Variations of blood glucose in the hen

It is already known that the normal values of blood glucose in birds are, as a general rule, double those found in humans and other mammals. In the hen values have been obtained wihch vary, according to the authors, between 161 and 280 mg. % (4).

Various factors influence the blood glucose in different senses and degrees, such as the strain, the sex, the sexual maturity, the laying phenomenon, feeding, etc., so that the great variation in the values is logical when the comparison is not made among lots of homogeneous birds.

The data found in the bibliography are old, and to-day the problem can be approached with material which is genetically homogeneous and has undergone very uniform influences of environment.

In the present study we have used Honegger hens, aged between 1 and eighteen months. These birds are all exposed to the same factors of environment (place, temperature and humidity), and have a diet which varies according to the age and necessities of the layers.

A study has also been made of a group of chickens of the Ledbrest-Pilch strain, aged 1 month, 1 ½ months and 3 ½ months. We also analysed a group of capons aged 3 ½ months.

The blood glucose was determined by the Hagendorn and Jensen method (1). Blood samples were obtained by puncture of the radial vein: sodic citrate was added to avoid coagulation. Estimates in all cases were carried out in triplicate. The various experiments are always based on results obtained from 4 birds.

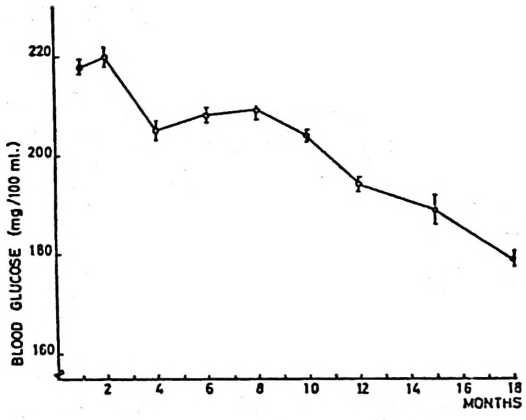

FIG. 1. Variation of blood glucose in hens in relation to age. The values indicated are averages four birds and their corresponding errors are marked.

In figure 1 it is shown that in the females a decrease in blood glucose is to be noticed with age. The variation curve obtained approaches very closely the values quoted by Heellr and Pursell (2). The beginning of laying represents a momentary increase in the blood glucose, a maximum point being reached between 8 and 9 months, which is the heaviest laying period in this strain. The dependence between the laying percentage and

the levels of glucose in the blood is clear (figura 2).

Comparison between the blood glucose values found in males and females shows us a certain relation, as can be seen in fig. 3, and this can be attributed to the sexual hormones. In the males the glucemia decreases with sexual maturity and castration increases it to levels approaching those of the inmature birds. A depressor effect of the androgenes has been suggested to explain such results (3).

In the females an analogous phenomenon could be supposed with the estrogenes, but this would remain hidden on account of the increase in the blood glucose with laying.

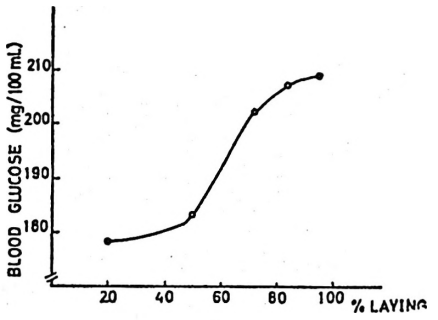

FIG. 2. Relation between the blood glucose and the laying percentage in the hen.

It seems evident that the sexual hormones have a depressor effect on the blood glucose in both sexes, and that there is an increase in blood glucose in the females which is connected with laying.

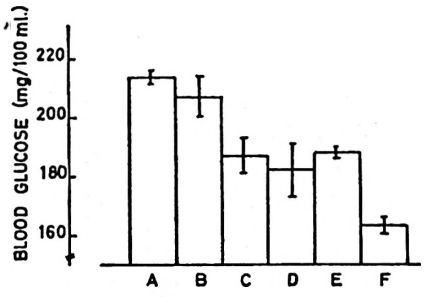

FIG. 3. Blood glucose values in different groups of hens: A) immature hens (1-4 months); B) laying hens (6-10 months); C) hens in low laying periods (12-18 months); D) capons (4 months); E) immature chickens (1-3 months); F) adult chickens (4 months).

References

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