Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

EFFECT OF HOMOLOGOUS TRADITIONAL CHINESE MEDICINE FEED ADDITIVES ON PRODUCTION PERFORMANCE OF LAYING HENS AND EGG QUALITY AND ECONOMIC BENEFITS

Li JingWen[1], Zhang Zhe[2], Wang, QianWen[1], Liu Wei[1]★

[1]*School of Life Sciences, Henan Normal University, XinXiang, China;*
[2]*School of Life Sciences, Lanzhou university, LanZhou, China*
Li JingWen (2000 -), female, born in Xinzheng, Henan Province, Undergraduate student, Henan Normal University.
Liu Wei (1987 -), male, born in XinXiang, Henan Province, is a lecturer of School of Life Sciences, Henan Normal University. E-mail: 2019117@htu.edu.cn

ABSTRACT

The purpose of this experiment is to study the effect of traditional Chinese medicine feed additives with the same medicine and food on the production performance, egg quality and economic benefits of laying hens. Firstly, formulate a prescription based on the nature, taste, meridian, and function of Chinese medicine. After many small-scale breeding experiments, the effect is continuously tested and then selected to be a medicine that can comprehensively improve layer production performance, egg quality and economic benefits. Feed additives of traditional Chinese medicine for eating homologous layers. 400 30-week-old Roman brown-shell hens with similar morphology, good physical condition, and basically the same weight was selected and randomly divided into four groups, each with 100 chickens, with 5 repeats in the group, the first group was the control group (CK), the second, third, and fourth groups are experimental groups, denoted by A, B, and C respectively. The control group was fed only the basal diet, and the experimental groups A, B, and C were fed with 0.3%, 0.5%, and 1% of the above-mentioned medicinal and food homologous layer Chinese medicine additives on the basis of the basal diet, respectively. The test found that compared with the control group, the egg shell thickness, Hastelloy unit, egg shape index, egg yolk color, egg yolk ratio, protein content in eggs and lecithin content in egg yolks were increased in the experimental group compared with the control group, and the cholesterol content in the egg yolk decreased significantly; The egg production rate and average egg weight have been improved, the feed-to-egg ratio has been reduced, and the economic benefit has been significantly increased; the serum SOD, T-ACO, and IgG content of laying hens have been significantly increased, and the MDA content and total cholesterol content have been significantly reduced. It can be seen that the traditional Chinese medicine feed additive for layers with the same medicine and food can effectively improve the production performance of layers, improve egg quality, enhance the body resistance of layers, and increase economic benefits. In this experiment, it is better that the 1% addition amount has the most comprehensive effect.

Keywords: ***laying hens; traditional Chinese medicine; feed additives; medicine and food homology; egg quality; production performance; economic benefits.***

At present, most layer farms adopt group breeding in order to adapt to the growth of layer hens and reduce breeding costs. Because layer hens have weak resistance and are prone to infectious diseases such as avian influenza, many hens die or become ill. Poor health of the hens directly leads to problems such as lower egg quality, low laying rate, and high rate of soft broken eggs. Once the above situation occurs, it will cause great losses to the chicken farm, and the disease will become a bottleneck restricting the development of the layer breeding industry. In order to reduce the economic losses caused by the above-mentioned situation, many layer farmers add chemicals and antibiotics to the basic diet of layer hens, which can alleviate the problem in a short time, but excessive addition of antibiotics, hormones, chemicals, etc. Ingredients, resulting in the increase of drug residues in eggs, the emergence

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

of drug-resistant strains, and excessive hormones, leading to a series of problems such as early maturity of children and deterioration of the ecological environment, which have caused great harm to human health. Antibiotics have been used as feed additives to alleviate the decline in poultry production performance and bring huge economic benefits to the poultry industry. However, due to their various drawbacks, they have brought outstanding problems such as drug residues, especially endangering animal and human health. It has been restricted or banned by many countries and regions. Since 2000, all EU member states have banned the addition of antibiotics to feed. China's "Ministry of Agriculture and Rural Affairs Announcement No. 194" requires that from January 1, 2020, all growth-promoting drug feed additives, except for traditional Chinese medicine, be withdrawn, marking that China's agriculture has begun to implement the most stringent anti-resistance, anti-resistance, and No resistance policy. Scholars at home and abroad have realized the above-mentioned problems and have conducted some research on Chinese herbal medicine layer feed additives, and have made certain progress. However, there are deficiencies in the research and application. For example, the current Chinese medicine feed additives can only be improved from a few aspects. The production performance of laying hens or the improvement of egg quality can comprehensively improve the production performance of laying hens, the self-immunity of the laying hens, the nutritional value of the eggs, reduce the heavy metals and antibiotic residues in the eggs, and reduce the feed-to-egg ratio. There are few feed additives, because the ratio and dosage of Chinese medicine are very critical, which directly affects the feeding effect. In addition, there is still a lack of research on low-cost traditional Chinese medicine feed additives for laying hens with the same medicine and food. There may be toxic side effects. In order to solve the above-mentioned problems, the research team has developed a kind of traditional Chinese medicine feed additive for laying hens with a good comprehensive effect. It hopes to provide a scientific theoretical basis for the application of Chinese herbal medicine feed additives with the same medicine and food in laying hen production. It is hoped that it can make new contributions to the development of Chinese herbal medicine resources in China, the development of better Chinese herbal medicine feed additives for laying hens, the development of new Chinese herbal medicine feed additive products and the development of laying hen breeding industry. Sipahi (2017), Creativity is a mental activity that brings innovation [18]. In this context, creative thinking is important for the application of herbal medicine feed additives in the same medicine and food and laying hen production.

1. The medicinal mechanism and active ingredient analysis of traditional Chinese medicine feed additives for medicinal and food homologous laying hens.

The traditional Chinese medicine feed additives developed by our team are based on the physiological characteristics, nutritional requirements, and production rules of the layers, paying attention to the conditional compatibility of the eighteenth and nineteenth in traditional Chinese medicine, as well as the vitamins and traces in the traditional Chinese medicine. The synergy and antagonism between elements, amino acids and other nutrients, combined with the nature, flavor, meridian and efficacy of traditional Chinese medicine, are selected according to certain principles. The traditional Chinese medicine feed additive is composed of Chinese medicines with the same medicine and food as yam, portulaca, astragalus, angelica, poria, ground ginseng, safflower seed, Jerusalem artichoke, gynostemma, fennel, etc., with no drug resistance, no residue, no toxic side effects It is nutritious and can prevent and treat diseases, overcome the disadvantages of antibiotics, hormones, and chemical agents, and avoid the side effects caused by long-term use of traditional Chinese medicines that are non-medicine and food homologous or can be used for health food in laying hens. The feed additive is formulated according to the functions of Chinese herbal medicines, and then selected through many small-scale feeding experiments and continuous testing of its effects. The feed additive can comprehensively improve the production performance of the laying hens, the self-immunity of the laying hens, the nutritional value of the eggs, reduce the heavy metals and antibiotic residues in the eggs, reduce the feed-to-egg ratio and the cholesterol content in the eggs, and increase a variety of nutrients in the eggs The reduction of the content of substances has a strong health-preserving and health-care effect, meeting the needs of contemporary people for a healthy diet, and realizing the optimal combination of ordinary food and health-care effects. The feed additive can effectively enhance the resistance of chickens, reduce the chance of infection with avian influenza and other plagues, reduce the odor of laying hens, protect the environment, and have good economic and social benefits.

