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AGRICULTURAL SCIENCES

EFFICIENCY OF USING A NEW FEED ADDITIVE IN FEEDING CHICKENS OF BROILERS

Ogorodnichuk G.

*Candidate of Agricultural Sciences
Vinnytsia National Agrarian University,
Vinnytsia, Ukraine*

Abstract

The paper set the task to study: the influence of feed additives on productive and slaughter indicators of poultry; to investigate the condition of the internal organs under the action of feed additives; calculate the economic efficiency of the enzyme preparation.

As a result of the experiment, an increase in live weight of poultry for 42 days of rearing by 371.8 g (***) $P < 0.001$), which is 13.4%, and a decrease in feed consumption per 1 kg increase by 0.09 kg or 4, 9%. The experimental group receiving the enzyme preparation in addition to the main diet had a higher weight of half-gutted carcass by 347.3 g or 15.8% and the weight of gutted carcass by 282 g or 14.3% and slaughter yield by 0.6% .

The use of the enzyme preparation in the feed for broiler chickens is economically justified: an increase in revenue by 16.7%, profit from sales by 41.5% and the level of profitability by 7.7%.

Keywords: broiler chickens, new feed additive, internal organs, gains, feed conversion.

Actuality of theme. At present, poultry farming in Ukraine is one of the most intensive and dynamic branches of agricultural production, which has all the opportunities to overcome the economic difficulties in a short time.

The main goal of poultry farming in our country is to increase the production of dietary, high-calorie products - eggs and meat in order to provide people with physiologically necessary nutrition [7].

Interest in the poultry industry is due to technological and economic advantages: compared to low feed costs, short reproduction period, the ability to regulate product quality. The latter depends on many factors, in particular, on the technology of breeding and keeping poultry.

An important factor in the development of poultry farming is selection work aimed at improving productive and breeding qualities, as well as the creation of new breeds, lines, crosses of all species of poultry. Therefore, as a result, it is necessary to apply scientifically sound technologies for keeping and feeding birds [32].

During the selection of cross COB - 500 special attention is paid to the efficiency of feed conversion. In all countries of the world, cross has the lowest feed costs for the production of 1 kg of chicken meat, which at current feed prices make it profitable and profitable to breed it [40].

In the world practice of poultry development as additives to poultry diets add biologically active substances: vitamins, antioxidants, trace elements, antibiotics and others that increase the body's resistance, improve feed intake, increase the secretion of digestive glands, effectively affect metabolic processes, but not involved in the breakdown of feed nutrients. Among biologically active substances, enzymes are the most important. Moreover, from these stimulants enzyme preparations are fundamentally different in that they are directly represented by biocatalysts that affect the digestibility of feed nutrients.

Enzymes in nature are multifaceted, and all life manifestations are related to their functions. Under the influence of enzymes in the digestive tract of animals is the breakdown of nutrients of feed masses, which are converted into energy and structural materials necessary for growth and reproduction, production and other biological synthesis in the body of living beings [41].

Enzyme preparations improve the chemical composition of rations as well as the digestibility of feed nutrients, which in turn improves the productivity of poultry. Compensating for the insufficiency of the enzymatic system of the digestive tract of birds, stimulate the assimilation of nutrients. According to experimental studies, the use of enzyme preparations allows to purposefully influence the productivity and more efficient use of feed.

Analysis of recent research and publications. Fundamentals of physiology and feeding of broiler chickens. The productive qualities of poultry, the economic feasibility of poultry farming in general is determined by a set of biological characteristics of poultry as an object of agricultural production.

Features of poultry nutrition are based on the structure and functioning of the digestive system. Digestive organs begin with the beak, the shape depends on the living conditions of the bird. There are no teeth in the mouth of the bird, so the food does not undergo physical changes, and, slightly wet with saliva, enters the esophagus, through which the food enters the ox. In the wild, food can be delayed for up to 8 to 12 hours. From the ox through the esophagus, the food enters the glandular stomach, where it is moistened with digestive juices. Next is the muscular stomach, the inner surface of which is covered with a cuticle. In the muscular stomach there is a grinding of a forage by reduction of a muscular wall of a stomach and by means of small stones which the bird swallows in advance. The muscular stomach is emptied reflexively by opening of a pylorus, and the chyme falls out in a duodenum, and then and in a small bowel. Under the action of pepsin

and hydrochloric acid in the initial segment of the duodenum is a partial breakdown of proteins. Moving through the small intestine, chyme mixes with intestinal juice, which contains amylase, invertase, trypsin, lipase, as well as bile, which further breaks down the main nutrients of the feed [3].

