tape recordings of the thermal noise with a harmonic analyzer, and to F. V. Hunt and S. S. Stevens of Harvard University and J. L. Stewart of the U.S. Naval Electronics Laboratory, San Diego Calif., for helpful discussions of these experiments.

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Effects of Methimazole on Thyroid and Live Weights of Cattle

Interest in the potential usage of different goitrogenic agents, especially thiouracil, in livestock and poultry production is manifest in the large number of investigations that have been made during the past 15 years, many of which are cited by Sykes *et al.* (*1*). Most investigators have studied the use of thiouracil in reducing basal metabolic rate in animals for purposes of either stimulating fattening in meat-producing animals or bringing about a more efficient over-all usage of the respective rations fed. Although some success has been achieved with thiouracil in reducing metabolic rate in animals (*2*), nevertheless other, unfavorable features have been noted in connection with its administration, such as its unpalatability and its tendency to slow rates of growth; hence, no general use of goitrogens in animal feeding has thus far been made. The objectives of the investigation described in this report were to determine the amount of a potent synthetic goitrogen, methimazole (1-methyl-2-mercaptoimidazole, or Tapazole) (*3*) necessary to bring about enlargement of the thyroid in cattle and to observe the influences of methimazole upon appetite, live-weight gains, and efficiency of feed utilization when it was fed to growing and fattening beef animals.

Thirty steers, weighing about 975 pounds each, were divided into six groups and full-fed a mixture of corn, hay, and protein supplement containing stilbestrol, a growth-promoting substance for beef cattle reported earlier (*4*). The rations were alike except for the amounts of methimazole added to the respective rations. Groups 1a and 1b received no methimazole, whereas groups 2, 3, 4, and 5 received rations that contained methimazole in the following percentages: 0.0017, 0.0035, 0.0052, and 0.0070, respectively. These levels corresponded to 200, 400, 600, and 800 mg per animal per day. The feeding experiment was carried out during the late fall and early winter season, during which the temperature was below freezing much of the time.

The results are presented in Table 1. Thyroid weights were rather variable within groups, but on the average they increased with each level of methimazole fed, the highest level producing thyroids approximately four times the size of those in the control cattle. The increased weights of the thyroids of the cattle in this study suggest that the levels of methimazole fed were sufficiently high to inhibit thyroxin secretion. The improvement noted in over-all feed utilization might be explained on the basis of a lowered thyroxin secretion and thus a lowered metabolic rate, whereby a higher percentage of the ration was converted into cattle live-weight gains. Live-weight gains were excellent in the cattle receiving methimazole, and in all cases these gains exceeded the gains made by the control animals. The maximum stimulation in gain by lots was 22 percent, and the average stimulation amounted to 11 percent. No depression in appetite accompanied the feeding of methimazole; rather, the cattle receiving the goitrogen consumed an average of 3 percent more feed than the control cattle. Over-all feed utilization was increased by the methimazole as much as 13 percent, with an average increase of 7 percent. The quality of meat produced by the inclusion of methimazole in the ration was indistinguishable from the quality of meat of the control cattle on the basis of federal grades and dressing percentages.

It was interesting to note that methimazole did not depress appetite, whereas thiouracil usually inhibits appetite and results in lowered rates of growth in almost all species of animals. This apparent discrepancy in the action of these two goitrogens is believed to be due to the unpalatableness of the thiouracil or to its greater toxicity at equivalent dosage levels. In earlier cattle experiments in this laboratory (*5*) it was impossible to feed sufficiently high levels of thiouracil to depress thyroid activity appreciably without at the same time decreasing feed consumption and rate of live-weight gain.

Table 1. Results of adding methimazole to the ration of cattle in a 79-day experiment.

Item	Methimazole added				
	Lot 1 None	Lot 2 0.0017%	Lot 3 0.0035%	Lot 4 0.0052%	Lot 5 0.0070%
Av. initial wt. of cattle (lb)	976	977	981	976	985
Av. final wt. of cattle (lb)	1209	1245	1226	1258	1222
Av. daily gain (lb)	3.0 ± 0.1*	3.4 ± 0.2	3.1 ± 0.1	3.6 ± 0.1	3.1 ± 0.2
	Av. daily ration				
Cracked corn (lb)	17.7	19.1	18.1	19.0	18.0
Alfalfa hay (lb)	6.0	6.0	6.0	6.0	6.0
Supplement (lb)	1.0	1.0	1.0	1.0	1.0
Total (lb)	24.7	26.1	25.1	26.0	25.0
Feed/100-lb gain (lb)	837	770	804	726	831
Dressing percentage	59.8	58.1	59.5	59.5	60.0
	Federal carcass grade				
Choice	4	3	2	1	2
Good	6	2	3	4	3
Av. wt. of cattle thyroid (g)	29 ± 3	35 ± 5	65 ± 10	70 ± 8	123 ± 18

* Standard error of mean.

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References and Notes

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Electron Microscopy of the Anaplasma Body: Ultrathin Sections of Bovine Erythrocytes

Anaplasmosis is an infectious disease of cattle. However, it has been recognized in another species (ovine) on one occasion in the United States (*1*). The acute or peracute form of the disease is