Methods used for determining the resistance of rats against infection with *C. crassicollis* have been previously described by the author.[5] Fifteen males and 15 females in one group were given 14 consecutive daily injections of 0.5 cc of sesame oil alone. Fifteen males and 15 females in a second group were given 14 consecutive daily injections of 0.5 cc sesame oil containing 0.005 mgm (5 International Esterogenic units) of theelin. A third group of 15 males and 15 females received 14 daily consecutive injections of 0.5 cc of sesame oil containing 0.6 mgm (equivalent to 40.2 International Androgenic units) of testosterone proprionate. All animals were inoculated at the time of the last injection. Seven weeks after infection the animals were sacrificed and the average number of parasites (cysts) determined by macroscopic examination of the livers. The average degree of infection in each group is given in Table 1. The normal sexual

TABLE 1

THE AVERAGE NUMBERS OF *Cysticercus crassicollis* FOUND IN NORMAL RATS AND IN RATS TREATED WITH EITHER THEELIN OR TESTOSTERONE PROPIONATE

Group	Number of rats and sex	Treatment	Average number of cysts (± P.E.)
1	15 males	Sesame oil	62 (± 2.15)
	15 females		42 (± 2.06)
2	15 males	Theelin	50 (± 2.49)
	15 females		45 (± 1.62)
3	15 males	Testosterone	64 (± 1.97)
	15 females	propionate	60 (± 2.86)

variation in resistance to infection is clearly brought out in Group 1. For example, the average infection of the control group of females was only 67 per cent. ($42 \times 100/62$) of that found in the control group of males (difference of 20 ± 3.1). The infection in females which received theelin was essentially the same as the untreated controls (3 ± 2.6), but the males which received theelin showed a slightly lower degree of infection than the untreated control males (12 ± 3.2). The theelin appeared to increase the resistance of males slightly, and the results probably would have been more pronounced had the animals been castrated. On the other hand, females which received male sex hormone showed a marked decrease in resistance to infection as compared to the normal females (18 ± 3.5), which was approximately the same as that shown by the untreated control males, whereas males which received male sex hormones showed no change in resistance.

It appears, therefore, that the normal sexual variation in resistance of rats to *C. crassicollis* can be modified by the injection of sex hormone, but any explanation of such reactions must await further investigations on the physiological and cellular effects of such substances.

[5] Dan H. Campbell, *Jour. Immunol.*, 35: 195, 1938.

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THE ANTIDERMATOSIS VITAMIN REQUIRED FOR REPRODUCTION IN THE DOMESTIC FOWL

THE antidermatosis vitamin[1] is the water-soluble factor which prevents the dermatosis or pellagra-like syndrome of the chick, first described by Ringrose and Norris[2] and obtained in aggravated form on the Wisconsin heated diet.[3] Although dermatosis in chicks has been frequently observed in the experimental laboratory, no evidence that the mature fowl suffers from a deficiency of this vitamin has yet been reported. Hence a study of this problem was initiated, the results of which are presented in this report.

White Leghorn pullets were used as the experimental subjects in this study. The control group of pullets was fed the following diet, designated the normal diet:

	Per cent.
Yellow corn meal	40.65
Wheat bran	20.00
Wheat flour middlings	20.00
Purified casein	7.00
Liver extract	0.35
Soybean oil	5.00
Wheat germ oil	0.50
Cod liver oil	0.50
Pulverized limestone	3.50
Steam bone meal	2.00
Iodized salt	0.50
Manganese carbonate	trace

The remaining pullets were fed the same diet except that the cereal portion and the liver extract were heated in an oven for 36 hours at 120° C. in order to destroy the antidermatosis vitamin. This diet was designated the heated diet.

By proper attention to composition and through appropriate biological assays the heated diet was demonstrated to contain all the vitamins known to be required by the domestic fowl or not yet shown to be required, with the exception of the antidermatosis vitamin and the new growth and reproduction factor reported by Bauernfeind *et al.*[4,5] These are vitamins A, B_1, B_4, B_6, D, E, K, riboflavin (G), nicotinic acid and the antiencephalomalacia factor.

[1] Called filtrate factor by the California workers.

[2] L. C. Norris and A. T. Ringrose, SCIENCE, 71: 643, 1930.

[3] O. L. Kline, J. A. Keenan, C. A. Elvehjem and E. B. Hart, *Jour. Biol. Chem.*, 99: 295, 1932.

[4] J. C. Bauernfeind, A. E. Schumacher, A. Z. Hodson, L. C. Norris and G. F. Heuser, *Proc. Soc. Exp. Biol. and Med.*, 39: 108, 1938.

[5] J. C. Bauernfeind, A. E. Schumacher, A. Z. Hodson, L. C. Norris, and G. F. Heuser, *Poul. Sci.*, 17: 444, 1938.

