

# A Progress Report . . .

## ERGOT IN RATIONS

## FOR FATTENING CATTLE

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Ergot is not a new disease of grains and grasses in North Dakota. It has been observed, particularly in rye, for many decades. The severity of the infestation varies with weather conditions, area, and variety and type of grain or grass.

Ergot is caused by a fungus, *Claviceps purpurea*, which infects the flowers of cereal grains and grasses causing the seed or kernel to develop as a purplish-black sclerotium. The ergot bodies are usually larger and less dense than the seeds of the grains or grasses.

Ergot toxicity is traceable to its content of alkaloids. These alkaloids cause various responses when consumed by or administered to an animal. One of the more common symptoms observed when toxic levels of ergot are consumed is the constriction of the blood vessels flowing to body extremities causing a shortage of blood in the legs, tail, ears, etc. of the animal. This may result in tissue death with "sloughing off" of the damaged appendages. This is often referred to as the chronic or gangrenous form of the disease.

Another symptom of toxicity is poor breeding efficiency, as evidenced by poor conception rate or abortion. Abortion results because the ergot stimulates the contraction of the uterine muscles. In fact, ergot was described in the middle ages and was used in childbirth and to control hemorrhages in the days of secret concoctions and potions.

Milk production may also be reduced by ergot in the feed. In some cases there is complete agalactia.

A recent circular (NDSU Extension Circular PP-551, 1971) reviews the toxic effects of ergot on livestock.

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Research on the effects of long term, low level (less than 0.15 per cent) feeding of ergot to fattening cattle was initiated in an effort to ascertain whether the results obtained from an evaluation of a new grain, triticale (Rossner), were due to the grain or to traces of ergot that the grain contained. No reports were found in the literature where ergot had been fed at low levels over a long period of time.

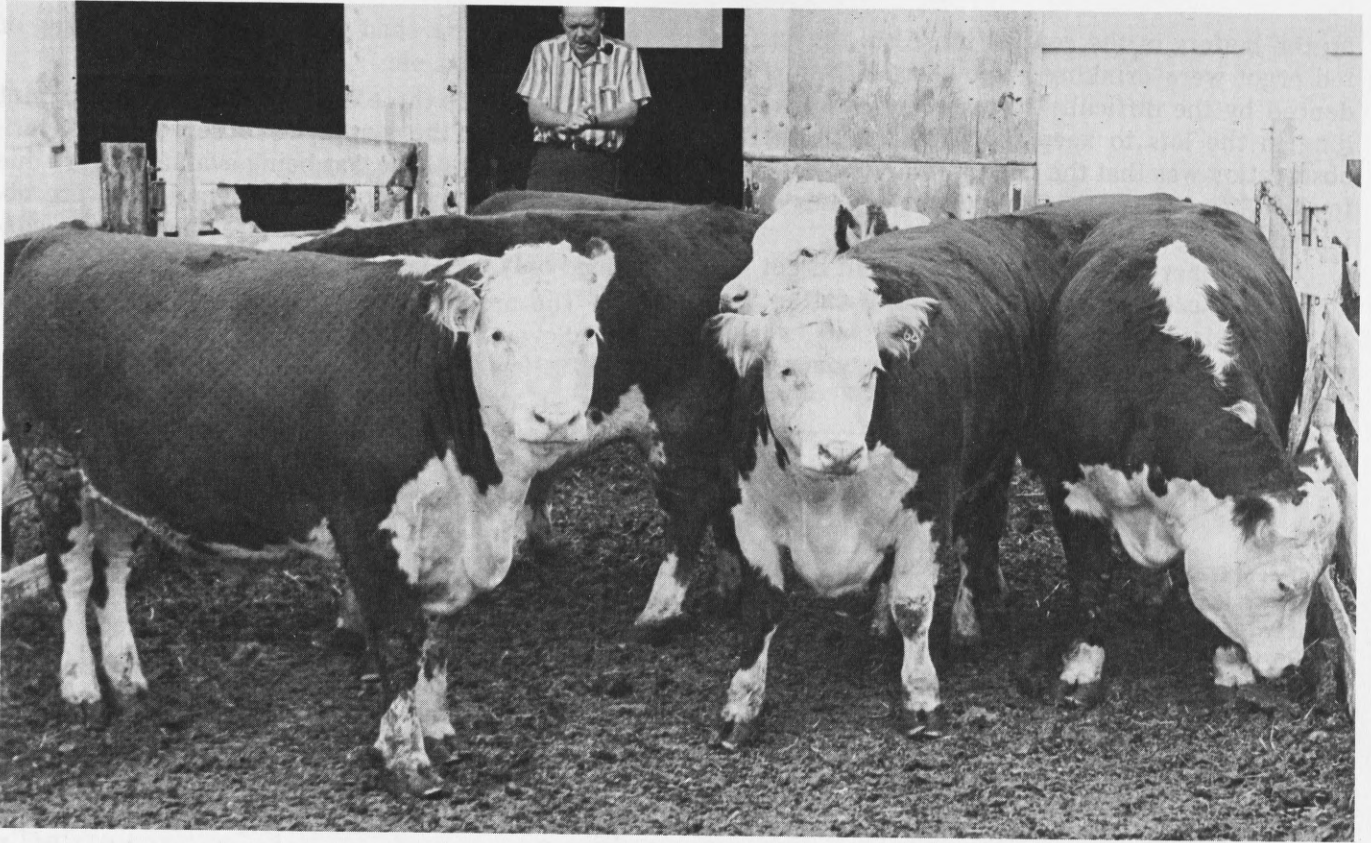
Because the first noticeable symptoms appeared to be a reduced feed intake and reduced gains, small fleshy heifers were allotted to four groups and fed finishing rations containing two levels of ergot from two sources to see if these symptoms would appear. The results of feed intake and gain are presented in Table 1.

