

The Histological Studies of Parathyroid Gland in Laying White Leghorn Hens (*Gallus domesticus*) in Relation to the Serum Calcium Level

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Abstract : The parenchymal cells recorded were dark chief, 21.33%; intermediate, 73.46% and light chief, 5.20% and their dimensions (in microns) were, 17.30 ± 4.49 , 19.98 ± 4.15 and 8.50 ± 8.49 , respectively, and mean of serum calcium was 49.66 mg/100 ml.

Key words : Parathyroid, laying, white leghorn hens, chief cells, micrometric, serum calcium.

The regular egg laying requires an active parathyroid gland according to Urist (1967), and a hen that lays 250 eggs in a year secretes a quantity of calcium in the form of egg shell corresponding to about 20 times calcium content of her entire body (Ringer and Mayer, 1970). There is an extensive information on the physiology of calcium metabolism in birds, but work on serum calcium, together with histology of parathyroid, has received relatively little attention. Thus, the present investigation was undertaken.

Material and Methods

Parathyroid glands, collected from fifteen apparently healthy white leghorn laying hens (approx. 9-month of age), were maintained under normal conditions of farm management. The tissue samples were processed by washing, dehydration, clearing and paraffin impregnation. The tissue sections cut were 4 to 8 micron thick, slides prepared and stained by Haematoxylin and Eosin for micrometric studies. The hundred parenchymal cells of different types were taken. The blood was analysed for serum calcium following Clark and Collip (1925).

Results and Discussion

Light microscopic studies of parathyroid glands in leghorn laying hens were undertaken to evaluate the attribution of parathyroid glands with serum calcium level. The glands were surrounded by distinct connective tissue capsule con-

sisting of layer of collagen fibers with a few fibroblasts. No oxyphil cell was detected. Only irregular shaped masses of chief cells, which exhibited three types of cells, as described by Mathur (1971) in hen and Capen *et al.* (1965) in cow, were discernible :

1. The dark chief cells were having basophilic nucleus with greater nucleo - cytoplasmic ratio. The cytoplasmic granules were many.
2. The light chief cells showed lightly eosinophilic colour with peripheral vacuolization.
3. The intermediate chief cells showed intermediate properties between the dark and light chief cells.

The present study demonstrated the highest degree of parathyroid activity of laying hens in having a greater number of dark and intermediate chief cells. This might be related to the lowered blood calcium level resulting from constant increased withdrawal of calcium from the circulating blood for shell formation. The lowered blood calcium level stimulated the parathyroid glands secretion of the parathyroid hormones.

The decrease in plasma/serum calcium level in the blood increased the activity (Table 1) in parathyroid in birds (Muller *et al.*, 1970; Sherwood, 1968).

The percentage and dimension of the dark, intermediate and light chief cells in parathyroid glands parenchyma of laying hens are shown in Table 1.

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