

UDC 631.46
AGRIS L02

<https://doi.org/10.33619/2414-2948/79/30>

THE IMPACT OF HYDROPONIC FEEDING STUFF WITH ANTIBIOTIC ACTION ON EGG-LAYING CAPACITY

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ВЛИЯНИЕ ГИДРОПОННЫХ КОРМОВ АНТИБИОТИЧЕСКОГО ДЕЙСТВИЯ НА ЯЙЦЕНОСКОСТЬ

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Abstract. The article describes the study of poultry feeding by adding fenugreek, liquorice, amaranth grains, having antibiotic action and hydroponically cultivated grains of corn, barley, amaranth and fenugreek to the feed allowance of chickens, having high nutritional qualities and influence on the egg-laying capacity of maternal chickens. The studies were carried out in the Khudat poultry farm of the Khachmaz district and on parental chickens, rearing at the Veterinary Scientific Research Institute. So, from antibiotic-effective plants in order to study the impact of fenugreek, liquorice, amaranth grain and cultivated hydroponically of corn, barley, amaranth and fenugreek grains having high nutritional qualities on the egg-laying capacity of chickens by adding to the feed allowance, an experiment was set. The feeds mentioned have antibacterial and antitoxic properties and regulate water-salt metabolism, contribute to the normal functioning of the stomach, stimulate the peristalsis of the gastrointestinal tract, strengthen the endocrine and immune system, the body's resistance. As a consequence of the studies conducted, it was found that the content of raw protein in amaranth grain grown by the hydroponic method is — 23.1%, and in fenugreek - 33.9%, as well as 19.9% of linolenic acid contained in the seeds mentioned, by reducing the level of the cortisol stress hormone which can destroy muscles and increase the fat layer, strengthens the immune system. As a result, the transport of nutrients to the cells improves, which makes it easier to absorb nutrients, increases bone density by improving the balance of calcium.

Аннотация. В статье рассказывается об изучении кормления птиц путем добавления в кормовой рацион кур растений пажитника, солодкового корня, зерна амаранта, обладающих антибиотическим действием и выращиваемых гидропонным методом зерен кукурузы, ячменя, амаранта и пажитника, обладающих высокими питательными качествами и влияние на яйценоскость материнских кур. Исследования проводились в Худатском птицеводческом хозяйстве Хачмазского района и на материнских курах, разводимых в ветеринарном научно-исследовательском институте. Так, был поставлен опыт для изучения влияния пажитника,

солодкового корня, амарантового зерна и проросших гидропонным методом зерен кукурузы, ячменя, амаранта и пажитника на яйценоскость кур с добавлением в кормовой рацион растений с антибиотическим действием. Упомянутые корма обладают антибактериальными и антитоксическими свойствами и регулируют водно-солевой обмен, способствуют нормальному функционированию желудка, стимулируют перистальтику желудочно-кишечного тракта, укрепляют эндокринную и иммунную систему, сопротивляемость организма. В результате проведенных исследований было установлено, что содержание сырого белка в амарантовом зерне, проросшем гидропонным методом, составляет 23,1%, а в пажитнике — 33,9%, а также 19,9% линоленовой кислоты, содержащейся в упомянутых семенах, снижая уровень гормона стресса кортизола, способного разрушать мышцы и увеличивать жировой слой, укрепляет иммунную систему. В результате улучшается передвижение питательных веществ в клетки, что позволяет легче усваивать питательные вещества, повышает плотность костной ткани за счет улучшения баланса кальция. Использование смеси отмеченных кормов с питательными кормами, положительно сказывается на яйценоскости, качестве ее инкубации и развитии птиц.

Keywords: antibiotic-effective, fenugreek, liquorice, amaranth, morphological analysis of chicken eggs, calcium, mineral complex.

Ключевые слова: антибиотического действия, пажитник, солодковый корень, амарант, морфологический анализ куриных яиц, кальций, комплекс минералов.

The use of a mixture of the feeding stuff mentioned with nutritious ones has a positive effect on egg – laying capacity, the quality of its incubation and the development of birds. A control group consisting of 50 head of bird and three experimental groups were created in each group. The chickens of the control group were fed with bird feed having nutritional value according to the appropriate recipe. For the chickens of the first experimental group, to the compound feeding stuff was used the amount of 10.0 kg/t of “fenugreek grain” + 4 kg/t of compound feed from “hydroponic fenugreek”. When feeding chickens of the second experimental group, the “amaranth grain” was used at the rate of 10.0 kg/t and “hydroponic amaranth” +4.0 kg/t.

And when feeding the chickens of the third experimental group, to the combined feeding stuff, along with 10.0 kg/t of “fenugreek grain” +4.0 kg/t of “hydroponic fenugreek”+10.0 kg/t of “amaranth grain”+4.0 kg/t of “hydroponic amaranth”, there was added crushed sweet liquorice to the feed allowance at the rate of 4.0 kg/t.

Studies have shown that the use of plants with an antibiotic action has led to an increase in the egg-laying capacity of chickens, eggs suitable for incubation, the survival rate of chickens, an increase in live weight, a reduction in feed costs, and an improvement in the morphological composition of chicken eggs.

