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.

Marsh grapefruit, Sultanina graps and some Chinese persimmons it is rare in watermelon and American cucumber and has not been reported in peppers.[4,5]

An experiment was conducted by the writer during the summer of 1938 with the National Pickling variety of cucumber, in an attempt to secure seedless fruits with normal shape by means of growth-promoting substances. There were 8 series of experiments. All the treated blooms were covered with wire cages before anthesis as well as 4 to 6 days after treatment in order to avoid contamination. It was found that natural parthenocarpy occurs in this variety, but the occurrence is very rare. Naphthalene acetic acid caused parthenocarpic fruits either when applied in lanolin paste of 1 per cent. to 5 per cent. concentrations or as a 0.05 per cent. aqueous solution. The percentage of fruit set in hormone-treated flowers was higher than from self-pollination.

With watermelon, eleven varieties were used. Both indolebutylic and naphthalene acetic acids (NAA in short) were used. These were applied as 1.0, 2.5, and 5.0 per cent. concentration in lanolin paste and as a NAA 0.05 per cent. aqueous solution. Twelve different treatments were used. No parthenocarpic fruits were formed except from blossoms treated with NAA. Fruits were induced to set by treating the cut style in all concentrations of lanolin paste and possibly in aqueous solution. Hormone-treated watermelons were perfectly seedless but varied in fruit shape. In general, the hormone-treated fruits were more or less triangular in shape, some even resembling the Table Queen squash rather than watermelon. Some, however, were normal in shape and size. The texture of these fruits was very solid and firm. No differences in flavor could be detected from normally pollinated fruits.

The seed of three plants of the Winter Sweet watermelon had been subjected to colchocine treatment before planting. The plants showed a typical colchicine effect, *i.e.*, stunting early in the season, large size of leaves and flowers and great vigor later in the season. Although pollen was present in great abundance, it failed to induce fruit setting when the blossoms were selfed. On the other hand, hormone-treated flowers set very satisfactorily. Fruits were formed in some open-pollinated flowers (with plenty of seeds), probably due to fertilization from nearby normal plants (vicinism).

Very satisfactory results were obtained in pepper of the Harris Wonder variety, both by using 1 per cent. of NAA in lanolin and spraying with 0.05 per cent. aqueous solution.

A detailed report will be published elsewhere in the near future.

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[4] H. A. Jones and J. T. Rosa, "Truck Crop Plants," p. 437, 1928.

[5] R. Wellington and L. R. Hawthorne, *Am. Soc. Hort. Sci. Proc.*, 25: 97–100, 1929.

SHORTENING DAYLIGHT PERIODS BETWEEN MAY 15 AND SEPTEMBER 12 AND THE PELT CYCLE OF THE MINK[1]

ONE of us[2] found that the pelt cycle of the ferret (*Putorius vulgaris*) is conditioned by length of day in correlation with the sexual cycle under the control of the hypophysis. This cycle was controlled and modified by manipulating the daily period of light to which the animals were exposed.

In a rather crudely and irregularly carried out experiment last summer, mink (*Lutreola vison*) were used as experimental animals, to see if this nearly related animal was responsive in the same way. The experiment was carried out in a cellar, where the temperature was not controlled and varied with the season but within somewhat narrower limits than that outside in the full light of day.

Controls consisted of about fifty mink of both sexes kept in the usual type of pen outside in the daylight and fed and cared for in the usual way. Some had distemper and some had not. Experimental animals consisted of four males and twelve females kept in the cellar in cages similar to those of controls. None of them had the distemper and all remained in good health and condition throughout the experiment. They were introduced into the cellar at four different times between May 15 and June 16.

By closing light-tight shutters over the two windows of the cellar, the light-time each day was gradually reduced from May 15 to June 23; increased gradually until July 26, because nothing seemed to be happening to the first animals introduced. It was then gradually reduced again until September 12. This second reduction was given because on July 26 it was noted that three of the animals (2 ♂ ♂ + 1 ♀) were in the condition of fur normal for the first week of October. They were shedding summer pelt and growing winter pelt from the tails forward. All experimental animals were removed from the cellar and returned to normal daylight on October 24. For two weeks, beginning on August 22, one male and one female that seemed to be slow to change pelt were placed in a refrigerator for from one-half to two hours each second day to see if

[1] Aided by grants from the National Research Council, Committee for Research in Problems of Sex, 1937–38, and the Penrose Fund of the American Philosophical Society, 1938–39, administered by T. H. Bissonnette.

[2] T. H. Bissonnette, *Anat. Rec.*, 63 (2): 159–168, 1935; *Quart. Rev. Biol.*, 11 (4): 371–386, 1936; *Endocrinology*, 22 (1): 92–103, 1938.