АУЫЛ ШАРУАШЫЛЫҒЫ, ВЕТЕРИНАРИЯ ҒЫЛЫМДАРЫ ЖӘНЕ ТАМАҚ ӨНІМДЕРІН ҚАЙТА ӨҢДЕУ

UDC 636.5.085
МРНТИ 62.01.05

DOI: https://doi.org/10.37788/2021-4/101-106

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Efficiency of using Artemia salina as part of a feed additive for chickens

Abstract

Main problem: The development of the genetic potential of poultry, as well as the receipt of high-quality eggs for collection or further incubation, are possible only if rational and correct feeding of the broodstock and, more importantly, the young during its rearing period is observed. During this period, high-quality protein nutrition occupies an important place, which determines the level of productivity, stable growth, reproductive ability of the bird, as well as the state of health during the feeding period.

Protein deficiency always remains an urgent problem for agricultural land, whose main activity is aimed at breeding dairy and meat animals. In this regard, research in the field of finding the use of non-traditional protein feed is of great need. If we summarize the modern achievements in the field of protein and aminoacid nutrition of poultry, we can find the most profitable way to obtain feed additives in industrial production.

The studies, the results of which will be described in this article, are aimed at studying the possibility, experimental substantiation of the optimal dosage and the effectiveness of using the feed additive from crustaceans Artemia salina in the diets of chickens of the egg-meat direction of productivity [1].

Purpose: To study the possibility, experimental substantiation of the optimal dosage and the effectiveness of the use of the feed additive from crustaceans Artemia salina in the diet of chickens of the egg-meat direction of productivity.

Methods: Analysis and generalization of theoretical information

Results and their significance: This article presents the results of the analysis and generalization of theoretical material. The theoretical significance is determined by the fact that it is invested in scientific and practical problems related directly to solving urgent problems, increasing the efficiency, competitiveness and quality of domestic poultry products.

Key words: crustaceans, branchipods, Artemia salina, feed additives.

Introduction

Modern industrial poultry farming is one of the most demanded branches of productive livestock farming, which is capable of producing products in a short time and in significant volumes, regardless of the season or weather.Thanks to this, this industry is one of the most important sources of replenishing the country's food resources. In addition, economic efficiency should be taken into account, which is due to the low cost of feed per unit of production [1, 2].

Currently, there are more than 70 operating poultry farms in Kazakhstan, and some of them have been modernized, which increased the production of meat products by several thousand tons, not counting private agricultural land that produces egg and meat products on their own.Egg products fully supply the domestic market [3].

One of the main factors ensuring high productivity of the product and reducing production costs is a complete diet during the feeding period. Consequently, one of the main indicators that characterize the nutritional value of the bird, as well as the state of health, is the change in live weight. It follows from this that for the fruitful development of the poultry farm, it is necessary to find a solution to the problem with a deficiency of feed protein so that the economic component is not affected. In this regard, studies in the direction of studying the possibility of replacing scarce feed additives of animal origin with other feed products that do not affect the growth rate and the economic component are very relevant.

To develop this direction, research continues on the concentration and effect of soil components: nitrates, pesticides, heavy metals, radionucleides on the quality of plant and livestock products, which are used as feed additives on the body of poultry. Research is also being carried out aimed at finding ways to reduce the level of toxic substances on the components of products that are used in the diet of chickens [4].

Currently, there are several poultry farms in Kazakhstan for the egg and meat direction, among which the most in demand is the poultry farm of Sary-Bulak Company LLP. The company was registered in 2003,

however, in the direction of the production of building materials, trade purchases. The poultry farm started its activities in 2008.The entire production process at the enterprise - microclimate, compound feed production, egg collection, as well as poultry feeding - is fully automated, which ensures high reliability and profitability.

Taking into account the directions in which the enterprise operates, then this company can be called a diversified holding, since in addition to its main activity, the egg and meat direction, the company is engaged in the preparation of compound feed, the cultivation of oilseeds, the production of refined and unrefined soybean oils, the processing of poultry meat, as well as the production of building materials (sandwich panels), from which the company began its activity. The company receives day-old chicks cross Hy-Line W-98 from Holland [5].