For the rearing of productive birds in poultry farming, it is important to obtain healthy young birds, maternal hens with high growth and productivity potential. In this regard, there are high requirements for feeding of chicken flocks. Since the need of maternal chickens for minerals is very high, vitamin and mineral supplements are prepared for them. For laying hens, the main criteria for performing the feeding by using wholesome plants of antibiotic action are: productivity, rational use of feed, egg weight, shell quality, elastic deformation of the shell, etc. [1-3].



Figure 1. Types of food

The aim of the study

Studying the increase in live weight in experimental chickens, reducing feed costs, increase in the survival rate during hatching of chicks and the quality of eggs suitable for incubation, using of plants with "antibiotic action" in feeding.

Place, material and methodology of research

Scientific and economic experimental studies were conducted in 2020-2022 at the Veterinary Scientific Research Institute and in the Khudat poultry farm of Khachmaz district on maternal chickens. The technology of rearing and keeping birds was carried out in ground conditions on a thick flooring.

Four groups of chickens (control and three experimental groups) were allocated for the experiment. The birds of all four groups were kept in separate poultry houses. The chickens of the control group were fed according to the basic feed allowance adopted on the farm [4-7]. And the chickens of the experimental groups were fed with adding of feeding stuff of antibiotic action to the main feed allowance. The scheme of the experiment is shown in the Table 1.

Table 1

EXPERIMENTAL ARRANGEMENT

<i>Groups</i>	<i>Feeding features</i>
Control	Basic ration
I experimental	To the basic ration + 10.0 kg / ton of fenugreek + 4.0 kg / ton of hydroponic fenugreek
II experimental	Basic ration + 10,0 kg/ton of amaranth grain+4,0 kg/ton of hydroponic amaranth
III experimental	Basic ration + 10,0 kg/ton of fenugreek grain + 4,0 kg/ton of hydroponic fenugreek + 10,0 kg/ton of amaranth grain +4,0 kg/ton of hydroponic amaranth + 4,0 kg/ton of crushed sweet liquorice.

Keeping conditions in all four groups were the same and corresponded to the technological parameters adopted for the keeping of maternal chickens.

In the course of the study, we studied the egg-laying capacity of chickens, the morphological composition of eggs, as well as the preservation of healthy poultry population [8-15].

During the experiment, a morphological analysis of chicken eggs for each group was carried out in 42-week-old birds.

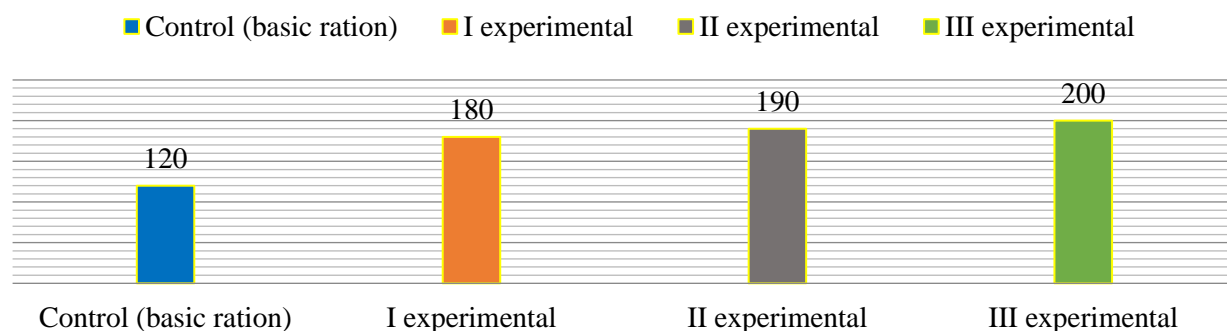


Figure 2. Laying capacity of maternal chickens

Table 2

INDICATORS OF PRODUCTIVITY OF MATERNAL CHICKENS

Indications	groups			
	Control	I experimental	II experimental	III experimental
On average, eggs from each chicken, pcs.	187	190	194	196
Eggs suitable for incubation, pcs.	173	180	186	187
The yield of an egg suitable for incubation, %	92,5	94,7	95,9	96,2
Egg yield by control group, %	100	102,3	103,7	104,0
Eggs, with the chicks hatching ability, pcs.	143	152	159	163
Hatching of chicks, %	82,6	84,4	85,5	87,1
Preservation of the chickens population, %	92,0	93,6	94,5	95,3
Feed consumption per 10 eggs (42 – week - old), kg	2,44	2,37	2,32	2,31

In the third experimental group using a mixture of plants, having antibiotic action with nutritious feeding stuff, egg – laying capacity was 196 eggs, which is 4.8% more than in comparison with the control group. In groups 1 and 2, egg – laying capacity was higher than in the control group by 1.6 and 3.7%, respectively. Also, in group 3, the number of eggs yield, suitable for incubation increased by 4.6% compared to the control group. The healthy keeping of birds in group 3 was 3.6% higher than in the control group.

