

**THE USE OF THE HLORELLA IN POULTRY FARMING****KARUNSKYI O.Y.<sup>1</sup>, GARBAZHIY K.S.<sup>2</sup>, BOGDAN N.K.<sup>1</sup>, MKRTCHYAN S.S.<sup>3</sup>,  
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*The article presents the results of the research through the use of Chlorella suspension in poultry farming. The methodology of research on the use of the Chlorella suspension, which is produced by the farm enterprise "U Samvela" in the Bilyaivsky district of Odessa region, is described.*

*The research was carried out on layer chickens of "Brown" breed at the age of 360 days, which were divided into 3 experimental groups: 1 – control group and 2 research groups with 300 head in each. The second group, throughout the experiment (160 days) were fed with a suspension of Chlorella in a concentration of 50 ml, and in the experimental group 3 – 60 million cells in 1 milliliter of fluid.*

*It has been established that the use of Chlorella suspension positively influences the growth of birds, which is characterized by the absolute, relative and average daily increments of the 2nd and 3rd experimental groups. The maximum result is in 2nd experimental group, where the optimal cell concentration in the Chlorella suspension is 50 million cells in 1 milliliter of fluid and daily rate was 30 grams per 1 head.*

**Key words:** *feeding, layer chickens, suspension, Chlorella.*

The article considers the use of innovative feed product Chlorella concentrate, which opens a new page in the field of poultry farming. The use of biologically active additives (BAA) in feed production is fundamentally important. In turn, the effectiveness of using BAA itself depends on their composition and concentration of biologically active substances in them, their form, digestibility, origin, production technologies, etc. Notable among the biologically active additives is the Chlorella microalgae (*Chlorella Vulgaris*), composing of a significant amount of protein, a wide range of vitamins, including fat-soluble, as well as macro- and micro elements in a biologically accessible form. In the course of its lifetime, microalgae synthesize substances that possess both bacteriostatic and probiotic effects.

The benefit of this product is that it may be cultivated throughout the year.

Technological peculiarities of the use of Chlorella biomass is that it is possible to be introduced into the diet, both in the form of a paste, and to feed, in the form of a suspension. Unlike paste, the suspension has biologically active products of Chlorella's secondary metabolism, but it has a low dry matter content and has a low expiration date. The level of technology, the quality of raw materials and other factors determine the biological value of the final product. But the main reason is the impossibility of using live natural plants in a dry matter. It is its inclusion as a source of high biological value that remains today a large reserve for poultry farming. Using the suspensions helps not only significantly increase the productivity of the poultry, improve the quality of products, but also increase the profitability of the industry.

Analysis of recent research and publications. The desire to achieve high rates in the field of poultry farming prompts scientists and manufacturers to apply numerous feed additives that do not always have a positive effect, especially on product quality.

In recent years, as part of the practical use of Chlorella, production experiments have been carried out in various livestock farming sectors, with positive results compared with other feed additives. These results indicate that there is no alternative to Chlorella as a feed additive in animal husbandry.

Chlorella concentrate is a new fodder product of natural origin, which includes a complex of biologically active substances.

Despite the clear benefits of using Chlorella as a feed additive, there are currently few publications devoted to the influence of Chlorella's suspension on poultry productivity and product quality.

The aim of the work is study of the effective influence of the Chlorella water suspension in complete feeds, which will give the maximum increase in live weight at different stages of feeding, increase the growth of live weight of replacement chickens, increase the preservation of poultry, productivity and reduce feed costs per unit of production.

**Subjects and research methods.** The research has been conducted on “Brown” breed chickens. The study of the use of Chlorella suspension was carried out at the poultry plant Farm Enterprise “U Samvela” in Bilyaivsky District of Odessa region. The object of research were Brown” breed chickens at the age of 365 days and 3 experimental groups were formed: 1- control group and 2-experimental groups, 300 head in each group according to the principle of analogues, taking into account the age, body weight and growth. For the experiment, a suspension of Chlorella was used, which is produced at a poultry farm of the Farm Enterprise “U Samvela” in Bilyaivsky District of Odessa region with a concentration of 50 and 60 million cells per 1 milliliter.

Reliability of the data received was determined by t criterion using Microsoft Excel 2007. The research scheme is shown in the table 1.

### 1. Scheme of research

Groups of the poultry under research	Number of units in a group, head	Method of feed	Duration of the research, days
1 – control group	300	Complete feed (CF)	160
2 – research group	300	CF + Chlorella suspension with a concentration of 50 million cells per 1 milliliter	160
3 – research group	300	CF + Chlorella suspension with a concentration of 60 million cells per 1 milliliter	160

**Basic results of research.** The poultry in all the groups received the basic diet, energy and nutritional value conformed to generally accepted norms. The composition and nutritional value of complete feed used in feeding the experimental groups are given in Tables 2 and 3. Chlorella suspension was added in the drinking water of the 2nd and 3rd research groups, at a concentration of 50 and 60 million cells per 1 milliliter of culture fluid. Cells concentration in suspension of Chlorella was diluted with tap water.

The main indicators of assessing the effectiveness of Chlorella suspension use are the dynamics of changes in poultry live weight and feed costs by 1 kg of growth.

In all research groups, the increment of live weight in chickens from the beginning of the research and until the end of the research was higher in relation to the control group; the especially large increment was determined in the 2nd experimental group.