The reaction of the gastrointestinal tract varies from acidic (pH - 2.2) - muscular stomach, to slightly alkaline - in the jejunum (pH - 7.0). In the cecum under the action of proteases produced by bacteria and enzyme residues is the breakdown of indigestible proteins. The rate of promotion of chyme by the bird's digestive tract depends primarily on the method of feeding, the composition of the diet and the particle size of its components. With the dry method of feeding complete ration of loose feed, feed masses pass through the digestive tract in chickens in 3 - 4 hours.

In addition to these features of digestion, it is very important that the bird does not have a large intestine, so it is not able to digest protein foods well. Therefore, the bird has two large caecum, designed to digest hard-to-digest protein foods.

According to VI Besulin [5], in poultry compared to mammals, better absorbed nutrients. Thus, in poultry the highest coefficient of feed digestibility - 85 - 90% against 75 - 80 - in pigs and 65 - 70% - in cattle.

In the body of birds compared to the body of mammals are more intense metabolic processes. This is confirmed by data on energy expenditure for maintenance foods needed by the body to ensure its viability. Poultry omnivorousness is an important biological feature that allows the use of various feed ingredients in feeding, mainly concentrated feeds, biologically active substances that ensure intensive growth and development, maintenance of normal immunological status, body resistance, high productivity.

Feeding is an integral part of the technology of poultry production. In the structure of the cost of poultry meat, feed costs are 60 - 70%. The realization of the genetic potential of poultry of different species and areas of productivity is possible only against the background of full feeding, ie meeting its needs for energy, nutrients and biologically active substances. This is achieved by organizing normalized feeding depending on the species, breed, cross, age, physiological condition, sexual characteristics and methods of maintenance [6, 7].

Normalized feeding - feeding of poultry according to scientifically substantiated norms of metabolic energy and complex of nutrients and biologically active substances. When organizing normalized feeding, it is necessary to take into account the peculiarities of metabolism in different species and age groups of birds.

The bird is characterized by intensive metabolism, and therefore high compared to other animals, body temperature (41 - 42°C) and three times higher oxygen demand per 1 kg of live weight. It is characterized by high conversion of metabolic energy and feed protein into products and limited endogenous synthesis of vitamins, so the need for them is provided by guaranteed supplements. The bird does not have sweat glands, which play an important role in thermoregulatory pro-

cesses, so the violation of the optimal temperature parameters of the bird leads to unnecessary costs for the regulation of heat generation and heat transfer. The bird has limited internal reserves of nutrients and energy, so the effects of poor feeding are detected quickly and are accompanied by a decrease in productivity, reproductive capacity and overall resistance of the organism [12].

The modern system of normalized feeding is based on a comprehensive assessment of the nutritional value of feed and the norms of the bird's need for metabolic energy, nutrients and biologically active substances. Estimation of feed nutrition is determined by the content of metabolic energy, crude protein, essential amino acids, crude fiber, minerals and vitamins. At the same time eating of forage, digestibility and assimilation of nutrients is considered. During the development of feeding norms, the factorial method of individual needs of different species of birds in energy and nutrients is used, ie certain indicators of costs for the maintenance of vital functions, product formation are determined.

Need - the amount of metabolic energy, nutrients and biologically active substances per day, necessary to ensure the normal course of vital functions and synthesis of products in strictly controlled conditions of poultry. The feed rate is the average amount of a certain amount of metabolic energy and nutrients and biologically active substances, the need for daily coverage of livestock costs, ensuring a certain level of productivity with efficient use of feed, taking into account possible losses in economic conditions. It will exceed the need of poultry in some indicators by 10 - 30%, as it takes into account the technological conditions of production (temperature fluctuations, feed quality, stress factors, etc.). Scientific studies show that the indicators by which the rationing of poultry (metabolic energy, crude protein, etc.) are in some dependence and change accordingly under the influence of various factors: the level of productivity, physiological condition, housing conditions. This makes it possible to apply the rationing of the content in 100 grams of complete feed metabolic energy and a complex of nutrients in optimal proportions [7].

