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EFFECT OF IMPROVING THE LIVING CONDITIONS OF EGG LAYING CHICKENS ON PRODUCTIVITY AND SOME PHYSIOLOGICAL INDICATORS

Shokhzod Shermatovich Khudayberdiyev,
Master's Degree Student
e-mail: shokhzodkhudayberdiev@gmail.com, Tel:+998939939362

Yunus Samandarovich Ruziev,
Docent, Samarkand State University

ANNOTATION

Enrichment of poultry habitats in poultry farms using environmental enrichment methods is more effective than empty cage systems, because for such kind of poultries raised outdoors or in a free-range home becomes this opportunity.
In our researches, the production of eggs and the ratio of heterophilus to lymphocytes were improved by enriching the cages of egg-oriented poultry with perch structure and sand.

Keywords: Enrichment, perch structure, sand, egg content, heterophilic, lymphocyte.

АННОТАЦИЯ

Обогащение мест обитания домашней куриный на куринефабриках методами обогащения окружающей среды более эффективно, чем системы пустых клеток, потому что у цыплят, выращиваемых на открытом воздухе или в птичниках, будет такая возможность. В нашем исследовании яйценоскость и обогащение яичных клеток структурой окуня и песком улучшили яйценоскость и соотношение гетерофилов к лимфоцитам.

Ключевые слова: обогащение, строение окуня, песок, яйценоскость, гетерофильный, лимфоцит.

INTRODUCTION

Poultry breeders add enriched environments in hen coops to keep captive birds as they would in the wild or to encourage the expression of behaviors left alone in a free circle. [13]. Including enrichment strategies in the form of nest boxes, dust baths and rivets, appropriate nesting of birds in captivity may be encouraged to express dust-bathing behaviors. These behaviors are important for caged birds because they express these behaviors when raised in the wild or in a free-living system. Hence, nest boxes, dust baths and perch structures are described as the basis for all forms of enrichment[2]. In the poultry industry, earlier enrichment strategies have been applied in visual, auditory, olfactory, and tactile forms.
Perch structures typically vary in height, shape, and materials. The shape of the perch can be in the form of squares, circles, rectangles. Birds bred in rectangular perch constructions have reduced foot cushion problems compared to round perch constructions. [1,9,10]. Subsequent research has shown that the early introduction of perch structures in birds has allowed birds to learn and become more familiar with the use of perch[12]. Perch also improves bone strength

[3] and maximizes the use of different locations in poultry houses where perch structures are housed. [14,15]. In addition, perch structures serve as shelters for birds attacked by aggressive partners [4], increases the space for birds [12] and also reduces the number of floor eggs. [5].
Poultries raised in the wild or in a free-range system may have access to sand and perform several activities on the sand. Some of these include eating sand, eating on sand, and bathing in dust in the sand. These measures have also been expressed by caged birds [7,16], especially as they get older.[17]. In the absence of sand, birds express these behaviors in other litter materials. Frequent biting and scratching of birds by the sand will shed the length of their beaks and claws and thereby reduces the level of damage to other birds [11]. Adding high amounts of sand to the feed, including diet (approximately 20-30%), diluted the feed and increased feed intake [18].

RELEVANCE OF THE TOPIC

In recent years, special attention has been paid to ensuring the biological and ecological safety of poultry products, raising and enriching the habitat of poultry, increasing the number of birds and the quantity and quality of products.
Finding the scientific basis for enriching poultry with additives to the animal habitat to develop natural behaviors, based on our local capabilities to further increase the productivity of hens and putting it into practice is one of the most pressing issues today.
Environmental enrichment strategies cannot be discussed without mentioning the European Union (EU) directive on the welfare of laying hens. Research carried out in the early years of the directive was on table egg laying birds because this specie was emphasized in the directive. The use of enriched housing was a directive established by the European Union (EU) in 1999 that is to be fully implemented by the year 2012.
According to the EU directive of 1999, the housing requirement for hens include (1) 750 cm2 per bird (nothing less than 600 cm2 and should be at least 45 cm high), (2) a minimum total cage area of 2,000 cm2 , (3) a nest, (4) litter, (5) 15 cm perch per hen, and (6) 12 cm of feed trough per hen [6,8].

