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ASSESSMENT OF ADAPTATIONS TO THE ENVIRONMENT OF HORSES OF THE KAZAKH BREED OF ZHABE BY THE INDICATION OF BLOOD

Annotation

The article gives information on the evaluation from the physiological side, the possibility of adaptation to the environment of horses of the kazakh breed of zhabe, which is bred in the foothills of the village of Konyrolen, Panfilov district of the Almaty region, along protein, cellular and enzymatic blood compositions.

Keywords: Blood, horse, physiology, morphology, biochemistry, AsAT-aspartate aminotransferase, ALAT-alanine aminotransferase, phagocyte, erythrocyte, gemotocrit.

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ASSESSMENT OF ULTRAVIOLET RADIATION INFLUENCE ON QUAIL CHICKS' PRODUCTIVITY

Abstract

This article contents the results of comprehensive studies related to productivity and biological features of female quails, the physiology of quail egg incubation through exposure of additional lighting, as well as the daily periodicity exposure on the ovipositioning reflex have been studied. The results obtained from the study of productive and biological features of quails, depending on the area of breeding and rearing conditions, represent new data for the poultry raising.

Keywords: quail chicks, ultraviolet light, feeding, diet.

Introduction

Quails' biological features allow in a short time and without large capital investments to make this industry one of the most profitable in the poultry industry. Furthermore, the quail farming - is the poultry industry, which quickly refundable. Quail earliness is twice faster than rabbits [1].

To achieve good results a full feeding is particularly important in raising and keeping of quails on the 1-day quail chicks are very small, but they grow fast. During a month, their weight increases more than 15 times, and when they are 2 months old they reach a live weight of adult birds [2].

When breeding quails you should remember the correct and rational feeding - the main condition to reduce the costs of manufactured products and to increase the quail farming economic profitability.

In this regard, the thorough and comprehensive studies related to breeding quail chicks in new environment are essential and have a great scientific and practical significance. It should be noted that taking dietary and medical - dietary drugs and the further development of this bird species is entirely dependent on number of issues solution such as the study of biological and physiological characteristics, development of feeding scientific methods, arranging the methods of keeping the advanced technology and ensuring the economic efficiency of the industry [3, 4].

Materials and methods of research

Quail chicks' growth and development are subject to certain biological principle. Therefore, to raise the healthy youngster you need to study their biological characteristics and consider it in order to create optimal conditions for them in the future [5].

A quail chick, as it is known, is refered to precocial type: the youngsters hatch fully developed, covered with down and may already peck the feed themselves. There are three phases in postembryonic period of quail chicks' development.

The first phase is characterized by imperfection in thermoregulation, depressed growth, development of the wing flight feathers, the same development of males and females. By the phase end the final resorption of residual yolk happens and the functional activity of many organs develops.

The second phase is characterized by rapid growth, increasing thermogenesis due to development of the sex glands, sexual dimorphism begins. The period end coincides with the molt beginning.

The third phase is characterized by the constant growth intensity, stable thermoregulation and primary feather growth finishes. Quails are have set behaviour reflexes (especially for feeding), habits develop.

Different sex and also different age quails' growth rate is variable (Table 1).

Table 1. Changes in quail chicks' live weight

Age, days	Quails for egg production, g		Quails for meat production, g	
	Female	Male	Female	Male
1	6	7	8	10
10	20	25	35	45
20	55	60	70	80
30	85	75	135	120
45	95	85	160	145
60	120	110	200	160

Even before hatching a quail chick's almost all the internal organs begin to function, and it has a significant part of adapted behavior patterns. It has been identified, that the foetus's nervous system forms very early, it controls and directs the work of organs, determines the fetus behavior. Before hatching a nestling can already perceive sound signals. Quail chicks well distinguish colors.

It should be noted that all the factors that may lead to unavoidable stress must be reduced as much as possible and you should select the time so that the effect of other stress situation is maximized. Also in some periods quail chicks were given high doses of vitamins.

Thus, under tests within the experiment we found out that birds, especially youngsters, quickly get used to a particular method, a way of keeping, smell, taste, degree of fragmentation and the feed composition, its colors, nutritional value.

Results and discussion

We have studied the influence of infrared radiation used for quail chicks' heating, and found out there are different opinions related to the choice of a rational system for quail chicks' raising space heating.

In some cases, a common space heating to a high temperature (32-35^{0}C) is used. The advantage of this method is quail chicks stay in uniform temperature environment. But herewith the capital and operating expenses for heating greatly increase.

Studies have shown that it is advisable to create the localized areas of high temperature. In this regard, various means of heating are developed and used: electric and gas brooders, heated floors, infrared emitters.