The peculiarities of this cross of chickens are active egg production with a balanced diet, undemanding care. From which it should be noted that this hybrid has record indicators not only for egg production, but also adaptation to any habitat, good immunity and non-conflict nature, which allows you to keep a larger number of heads in one place. Of the disadvantages, only a short period of active egg-laying can be noted. These parameters allow experiments to be carried out in order to find the most optimal and profitable composition of feed additives to increase live weight, without affecting the characteristics of the egg production of chickens [6].

Materials and methods

The authors analyzed and summarized publicly available information on the selected topic.

Results

The main requirements for the products of poultry farms of the egg and meat direction are high egg production, the volume of live weight, unpretentiousness to living conditions and the ability to experiment with the diet without negative consequences for the product itself, as well as for humans, due to the natural consumer of the product.

The Hy-Line cross breed is the most unpretentious in terms of habitat and conditions. Based on the observations of experienced poultry breeders, this breed behaves more confidently indoors than outdoors. Another advantage of this breed is strong immunity, which does not save chickens from vaccination against diseases of Marek, Gumboro, Newcastle [7].

It is well known that the introduction of various additives into the composition of a technological product in the process of its production improves its physical and mechanical properties and feed value. Thus, as the most profitable and suitable, pre-starter compound feed was selected for our purposes.

Pre-starter compound feed is a complex, homogeneous mixture of easily digestible feed components for feeding animals and poultry of the initial stage of life (chickens, piglets, calves), which guarantees high safety, growth rate and future productivity. Pre-starter compound feed is a combination of the latest advances in science, practical experience, and proven production technology. Specially processed raw materials increase the nutritional value of feed, since during its production the availability of nutrients in grain and soy products significantly changes, the influence of anti-nutritional factors decreases.

Supplements that stimulate the immune system improve the safety of the livestock. The use of flavoring and aromatic substances in pre-starter compound feeds increases feed consumption and stimulates the development of the gastrointestinal tract. The use of pre- and probiotics protects the gastrointestinal tract from pathogenic and putrefactive bacteria. The special structure of the pre-starter compound feed (micro granule) makes the feed attractive for young animals and easy to use.

The inclusion of pre-starter compound feed in the broiler feeding program allows you to get chicks weighing 186-196 g at a week of age. The use of pre-starter compound feed specially developed for egg chickens increases the subsequent egg productivity of the hen by 5-6 eggs [8].

Discussion

The main principle of intensifying the production of poultry products, as before, is the efficient use of feed. Moreover, at present, the main limiting factor for the further development of poultry farming is the limited feed resources. In this connection, an important direction of research in the field of poultry feeding is the search for cheaper non-traditional and affordable feed products that are close in their biological value to traditional ones and can reduce the proportion of grain and imported protein feed in the diets. But, before using them for feeding poultry, it is necessary to develop in detail and determine the level of introduction of new additives into the diets and study their influence on the physiological functions of the bird, its productive and quality indicators.

To date, over 5 thousand different works on Artemia salina cysts have been published in domestic and foreign literature, however, research is mainly aimed at their use in pharmacology, food industry, fish farming. Artemia cysts, from which nauplii can be obtained within 24 hours, are recognized throughout the world as the best live starter food for many species of fish and crustaceans [9].

Artemia salina) is a species of crustaceans from the order Branchiopoda. In nature, Artemia salina lives in salt lakes: chloride, sulfate and carbonate. Often the reservoirs in which Artemia live are located in resort areas. Crustaceans are involved in the formation of therapeutic mud, which are famous for salt lakes. As a rule, brine shrimp is the only inhabitant of the reservoir, since other organisms that form zooplankton do not survive at such a high salt concentration.

Females lay eggs after mating or as a result of parthenogenesis. The egg sac in females is located on the abdomen. The egg sac (uterus) of one female Artemia can contain up to 200 eggs. However, the average fertility is 50-60 eggs, droppings every 5-7 days, during their life there are 15-18 eggs.