The yam, astragalus, angelica, safflower seed, cumin are mild in nature, poria coco--s are flat in

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

nature, purslane, ground ginseng, Jerusalem artichoke, gynostemma pentaphyllum are cold in nature, taking into account the combination of temperature and cold, suitable for layers of different physiques use.

The yam, Astragalus, Angelica, Poria, Gynostemma, Jerusalem artichoke taste sweet, Portulaca oleracea tastes sour, ground ginseng tastes slightly bitter, safflower seeds, cumin taste pungent, the overall taste of the traditional Chinese medicine feed additive is better. The layer feed does not affect the feed intake of the layer.

In the yam, astragalus, poria, ground ginseng, gynostemma pentaphyllum, and fennel enter the kidney meridian, yam, astragalus, angelica, poria, gynostemma pentaphylla, fennel enter the spleen meridian, and yam, astragalus, poria, ground ginseng, artichoke, and gynostemma Lung meridian, purslane, angelica, astragalus, Jerusalem artichoke, cumin enter the liver meridian, purslane enters the large intestine meridian, angelica, tuckahoe, and safflower seed enter the heart meridian, ground ginseng and fennel enter the stomach meridian, which can regulate laying hens Different organs.

The feed additive has many skills to enhance the physical function of laying hens and supplement a variety of nutrients. The yam in the prescription has the functions of invigorating the spleen and stomach, helping digestion, nourishing the kidney and essence, nourishing the lungs and relieving cough, lowering blood sugar, and anti-hepatic coma. It contains amylase, polyphenol oxidase, saponins, mucus protein and a variety of nutrients. Purslane has bactericidal and anti-inflammatory, lowering blood pressure, anti-aging effects, and is rich in malic acid, glucose, calcium, phosphorus, iron, vitamin E, carotene, vitamin B, vitamin C, and omega-3 fatty acids and other nutrients. Astragalus has the functions of replenishing qi and solidifying the surface, diuresis, strengthening the heart, lowering blood pressure, antibacterial, supporting toxins, excreting pus, generating muscles, strengthening capillary resistance, antiperspirants and sex hormones, and contains alkaloids, legumin, folic acid, Amino acids, betaine, saponins, carbohydrates, proteins, riboflavin, flavan compounds, iron, calcium, phosphorus, selenium, zinc, copper, manganese and many other trace elements. Angelica has anti-inflammatory and anti-bacterial, anti-tumor, enhanced lung function, scavenging free radicals, improving cardiovascular and blood functions, sedation, etc. It contains Angelica sucrose, a variety of amino acids, volatile oil, as well as n-butene, lactone, niacin, ferulate Acid and sesquiterpenoids, it also contains vitamin A, vitamin E, volatile oil, arginine and a variety of minerals. Poria has the functions of nourishing the heart and calming the nerves, regulating phlegm and dampness, invigorating the stomach, diuresis, anti-tumor, lowering blood sugar, and promoting hematopoiesis. It contains rich protein and polysaccharides of poria cocos, poria cocos acid, fatty acids, lecithin, adenine, Proteases, triterpenoids, minerals such as potassium, iron, calcium, magnesium, manganese, zinc, copper, selenium and trace elements such as vitamin B2 and niacin. Ground ginseng has the effects of refreshing, appetizing, replenishing liver and kidney deficiency, strengthening waist and knee muscles. It is known as a substitute for cordyceps. It contains polysaccharides, crude protein, crude fat, vitamins, amino acids, palmitic acid, and hard Fatty acid, linolenic acid, mineral elements, caffeic acid derivatives, flavonoids, etc. Safflower seeds have the effects of promoting blood circulation, clearing blood stasis and relieving pain, anti-cancer, anti-oxidation, and lowering cholesterol. It contains rich elements such as fatty acids, vitamin E, linoleic acid, sterols, and phospholipids. Jerusalem artichoke has the effects of lowering blood lipids, improving lipid metabolism, adjusting blood sugar in two directions, clearing heat and cooling blood, and contains inulin, terpenoids, flavonoids and other substances. Gynostemma pentaphyllum has the functions of lowering blood lipids, regulating blood pressure and preventing thrombosis, strengthening cardiovascular function, regulating blood sugar, promoting sleep, anti-free radicals, anti-bacterial and anti-inflammatory, and increasing the body's oxygen content. It contains gypenosides, gypenosides (polysaccharides), and water-soluble amino acids. Flavonoids, multiple vitamins, trace elements, minerals, etc. Fennel has the functions of dispelling cold and relieving pain, regulating qi and stomach, and contains mainly anethole, dimerized anethole, cuminone, fenchone, anisic acid, etc.

2. The effect of the traditional Chinese medicine feed additive for laying hens on egg quality, laying hen production performance and economic benefits.

2.1 Test materials

2.1.1 Traditional Chinese medicine feed additives for laying hens

Using the optimized formula of traditional Chinese medicine feed additives for laying hens, dried and crushed into 400 meshes.

2.1.2 Experimental animals

400 30-week-old Roman brown-shell hens with similar morphology, good physical condition, and basically the same weight was selected.

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

2.1.3 Basal diet

Based on the nutritional standards of laying hen feed, the basic diet is corn-soybean meal type diet. The composition of the diet (unit: %): corn 59.5, bran 4, soybean meal 14.5, stone meal 8.3, cotton meal 5.5, rapeseed meal 4, Meat and bone meal 2.5, salt 0.5, methionine 0.1, lysine 0.1, premix 1.

2.2.1 Test grouping

400 30-week-old Roman brown-shell hens were randomly divided into four groups, each with 100 chickens, with 5 repeats in the group, the first group was the control group (CK), and the second, third, and fourth groups were experiments Groups are represented by A, B, and C respectively. The control group was fed only the basal diet, and the experimental group A, the test group B, and the test group C were fed with 0.3%, 0.5%, and 1% traditional Chinese medicine additives for laying hens on the basis of the basal diet.

2.2.2 Feeding management

This test was carried out in the chicken farm in Xipingluo Township, Huixian City from April to June 2018. There was a 14-day pre-test period before the start of the test. During the pre-test period, the chicken pens were disinfected, chickens dewormed, and epidemic prevention, weighing, grouping, numbering, recording. The pre-trial period is 14 days with basal diet. On the basis of the basal diet, compound Chinese medicine feed additives are added, and the addition amount is gradually increased from less to more. To the beginning of the trial period. Add to the normal amount. After 14 days of pre-test, enter the 42-day formal breeding test. During the test period, the chicken coop was managed by a dedicated person, free to eat, provide enough drinking water, and keep the chicken house dry and sanitary. Feed at 6:00, 11:00, and 17:00 every day, weigh the remaining feed before feeding, and count the daily consumption. Collect eggs regularly at 10:00 and 16:00. Real-time monitoring of the health status of the chicken flocks, and recording of dead chickens, regular disinfection in the chicken coop. The rest is carried out in accordance with the regular management of the chicken house. The experiment started on April 1 and ended on May 26.