Unlike young hens of broiler hens, broilers have extremely high growth energy, especially in the first period of life, and are prone to obesity in the next. It is established that high productivity of broilers is possible under the conditions of achievement by them of the potential weight conditions from the first days of life. Therefore, it is important to start feeding the young immediately after its receipt for cultivation, no later than 12 - 13 hours from the moment of their removal. As a highly productive organism, broilers are more sensitive to various deviations in feed, this is reflected in the deterioration of their health, reduced weight gain [19,39].

The system of normalized feeding is aimed at the rational use of feed, as well as reducing the cost of feed per unit of output and reducing its cost. In the conditions of industrial production of poultry products, as evidenced by domestic and international experience, the most effective is the dry method of feeding poultry with complete feed, which fully meets its need for metabolic energy and nutrients and biologically active substances.

In terms of production, lack of energy in the diet is the cause of reduced poultry productivity. When feeding poultry, a sufficient concentration of metabolic energy in the feed is not only an important factor in energy nutrition, but also the normalization of other nutrients and biologically active substances. The fact is that the caloric content of feed depends on its consumption, and this causes the entry into the body of poultry protein, amino acids, vitamins, minerals. Metabolic energy is an indicator that indicates the nutritional value of feed and characterizes the energy available to birds of chemical bonds of proteins, fats and carbohydrates. Nowadays, the composition of feed mixtures for poultry mainly include wheat, barley, sunflower meal [41].

In the process of digestion, some of the gross energy of feed is excreted with indigestible residues in the feces, and the second - remains in the body. This is the digestible energy of nutrients, which is 80 - 85% of the gross energy of feed. Exchange energy is 72 - 75% of gross. It is the content of metabolic energy that determines the energy nutrition of poultry feed. Metabolic energy provides the body with the most important physiological processes: growth, development, egg formation, normal functioning of all systems.

The unit of measurement of the energy value of feed in accordance with the International System of Units (SI) is the joule (J). According to this system, one calorie corresponds to 4.1868 J. However, the metabolic energy in modern feeding norms is expressed not only in kilojoules (kJ) and mega joules (MJ), but also in kilocalories (kcal).

When feeding highly productive poultry in the diet it is necessary to adhere to the optimal ratio of metabolic energy and protein.

The energy-protein ratio is the amount of metabolic energy in 1 kg of feed per 1% of protein [12].

Under conditions when the food contains insufficient metabolic energy, the protein in the body is spent on energy needs. And this leads to lower productivity and increased feed costs per unit of output. Excess metabolic energy reduces feed consumption and nutrient efficiency and promotes intense fat deposition in the body of the bird.

The rationing of protein nutrition is carried out on crude protein. The composition of crude protein includes proteins and non-protein nitrogenous compounds - amides. Feed protein in poultry is converted into protein in meat, eggs and feathers.

Protein completeness of poultry feeding is achieved not only due to crude protein, but first of all, the content of essential amino acids in the diet. The following amino acids have a significant effect on protein synthesis in the body: lysine, methionine, cystine, tryptophan, arginine, histidine, leucine, isoleucine, threonine, phenylalanine, valine. However, lysine, methionine and cystine deficiency are most common in poultry feeding. In compound feeds, methionine is calculated together with cystine. In the body of birds from methionine cystine is formed [10].

Not only the lack but also the excess and imbalance of amino acids in the diet has a negative effect on the productivity of poultry and the efficiency of production.

In order to properly balance the feed for amino acids, it is necessary to calculate the index of amino acid balance. In the absence of amino acids in the diet, first of all, the first limiting amino acid is introduced into the feed to the norm, then - the second, third.

The enrichment of compound feeds with amino acids of chemical synthesis is effective: DL-methionine, L-lysine, monochlorohydrate, feed lysine concentrate, etc.

In the feeding of poultry normalize crude fiber, which includes cellulose, hemicellulose, lignin and other compounds. Fiber is necessary for normal digestion, as it forms a certain amount of chyme in the intestine, increases its peristalsis, activates the release of digestive enzymes, which has a positive effect on the digestibility of nutrients. But there are no enzymes in the body that break down fiber. This occurs mainly in the blind processes of the intestine under the influence of enzymes of microorganisms [12].

Animal and vegetable fats are used in poultry feeding. Their desired ratio in the feed is 1: 1. The norms of fat intake in compound feeds according to the recommendations of the Institute of Poultry UAAS are for young animals raised for meat (%): broiler chickens 1 - 4 weeks of age - 3 - 5, older - 5 - 8.