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It should be noted there are sufficient amount of works devoted to researches on both electric and gas infrared emitters for heating birds, but the works associated with quails are not in literature sources available for us. In this regard we studied issues related to generating the heat transfer equation for quails of different ages staying in the area of heating with infrared emitters. The equation was generated based on the calculation:

$$(Q_f - Q_s) + Q_h = Q_p + Q_k + Q_i, \quad (1)$$

wherein: Q_f - the heat produced in the body through food consumption;

Q_s - the heat used for warming up the food and water consumed by a bird;

Q_h - the heat absorbed from the infrared radiation;

$Q_p : Q_k : Q_i$ - the heat released from the quail chicks' body surface to the environment (radiation, convection and evaporation).

We have determined the physiologically useful heat, as well as the heat loss through evaporation under the reference data, herewith the data on hens were the control.

It is well known that after the 1st week of life the feather cover, which is a thermal insulation, effects quail chicks' thermoexchange. Therefore provided here equation (2) will be different.

$$Q_{tp} = \frac{\lambda}{d} \lambda * F_{ch}\left[t_{ch} - t_{fc}\right] \quad (2)$$

wherein: λ - thermal conductivity of feather cover;

d - thickness of the feather cover, mm;

t_{ch} - chicks' body temperature, ^{0}C;

t_{fc} - the feather cover temperature, ^{0}C;

F_{ch} - chicks' body surface, m^2.

Using the heat balance equation you can calculate a number of data like the temperature of quail chicks, the optimal irradiance, thermal output et al. Irradiation is the most important feature when the infrared heating is used.

The data obtained during the experiment, as well as the irradiation features of electrical ultraviolet lamp type КИ -220-1000 see in Table 2.

Table 2. The irradiation features of electrical ultraviolet lamps type КИ -220-1000 (W/m)

Height of the lamp, m	Distance from the heating center, m					
	0	0.1	0.2	0.3	0.4	0.5
0.5	388	360	325	266	200	150
0.6	290	275	250	215	175	150
0.7	210	200	185	160	140	110
0.8	155	150	143	125	100	95

Irradiation was measured in the heating zone perpendicularly to the emitter.

Maximum uniformity of irradiance, hence, the temperature distribution, was reached through increasing the lamp height.

Table 3 shows the irradiance features in the heating area when using gas infrared emitter type "Zvezdochka SKB" (star SKB) "Gazpriboravtomatika".

Table 3. The irradiation features of gas infrared emitter type "Zvezdochka" (W/m)

Height of the lamp, m	Distance from the heating center, m					
	0	0.1	0.2	0.3	0.4	0.5
0.5	280	275	234	175	146	126
0.6	220	232	200	165	140	110
0.7	176	178	170	150	140	110
0.8	155	150	143	125	100	95

Experiment results show that the gas emitters with more powerful 1,200-6,000 cal / h heat output should be used for the quail chicks' heating. Furthermore, when using gas infrared emitters you do not need additional heating sources, like it happens with brooders using.

We also tested the influence of ultraviolet light on quail chicks' growth, weight gain, mineral metabolism and increased resistance against rickets, squatting on their hocks, perosis and gout.

From the first days of the experiment, it was observed that irradiated with ultraviolet light quail chicks experienced a pleasant feeling. This was seen when the UV lamp was switched on the quail chicks gathered under the lamp and sat quietly in this position until the end of the irradiation. After three sessions of exposure chicks willingly eat feed than the control ones, became more alive and energetic. After three weeks the tested quail chicks had significantly better plumage and often came to the feeder with mineral feed than the control ones.

As a result, it was found that 1 experimental group quails chicks which were subjected to irradiation, had a higher weight gain than the control ones and exceeded in average for 8.9%.

The exposed quail chicks' health status was better than the control ones. In the third week of chicks' growing in the control group there were cases of squatting on hocks (as if for the rest).

The same data have been obtained in group II also exposed to UV radiation, but quail chicks bred in the later periods of incubation.

Body weight gain in group II increased during the whole raising period, the same as chicks from test group I.

The lowest mortality was observed among irradiated chicks compared with control chicks.

UV exposed chicks were significantly more resistant to diseases than unexposed chicks (the control group).

Ultraviolet light, stimulating the organism functioning, increased its physiological function, improved mineral metabolism and disease resistance. Not UV exposed control birds had growth slowdown, mineral metabolism disorders.

The second series of experiments involving five groups of quail chicks were done to clarify the said provisions. All groups had the same hatching time, there were in the same conditions of feeding and keeping, only difference the UV exposed tested groups were given fish oil as a part of diet.

Table 4 shows the fish oil portions as a part of diet as well as the UV exposure radiation dose for birds in groups.

Table 4. The fish oil dosage as a part of quail diet

Age, days	5-6	7-8	9-10	11-12	13-14	15-16	17-19
dosage, g	0.05	0.10	0.15	0.20	0.25	0.30	0.40
age, days	20-22	22-24	25-27	28-30	31-33	3436	37-39
dosage, g	0.5	0.6	0.7	0.8	0.9	1.0	1.1
age, days	40-42	43-45					

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dosage, g	1.2	1.3					

Quails from the experimental groups I and II received unirradiated fish oil as a part of diet.