## 2. Composition of complete feed, %

Constituents	%	Constituents	%
Corn	-	Baking soda	-
Wheat	52.69	Limestone	9.00
Barley	14.20	Soja bean oil	-
Sunflower oil cake	7.00	Vitamin-mineral premix	0.50
Soybean cake	5.23	Mono-calcium phosphate	0.90
Fishmeal	4.46	Lysine	0.50
Wheat bran	5.02	Kreoline	0.10
Table salt	0.25	Methionine	0.15
<b>Total</b>			100

## 3. Nutritional value of complete feed

Constituents	%
Available energy	1.10
Crude protein	12.5
	0
Crude fiber	2.50
Lysine	0.05
Methionine	0.80
Tryptophan	0.40
Calcium	3.50
Phosphorus	0.70
Sodium	0.20

As for the ratio of the amount of feed per one kilogram of weight increment, the rates of in all the groups were almost equal, but lower than the control group by 6.2%. The results received at the end of the research are given in Table 4.

## 4. Dynamics of the live weight in chickens of research groups

Poultry age, days	Group		
	1 – control group, grams	2 – research group, grams	3 – research group, grams
365	1805	1800	1800
445	1887	1998	1896
525	1980	1993	1990

The pattern of poultry growth was estimated on the basis of absolute, daily average increments (Table 5). The main products of poultry farming are eggs and meat. Poultry lay eggs which vary in size. The egg mass determines the overall presence of yolk and protein in them and is one of the main indicators for classification according to the standard.

The poultry of the control group gave 20181 eggs, accounting for 69% egg-laying. The productivity of the poultry of the research group amounted to 79.4% (23820 eggs were obtained),

which is 12.4% higher than the control group. The weight of the poultry's egg in the control group is 63%, while in the experimental group this figure is 69.2%, which is 5.5 grams or 8.6% higher. According to these parameters, the egg mass in the control group is 128 kg, in the experimental group the egg mass is 165 kg, which is 37 kg higher with an average egg weight of 69.2 g.

### 5. Indices of increment of live weight of the poultry in experimental groups

Group	Age, days	Показники		
		Absolute increment, grams	Average daily weight increment, grams	Relative increment, %
1 – control group	365	-	-	-
	445	82.0	1.0	100
	525	80.0	1.0	100
2 – research group	365	-	-	-
	445	98.0	1.2	119.5
	525	95	1.1	118.7
3 - research group	365	-	-	-
	445	96.0	1.2	117.0
	525	94.0	1.1	117.5

Note: - \*  $P > 0,05$

It should be noted that in egg yolks of the research group poultry, such indicators as the presence of fat-soluble vitamins A and E increased sharply. Thus, at a rate of vitamin A - 6 mg / g, it was found - 8.15 mg / g, which is 35.8% higher. The norm of vitamin E is 85 mg / g. In the eggs of the research group poultry, this figure was 131% higher and amounted to 197 mg /g. The presence of keratinoides increased significantly (by 17.6%).

Eggs are a product satisfying a variety of needs for nutrients, which increase with the use of Chlorella suspension.

### Conclusions

Summing up the analysis of these studies, we conclude that the use of Chlorella suspension of in the feeding laying chickens in the dose of 30 ml / head with a concentration of 50 million cells per 1 milliliter of solution positively affects growth, as indicated by the absolute, relative and average daily increments in experimental groups. It also improves the quality of products, especially its content of vitamins. Maximum results were shown by 2nd experimental group, where the concentration of the Chlorella suspension solution, when fed 30 ml of suspension for 1 head / day, was 50 million cells per 1 milliliter.

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**А. Й. Карунский, Е. С. Гарбажи, Н. К. Богдан, С. С. Мкртчян, Л. А. Салимон. Использование суспензии Хлореллы в птицеводстве.**

Статья посвящена исследованиям эффективности использования суспензии Хлореллы в птицеводстве. Представлена методология исследования по использованию суспензии Хлореллы, которая произведена предприятием фермы «У Самвела» в Бежлевоком районе Одесской области. Исследование проводили на яичных цыплятах кросса «Браун» в возрасте от 0 до 360 дней, которые были разделены на 3 группы: 1 - контрольная и 2 опытные группы по 300 голов в каждой. II группа в течение эксперимента (160 дней) получали суспензию Хлореллы в концентрации 50 млн., и в III опытной группе - 60 млн. клеток в 1 миллилитре суспензии. Установлено, что использование суспензии Хлореллы положительно влияет на рост яичного молодняка птицы II, III опытных групп, что подтверждается повышенными абсолютными, среднесуточными, относительными приростами. Максимальные продуктивные качества установлены у молодняка птицы II опытной группы.

**Ключевые слова:** кормление, цыплята яичных пород, суспензия Хлореллы.

**О. Й. Карунський, К. С. Гарбажи, М. К. Богдан, С. С. Мкртчян, Л. А. Салимон. Використання суспензії Хлорели в птахівництві.**

Стаття присвячена дослідженням ефективності використання суспензії Хлорели в птахівництві. Представлена методологія дослідження з використання суспензії Хлорели, яка виготовлена підприємством ферми "У Самвела" у Біляївському районі Одеської області. Дослідження проводили на яєчних курчатах кросу "Браун" у віці від 0 до 360 днів, які були розподілені на 3 групи: 1 - контрольна і 2 дослідні групи по 300 голів у кожній. II група впродовж експерименту (160 днів) отримували суспензію Хлорели в концентрації 50 млн., і в III дослідній групі - 60 млн. клітин в 1 мл суспензії. Установлено, що використання суспензії Хлорели позитивно впливає на ріст яєчного молодняка птиці II, III дослідних груп, що підтверджується підвищеними показниками абсолютного, середньодобового, відносного приростів. Максимальні продуктивні якості встановлені у молодняка II дослідної групи.

**Ключові слова:** годівля, курчата яєчних порід, суспензія Хлорели.