In feeding birds normalize such macro - elements as calcium, phosphorus and sodium.

Calcium is involved in the processes of skeleton formation, egg shells, blood clotting, enzyme activation, transmission of nervous system excitation and stabilization of cell membrane permeability. Phosphorus is central to the metabolism and energy of the bird. Phosphorus deficiency can cause loss of appetite, which negatively affects the productivity of poultry. Excess phosphorus reduces the absorption of calcium and causes excessive deposition in the kidneys, inhibits the growth of young animals, impairs the quality of egg shells. Sodium is an integral part of buffer systems that maintain acid-base balance in the body, regulates water metabolism, optimizes the environment for the action of enzymes. Sodium is a calcium antagonist, it increases the permeability of cell membranes. Sodium deficiency is usually observed in feeds (rations) with low feed content of animal origin [15].

Trace elements (manganese, zinc, iodine, copper, cobalt, iron, selenium, etc.) are indispensable factors in poultry nutrition. As part of many biologically active compounds - enzymes, hormones, vitamins, they affect the metabolism and energy in the body of the bird, and hence its productivity, reproductive qualities and natural resistance. Trace elements are normalized to 1 ton of feed. Their content in the components of feed is not taken into account. In the enrichment of feed with trace elements, it is important in the form of which chemical compounds they are used [43].

Standardization of vitamins. Vitamins are biologically active compounds that are not a source of energy or a plastic material, but are necessary for the normal course of metabolic processes in the body of the bird. The complete absence of vitamins in feeding causes beriberi with profound spread of metabolism, which leads to serious diseases and death of birds. In case of

insufficient supply of vitamins to birds, hypovitaminosis occurs, and in excess - hypervitaminosis.

In modern poultry farming, two types of poultry feeding are mainly used: dry and combined.

Broiler chickens, in contrast to other species of poultry, have a high growth rate, so from the first days they need to be fed complete feed, balanced in all nutrients [12].

Compound feeds are feed mixtures of plant, animal, mineral and biologically active feeds. They are made according to appropriate scientifically based recipes that provide the necessary combination of ingredients, efficient use of nutrients and high productivity of poultry with minimal feed costs per unit of output.

The first 5 - 7 days the chickens are fed pre-start feed, which includes only good quality feed that contains easily soluble nutrients that are easily absorbed by the body. Approximate variant of pre-start compound feed, %: corn - 50, wheat - 24, soybean meal - 14, milk powder - 12.

Complete feeds should be enriched with vitamins, trace elements and balanced in essential amino acids. They are fed without the addition of other feeds [41].

The range of compound feeds TM "Best Mix" allows you to use two methods of fattening with pre-starter feed and without the use of prestarter feed.

The composition of feed: wheat, corn, soybean meal, soybean meal, soybean extrudate, sunflower meal, sunflower meal, corn gluten, limestone, monocalcium phosphate, vegetable oil, salt, amino acids: lysine, methionine.

Starter feed, according to the recommendations, in 100 g should contain: crude protein - 22 g, metabolic energy - 1298 kJ, fiber - 4 g, calcium - 1.0 g, phosphorus - 0.8 g, sodium - 0.3 g, amino acids, vitamins. Finishing feed (4 weeks of age before slaughter) in 100 g should contain: metabolic energy - 319 kJ, crude protein - 19 g, crude fiber - 4.5, calcium - 0.9, phosphorus - 0.7, sodium - 0, 3 years

As planting density increases, so does the number of products produced per unit area, but poultry growth decreases, feed costs increase, and meat quality decreases. Front of feeding at dry type of rations for chickens - broilers of 2,5 cm.

Unbalanced feeding provokes metabolic disorders and reduced immunity of birds. This, in turn, leads to the field viruses overcoming the immune barrier, then the conditionally pathogenic microflora becomes pathogenic, and the bird gets both viral and sequential bacterial problems.

For birds, water is no less important than food. The needs of poultry depend on air temperature, diet, physiological condition. Water consumption for watering for poultry is 0.25 - 0.30 liters per day per head [15, 41].