GOALS AND OBJECTIVES OF THE RESEARCH WORK

Our research aims to increase the productivity of broiler hens by encouraging them to express their behavior as if they were in the wild or in a free environment by adding enrichment to the environment in the cage. Including an enrichment strategy in the form of a sand and perch structure, the birds in the cage can be encouraged to express nesting, bathing, and bathing behaviors accordingly. These behaviors are important for caged hens because they express these behaviors when they are naturally housed in a free-range system or when raised in the wild.
In our researches, methods of enrichment consisting of sand and perch structure, which form the basis of the habitat of broiler hens raised on special poultry farms, were developed, and the task was to raise hens in this formed environment in accordance with other regulatory requirements.

Objectives

1) To evaluate production in broiler breeders reared in environmentally enriched pens.
2) To explore the links between physiological indicators and fertility in broiler breeders reared in environmentally enriched pens.

RESEARCH CONDITIONS, MATERIALS AND METHODS

The object of our study was the same (analogous) in all physiological parameters, 36 breeds of hens at 22, 30, 38 weeks of age were placed in separate cages of 2500 cm^2 for treatment. The poultry are fed and watered in a 22 C room with environmental control, ventilation for ventilation. There were four treatments in each room.

The four treatments were 1-sand (S), 2-perch (P), 3-sand and perch combination (SP), and 4-control (C), each treatment 3 times for 22-, 30-, and 38-week-old hens. repeated. A total of 12 treatments were performed and production indicators (daily egg production), physiology (heterophil / lymphocyte ratio) were determined.

The ratio of heterophyll to lymphocytes in the blood was calculated by spectrophotometry (EMC-30PC-UV). Daily egg production was calculated as a percentage (%), with the ratio of the total number of eggs laid per day to the total number of hens. The following formula was used:
Egg production (%) = (total # of eggs laid/number of hens)*100

REVIEW OF THE RESULTS OBTAINED

Poultry hens enriched their habitat with sand and perch structure and obtained results on their daily egg production and blood heterophil and lymphocyte ratios. Of the 4 treatments in our experiments, 1st was sand (S), 2nd was perch (P), 3rd was a combination of sand and perch (SP), and 4 was control (C).

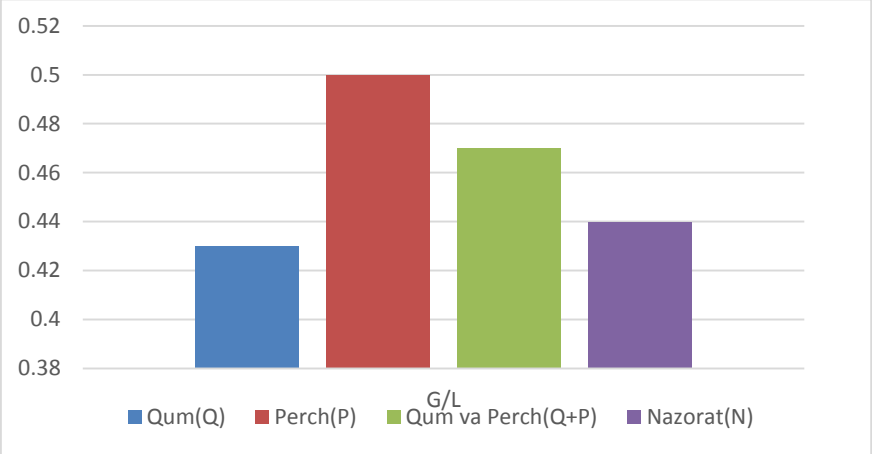
Table 1. Influence of enrichment strategies on G and L ratios of one hen's blood

Treatments	22 weeks	30 weeks	40 weeks
Sand (S)	0,32	0,48	0,48
Perch (P)	0,38	0,60	0,53
Sand & perch (SP)	0,40	0,52	0,50
Control (C)	0,34	0,50	0,49

In our experiments, the heterophyll and lymphocyte ratios were calculated separately for each weekly hen. For 22-week-old hens, the treatment was 0.32 in the first (sand (S)), 0.38 in the second (perch (P)), 0.40 in the third (sand and perch combination (SP)), and 0.42 in the last (control). (C)) was at a ratio of 0.34. For 30-week-old hens, 0.48 in the first (sand (S)), 0.60 in the second (perch (P)), 0.52 in the third (combination of sand and perch (SP)), and 0.52 in the last (control (C)) at a ratio of 0.50, for hens at 38 weeks of age in the first of 4 treatments (sand (S)) 0.48, in the second (perch (P)) it was 0.53, in the third (sand and perch combination (SP)) it was 0.50, and in the last fourth (control (C)) it was 0.49 (Table 1).