2.2.3 Testing indicators and methods

2.2.3.1 Egg quality inspection indicators and methods

Measure the index of egg yolk color, egg shape index, egg shell thickness, Hastelloy unit, egg yolk ratio, protein content, cholesterol content, lecithin content, antibiotic content, etc.

Egg weight: Weigh with electronic balance, accurate to 0.01g.

Egg yolk color: use Roche color fan for color comparison.

Egg shape index: The calculation method is egg shape index=longitudinal diameter length of egg/horizontal diameter length of egg.

Eggshell thickness: Take the big end, the small end and the middle part of the eggshell, remove the inner shell membrane with tweezers, measure the thickness with an eggshell thickness tester, and average the three points. Count the number and percentage of each batch of eggs at all levels, the unit is millimeters, and the accuracy is 0.01 millimeters.

Hough unit: Take three equidistant points evenly distributed between the edge of the egg and the middle point of the edge of the concentrated protein (avoid the protein band), measure the protein height with a uniform protein height meter, and calculate the average value. Then find the Hastelloy unit according to the following formula:

$$Hough\ unit = 100 \bullet \mathrm{Log}(H - 1.7W^{0.37} + 7.57)$$

In the formula: H is the height of concentrated protein (mm); W is the egg weight (g).

Egg yolk ratio: the ratio of egg yolk to egg weight.

Determination of protein content in eggs (refer to the method of Chen Dingdi) [1], determination of cholesterol content (refer to the method of Wang Huiyun, etc.) [2], determination of egg yolk lecithin content (refer to the method of Zhu Yunfen, etc.) [3].

Antibiotic content determination: mainly determine the content of florfenicol, penicillin, streptomycin, chloramphenicol and neomycin. Take florfenicol as an example. Break fresh eggs until they are fully mixed in the mixer (egg white and egg yolk are thoroughly mixed). Weigh 0.2 g of the well-mixed eggs into a 1.5mL centrifuge tube and add 1.2ml of florfenicol put the diluent in the centrifuge tube and vigorously shake it for 1 min. Use a dropper to blow the liquid in the centrifuge tube vigorously (no less than 10 times) to mix the sample and buffer thoroughly. Use a pipette to pipette 150 μL of the mixed liquid directly into the sample hole of the test card, start timing, and read the result in 5-8 minutes. Florfenicol, penicillin, streptomycin, chloramphenicol, neomycin immune colloidal gold rapid detection reagent cards were purchased from Shandong Jiuru Instrument Co., Ltd.

2.2.3.2 Indexes and methods for layer performance testing

Observe and record the appearance, egg production, and daily feed consumption of layers, measure egg weight, calculate egg production rate, feed-to-egg ratio and economic benefits.

Laying rate (%) = (number of eggs laid per day/number of chickens in stock) ×"100".

Feed-to-egg ratio = daily feed consumption / daily egg production.

2.2.3.3 Indexes and methods for blood biochemical testing of laying hens

Fasting for 20h after the end of the test. Each treatment group randomly selected 20 chickens, a

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

total of 100 chickens. Take 8mL of blood collected by cutting the neck, mix it with a sodium heparin tube and store it at low temperature (4℃), centrifuge at 35000r/min for 10min, take the supernatant (plasma) and store it at -20℃ for testing.

The blood biochemical indicators and methods measured are as follows:

Determination of superoxide dismutase (SOD) in serum: the hydroxylamine method was used.

Malondialdehyde (MDA) determination: using thiobarbituric acid method.

Determination of total antioxidant capacity (T-ACO): colorimetric method is used.

Determination of Total Cholesterol (TC): Using a kit method, the kit used is Chicken Total Cholesterol (TC) ELISA Kit (Shanghai Enzyme Link Biotechnology Co., Ltd.), measured with 1800 spectrophotometer.

Alkaline phosphatase (ALP) content determination: the kit method is used, and the kit used is the chicken alkaline phosphatase (ALP) ELISA kit (Shanghai Enzyme Link Biotechnology Co., Ltd.), measured with 1800 spectrophotometer.

IgG (immunoglobulin G) determination: the kit method is used, and the kit used is the chicken immunoglobulin G (IgG) detection kit (Shanghai Xinyu Biotechnology Co., Ltd.), which is determined with 1800 spectrophotometer.

2.2.4 Statistical analysis

SPSS20.0 software was used to analyze and compare the data, expressed as mean ± standard error, $P<0.01$ means the difference is very significant, $P<0.05$ means the difference is significant, $P>0.05$ means the difference is not significant.

2.3 Test results

2.3.1 The effect of traditional Chinese medicine additives in layer feed on egg quality

2.3.1.1 Effect on egg shell thickness, Hastelloy unit, egg shape index, egg yolk color, egg yolk ratio

The effect of traditional Chinese medicine additives in layer feed on egg shell thickness, Hough unit, egg shape index, egg yolk color, and egg yolk ratio are shown in Table 1. It can be seen from Table 1 that the three groups of test groups A, B, and C all improved the quality of eggs compared with the control group, and the improvement effect of group D was the most obvious. In terms of eggshell thickness: Compared with the control group, the test groups A, B, and C increased by 8.23%, 11.05%, and 11.57% respectively, and the differences were extremely significant compared with the control group ($P<0.01$); in the Hastelloy unit Aspect: Compared with the control group, the experimental groups A, B, and C increased by 2.09%, 4.11%, and 6.22%, respectively. Compared with the control group, the experimental groups A, B, and C all increased, but the experimental groups A and B increased Not obvious, the difference is not significant compared with the control group ($P>0.05$), the test group C is significantly different from the control group ($P<0.05$); in terms of egg shape index and egg yolk ratio: test group A, B, C and Compared with the control group, the improvement was not obvious, and the difference was not significant compared with the control group ($P>0.05$); in terms of egg yolk color: compared with the control group, the test groups A, B, and C increased by 6.27 respectively %, 8.15%, 13.07%, the test group A was significantly different from the control group ($P<0.05$), and the test group B and C were significantly different from the control group ($P<0.01$).

Table 1 The effect of traditional Chinese medicine additives in layer feed on eggshell thickness, Hough unit, egg shape index, normal rate of eggshell color, and egg yolk ratio

Group	egg shell thickness	Hough unit	egg shape index	egg yolk color	egg yolk ratio%
CK	0.389+0.033A	81.87+3.25a	1.334+0.041	7.73+0.47A	32.12+0.21
A	0.421+0.031B	83.52+2.43a	1.338+0.042	8.25+0.32AB	32.18+0.42
B	0.432+0.017B	85.21+2.81a	1.341+0.052	8.36+0.31B	33.58+0.39
C	0.434+0.023B	86.96+2.22b	1.342+0.016	8.74+0.35B	34.42+0.25

(In the same column, the same letter or no letter indicates that the difference is not significant ($P>0.05$), different lowercase letters indicate significant differences ($P<O.05$), and different capital letters indicate extremely significant differences ($P<O.01$), Only analyze the difference between each experimental group and the control group.)

