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NOTE

RIBOFLAVIN CONTENT OF THE NATIVE IRANIAN POULTRY EGGS

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ABSTRACT

Variation in egg riboflavin content (ERC) of the native hens belonging to 8 regions (5 eggs per hen and 8 hens per region) was studied. The diet contained 7.4 micrograms riboflavin per g. Mean ERC for the hens of different regions varied between 3.3 and 4.1 micrograms per g egg liquid, but the differences amongst regions were not significant (P>0.05).

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میزان ریبوفلاوین در تخم‌مرغ‌های بومی ایران

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چکیده

تغییرات غلظت ریبوفلاوین تخم مرغ در مرغ‌های بومی ۸ ناحیه استان فارس (هر ناحیه ۸ مرغ و ۵ تخم مرغ بازای هر مرغ) با جیره‌ای حاوی ۷/٤ میکروگرم ریبوفلاوین در گرم مطالعه شد. بین مرغ‌های نواحی مختلف اختلاف معنی‌داری مشاهده نشد و میانگین غلظت ریبوفلاوین در بخش مایع تخم‌مرغ (سفیده و زرده) برای ۸ ناحیه از ۳/۳ تا ٤/۱ میکروگرم در گرم متغیر بود.

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INTRODUCTION

Riboflavin is necessary for the normal physiology of the chicken. The effects of riboflavin deficiency include reduced growth rate and viability, increased embryonic mortality and decreased egg production and hatchability (4).

The riboflavin content of the egg is influenced by the level of this vitamin in the diet (2). The increase in riboflavin concentration of the blood and egg can be affected only if the diet contains adequate riboflavin, and high dietary levels of riboflavin (over 3 micrograms per 1 g of feed) are needed to ensure optimum hatchability (8).

Hens have been found which, even on diets rich in riboflavin, are unable to tranasfer this vitamin to their eggs. Fertile eggs of such hens have high embryonic mortality and few embryos survive beyond 14 days of incubation (10). Injection of supplementary riboflavin into the air cells of the deficient eggs early in incubation results in restoration of normal hatchability (10). Genetic studies have shown that the underlying trouble is caused by a simple recessive, autosomal gene (rd). This gene behaves in an incompletely dominant manner, where heterozygous hens (Rd rd) put in their eggs amounts of riboflavin that are subnormal, but apparently adequate for normal development of the embryo (3,10).

The riboflavin concentration of the eggs of various breeds, when fed the same diet, differed (1, 9). Variation in riboflavin content of the eggs from individual hens has also been reported (9).

In the present experiment, variations in riboflavin content of the eggs from native Fars chickens were investigated.

MATERIALS AND METHODS

The experimental hens originated from flocks established at the Animal Research Station, Shiraz University, as a part of a project to study production

characteristics of the native Fars chickens, The birds originated from eight different regions of the province. The term "region" refers to a group of villages in close proximity located in a particular provincial area. A standard diet containing 7.4 micrograms riboflavin per g was fed *ad lib*, and other experimental conditions were similar for all groups (13). The birds were kept in cages.

In this experiment, sixty four 7-month-old hens (8 per region) were used. Five eggs were collected and their riboflavin content was determined fluorometrically (5). Data were subjected to repeat measurement analysis of variance (6).

RESULTS AND DISCUSSION

Mean riboflavin concentration of the eggs (ERC) from various regions ranged between 3.3 and 4.1 micrograms per g egg liquid, however, the differences amongst regions were not significant (Table 1). Various studies have reported differences amongst breeds in this respect (1, 9, 11).

Table 1. Mean and SD of riboflavin concentration (micrograms per g) in the eggs of the native Fars chickens according to region (8 hens per region).

Region No.	1	2	3	4	5	6	7	8
Mean	3.57	3.46	3.76	3.54	3.82	3.29	3.60	4.11
SD	0.69	0.69	0.69	0.82	0.45	0.71	0.67	0.88

For 320 eggs examined, the riboflavin concentration varied from 2 to 5.5 micrograms per g. In 50% of the hens ERC was between 3.5-4.4 and in 80% between 2.6-4.4 micrograms per g. ERC for 5 hens was less than 2.6 and for 4 hens was greater than 4.7 micrograms per g. Individual differences in ERC

have also been reported for the Barred Plymouth Rocks (9) and the Single Comb White Leghorns (14).

The riboflavin content of the diet was 7.4 micrograms per g which is almost double the minimum concentration proposed by Petersen *et al.* (12). The dietary concentration seemed to be sufficient for realization of the genetic potential of the native hens in transferring dietary riboflavin to the eggs.

The lowest ERC in these eggs was 2 micrograms per g and it seems unlikely that mutation similar to that described for the Single Comb White Leghorns (10) has happened in these chickens.

It has been shown that riboflavin utilization is controlled by several genes (7). It may, therefore, be possible to select hens which transfer more riboflavin to their eggs and thus increase the nutritive value of eggs.

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