There are two types of eggs: thin-walled eggs, which hatch immediately, and eggs with a thick shell, which can remain dormant. Diapause can last for a number of years and ends when the eggs are in the water. Eggs with a thick shell are formed when the salt concentration increases - when the reservoir dries up.

The eggs hatch into nauplii(figure 1) about 0.5 mm in length. They have a single simple eye that only senses the presence and direction of light. Nauplii swim towards the light, while adults try to swim away from it. Later, two more full eyes develop, but the original eye also remains, resulting in a three-eyed creature.The juveniles become sexually mature in 18-30 days (figure 2).

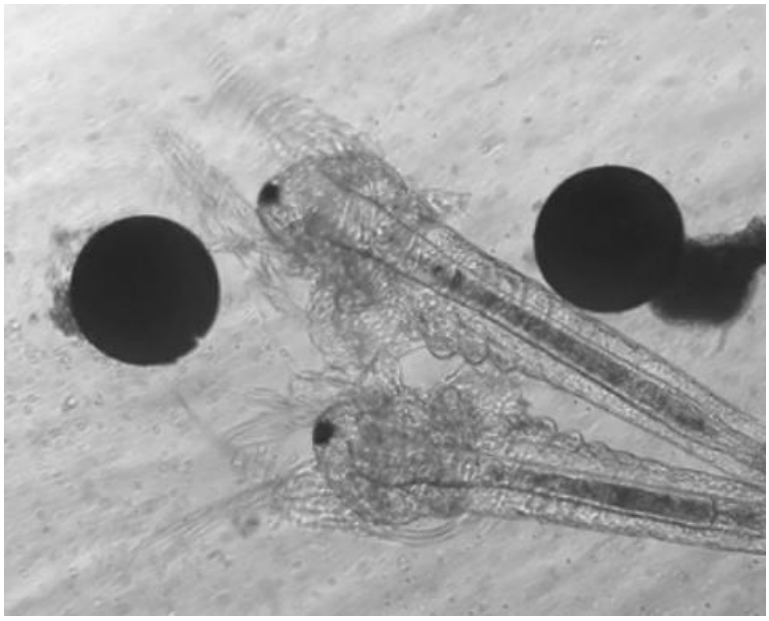

Figure 1 – Brine shrimp nauplii eat nutrients from cysts

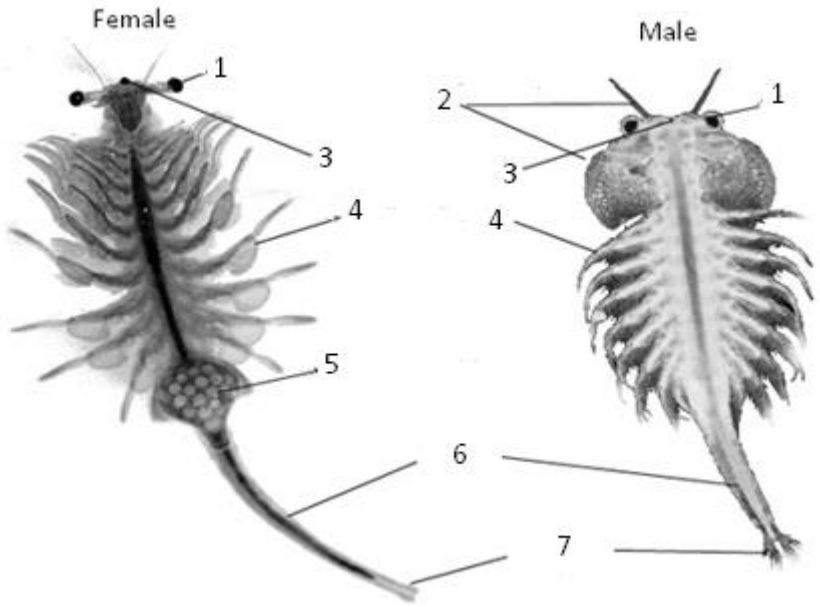

Figure 2 – The structure of the male and female Artemia salina. 1 – eye; 2– antennasandantennules; 3 – nauplius peephole; 4 – trunk limbs; 5 – egg sac (uterus); 6 – telson; 7 – caudal ramus

Under conditions that prevent the formation of hemoglobin, and with a lack of chlorophyll in the feed, Artemia becomes viviparous. This crustacean lives up to 6 months.[10].