2.3.1.2 Effect on protein content, yolk cholesterol content, and yolk lecithin content in eggs

Table 2 shows the effect of traditional Chinese medicine feed additives in layer feed on protein content, cholesterol content and lecithin content in eggs. It can be seen from Table 2 that traditional Chinese medicine feed additives for laying hens can improve the nutrient content in eggs. In terms of total protein: the test group A, B, and C all increased compared with the control group, but the

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

improvement was not obvious, and the difference was not significant compared with the control group (P>0.05); in terms of cholesterol content in the egg yolk: the test group Compared with the control group, A, B, and C all decreased, and the decrease was obvious, which decreased by 8.79%, 15.23%, and 25.41% respectively. Compared with the control group, the difference was extremely significant (P<0.01); in the egg yolk lecithin content Aspects: Compared with the control group, the test group A, B, and C all increased by 4.36%, 7.83%, and 12.63% respectively. The test group A did not increase significantly, and the difference was not significant compared with the control group (P>0.05) Compared with the control group, the experimental group B has a significant difference (P<0.05), the experimental group C has a significant increase, and the difference is extremely significant compared with the control group (P<0.01).

Table 2 Effects of traditional Chinese medicine additives in layer feed on egg protein content, egg yolk cholesterol content, and egg yolk lecithin content

Group	egg protein content (%)	egg yolk cholesterol content (mg/g)	egg yolk lecithin content
CK	12.22±0.2 15	23+0.97A	11.24±0.65A
A	12.80±0.37	13.89±0.84 AB	11.73±0.72A
B	13.14±0.48	12.91+1.09 B	12.12±0.59 AB
C	13.09±0.32	11.36+0.89 B	12.66 +0.26 B

(In the same column, the same letter or no letter indicates that the difference is not significant (P>0.05), different lowercase letters indicate significant differences (P<O.05), and different capital letters indicate extremely significant differences (P<O.01), Only analyze the difference between each experimental group and the control group.)

2.3.1.3 Impact on the content of antibiotics in eggs

Table 3 for the effect of traditional Chinese medicine additives in layer feed on the content of antibiotics in eggs. It can be seen from Table 3 that florfenicol, penicillin, streptomycin, chloramphenicol, and neomycin were not detected in the eggs of the three groups of test groups A, B, and C, which reached the current national level of green food. Hygienic requirements for eggs.

Table 3 Test results of egg residue content

Group	florfenicol	penicillin	streptomycin	chloramphenicol	neomycin
CK	Negative	Negative	Negative	Negative	Negative
A	Negative	Negative	Negative	Negative	Negative
B	Negative	Negative	Negative	Negative	Negative
C	Negative	Negative	Negative	Negative	Negative

(Florfenicol, penicillin, streptomycin, chloramphenicol, neomycin immunogold rapid detection reagent card used for antibiotic detection in this test can only be qualitatively tested, as long as it is lower than the lower limit of detection on the rapid detection reagent card the displayed result is undetected)

2.3.2 The effect of traditional Chinese medicine additives in layer feed on layer performance and economic benefits

2.3.2.1 Changes in the appearance of laying hens

The laying hens of test groups A, B, and C are basically plump and bright, with bright eyes, standing upright, short of breath, bright red crown, shiny scales of chicken feet, strong movement, and no drooling; the eggs of the control group Nearly 30% of the chicken's eyes are a little dangling, standing unstable, a little swollen eyelid, mouth breathing, irregular plumage, dark purple crown, weak movement, red spots in the anus, and drooling.

2.3.2.2 The effect of traditional Chinese medicine additives in layer feed on average egg weight and egg production rate

Table 4 shows the effect of traditional Chinese medicine additives in layer feed on average egg weight, egg production rate, and soft broken egg rate. It can be seen from Table 4 that compared with the control group, the three groups of test groups A, B and C all improved the production performance of laying hens.

In terms of average egg weight: Compared with the control group, the test groups B and C have

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

increased, but the increase is not obvious, the test group A is slightly lower than the control group, and the test groups A, B, C are compared with the control group The difference is not significant (P>0.05); in terms of egg production rate: the test groups A, B, and C have increased compared with the control group, and they have increased by 2.29%, 3.42%, and 6.35%, respectively, compared with the control group. The difference between B and the control group was not significant (P>0.05), and the difference between the test group C and the control group was significant (P<0.05).

Table 4 The effect of traditional Chinese medicine additives in layer feed on egg production rate, soft broken egg rate and average egg weight

Group	Average egg production rate (%)	Average egg weight (g)
CK	82.68±2.52A	62.23±1.36
A	84.57±1.79A	61.88±1.19
B	85.81±1.73A	62.76±1.22
C	87.93±1.88AB	63.05±0.89

(In the same column, the same letter or no letter indicates that the difference is not significa--nt (P>0.05), different lowercase letters indicate significant differences (P<O.05), and differe--nt capital letters indicate extremely significant differences (P<O.01), Only analyze the difference between each experimental group and the control group.)

2.3.2.3 The effect of traditional Chinese medicine additives in layer feed on daily feed intake, feed-to-egg ratio and egg production

The effects of traditional Chinese medicine additives in layer feed on daily feed intak--e, feed-to-egg ratio and egg production are shown in Table 5. It can be seen from Table 5 that traditional Chinese medicine additives in layer feed can increase daily egg production and reduce feed-to-egg ratio. In terms of average daily feed intake: the experimental group A, B, C did not change much compared with the control group, the experimental group A, B, C compared with the control group were not significantly different (P>0.05); Aspect: Compared with the control group, the test groups A, B, and C are all reduced, and they are reduced by 2.01%, 4.13%, and 7.43% respectively from the control group. The difference between the test groups A and B and the control group is not significant (P>0.05), the experimental group C is significantly different from the control group (P<0.05); in terms of daily egg production: the experimental group A, B, and C have increased compared with the control group, and have increased by 1.19 compared with the control group. %, 3.96%, 6.32%, the difference between the test group A and B compared with the control group is not significant (P>0.05), and the difference between the test group C and the control group is significant (P<0.05).

Table 5 The effect of traditional Chinese medicine additives in layer feed on daily feed intake, feed-to-egg ratio and egg production

Group	Average daily feed intake (g)	Feed egg ratio	Daily egg production (kg)
CK	122.32+2.52	2.42+0.16a	5.06+0.03a
A	121.57+1.79	2.37+0.22a	5.12+0.07a
B	121.81+1.73	2.32+0.17a	5.26+0.09a
C	120.93+1.88	2.24+0.28b	5.38+0.12b

(In the same column, the same letter or no letter indicates that the difference is not significant (P>0.05), different lowercase letters indicate significant differences (P<O.05), and different capital letters indicate extremely significant differences (P<O.01), Only analyze the difference between each experimental group and the control group.)