In order to study the egg-laying capacity of experimental chickens and egg quality in 42-week-old birds, a morphological analysis of chicken eggs was carried out for all four groups, and egg yield of chickens was determined. The hatching of chickens is determined by the ratio of the number of healthy chickens to the number of eggs laid in the incubator, in percentage terms. We found that in the third experimental group, the hatching of chickens was 87.1%, which is 4.5% more than in the control group. And in groups 1 and 2, the hatching of chickens was higher than in the control group by 1.8 and 2.9%, respectively. Based on this, it can be noted that the using of plants with antibiotic action had a significant positive effect on the morphological quality of chicken eggs in experimental groups (Table 3).

One of the signs that determine the incubation quality of eggs is the egg yolk index. The egg yolk index determines the normal content of vitamin "A" in the egg and increases the incubation qualities of the egg, healthy chicks hatch from such eggs.

Table 3

MORPHOLOGICAL ANALYSIS OF CHICKEN EGGS

Age of birds, weeks	Groups				Incubation egg
	Control	I experimental	II experimental	III experimental	
<i>Egg weight, g, M±m</i>					
42	50,4±1,22	59,4±0,63	60,2±0,67	62,5±0,59	48-72
<i>Eggshell weight, g, M±m</i>					
42	6,5±0,07	6,6±0,07	6,5±0,08	6,6±0,08	6,5-6,8
<i>Eggshell thickness, mcm, M±m</i>					
42	345,7±2,41	362,7±3,37	355,7±4,20	361±3,37	higher than 330
<i>Elastic deformation of the egg, mcm, M±m</i>					
42	20,4±1,01	21,2±1,03	21,5±0,82	21,6±0,36	below 25
<i>Egg white index, % M±m</i>					
42	72,1±0,03	91,3±0,06	92,7±0,05	93,5±0,08	higher than 70
<i>% M±m Egg yolk index, % M±m</i>					
42	45,6±7,18	48,1± 0,97	48,4±0,67	48,7±0,67	40....50

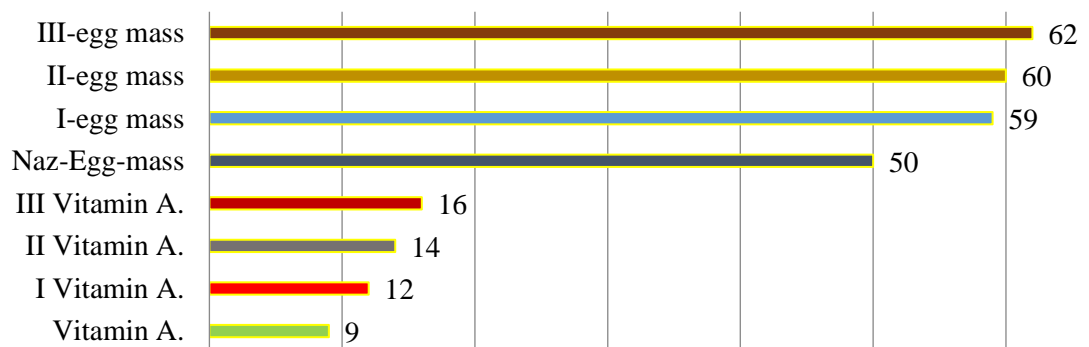


Figure 3. Egg weight and amount of vitamin "A"

- The amount of vitamin "A" in chicken eggs of the first experimental group is 10-15 micrograms, egg weight is 59.4 grams; The amount of vitamin "A" in 1 g of egg yolk of the second experimental group is 12-16 micrograms, weight is 60.2 grams; The amount of vitamin "A" in 1 g of egg yolk of chickens of the third experimental group-12-20 micrograms, egg weight-62.5 grams. Conversely, the amount of vitamin "A" in the yolk of chicken eggs of the control experimental group (fed with birdseed having nutritional value) was 8-10 micrograms, the incubation quality of the collected eggs was low, and the weight was 50.4 grams (Figure 3).

Eggs for incubation must have the correct shape, clean and smooth shell. The height of the air chamber for fresh eggs can be 1.5-4.0 mm. The egg yolk should be located in the center of the egg, but the location a little closer to the air chamber is acceptable.

Result

1. The use of plants having antibiotic action has a significant positive effect on the egg – laying capacity of chickens of experimental groups and the morphological quality of eggs.

2. By adding amaranth and fenugreek in a complex composition to compound feeding stuff grown by the hydroponic method with high nutritional qualities, it is possible to increase the egg-laying capacity in maternal chickens.

The results obtained are recommended for using in poultry farms.

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Работа поступила
в редакцию 01.05.2022 г.

Принята к публикации
04.05.2022 г.

Ссылка для цитирования:

Gasanov M., Rustamova S., Khudiev F. The Impact of Hydroponic Feeding Stuff with Antibiotic Action on Egg-laying Capacity // Бюллетень науки и практики. 2022. Т. 8. №6. С. 247-253. <https://doi.org/10.33619/2414-2948/79/30>

Cite as (APA):

Gasanov, M., Rustamova, S., & Khudiev, F. (2022). The Impact of Hydroponic Feeding Stuff with Antibiotic Action on Egg-laying Capacity. *Bulletin of Science and Practice*, 8(6), 247-253. <https://doi.org/10.33619/2414-2948/79/30>