Table 1. Effect of Ergot on Feed Intake and Gain of Beef Heifers.

Lot	1	2	3	4
Treatment	Control	0.5% Rye Ergot	0.5% Wheat Ergot	1% Wheat Ergot
Initial Wt. Lb.	591	594	603	586
Final Wt. Lb.	623	592	572	571
Av. Daily Gain, Lb.	0.65	-.04	-.057	-0.31
Feed per day, lb.	11.1	8.88	8.00	7.77
Feed per pound gain, lb.	17.2	—	—	—

The heifers were fleshy and were kept on these rations for only 49 days at which time the experiment was terminated to make room for other research.

The control group did not gain well, but the groups receiving the added ergot ate 20 to 30 per cent less feed and lost weight. In addition, the heifers on the ergot were showing heavier hair coats which were dull and lacked the "bloom" seen



North Dakota Experiment Station steers fed a normal ration. Note their bloom, alertness and condition.



A similar lot of steers fed ergot (0.15% of ration). Note their long, matted hair coat, lack of bloom, unthriftiness and listlessness.

on the heifers in the control lot. Also, the heifers fed ergot were drinking much more water as evidenced by the difficulty in providing enough bedding in the lots to keep the pens dry. A further observation was that the heifers fed ergot appeared to show more stress from the warm weather experienced during the trial.

In another experiment, 0.5 per cent ergot was added to barley rations for fattening cattle. Two lots were dairy-beef crossbred steers and two lots were beef steers. The results are summarized in Table 2.

**Table 2. Ergot in Rations for Fattening Cattle.**

Lots	Crossbreds		Beef breed	
	1	2	3	4
<b>Treatment-Ergot</b>	<b>0</b>	<b>0.5%</b>	<b>0</b>	<b>0.5%</b>
Initial wt. lbs.	538	520	382	372
Final wt. lbs.	1056	1011	817	761
Av. Da. Ga. Lb.	2.19	2.12	1.88	1.68
Av. Feed/day/lb.	17.2	15.2	13.4	11.7
Lbs. feed/lb. gain	7.8	7.2	7.1	7.0
Per cent Intake of Control	—	88	—	87
Per cent Gain of Control	—	97	—	89

As can be seen from the table, feed intake was reduced as the steers on ergot consumed only about 88 per cent as much of the ration. The gains were reduced more for the beef type than for the dairy-beef crosses. In general the dairy-beef crosses were more aggressive, ate more and gained faster, but were not as efficient in feed conversion.

In regard to other expressions of toxicity, the wet pens were in evidence as a result of greater water intake and urination. The inability to shed winter coats was also in evidence, and the ergot-fed cattle showed increased respiration and some discomfort on warmer days. The beef-type showed more stress than did the dairy-beef crosses. This and other observations suggest that not all cattle respond alike to the effects of ergot in the ration.

In another experiment comparing performance of yearling steers receiving 0 or 0.15 per cent ergot, steers receiving ergot consumed eight per cent less feed and gained three per cent more slowly with comparable feed efficiencies. In another comparison, steers receiving 0.15 per cent ergot consumed 15 per cent less feed per day and gained 25 per cent less rapidly. In this comparison the gains were affected more by an outbreak of foot rot which was very difficult to cure, presumably because of less blood flow to the feet. There were also cases of digestive upsets in the ergot-fed lot, not noted in any other lot. The other usual symptoms of toxicity were also present, increased urination and wet

pens, inability to shed winter hair with matting of hair, heat stress, etc.

From these three experiments, it was apparent that many of the symptoms observed in experiments where triticale was being evaluated were due to the traces of ergot. Similar symptoms were observed in one experiment where the triticale contained only 0.06 per cent ergot.

The problem of ergot toxicity is not a simple one. Several questions remain unanswered in regard to low level long term feeding of ergot. Not all ergot appears to have the same level of toxicity. Whether this variation due to grain species (i.e., ergot from rye, wheat, triticale, etc.) is of any significance is not known. The effect of storage, or grinding and storage, on potential toxicity is unanswered. A limited number of observations showed that ergot stored for two years was still toxic. The tolerance to ergot by different breeds or species of livestock has not been fully clarified.

Until more definitive data is available, any rations containing 0.06 per cent or more ergot should be considered potentially toxic, particularly for long term feeding. Many of the symptoms of toxicity observed for levels of 0.15 per cent and 0.5 per cent ergot in rations were also observed in triticale rations containing 0.06 per cent ergot.

In general, the symptoms most generally observed for long term low level (less than 0.15 per cent) feeding of ergot were reduced feed intake, reduced gain, unthriftiness, increased water intake and urination, and heat stress. The cattle did not shed their long winter hair normally, as shown in the pictures. At temperatures of 80° F and above, the cattle had increased respiration rates (panting) and frequent slobbering of saliva.

The cattle had less resistance as evidenced by the difficulty in curing foot rot when it occurred. There were more digestive disturbances and difficulty in keeping on full feed. Lameness and tender feet and legs was observed. Some cattle were nervous, while others appeared dull and listless. This could be called "unpredictable behavior".

The symptoms of ergot toxicity could go unnoticed unless similar cattle without ergot in the feed were available for comparison, because in general, the symptoms are those of "poor-doing, unthrifty" cattle. No treatment for ergotism is known at this time. Cattle which had been fed ergot and showed many of the symptoms of ergotism had not fully recovered even after six weeks of feeding an ergot-free ration.

Research on the various aspects of ergotism is continuing in an effort to shed more light on the many problems associated with this disease.