2.3.2.4 The impact of traditional Chinese medicine additives in layer feed on economic benefits

Table 6 for the impact of traditional Chinese medicine additives in layer feed on economic benefits. It can be seen from Table 6 that traditional Chinese medicine additives for layer feed can improve the economic benefits of layer breeding. Compared with the control group, the experimental groups A, B, and C increased by 3.87%, 10.61%, and

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

17.72%, respectively. When comparing economic benefits, only the cost of feed was calculated, and other costs such as epidemic prevention were not calculat--ed. The price of eggs was also calculated at the normal price. Feeding laying hens with feed additives for laying hens can increase the resistance of laying hens, reduce daily anti-epidemic drugs, and reduce the occurrence of plagues. It can also reduce the mortality rate of broilers and the rate of soft and broken eggs, although the added Chi--nese medicine has increased Some costs, but the overall comparison can also improve the efficiency of breeding. If eggs are sold in accordance with nutrition and health eggs, the economic benefits will be higher.

Table 6 The effect of traditional Chinese medicine additives in layer feed on economic benefits

Group	Price （¥/Kg）	Daily Income （¥）	Daily consumption (Kg)	Feed Price （¥/Kg）	Daily Profit （¥）
CK	8	40.48	12.23	2	16.02
A	8	40.96	12.16	2	16.64
B	8	42.08	12.18	2	17.72
C	8	43.04	12.09	2	18.86

(Egg price and feed price are calculated based on the market price at the time. This table only calculates the feed cost price, and the other costs are not calculated.)

2.3.3 The effect of traditional Chinese medicine feed additives in laying hens on blood biochemical indicators

2.3.3.1 The effect of traditional Chinese medicine feed additives for laying hens on the contents of serum SOD, MDA and T-ACO in laying hens

Table 7 for the effect of traditional Chinese medicine additives in layer feed on serum SOD, MDA and T-ACO levels in layer. It can be seen from Table 7 that traditional Chinese medicine feed additives for laying hens can significantly improve the antioxidant capacity of the body of laying hens. In terms of SOD content of superoxide dismutase: Compared with the control group, the test groups A, B, and C have increased by 6.47%, 12.93%, and 24.62%, respectively. The increase in the test group A is not obvious. The difference between the two groups were not significant (P>0.05), the test group B and C increased significantly, compared with the control group, the difference was extremely significant (P<0.01); in terms of MDA content: the test group A, B, C and Compared with the control group, they all decreased, which were 8.66%, 18.16%, 32.01% lower than the control group. The test group A decreas--ed significantly, and the difference was significant compared with the control group (P<0.05). The test group B and C decreased significantly Compared with the control group, the difference is extremely significant (P<0.01); in terms of the total antioxida--nt capacity T-AOC content: the test group A, B, and C all have increased compared with the control group, and they have increased by 11.41% respectively compared with the control group, 23.26%, 29.46%, the test group A increased significantly, compared with the control group, the difference was significant (P<0.05), the test group B, C increased significantly, compared with the control group, the difference was extremely significant (P<0.01).

Table 7 Effects of traditional Chinese medicine feed additives in laying hens on the contents of serum SOD, MDA and T-ACO in laying hens

Group	SOD/ (U/mL)	MDA/ (nmol/mL)	T-AOC/ (U/mL)
CK	189.32±2.53A	12.12±0.36A	18.06±0.53A
A	201.57±3.79A	11.07±0.22AB	20.12±0.47AB
B	213.81±1.73B	9.92±0.19B	22.26±0.69B
C	235.93±1.88B	8.24±0.28B	23.38±0.62B

(In the same column, the same letter or no letter indicates that the difference is not significant (P>0.05), different lowercase letters indicate significant differences (P<O.05), and different capital letters indicate extremely significant differences (P<O.01), Only analyze the difference between each experimental group and the control group.)

2.3.3.2 The effect of traditional Chinese medicine feed additives in laying hens on the content of serum TC, ALP and IgG in laying hens

Table 8 for the effect of traditional Chinese medicine additives in layer feed on the serum TC, ALP and IgG content of layer. It can be seen from Table 8 that traditional Chinese medicine feed additives for laying hens can significantly improve the immunity of laying hens. In terms of total cholesterol TC content: Compared with the control group, the test groups A, B, and C are all reduced, which are 7.04%, 13.09%, and 25.84% lower than the control group,

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

respectively. The test group A has a significant decrease compared with the control group. Significant difference (P<0.05), test group B, C decreased significantly, compared with the control group, the difference was extremely significant (P<0.01); in terms of alkaline phosphatase ALP: test group A, B, C compared with the control group All have improved, 0.72%, 4.36%, 5.84% higher than the control group respectively, and the difference is not significant compared with the control group (P>0.05); in terms of IgG: the test groups A, B, C are all compared with the control group Compared with the control group, it increased by 5.88%, 12.07%, and 15.48% respectively. The test group A increased significantly, and the difference was significant compared with the control group (P<0.05). The test group B and C increased significantly, compared with the control group. The ratio difference is extremely significant (P<0.01).

Table 8 The effect of traditional Chinese medicine feed additives in laying hens on the content of serum TC, ALP and IgG in laying hens

Group	T/ (nmol/L)	ALP/ (U/L)	IgG/ (mg/mL)
CK	2.98±0.13A	156.12±16.36	3.23±0.13A
A	2.77±0.26AB	157.25±18.22	3.42±0.17AB
B	2.59±0.23B	162.92±22.19	3.63±0.22B
C	2.21±0.08B	162.24±19.28	3.73±0.18B

(In the same column, the same letter or no letter indicates that the difference is not significa--nt (P>0.05), different lowercase letters indicate significant differences (P<O.05), and differe--nt capital letters indicate extremely significant differences (P<O.01), Only analyze the differrence between each experimental group and the control group.)

2.3.4 The impact of traditional Chinese medicine feed additives for laying hens on the environment of the chicken house

During the test, the environment of the chicken house was better and the smell was less. When the experiment was not done, the environment of the chicken house was poor and the smell was great. This may be because the traditional Chinese medic--ine feed additives for laying hens reduced the generation of odor sources such as N and P in the feces of laying hens.

3 Discussion

3.1 Pharmacological analysis of the effect of traditional Chinese medicine feed additives in laying hens on egg quality

In terms of eggshell thickness: good eggshell quality is conducive to the preservation and transportation of eggs, and is conducive to improving the hatching rate of breeding eggs. In the experiment, the eggshell thickness of the experimental group and the control group increased significantly. The main reasons are as follows: 1. Flavonoids in traditional Chinese medicine can secrete hormones and metabolize calcium and phosphorus, increase calcium absorption, thereby improving eggshell quality [4]; 2. Chinese medicine is rich in minerals and calcium, which can supplement calcium sources for the body; 3. Organic acids in traditional Chinese medicine can promote the body's absorption of calcium.

In terms of total egg protein content and Hastelloy unit: Hastelloy unit is an import--ant indicator to measure the quality of egg protein. The higher the Hastelloy unit, the more viscous the protein and the better the quality. In the experiment, compared with the control group, the total egg protein content and Hastelloy unit of the test group increased, but the total protein content was not significantly increased, and the Hastelloy unit increased significantly. The polysaccharides in traditional Chinese medicine in the feed additive can enhance protein secretion to a certain extent [5], the amino acids in traditional Chinese medicine, trace folic acid and abundant calcium, iron, phosphorus and many essential trace elements, oleic acid, linoleic acid, etc. Nutrients are all conducive to the deposition of protein in eggs. The nutritional, health care and regulating functions of the traditional Chinese medicine additive are the main reasons for enhancing the Hastelloy unit of eggs.