However, not all eggs are known to be viable. Artemia salina eggs with a hatching percentage of less than 50% are considered substandard, since it is economically unprofitable to incubate nauplii from them, but at the same time they are a very highly nutritious food product for animals and birds.

Due to the fact that cross chickens are more layers than owners of large carcasses, the addition of Artemia salina crustaceans to the diet will replace part of the vitamins and minerals, replenishing the deficiency of crude protein, which will allow them to gain the required mass without losing the characteristics of high egg

production. The possibility of growing aquatic organisms will allow you to monitor the nutrition of the future feed additive and eliminate possible shortcomings in the process of incubation and hatching of Artemia cysts.

Issues related to the use of crustaceans Artemia salina in industrial poultry farming have not been sufficiently studied, in particular, when feeding chickens and layers. There is very little information about their effect on productivity, physiological state of poultry, digestibility and assimilation of nutrients, product quality. Therefore, the scientific development of the practical use of crustaceans Artemia salina in feeding chickens, as a new feed additive, is very relevant.

According to the analysis of the research results, the chemical composition of Artemia salina cysts is non-toxic and does not have a negative effect on the reproductive capacity of hens. When balancing feed mixtures with an additive from Artemia cysts, the main attention was paid to the content of crude protein, amino acids, available phosphorus, calcium and metabolizable energy. Due to the mixing of feed mixtures, the percentage of fishmeal content in the finished product decreased.

The amount of crude protein is within 33.5%, calcium – 0.1 %, sodium – 0.97 %, and phosphorus – 0.54 %. While the mass fraction of 16 basic amino acids is 35.83%, including: methionine – 0.97 %, lysine – 3.22 %, leucine – 2.71 %, isoleucine – 1.34%, cystine – 0.72 %, valine – 1.77%, tyrosine – 2.03%, serine – 2.40 %, glycine – 2.19%, training – 1.81 %, phenylalanine – 1.59 %, arginine – 2.26% , histidine – 1.84 %, alanine – 2.25 %, glutamic acid – 5.21 %, aspartic acid – 3.52 % [11].

The cultivation of Artemia salina in industrial production also does not require large expenses. Despite the rather whimsical nature of crustaceans to the temperature regime under conditions of artificial breeding, the increase in living biomass is quite high. When comparing the conditions of detention in nature and in the laboratory, the natural content is noticeably in the lead. However, taking into account the hatching and growth of aquatic organisms, the most improved conditions can be recreated in industrial production. In this way, you can control the number and influence the chemical composition by means of feed.

Based on all these findings, we can say that cysts are more in demand, but less effective for economic purposes. Much more benefit can be obtained from nauplii or adults.

Especially if the whole process is controlled, because crustaceans are not very whimsical for industrial production. At the output, you can get individuals almost identical in color and size.

Conclusion

Thus, the inclusion of crustaceans Artemia salina in the composition of pre-starter compound feeds will increase the live weight of chickens without disturbing the main feature of the Hy-Line cross chickens. Considering the chemical composition of the aquatic life and its food, which can be controlled during the hatching and development of the crustacean, it is possible to achieve maximum efficiency in both the meat and egg production directions.

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Тауықтарға арналған азық қоспасының бөлігі ретінде Artemiasalina жемдік қоспасын қолданудың тиімділігі

Аналық малды және одан да маңыздысы, оны өсіру кезеңінде ұтымды және дұрыс азықтандыру байқалса ғана, құстың генетикалық әлеуетінің дамуы, сондай-ақ жинау немесе одан әрі инкубациялау үшін жоғары сапалы жұмыртқалар алу мүмкін болады. Бұл кезеңде жоғары сапалы ақуызды қоректену маңызды орын алады, бұл құстың өнімділік деңгейін, тұрақты өсуін, ұрпақты болу қабілетін, сондай-ақ азықтандыру кезеңінде денсаулық жағдайын анықтайды.