The table shows that for all weekly broiler hens, the ratio in the second and third groups increased compared to the control group, while in the first group there was a slight decrease. The second treatment, enriched with perch structure, increased by 0.04 in 22-week-old hens,

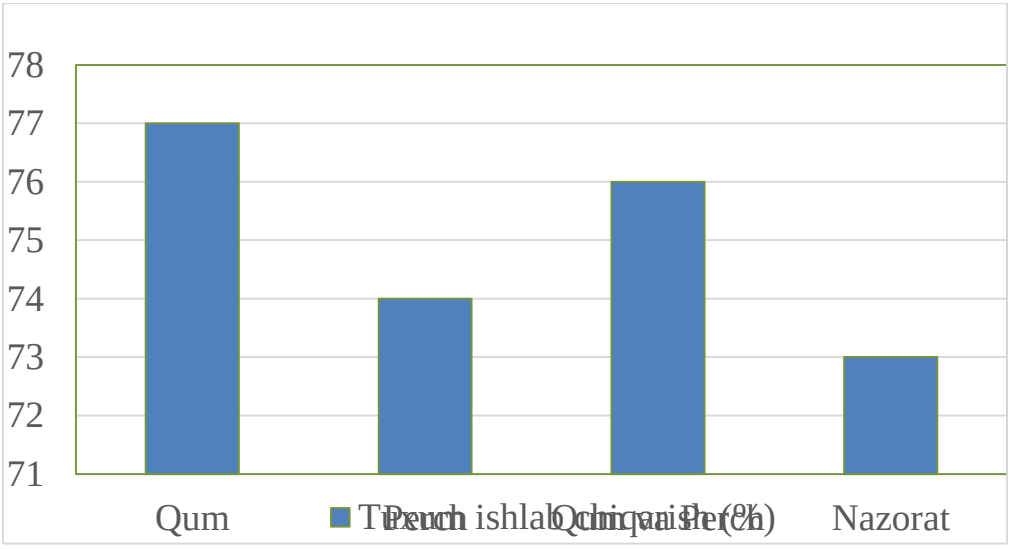
0.10 in 30-week-old hens, and 0.04 in 40-week-old hens compared to the control group. In the third group, which consisted of a combination of sand and perch, the control group increased by 0.01 in 22-week-old hens, 0.02 in 30-week-old hens, and 0.01 in 40-week-old hens (Table 1).



1st graph. Average effect of enrichment strategies on G and L ratios of poultry blood *
* The arithmetic mean of the sum of the G / L ratios of hens at 22, 30, and 40 weeks

In our next experiment, the enrichment was averaged as the sum of the results of the 22-, 30-, and 40-week-old poultry hens to determine the total ratio of heterophilic blood to lymphocytes in all hens. For all weekly hens, the treatment was 0.43 in the first (sand (S)), 0.50 in the second (perch (P)), 0.47 in the third (sand and perch combination (SP)), and 0.47 in the last fourth (control (C)) was equal to a ratio of 0.44 (Figure 1). This means that it decreased by 0.01 in the first treatment, increased by 0.06 in the second treatment, and increased by 0.03 in the third experiment. No other health-related abnormalities were observed in other key blood parameters (Figure 1).

Based on the above formula, daily egg production was calculated separately for each poultry. The production rate was 77% in the first of 4 treatments (sand (S)), 74% in the second (perch (P)), 76% in the third (combination of sand and perch (SP)) and in the last fourth (control (C)) was 73% (Figure 2).



2nd graph The effect of enrichment on overall egg production

Thus, in our experiments, an increase in production was observed in other groups compared to the control group. In the first group (sand) there was a 4% increase compared to the control group, in the second group (perch) 1% compared to the control group, and in the third group (combination of perch and sand) a 3% increase compared to the control group ($p = 0.08$). It can be seen that enrichment methods have improved egg production (Figure 2).

CONCLUSION

In this research work, the perch structure and their habitat were enriched to determine the ratio of sand to egg productivity of hens in the egg direction and heterophil to lymphocyte. That's why, as a result of raising hens in a perch structure and sand-formed habitat, it is possible to increase the productivity (egg production) of poultries by improving some physiological parameters of the blood (heterophyll and lymphocyte ratio).

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