

## THE EFFECT OF FEEDING THYROACTIVE COMPOUNDS TO LACTATING SOWS<sup>1</sup>

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The thyroid hormone is known to be necessary for maintenance of milk secretion. Thyroactive compounds which have thyroxine activity are reported to be metabolic stimulants and to increase milk production (1, 2, 3, 4). These studies have been most active in the field of lactation since the work of Reinecke and Turner (5), who developed the method of producing an iodinated casein of high biological activity. An increased respiration rate, heart rate, elevated body temperature, and hyperirritability are undesirable effects that may occur. Metabolism is increased, so increased feed must be consumed to avoid loss of weight.

Reinecke and McMillen (6) reported that iodinated casein stimulated the milk production of two poor-milking sows. Johnson *et al.* (7) reported that iodinated casein fed to lactating sows increased pig gains during the first week of the lactation period. These workers postulated that the iodinated casein may have increased the colostrum production of the sow, thus allowing the young pigs to receive more nutrients and resulting in heavier, thriftier pigs by the end of the first week of lactation.

The experiment reported herein was conducted to determine if feeding the thyroactive compounds, triiodothyronine, thyroxine, and iodinated casein, to lactating sows would influence pig weights or mortality.

### EXPERIMENTAL

The first trial consisted of using forty-two sows that were allotted into three groups on the basis of breed, age, and farrowing date. The sows were started on the experiment on the 111th day of their gestation period and remained on the experimental treatments until their pigs were five weeks old. A highly fortified, concentrated ration was full-fed during the entire period. The composition of the rations used in trials 1 and 2 is given in Table I. Triiodothyronine was fed at a level of 300 mcg. per pound of ration and thyroxine at a level of 750 mcg. per pound. The third group received the un-

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supplemented basal ration. This trial was conducted during the fall of 1957.

TABLE I  
COMPOSITION OF RATIONS

	Trial 1	Trial 2
Ground yellow corn	41.5%	59.3
Ground oats	15	15
Alfalfa meal	10	10
Wheat bran	5	.....
Soybean oil meal	11	7
Meat and bone scraps	5	7
Whey	5	.....
Fish solubles	2.5	.....
Distillers dried solubles	2.5	.....
Trace mineral salt	0.6	0.5
Dicalcium phosphate	0.35	0.5
Ground limestone	0.1	0.5
Vitamin-Antibiotic	1.45	0.2

Sixteen sows were divided into two groups for the second trial, which was conducted during the summer of 1958. The basal ration used was less complex than that used in trial 1. One group of sows was fed the basal ration and the other group received the basal ration supplemented with 100 mg. of iodinated casein per pound of ration. This trial lasted seven weeks. Pig gains, mortality, and sow weight loss were the major criteria used in evaluating the thyroactive compounds used in these two trials.

### RESULTS AND DISCUSSION

The data obtained in the first trial are given in Table II. The addition of either 300 mcg. of triiodothyronine or 750 mcg. of thyroxine per pound to rations fed to sows during the farrowing and lactation periods failed to improve two- or five-week weights of the nursing pigs. Pigs from sows fed triiodothyronine gained less than those in the other two groups. Since these pigs were also smaller at birth, these results are as expected, as it has been shown that birth weight influences weaning weight (8). Pig mortality from birth to five weeks of age was slightly greater when the sows received the thyroactive compounds than in the control group.

**TABLE II**  
**TRIODOETHYRONINE (T-3) AND THYROXINE (T-4)**  
**FOR LACTATING SOWS**

	Control	300 mcg. T-3 per lb.	750 mcg. T-4 per lb.
No. sows farrowed	14	14	14
No. pigs farrowed per sow	7.8	7.1	7.6
No. pigs weaned per sow	7.0	6.2	6.2
Pct. mortality birth to weaning	10.0	13.2	18.7
Av. birth wt. of pigs, lbs.	2.87	2.65	2.77
Av. 2 week wt., lb.	8.24	7.67	8.14
Av. 5 week wt., lb.	17.80	16.33	17.85
Total gain to 5 weeks, lb.	14.93	13.68	15.08
Initial sow wt., lb.*	477	459	463
Final sow wt., lb.	461	440	435
Av. wt. loss per sow, lb.	16	19	28
Av. feed consumed per day, lb.	13.9	14.9	13.8
Av. feed per cwt. gain, lb.	547	807	736

\* Weight within 24 hours post farrow.

A greater weight loss occurred in the sows fed the thyroid active compounds, particularly those fed thyroxine. This loss in weight was primarily responsible for the higher feed requirement per unit of gain for those sows and litters receiving thyroactive compounds.

The results of trial 2 in which iodinated casein was fed to lactating sows are presented in Table III. These results follow the same trend as those of the previous trial. The greatest effect of iodinated casein appears to be the greater weight loss of the sows which received this ration. Differences in thyroxine intake as well as the different length of lactation periods are possible reasons for the differences in weight loss of treated sows in the two trials.

#### SUMMARY

Triiodothyronine, thyroxine, and iodinated casein were fed to lactating sows from the 111th day of gestation until the pigs were weaned at 5 or 7 weeks. The thyroactive compounds did not statistically affect the number or weight of pigs weaned. However, they did cause a greater weight loss of the sows and a decreased feed efficiency in the one trial where feed consumption was recorded.

**TABLE III**  
**IODINATED CASEIN FOR LACTATING SOWS**

	Control	100 mg. Iodinated Casein per lb.
No. sows farrowed	8	8
No. pigs farrowed per sow	8.1	8.6
No. pigs weaned per sow	7.0	6.6
Percent mortality birth to weaning	13.0	23.2
Av. birth wt. of pigs, lb.	3.0	2.9
Av. 7 week wt., lb.	27.2	26.6
Total gain to 7 weeks, lb.	24.2	23.7
Initial sow wt., lb.*	435	455
Final sow wt., lb.	390	361
Av. wt. loss per sow, lb.	45	94

\* Weight within 24 hours post farrow.

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