Moreover the birds in the experimental groups I and IV were UV irradiated in addition, but the group II was not irradiated, it was the control. Group III, as already said above, was not irradiated, but received UV irradiated fish oil as a part of diet. Quails in groups IV and V received the same diet, but no fish oil. Furthermore quails in group V were not UV exposed. Birds in the experimental group IV were UV irradiated using the same dosage as the experimental group I.

As a result of series of experiments it was revealed that the groups with quail chicks not exposed to radiation (group II) had diseases caused by a mineral metabolism disorder: rickets, squatting on hocks, visceral gout, gouty nephritis, as well as hypovitaminosis and avitaminosis A. At the same time the quail chicks in experimental group III receiving UV irradiated fish oil although had diseases associated with mineral metabolism disorder, but with less severity than in group II, the group I (UV irradiated) had no reported diseases like rickets and avitaminosis.

The experimental group IV (irradiated), but which did not receive fish oil, had less number of quail chicks with weak legs compared with the non-irradiated group V, but had higher number than in groups I, III.

Quail chicks' weight gain in experimental groups was also different. Irradiated quail chicks (group I) grew significantly better than the chicks in other groups.

The average weight gain of quail chicks in group I was 31.7 g more than in group II and 16.5 g more than in group III. For 18.0 g more than in IV and 38.5 g more than in group V, it means that a combination of irradiation and feeding with fish oil caused better results.

Conclusions

UV exposure to birds should be considered as a necessary factor that increases the body's vital functions. If this unit, stimulating the physiological functions of the body, is excluded from the common line of factors it breaks the body correct operating.

The quail-layers irradiated for 30 minutes daily in the winter (50-80 UV units) show an increase in egg production; on average from each quail in December for 5 eggs, in January for 4 eggs and in March for 3 eggs more were received compared with the control group.

Thus based on the experimental data, as well as practical observations we conclude if the natural light in the ambient environment is limited and the sun influence on the body reduces, then the additional UV light effect on chicks, with full fed diets enriched with vitamin D and mineral salts, provides prevention of mineral metabolism disorders, stimulates the body vital functions, improve its physiological functions, quail chicks have improved appetite, increased weight gain, increased resistance to diseases.

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ОЦЕНКА ВЛИЯНИЯ УЛЬТРАФИОЛЕТОВОГО ИЗЛУЧЕНИЯ НА ПРОДУКТИВНОСТЬ ПЕРЕПЕЛЯТ

Аннотация

В статье приведены результаты проведенных комплексных исследований на продуктивность и биологические особенности перепелок, изучена физиология инкубирования перепелиных яиц путем воздействия дополнительного освещения, а также суточной периодичности на рефлекс яйцекладки. Полученные результаты с позиции изучения продуктивных и биологических особенностей перепелов, в зависимости от зоны разведения и условий выращивания, представляют новые данные при выращивании сельскохозяйственной птицы.

Ключевые слова: перепелята, ультрафиолетовые лучи, кормление, рацион.

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БӨДЕНЕ ӨНІМДІЛІГІНЕ УЛЬТРАКҮЛГІН СӘУЛЕНІҢ ӘСЕРІН БАҒАЛАУ

Андатпа

Мақалада келтірілген комплексті зерттеулер: бөдене өнімділігі және биологиялық ерекшеліктері, бөдене жұмыртқаларын инкубациялауда қосымша жарық берудің әсері, сондайақ жұмыртқа салудың тәуліктік кезеңділігі. Бөдененің өнімділігі және биологиялық ерекшелігі тұрғысынан қарағанда алынған нәтижелер құс өсіру үшін жаңа дәлел бола алады.

Кілт сөздер: бөдене, ультракүлгін, сәулелер, азықтандару, рацион.

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ВЕСЕННИЕ НЕКТАРОПЫЛЬЦЕНОСЫ В РЕСПУБЛИКЕ ЧУВАШИЯ

Аннотация

Пчелиные семьи необходимо обеспечивать энтомофильными растениями, цветущими в мае, в определенной последовательности: ивовыми, чистотелом большим, кленом остролистным и полевым, миндалем низким, одуванчиком, иргой, смородиной, каштаном конским и многими другими. Представлены данные о сроках цветения и медопродуктивности весенних медоносов.

Ключевые слова: пчелиная семья, нектаропыльценосы, цветущие в мае, ива ломкая и пятитычинковая, клен полевой и остролистный, окопник, медопродуктивностъ.

Введение

По числу зацветающих и цветущих растений май значительно богаче апреля, что, прежде всего, связано с повышением температуры воздуха и почвы. Преобладают