Негізгі қызметі сүтті және етті малдарды өсіруге бағытталған ауыл шаруашылығы жерлері үшін белок тапшылығы әрқашан өзекті мәселе болып қала береді. Осыған байланысты дәстүрлі емес протеиндік жемдерді пайдалануды іздеу бойынша зерттеулер қажет.

Құстарды нәруыздық және аминқышқылды қоректену саласындағы қазіргі жетістері және оның түрлі ерекшеліктерін ескере отырып қорытындылайтын болсақ, өнеркәсіптік өндірісте азықтық қоспаларды ала отырып ең тиімді жолын табуға болады.

Сипатталған зерттеулерге сүйене отырып жұмыртқа-ет бағытындағы тауықтардың рационында шаянтәрізділерден Artemiasalina жемдік қоспасын қолдану мүмкіндігін, оңтайлы дозасын тәжірибелік негіздеу мен тиімділігін зерттеуге бағытталған.

Негізгі мақсаты – өнімділігінің жұмыртқа-ет бағытындағы тауықтардың рационында шаян тәрізділерден Artemia salina жемдік қоспасын қолдану мүмкіндігін, оптималды дозасын тәжірибелік негіздеу және тиімділігін зерттеу.

Мақаланы жазу барысында қолданыланған әдістер: теориялық ақпаратты талдау және жалпылау.

Бұл мақалада теориялық материалды талдау және жалпылау нәтижелері берілген. Теориялық маңыздылығы оның өзекті мәселелерді шешуге, отандық құс өнімдерінің тиімділігін, бәсекеге қабілеттілігін және сапасын арттыруға тікелей байланысты ғылыми-практикалық мәселелерге инвестициялануымен анықталады.

Түйін сөздер: шаянтәрізділер, бұтақаяқтылар, Artemia salina, жемдік қоспалар.

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Эффективность использования Artemiasalina в составе кормовой добавки для кур

Развитие генетического потенциала сельскохозяйственной птицы, а также получение высококачественных яиц для сбора и продажи или дальнейшей инкубации, вероятны лишь при условии соблюдения рационального и правильного кормления маточного стада в условиях производства и, что более важно, молодняка в период его выкармливания. В этот период одно из главных мест занимает качественный подбор протеинового питания, что характеризует уровень продуктивности, стабильный рост, воспроизводительную способность птицы, а также состояние ее здоровья в период выкармливания.

Протеиновый дефицит всегда был и остается актуальной проблемой для сельскохозяйственных земель, на которых разводят животных молочно-мясного направления. В связи с этим существует острая необходимость проведения исследований, которые направлены на поиск использования нетрадиционных белковых кормов.

Если изучить и обобщить современные достижения биотехнологии в области протеинового и аминокислотного питания птицы с учетом ее видовых особенностей, можно отыскать наиболее выгодный способ получения кормовых добавок в условиях промышленного производства. Исследования, результаты которых будут описаны в данной статье, направлены на изучение возможных экспериментальных обоснований для оптимального дозирования в кормовые добавки рачков Artemiasalina для эффективного использования в рационах кур яично-мясного направления продуктивности. Целью является изучение возможных экспериментальных обоснований для оптимального дозирования в кормовые добавки рачков Artemiasalina для эффективного использования в рационах кур яично-мясного направления продуктивности. Методы, используемые при написании статьи, - анализ и обобщение теоретической информации.Теоретическая значимость определяется тем, что оно вкладывается в научно-практические проблемы, связанные непосредственно с решением актуальных проблем, повышением эффективности, конкурентоспособности и качества отечественной продукции птицеводства.

Ключевые слова: рачки, жаброногие, Artemiasalina, кормовые добавки.

Date of receipt of the manuscript to the editor: 2021/11/25