to secure definite

information. To the 881 addresses thus obtained, we sent letters enclosing blank forms on which to supply detailed information in regard to the losses of the winter of 1906-1907, as well as such information in regard to the losses of previous winters as could be remembered. Replies were received from 462 persons of whom 404 had lost cattle from cornstalk disease during the winter of 1906-1907.

That the losses were not confined chiefly to new settlers, as claimed by some, is evident from the fact that only 73 of the 404 had resided in the county for less than ten years.

The total loss of the 404 farmers from cornstalk disease in 1906-1907 was 1,531 animals. The heaviest losses were of animals from one to three years old. One hundred and eighty-two were less than one year old, 551 were between one and two, 402 were between two and three, while 223 were over three. The ages of 173 of the cattle lost were not reported.

The losses by months were: October, 24; November, 327; December, 393; January, 422; February, 142; March, 142. The heavy losses in November, December and January are to be attributed to the cattle being turned into the fields chiefly in these three months.

The first loss of each farmer usually occurred during the first month after the cattle were turned into the fields, it being during the first month in the case of 336 farmers, during the second in that of 44 and during the third or fourth in that of 11. In the first month the losses were heaviest during the first two weeks, being 132 in the first week, 102 in the second, 41 in the third and 61 in the fourth. During the first seven days the losses were 14, 20, 22, 12, 11, 20 and 33 respectively.

The length of time that the cattle had been on the stalks before dying was very similar to that before the first loss. Of the 1.503 in regard to which we have data, 428 died during the first week, 377 during the second, 170 during the third and 187 during the fourth. The total loss during the first month was 1,162, during the second 238 and during the third 103.

Where the cattle had no other feed than cornstalks the loss averaged 81 per 1,000 cattle and 41 per 1,000 acres. Where they had some other feed in addition to the stalks the loss was 61 per 1,000 cattle and 46 per 1,000 acres. The percentage loss of cattle was less where they were fed, but it should be noted that while for each animal of the first class there were two acres of stalks, there were only 1¼ acres for each of the second class.

It has been said by experiment stations and accepted by the majority of cattle owners that the liability to loss is greatly reduced when the cattle are allowed to remain on the stalks only a short time at first. Our data do not support this view at all. Eighty-one farmers, who allowed their cattle to remain in the fields for only one hour or less at first, lost 327 head; 139, who allowed them to remain from two

to three hours, lost 574; 46, who limited the time to from four to six hours, lost 186. Those who allowed the cattle to remain in the fields all day and kept them out at night numbered 27 and lost 140. Lastly, 88 farmers, who allowed their cattle to remain on the stalks night and day from the first, lost 373. It will be seen that each of the 381 farmers lost on the average from four to five head of stock no matter to which of the five classes he belonged.

The failure of any feed or any combination of feeds to prevent loss of animals is well shown by the following table:

Feed given cattle in addition to the cornstalk pasture	No. of farmers.	No. of cattle lost	No. of cattle pastured	No. of acres pastured	No. of cattle lost. per 1000 cattle	No. of cattle lost per 1000 acres tured pas-
None	113	464	5689	11077	81	41
Corn	33	115	1484	3171	77	35
Prairie hay	79	333	7541	5096	44	65
Alfalfa hay	26	87	1402	2560	62	33
Green feed *	23	97	1297	1862	74	52
Corn and prairie hay	36	146	1993	3154	61	45
Corn and alfalfa	10	62	2282	1335	28	46
Corn and green feed	5	11	203	418	54	26
Prairie hay and alfalfa	14	52	1343	1640	39	31
Prairie hay and green feed	13	38	578	1185	65	32
Alfalfa hay and green feed	6	33	331	567	99	58
Corn, prairie hay and green feed	6	27	185	236	145	114
Corn, alfalfa and green feed	2	4	57	160	70	25
Corn, prairie hay and alfalfa	5	24	192	260	125	92
Prairie hay, alfalfa and green feed	3	14	131	255	107	54
Corn, prairie hay, alfalfa and green feed	5	16	193	295	82	54

* "Green feed" is used to signify that the cattle were allowed to pasture on rape, wheat or rye in addition to cornstalks.

Request has come to us to tabulate from our data how soon cattle died after they were turned into the stalk fields. The following are the data compiled:

Out of the 5015 cattle which were allowed to remain only one hour on the stalks at first, the loss was 364 or 7.6 per hundred. Of the 6763 cattle that remained in the field from two to three hours, 545 died, a percentage of 7.8. Of the 2663 cattle that were left in the field from

four to six hours 184 died, a percentage of 6.3. Of 1450 cattle that were allowed in the stalks for twelve hours at first 125 died, a loss of 8.6 per hundred. Of the 8237 that were left in the field all the time 377 were lost, a percentage of 4.5.

We think we are quite justified from the above data in concluding that there is no greater risk when the cattle are allowed in all the time than when they are turned in for only a short period at the beginning of the feeding of the stalks.

The losses reported by those who withheld either salt or water were about the same as the losses of those who gave their cattle a liberal supply of both. Out of 183 cattle that had salt but were not well supplied with water 10 were lost; out of 3,970 having plenty of water but no salt 211 were lost, while among the 18,687 having both salt and water there were 1,310 deaths.

We have been unable to find any relation between the rainfall of the summer, or of the autumn, and the losses of the following winter. Neither the temperature of the winter months nor the snowfall has been found to influence the losses when the latter were considered in ten-day periods.

No part of the county was distinguished by a heavy proportionate loss. Neither was there any important difference between upland and bottom land or between sandy and heavy soil.

The replies indicate the general agreement of the farmers in the view that few animals attacked by the malady recover. Of the 404 reporting, only 22 reported having ever had an animal recover.

In previous publications of this Station it has been shown that smut is not responsible for the disease and that what is called "dry murrain" is simply a natural condition of the third stomach.

Since the discovery in sorghum of a glucoside containing a powerful poison, hydrocyanic acid, many fruitless attempts have been made to obtain a similar chemical compound from cornstalks. Up to the present time no poisonous substance has been found in the stalks taken from fields where cattle have died.

CONCLUSIONS

1. The farmers of the central counties of Nebraska, unless they are to lose the valuable forage of their cornstalks, must choose between two alternatives:

(a) Cutting the stalks when the corn ripens and shocking them in the field.

(b) Pasturing the standing stalks with the knowledge that they are liable to lose as many as one-twentieth of their cattle in an unfavorable season.

2. No precaution and no feed or combination of feeds has been found to prevent or to mitigate the losses from cornstalk disease.