The new growth and reproduction vitamin was added to the heated diet by means of a whey adsorbate and the antidermatosis vitamin by means of a rice bran concentrate.[6] This concentrate had been treated several times with fuller's earth to remove vitamin B_1, riboflavin and most of vitamin B_6. The concentrate was assayed in accordance with the procedure of Jukes and Lepkovsky[7] and found to have an antidermatosis value of 25.

At the start the hens were divided into two groups, one of which was fed the normal diet and the other of which was fed the heated diet in order to deplete the hens in this group of their reserves of the antidermatosis vitamin. This was determined by studying the hatchability of the eggs laid by this group. Weekly hatches were conducted during a depletion period of 7 weeks. The average hatchability of the eggs of the hens fed the normal diet during the depletion period was 63.9 per cent., while that of the hens fed the heated diet was 15.8 per cent. The hatchability of the latter group decreased to 2.7 per cent. during the depletion period. No improvement in the hatchability of this group was obtained by supplementing the heated diet first with 5 per cent. of the antidermatosis-vitamin concentrate and finally with 10 per cent.

Since it was recently found that the heated diet was also deficient in a new growth and reproduction factor, labile to dry heat treatment, the hens fed this diet were divided into three groups. One group was fed the heated diet as heretofore, a second group was fed the heated diet plus 5 per cent. of whey adsorbate containing the new factor, and a third group was fed the heated diet plus 5 per cent. of whey adsorbate and 5 per cent. of the antidermatosis vitamin concentrate. Their response in hatchability of eggs to these treatments was compared to that of the group of hens fed the normal diet. The results are presented in Table 1.

TABLE 1
HATCHABILITY RESULTS OBTAINED DURING THE EXPERIMENTAL PERIOD

Pen	Number eggs set	Number hatches	Per cent. hatch
1. Normal diet	232	6	60.0
2. Heated diet	115	6	2.8
3. Heated diet + 5 per cent. whey absorbate	139	6	3.3
4. Heated diet + 5 per cent. whey adsorbate + 5 per cent. antidermatosis vitamin concentrate	136	6	48.0

The average hatchability of the eggs of the hens fed the normal group was 60.0 per cent. during the experimental period, while that of the eggs of the hens fed the heated diet was 2.8 per cent. When 5 per cent. of whey adsorbate was added to the heated diet no improvement in hatchability was obtained over that on the heated diet. But when both 5 per cent. of whey adsorbate and 5 per cent. of antidermatosis vitamin concentrate were added to the heated diet the hatchability increased rapidly so that at the third hatch it was approximately equal to that of the hens fed the normal diet. The average hatchability of this group of hens during the experimental period was 48.0 per cent.

The hens were fed the heated diet for a period of 28 weeks without any macroscopic evidence of dermatosis developing and without any effect upon egg production or mortality. When a similar heated diet was fed to the chicks of normally fed hens, dermatosis did not develop until the chicks were 14 days of age. But when the chicks of hens nearly depleted of the antidermatosis vitamin were fed in a like manner, symptoms of dermatosis appeared at three to four days of age. This is evidence that the hens fed the heated diet deposited less of the antidermatosis vitamin in their eggs than the hens fed a normal diet.

It is concluded from the results presented in this report that the antidermatosis vitamin is required for hatchability or reproduction in the domestic fowl but that a lack of this vitamin did not affect egg production or mortality during the period represented by this experiment.

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[6] Prepared by Vitab Products, Emeryville, California.
[7] T. Jukes and S. Lepkovsky, *Jour. Biol. Chem.*, 114: 117, 1936.

INDUCED PARTHENOCARPY OF WATERMELON, CUCUMBER AND PEPPER

PARTHENOCARPIC fruits, induced by means of hormones in lanolin paste, have been secured by Gustafson[1] in tomato, pepper, crookneck summer squash, Hubbard squash, eggplant and some ornamental plants. Several attempts were made to induce fruit set in watermelon and pumpkins, but failed. The result in cucumber was also discouraging.

Gardner and Marth[2] obtained parthenocarpic fruits in American holly and strawberry by spraying the pistillate flowers with different concentrations of hormones. Wong[3] in Florida found that indoleacetic and indole-propionic acids in lanolin paste did not induce parthenocarpic fruit, although parthenocarpy did exist in both seedless and seedy varieties of some common oranges in Florida.

While natural parthenocarpy commonly occurs in banana, Washington Navel and Valencia oranges,

[1] F. G. Gustafson, *Proc. Nat. Acad. Sci.*, 22: 628–36, 1936; *Am. Jour. Bot.*, 24: 102–7, 1937; *Bot. Gaz.*, 99: 840–4, 1938.
[2] F. E. Gardner and P. C. Marth, *Bot. Gaz.*, 99: 184–95, 1937.
[3] Cheong-yin Wong, unpublished data, 1937.