Ways to improve poultry meat productivity. The purpose of broiler production is to obtain the maximum yield per unit area of poultry at minimum labor costs and material and energy resources. That is why in broiler production the issues of adjusting the recommended programs for growing young animals in order to increase the intensity of its growth remain relevant. At the same time, it is equally important to improve the

meat quality of poultry, as well as to achieve the maximum economic effect, which justifies the chosen direction of research.

In the conditions of modern production of poultry products the development of new technologies and also separate technological receptions is directed both on increase in production, and on decrease in specific expenses of material - power and other means. Currently, resource - saving technologies are gaining ground, the development of which is based on new achievements of biological sciences and scientific and technological progress [5].

In the conditions of modern production of broiler meat the following basic principles are allocated:

- use of highly productive hybrid poultry;
- growing broilers in poultry houses equipped with tools that provide full mechanization and automation of production processes and regulation of the microclimate, depending on age, high productivity;
- application of resource-saving technological methods;
- execution of production processes according to the technological schedule;
- the use of complete dry feed, which meet the biological needs of the body of the bird and allow to obtain high quality products;
- strict observance of sanitary and veterinary rules.

One of the decisive factors in obtaining high-quality meat with minimal feed costs is the optimal time for raising poultry. From an economic point of view, poultry production is more profitable the shorter the growing time, because at an early age the growth rate is the highest and the best feed payment. The increase in broilers with lower intensity lighting is higher, and feed costs per unit of production are lower [10].

Among the technological factors that have the greatest impact on poultry productivity should be noted the density of planting chickens. It has been found that by regulating the stocking density of broilers it is possible to increase productivity and economic efficiency of meat production. Planting density of 20 heads per square meter.

The efficiency of broiler meat production depends to a large extent on economically useful traits that contribute to the production of chickens with increased live weight. Such features are the lowest cost of labor and feed with a relatively short period of time of poultry.

Meat productivity - the most important economically useful property of the bird. It is characterized by the weight and meat qualities of the bird at slaughter age, as well as nutritional value - the quality of meat.

Meat productivity is the amount of meat and carcass components obtained from an animal or group of animals over a period of time.

Live weight is the main feature that determines the amount of meat in a bird of any age. Live weight is set by weighing. It is better to weigh the bird in the morning, before feeding.

Meat productivity is characterized by live weight, meat quality of poultry at slaughter age and nutritional value of meat. White broiler meat contains more than 20% complete protein and only 1-2% fat. The most effective is the breeding of hybrid poultry in the direction

of productivity, obtained by crossing specialized lines of meat and meat - egg breeds. Low feed costs per unit of growth, meat precocity, high mobility of the industry are important for the development of meat poultry [11].

Poultry productivity is assessed by the following characteristics:

- growth rate - an indicator characterized by the weight of the bird, which it reached at the slaughter age, or determined by the indicators of absolute, relative and average daily gain;

- weight - the main indicator used to determine the amount of meat in poultry of any age to obtain reliable indicators. Weight is determined by weighing in the morning before feeding.

When assessing the meat quality of poultry, be sure to pay attention to:

- weight before slaughter (before slaughter weight), which is determined after 12 - 16 hours. stay of birds without food and 4 hours. - without water;

- weight of unharvested carcass (slaughter weight)
- weight of carcass without blood and feathers (waterfowl - down);

- the weight of the half-gutted carcass - the weight of the carcass without blood, feathers, head, limbs, wings to the elbow joint, in which all internal organs are removed, except the lungs and kidneys;

- weight of edible parts, such as limbs (paws), head, torso bones, gastrointestinal tract (esophagus, goiter, glandular stomach, cuticle, intestine with contents, pancreas, gallbladder), fallopian tube, ovary, testes, larynx, trachea;

- chest muscle weight.

Carcass category is the main indicator that characterizes the quality of meat. It is determined by fatness, taking into account the development of adipose and muscle tissue. The main components of the carcass are muscle, fat, bone and connective tissue, cartilage and ligaments. Muscle and fat increase the category and nutritional value of meat, while bones and cartilage reduce it. Significant amounts of adipose tissue reduce the relative protein content and digestibility of meat, but the location of adipose tissue in carcasses is important: intramuscular fat is more difficult to separate from meat than subcutaneous.

As the percentage of connective tissue in the carcass that contains defective proteins increases, the quality of the meat and its taste properties decrease. The most valuable carcasses in the ratio of muscle and bone tissue 4 - 4,5: 1 [10, 32].