In terms of egg shape index: The egg shape index is one of the important indicators to measure the quality of poultry eggs. A good egg shape index is conducive to impro--ving the hatching rate of breeding eggs. The egg type index is mainly affected by genetic factors [6], and the traditional Chinese medicine feed additive has little effect on the egg type index.

In terms of egg yolk color and egg yolk ratio: egg yolk color is formed by the depo--sition of fat-soluble pigments in the yolk during egg formation. The process of pigment deposition in laying hens is relatively simple. During the peak period of egg production, almost all the pigment absorbed from the intestine of laying hens is deposited in the egg yolk. Laying hens do not have the ability to synthesize these pigments, and only take them from feed [7]. Many traditional Chinese medicines in the traditional Chinese medicine feed additives contain pigments. For example, purslane contains pigments such as carotene, and pigments such as astragalus and riboflavin, which can be absorbed by the intestines of laying hens and deposited in the yolk to increase the color of the yolk. The egg yolk ratio is one of the important indicators to measure the nutrient content of eggs. The larger the egg yolk ratio, the better the egg quality. In addition to genetic factors, the ratio of egg yolk is also regulated by

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

nutrition factors [8]. On the one hand, the feed additive can supplement nutrition for laying hens, and on the other hand, it can improve the utilization rate of feed nutrients, thereby increasing the specific gravity of egg yolk. The yolk color and the yolk ratio have a relatively large impact on the quality and price of eggs. Therefore, increasing the yolk color and the yolk ratio can increase the selling price of eggs, thereby increasing the profit of farmers. The test results showed that compared with the control group, the egg yolk color and the egg yolk ratio of the experimental group improved significantly, but the improvement was not significant. The feed additive has the functions of deepening egg yellow color and increasing egg yolk ratio, and improving egg quality.

In terms of cholesterol content in egg yolk: Cholesterol is an important part of cell membrane, and intake of a certain amount of cholesterol is of great significance to ensure the normal function of the body. Eggs are very nutritious, but the cholesterol in eggs is more likely to lead to an increase in serum cholesterol levels than other food-borne cholesterol. This also makes many people worry about eating eggs, especially for people with high cholesterol. Therefore, reducing the content of cholesterol in eggs is of great significance. In the experiment, it was found that compared with the control group, the test group had significantly lower cholesterol content in egg yolk. Flavonoids and other substances in traditional Chinese medicine feed additives can inhibit cholesterol synthesis [9]; polysaccharides, alkaloids and other components can enhance the immunity of laying hens Levels, reduce the content of triglycerides and cholesterol in the serum, thereby reducing the content of cholesterol in the egg yolk [10]; substances such as lecithin can be combined with cholesterol to reduce the abso--rption of cholesterol in the intestinal tract or cut off the enterohepatic circulation and reduce the cholesterol level [11]. The traditional Chinese herbal medicine feed additive reduces cholesterol content in eggs by inhibiting the synthesis and absorption of cholesterol in the chicken body and promoting the excretion of cholesterol.

In terms of egg yolk lecithin content: Lecithin can make brain nerves get nutritional supplement in time, which is beneficial to eliminate fatigue and relieve nervous tension. Egg yolk is rich in lecithin, which is the best way for human body to supplement lecithin. In the traditional Chinese medicine feed additive, Poria and other Chinese medicines contain lecithin and other substances, which can increase the lecithin content in the egg yolk to a certain extent. In addition, lecithin is mainly present in egg yolk, and the increase in egg yolk ratio will also increase the content of lecithin.

In terms of the content of egg antibiotics: florfenicol, penicillin, streptomycin, chloramphenicol, neomycin and other antibiotics in the test group's eggs were not detected, which met the current national hygiene requirements for green food eggs. It can be seen from the results that the Chinese herbal feed additive has a certain effect in reducing the antibiotic content of eggs. The reasons may be as follows: 1. Antibact--erial, antiviral, and detoxifying substances contained in traditional Chinese medicine feed additives can speed up the metabolism of antibiotics in laying hens and accelera--te the discharge of antibiotics and other toxic substances; 2. Chinese medicine feed additives can Enhance the immunity of laying hens and avoid the use of antibiotics and other drugs.

3.2 Pharmacological analysis of the effect of traditional Chinese medicine feed additives in laying hens on production performance and economic benefits of laying hens

In terms of the body surface of the laying hens: Compared with the laying hens of the control group, the laying hens of the test group have significantly better body surface characteristics than the control group. This may be because the traditional Chinese medicine feed additives enhance the body resistance of the laying hens and supplement certain nutrients.

In terms of egg production rate: compared with the control group, the laying hens in the experimental group have a certain increase, and the increase in the experimental group C is the most obvious. From the perspective of traditional Chinese medicine, the decrease in laying rate of laying hens is caused by weak qi and blood in layers, and from the perspective of western medicine, it is caused by the decline of the reproductive endocrine system. The traditional Chinese medicine feed additive contains rich biologically active substances, such as polysaccharides, alkaloids, saponins, mucus proteins, linolenic acid, volatile oil, etc., which are beneficial to stimulate the growth of laying hens, maintain the balance of the internal environment, improve the reproductive endocrine system, and promote follicles Development, incr--ease enzyme activity, accelerate the conversion of protein and energy in the layer, improve the production performance of the layer, and help laying eggs. In addition, traditional Chinese medicine feed additives can also improve production performance by regulating the immune function of the body.

In terms of egg weight: Compared with the control group, the test group had an increase in egg weight, but the increase was smaller. The traditional Chinese medicine feed additive has no obvious effect on egg weight. Egg weight is affected by many factors such as heredity, breed, age, environment, nutrition and so on, among which heredity is the most important factor [12]. Nutrients also have a certain effect on egg weight. The fatty acid, energy and protein in the

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

traditional Chinese medicine feed additive have a certain effect on the increase of egg weight, but it has little effect.

In terms of feed-to-egg ratio: the test group has a decrease compared with the control group, and the test group C has a significant decrease. Traditional Chinese medicine feed additives have a variety of nutrients needed for the growth of laying hens, which can improve the nutrition of laying hens, improve the metabolism of laying hens, and promote the digestion and absorption of nutrients in animals, thereby increasing feed conversion rate and reducing feed-to-egg ratio. In addition, the traditional Chinese medicine in feed additives can increase the activity of intestinal enzymes in laying hens and promote the normal metabolism of laying hens, thereby improving the utilization of nutrients and the production performance of laying hens.

In terms of economic benefits: adding this traditional Chinese medicine feed additive to the basic diet of laying hens can significantly increase the laying rate and egg production of laying hens, reduce the feed-to-egg ratio, increase the feed conversion rate, and bring more benefits to farmers. High economic efficiency. Large-scale breeding farms are generally agglomeration breeding. Once the disease occurs, it will bring great economic losses to the farmers. This feed additive can effectively improve the immunity of the laying hens, and can reduce the use of anti-epidemic drugs and reduce the breeding risk. The feed additive can significantly improve the quality of eggs, and the nutrient content is higher than that of ordinary eggs. With improvement of people's living standards, the demand for nutritious and healthy food is also increasing. If the eggs are sold as health-care eggs, the economic value higher. More importantly, it can provide humans with healthy eggs, avoid the harm caused by hormones and antibiotics, and the social benefits are also obvious.

