Effect of feed additions marine and plant origin on growth of poultry

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The article contains materials of scientific and economic experience on the use of feed flour from Japanese Corbicula and Eastern Galega in feeding young hens. We conducted two scientific research and economic experiments on the inclusion of these additives in the diet of young poultry. Experiments were carried out on young poultry of the Haysex white cross. The purpose of the research work is to study the possibility of including in the diets feed flour from Japanese Corbicula and plant additives made from Eastern Galega. Thus, when feed flour from Japanese Corbicula was included in the diet of young poultry, the following results were obtained: weight gain increased by 14.3-19%. The inclusion of plant-based additives in the diet of young poultry increased the live weight in the experimental groups by 10.5-14.9%. Keywords: feeding, Corbicula Japanese, Galega, feed addition, young hen, diet, ration.

1. Introduction

The far Eastern region can provide the industry with both plant and marine feed that can be used in poultry farming as feed additives. In the Primorsky territory, shellfish, hydrobionts, and others are widely extracted and processed. Waste from marine processing can be used for feed purposes. This will reduce the cost of using and purchasing expensive mineral and vitamin supplements. The region also has a rich flora. On the territory of the region grow relict trees, medicinal shrubs and herbs, whose diversity could also be used for food purposes.

Marine and fish products, as well as waste products from their processing, are rich in protein and minerals that are necessary to ensure the full value of animal and poultry diets. Supplements of marine origin have antioxidant and radioprotective activity, increase the body's resistance to diseases, increase the immune system, and improve metabolism [1-6].

Japanese Corbicula has an anti-inflammatory, antioxidant effect. As for the medicinal properties of Corbicula, in another way it is also called "sea healer". The muscle tissue of Corbicula japonica differs from other seafood. And if we compare with fish, shrimps, and other seafood products shellfish meat contains about 5-8 times more carbohydrates, which with proteins or lipids form compounds and it can stimulate immune system and has an anti-bacterial effect. The tissues contain such vitamins as natural water-soluble (B1, B2, B6, PP, C, etc.) and fat-soluble (A, E, O, K, etc.) vitamins [7].

Corbicula Japanese contains aminoacids such as taurine, glycine regulate blood sugar and cholesterol metabolism. Also Corbicula Japanese has antioxidant compounds necessary for the
treatment of hypertension, arthritis, liver and regeneration of tissues after diseases and radiation damage. Shellfish Corbicula Japanese tissues are rich in potassium, selenium, iodine, and fluoride.

In addition, the Primorsky territory has large reserves of plant resources that contain biologically active substances that positively affect the growth, development, and productivity of poultry.

Plant flour from Eastern Galega is almost as high in protein and carotene content as traditional protein crops such as clover and alfalfa, and is a valuable source of these nutrients in the diet of animals. For 1 EKE of Eastern goat meat, 150-190 g of digestible protein is necessary. In addition, Galega grows early in the spring, which allows you to get nutritious food at the same time as winter rye. Galega grows is 3-4 weeks earlier than clover and alfalfa. The feed advantages of the Eastern Galega are due to the high leafiness - 60-75 % (for example, meadow clover, alfalfa leafiness -35-45 %, pink clover-30-40 %). The green mass of Eastern Galega is a raw material for the preparation of vitamin plant flour. Zootechnical control and nutritional assessment showed that 1 kg of Eastern Galega's grass flour contained 0.72-0.78 EKE, 147-150 g of digestible protein, 46-50 g of sugars, 13.9-14.0 g of calcium, 2.8-3.0 g of phosphorus, 500-558 mg of iron, 2.0-2.5 mg of copper, 39.0-40.0 mg of zinc, 80.0-88.0 mg of manganese, 0.1-0.2 mg of iodine and 172.0-180.0 mg of carotene. [8]

Eastern goat has an antibacterial and anti-inflammatory effect, increases the body's resistance and resistance to diseases.

The composition of Eastern goat's milk includes vitamins of group C, P and B, flavonoids, tannin, with its help you can normalize your metabolism.

The flowers and leaves contain organic acids, and the seeds are made up of sugar, fatty oils, and phytosteroids.

2. Materials and methods

We formed four groups of chickens at the age of 5 weeks with 150 heads by means the method of analogs (control and three experimental ones) to study the effect of marine feed addition. And we formed 4 groups of chickens to study the effect of Galega. All poultry were kept in the same conditions, optimal for temperature, lighting, and ventilation. The control group received the main diet adopted in the farm. The experimental group with the main diet received a feed additive in the form of flour from waste processing of Japanese Corbicula, Galega. The research scheme is shown in (table 1)

| Feed complex         | Group       | Length of research | Amount of poultry | Diet   |
|----------------------|-------------|--------------------|-------------------|--------|
| Corbicula japanese   | control     | 90 days            | 150               | BR*    |
|                      | I experimental | 90 days            | 150               | BR+3%  |
|                      | II experimental | 90 days           | 150               | BR+5%  |
|                      | III experimental | 90 days           | 150               | BR+7%  |
| Eastern Galega       | control     | 90 days            | 150               | BR*    |
|                      | I experimental | 90 days            | 150               | BR+2%  |
|                      | II experimental | 90 days           | 150               | BR+3%  |
|                      | III experimental | 90 days           | 150               | BR+5%  |