3.3 Pharmacological analysis of the effect of traditional Chinese medicine feed additives in laying hens on blood biochemical indexes of laying hens

In terms of antioxidant capacity: oxidation in layers can accelerate aging, and aging can reduce the function of various organs in laying hens, thereby affecting production performance and egg quality. Compared with the control group, the antioxidant capacity of the experimental group was significantly improved. The SOD content of super--oxide dismutase and the total antioxidant capacity T-AOC content were higher than the control group, and the MDA content of malondialdehyde was lower than the control group. The traditional Chinese medicine feed additive has a variety of active ingredients and has obvious antioxidant effects. For example, it contains polysaccharide components, such as yam polysaccharide, astragalus polysaccharide, etc., by improving the activity of antioxidant enzymes, increasing the content of SOD and reducing lipids The amount of peroxidation product malondialdehyde (MDA) produced has an anti-oxidant effect [13]; flavonoids can directly scavenge free radicals in the body and have an anti-oxidant effect; polyphenols through their phenolic hydroxyl hydrogen donors, Combine with free free radicals to block the chain reaction of free radicals. In addition, it can also increase the activity of antioxidant enzymes, thereby playing an anti-oxidant effect [14]; saponins and alkaloids also have good antioxidant capacity.

In terms of total cholesterol: The total cholesterol content in the serum of the test group was significantly lower than that of the control group. Studies have shown that high cholesterol in the body is related to blood viscosity, "blood stasis" and "phlegm turbidity" [15]. The traditional Chinese medicine feed additive formula has the functions of nourishing liver and kidney, invigorating the spleen and qi, promoting blood circulation and removing blood stasis, eliminating food, removing phlegm and diuresis, and can reduce the cholesterol content in the body to a certain extent. A variety of active substances contained in traditional Chinese medicine in feed additives can reduce cholesterol. For example, sterols contained in safflower seeds can compete with animal sterols in the intestines of laying hens, thereby reducing the absorption of cholesterol; Poria, etc. The lecithin and other substances contained in it can be combined with cholesterol, reduce the absorption of cholesterol in the intestine, and play a role in lowering cholesterol; Astragalus can achieve the effect of reversible phosphorylation and dephosphorylation of hepatocyte microsomal hydroxymethylpentanyl coenzyme Inhibition of the activity of A reductase (CHMGR) plays a role in regulateng lipid metabolism [16]; Poria and other triterpenoid compounds can reduce the production of acetyl-CoA, a raw material for the synthesis of cholesterol. In addition, cholesterol is the precursor of steroid hormone synthesis. Stress response can stimulate the secretion of adrenaline, thereby enhancing the body’s demand for cholesterol. Traditional Chinese medicine feed additives can alleviate the increase in adrenaline activity caused by stress, thereby reducing serum cholesterol in laying hens. Level. The omega-3 fatty acid in the feed additive purslane can inhibit the absorption of cholesteric acid in laying hens and reduce the blood cholesterol concentration.

In terms of alkaline phosphatase ALP: the test group has an increase in content compared with the control group. Alkaline phosphatase is a key enzyme in the process of digestion and metabolism. It mainly

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

comes from the liver and participates in fat metabolism. The level of activity can reflect the metabolic intensity of the animal body. Studies have shown that the level of alkaline phosphatase in the serum of laying hens is positively correlated with egg production [17]. The traditional Chinese medicine feed additive can effectively increase the alkaline phosphatase activity and strengthen the body metabolism of laying hens.

In terms of IgG: the test group has increased content compared with the control group, indicating that the traditional Chinese medicine feed additive can enhance the immunity of laying hens. The traditional Chinese medicine feed additive contains a variety of substances that enhance the immunity of laying hens, such as astragalus polysaccharides, tuckahoe polysaccharides and other polysaccharides, which can sign--ificantly enhance the phagocytic rate and phagocytic index of macrophages, and promote the body's antibody production; astragaloside, etc. Saponins can enhance the phagocytic function of the reticuloendothelial system, promote antibody production, promote antigen-antibody reaction and lymphocyte transformation. Saponins have a wide range of effects on the immune system of animals, including humoral immunity, cellular immunity, and immune regulation; the alkaloids contained in them can enhance humoral and cellular immunity.

3.4 Analysis of the impact of traditional Chinese medicine feed additives in laying hens on the environment of the chicken pen

After using traditional Chinese medicine feed additives for laying hens, the environment of the chicken house is better and the odor is less. From the perspective of traditional Chinese medicine, the lung and the large intestine are on the outside and inside. The traditional Chinese medicine feed additives Chinese yam, astragalus, poria cocos, ground ginseng, Jerusalem artichoke, and Gynostemma enter the lung meridian, and enhance the intestinal function by regulating the lung function of laying hens; purslane enters the intestinal meridian, promotes intestinal peristalsis, and kills the intestine Bacteria; polysaccharides in traditional Chinese medicines such as yam, astragalus, poria cocos, etc. can regulate the intestinal flora of laying hens and excrete toxins; angelica can enhance the gastrointestinal absorption capacity of laying hens; the inulin in Jerusalem artichoke is not digested and absorbed but directly enters the large intestine It is preferentially used by bifidobacteria to produce acetate and lactate, which reduces the pH of the large intestine, thereby inhibiting the growth of harmful bacteria. It can greatly increase the beneficial bacteria in the colon of laying hens, reduce pathogenic bacteria and spoilage bacteria, such as Salmonella, Listeria, Staphylococcus aureus, coliforms, etc.; Ground ginseng can effectively regulate the intestines and stomach and help digestion; Gynostemma can effectively clean the intestines Tract; Cumin is rich in fennel oil, which can effectively stimulate gastrointestinal peristalsis and help intestinal exhaust. In summary, the traditional Chinese medicine feed additive formula can increase the content of beneficial bacteria in the intestinal tract of laying hens, kill bacteria and viruses in the body, enhance intestinal peristalsis, increase feed conversion rate, and reduce fecal excretion and urine and feces. The emission of odor sources such as N and P will improve the environment of the chicken pen. The improvement of the chicken pen environment protects the environment on the one hand, and reduces the probability of chicken plague on the other.

4 Conclusion

1. The traditional Chinese medicine feed additive formula of the layer has the same medicine and food. The traditional Chinese medicine comprehensively considers the combination of temperature and cold, the taste and the meridian, and also considers whether the medicine and food are homologous and can be used in health food. The feed additive is nutritious and can prevent diseases of laying hens, can effectively improve the production performance of laying hens, improve egg quality, enhance the body resistance of laying hens, improve the environment of chicken pens, and increase farmers' income.

2. Add 0.3%, 0.5% and 1% of traditional Chinese medicine additives for laying hens on the basis of the basal diet for feeding hens. The addition of 1% is better than the addition of 0.3% and 0.5%.

3. In terms of egg quality, traditional Chinese medicine additives in layer feed can increase eggshell thickness, Hastelloy unit, egg shape index, egg yolk color, egg yolk ratio, increase protein content in eggs and lecithin content in egg yolks, and reduce cholesterol content in egg yolks. Among them, the eggshell thickness, egg type index, and egg yolk ratio increased insignificantly, and the difference was not significant compared with the control group ($P>0.05$); the increase in the Hastelloy unit test A and B group was not significant, and the difference was not significant compared with the control group ($P>0.05$), the test C group increased significantly, compared with the control group, the difference was significant ($P<0.05$); the egg yolk color improved significantly, the test A was significantly different from the control group ($P<0.05$), the test B and C groups Compared with the control group, the difference is extremely significant ($P<0.01$); the protein content in the eggs does not increase significantly, and the difference is

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

not significant compared with the control group (P>0.05); the lecithin content in the egg yolk is significantly increased in the test group C, compared with the control group The difference is extremely significant (P<0.01), the test group B is significantly different from the control group (P<0.05), the test group A has little change compared with the control group, and the difference is not significant (P>0.05); The content of cholesterol test group B and C decreased significantly, and the difference was extremely significant compared with the control group (P<0.01), and the difference between test group A and the control group was significant (P<0.05). Florfenicol, penicillin, streptomycin, chloramphenicol, and neomycin were not detected in the eggs, which met the current national hygiene requirements for green food eggs.

4. In terms of layer production performance and economic benefits, layer feed additives can significantly improve the appearance of layers. Increase egg production rate, average egg weight, reduce feed-to-egg ratio, and increase economic returns. Among them, the average egg production rate increased significantly, the experimental group A and B were significantly different from the control group (P<0.05), and the experimental group C was extremely different from the control group (P<0.01); the average egg weight was not significantly improved The difference between the test group and the control group was not significant (P>0.05); the feed-to-egg ratio in the test group C decreased significantly, compared with the control group (P<0.05), the test A and B groups did not decrease significantly. Compared with the control group, the difference was not significant (P>0.05); compared with the control group, the economic benefits of test groups A, B, and C increased by 3.87%, 10.61%, and 17.72%, respectively.

5. It can significantly improve the antioxidant capacity and immunity of laying hens. Compared with the control group, the serum SOD and T-ACO levels of the experimental group were significantly increased, and the MDA content was significantly reduced. It can significantly reduce the total cholesterol content in the serum of laying hens. The difference between the test group A and the control group is significant (P<0.05), and the difference between the test group C and the control group is extremely significant (P<0.01). The content of alkaline phosphatase ALP increased, but compared with the control group, there was little change, and the difference was not significant (P>0.05). The IgG content increased significantly, the test group A was significantly different from the control group (P<0.05), and the test group B and C were significantly different from the control group (P<0.01).

6. Can significantly improve the chicken pen environment.

References

Dingding Chen. Comparative Analysis of Nutritional Composition of Introduced Eggs and Local Eggs (in Chinese) [J]. Journal of Anhui Agricultural University,1998(04):130-133.

Wang-Hui-Yun, Gao-Ying. [J]. FOOD SCIENCE, 1995, 16(6): 58-59.

Yunfen Zhu, Kuanwei Chen, Qinglian Ge, Wei Han, Zuhao Shi, Jiansen Gong. Determination of egg yolk lecithin content by spectrophotometry (in Chinese) [J]. Jiangsu Journal of Agricultural Sciences,2010,26(04):853-856.

Chunhong Li, Ziyun Ji, Yulong Dong, Jinfeng Jia, Wanyu Shi, The effect of two groups of single medicines on the production performance and egg quality of old layers (in Chinese) [J]. Feed Industry, ,2014,35(01):38-40.

Hongfang Wang, Effects of Astragalus Polysaccharides on Production Performance, Antioxidant Enzyme Activity, Immune Function and Main Intestinal Flora of Layers[D]. Hebei Agricultural University,2010.

Yunyu Li, Peiguo Li.Several factors affecting hatchability of breeding eggs (review) (in Chinese)[J]. Journal of Hebei Normal University of Science & Technology, 2004(04):68-71.

Zhonggang Cheng, Yingcai Lin, Li Zheng. Coloring of broiler skin and egg yolk (in Chinese). Feed China, 2001(05):23-26.

Mishra W C,et al.Heritabilit ies and genentic correclation of some economic tratits in a Rhode Island flock[J],ndian fournal of poultry,1999,12:17-19.

Na Jin, Xiaoqian Jiang, Yaran Shi, Yilin Liu, Wenshu Zou, Fenghua Liu. Effects of Qicao Extract on Laying Performance, Egg Quality and Cholesterol Metabolism of Laying Hens, Chinese Journal of Animal Nutrition, 2018,30(11):4611-4618.

Hangkun Ma, Fengqin Xu, Research progress on lipid-lowering mechanism of traditional Chinese medicine and its effective lipid-lowering components (in Chinese) [J]. Chinese Journal of Integrative Medicine on Cardio, 2016,14(13):1494-1497.

Fang Yang. Study on the nutritional effects of egg cholesterol and its lipid-regulating components and its mechanism (in Chinese) [D]. Huazhong Agricultural University,2013.

Turk J
Field Crops
2021, 26(1), 285-298
DOI: 10.17557/tjfc.834527

Qiang Chen, Factors affecting egg quality in production[J]. Technical Advisor for Animal Husbandry, 2006(12):10-11.

Hongjie Jia, Zhaoguo Shi, Shugeng Wu, Jing Wang, Haijun Zhang, Guanghai Qi, Huiyuan Lu, Zhiming Wang.Effects of Flos lonicerae-Baikal skullcap and Astragalus Polysacharin Compatibility Use on Performance, Egg Quality,Serum Antioxidant and Biochemical Indexes of Laying Hens. Chinese Journal of Animal Nutrition, 2019,31(03):1334-1341.

MENG Qing-hua,YU Xiao-xia,ZHANG Hai-feng,ZHANG Shao-liang(1.School of Chemistry and Chemical Engineering,Shanghai Jiaotong University,Shanghai 200240,China; 2.College of Chinese Pharmacy Shanghai University of Traditional Chinese Medicine, Shanghai 201203,China;3.Tsinglung Hi-Tech Co.,LTD,Yichun 336000,China)

Mingsuo Song, Yuyi Wang. On the relationship between blood stasis and phlegm turbidity[J]. Chinese Journal of Integrative Medicine on Cardio, 2005(01):62-63.

Sipahi, E. (2007). Creativity and the Importance of Business Management. August 2017.

Shuli Wang, Qin Zhao, Yu Huang. Mechanism of action of chrysanthemum and other traditional Chinese medicine water decoction on hydroxymethylglutaric indica coenzyme A reductase of isolated rat liver cells [J]. Biochemical Journal, 1988, 4(6): 517.

Wileo Fh et al. Estimates of correlations between Serum alkaline PhosPhatase level and Produetivetraits[J]. Poult.Sei,1963, (43):1457-1458.