*BR – Basic ration (diet)

We entered the following doses of marine feed meal in the diet of poultry: 3, 5 and 7 % in the ration and feed flour plant origin 2, 3, 5%. The control group was fed a diet adopted by the farm, the experimental groups received basic ration plus feed flours according the scheme. Young poultry were kept in cell batteries during the experiment. The scientific research lasted 90 days (12 weeks), according to the methodology.
3. Results and discussion

Conducted our research work we can make next conclusions. Results of research work are presented in table 2.

### Table 2. Changes in live weight of young poultry.

| Index                        | Group          | control | I experimental | II experimental Marine feed meal | III experimental | control |
|------------------------------|----------------|---------|----------------|----------------------------------|------------------|---------|
| Live weight at the beginning of the research, g |               | 335.1±2.1 | 334.9±2.14 | 335.8±2.15 | 335.1±2.30 |
| Live weight at the end of the research, g |               | 1110.4±4.07 | 1128.5±5.01** | 1143.5±4.28** | 1161.9±5.02** |
| Absolute increase of gain, g |               | 775.3 | 793.6 | 807.7 | 826.8 |
| Daily gain, g                |               | 8.61 | 8.82 | 8.97 | 9.2 |
| Safety, %                    | Galega Eastern | 96.8 | 97.1 | 98.0 | 98.5 |
| Live weight at the beginning of the research, g |               | 334.9±1.8 | 334.7±2.11 | 335.0±2.2 | 335.1±2.14 |
| Live weight at the end of the research, g |               | 1113.3±4.33 | 1125.7±4.05** | 1137.5±4.11** | 1157.1±4.62** |
| Absolute increase of gain, g |               | 778.4 | 791 | 802.5 | 822.0 |
| Daily gain, g                |               | 8.65 | 8.79 | 8.92 | 9.1 |
| Safety, %                    |               | 96.3 | 97.0 | 97.1 | 97.5 |

Where: ***P≤0.1, **P≤0.01, *P≤0.05

The absolute increase of gain in the experimental groups was higher by 18.3-51.5 when using Japanese Corbicula flour, daily gain also was higher in experimental group and the highest safety was in III experimental group and equal 98.5%. Using Galega flour in diet of young chicken the maximum safety was in III experimental group (97.5%) and the maximum daily gain and absolute increase of gain were also in III experimental group (9.1 g and 822.0 g).

Also we studied development of experimental poultry. The main index of development is length of carcass. We took measurements, in particular the length of the carcass in age of 120 days. The results are shown in table 3.

### Table 3. Length of carcass of experimental poultry, mm.

| Group          | Corbicula Japanese | Galega Eastern |
|----------------|--------------------|----------------|
| control        | 179.3              | 180.3          |
| I experimental | 183.6              | 185.4          |
| II experimental| 198.4              | 187.5          |
| III experimental| 202.1             | 194.2          |
| control        | 179.3              | 180.3          |

The table shows that the highest index were in the experimental groups. The advantage of the experimental groups over the control when using Corbicula was 4.3-22.8 mm and when using Galega – 5.1-13.9 mm.
The superiority of experimental groups over control can be showed in more detail in figures 1 and 2.

**Figure 1.** Length of carcass. (Corbicula Japanese).

**Figure 2.** Length of carcass. (Galega Eastern).

Thus, using untraditional feed additions (Corbicula and Galega) in feeding of poultry Haysex White has a positive effect on growth, gaining, safety and length of carcass.

To determine the economic effect of using feed flours, we conducted a production experiment. The production experiment was carried out in the same farm, the number of poultry was 100 in each group, two groups were formed (control and experimental). The duration of the experiment is 90 days. The results are shown in table 4.

**Table 4.** Economic results of feed additions inclusion.

| Index                                           | control | Group experimental (Corbicula) | Group experimental (Galega) |
|-------------------------------------------------|---------|-------------------------------|-----------------------------|
| Amount of poultry, heads.                       | 100     | 100                           | 100                         |
| The duration of the experience, days            | 90      | 90                            | 90                          |
| Total gain, kg                                  | 77.5    | 81.7                          | 81.2                        |
| Price of 1 kg of chickens, RUB                  | 250     | 250                           | 250                         |
| Profits from the sale of chickens, RUB          | 19375   | 20425                         | 20300                       |
| Price of feed additions, RUB                    | -       | 675                           | 540                         |
| Additional profit of the company from the inclusion of additives, rubles | - | 375                           | 385                         |
4. Conclusion
Feed additions of marine and plant origin had a positive effect on poultry growth and length of carcass. Using of Galega Eastern and Corbicula Japanese is effective way of increasing meat production in poultry. Including Corbicula allows to get additional profit is 375 rubles and Galega Eastern – 385 rubles.

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