Poultry meat quality indicators depend on the composition and properties of raw materials, conditions and modes of technological processing and storage. The chemical composition of meat varies depending on age, fatness, sex, type of poultry feeding and the percentage of its constituent tissues. In general, the main components of poultry meat are the same as the components of the meat of slaughtered farm animals: water, proteins, fats, extractives, enzymes. Because the most valuable in bird carcasses is muscle tissue.

Water is contained in the muscle tissue in a hydrated - bound or free state. Its amount varies between 47 - 78%, depending on the fatness and age of the bird. As the percentage of adipose tissue and the age of the

bird increases, the water content of the meat decreases because the main water retention is protein.

Protein forms the nutritional value of meat. Their content in poultry meat is higher than 20% compared to other species of slaughtered animals. Because there is relatively little connective tissue in meat, the level of complete proteins (myosin and actin) is higher. Protein in poultry meat contains a complete set of essential amino acids: in broiler and goose meat, this ratio is optimal for the human body. Lipids in poultry meat are represented by glycerides, phospholipids and cholesterol.

Enzymes are used to build tissues, their main function is plastic. Aspartic-reducing enzymes peroxidase and catalase determine the degree of freshness of meat [11].

Meat productivity of poultry, as well as egg, is a complex quantitative feature. In addition to the above indicators characterizing meat productivity, the following are important: payment for feed growth, plumage rate and nutritional value of meat.

Feed costs are an indicator that determines the economic efficiency of raising poultry. The value of this indicator is difficult to overestimate, because the cost of meat production is 70% of the cost of feed.

The plumage rate and growth rate of young poultry are inherited qualities associated with the peculiarities of metabolism. Growth rate is a sign that is taken into account in young meat. The most intensive growth occurs in the first month of life.

There are significant differences in the growth rate of the bird depending on the species, breed, cross and age.

Influence of bird species. Birds of different species differ in growth rate, meat productivity, meat quality. Broiler chickens are widely used in poultry production, which are characterized by high growth rate, good feed payment, they have tender and juicy meat, soft sternum cartilage. Their meat is characterized by high nutritional and biological value. Broilers convert feed protein into food 1.5 - 2 times better than other animals. Broiler meat is low in fat (12%), while goose meat is 39% fat and duck meat is 38% fat. Broiler fat contains more unsaturated than saturated fatty acids, it is mainly found in the skin, not in muscle tissue [10, 38].

Meat birds differ from egg birds in high growth rates and higher live weight, good meat body shape (large width, depth, roundness of the body). Their meat is juicier and tastier.

Influence of sex. Due to the biological characteristics of each sex, there is a different growth rate of males and females. Male turkeys are 50% or more heavier than females, roosters - by 12 - 15%, kachurs - by 6 - 12%.

Male carcasses are more bony. The number of edible parts and muscles in females is slightly higher than in males. Muscle fibers are larger in males and smaller in females. Male meat has a higher moisture content and lower fat content than female meat. Female meat is superior to male meat in protein content. Rooster meat is less juicy than chicken.

Influence of age. The intensity of metabolism in birds and the intensity of their growth decreases with age. Feed costs are directly related to the age of the bird. With age, the relative muscle mass, carcass and edible

parts of the carcass increase, and the relative skeletal mass decreases. As the bird ages, the water content of the muscles decreases, the amount of dry matter, protein and fat increases, but the conversion rate of protein into food protein decreases. With the age of the bird, the ratio of complete and incomplete proteins in the meat deteriorates, which leads to biological deterioration of the completeness of the meat, the amount of unsaturated fatty acids decreases and the content of saturated ones increases, the tenderness and juiciness of the meat decreases.

One of the crucial factors in obtaining high-quality meat with minimal feed costs is the optimal time for raising poultry.

From an economic point of view, the production of poultry meat is more profitable with a short period of their cultivation, as at an early age the growth rate is highest and the payment for feed is the best [3, 10].

With the age of the bird increases the slaughter yield (percentage of slaughter weight to live weight of poultry before slaughter after starvation). However, this is more related to the increase in live weight than to age, because when the age of the bird is different, but the live weight is the same, the slaughter yield does not change.

The best time to raise young for meat: broilers - up to 6 weeks, turkeys - up to 17 weeks, ducks - up to 7 weeks, geese - up to 9 weeks, guinea fowl - up to 12 weeks, quail - up to 9 weeks.

Influence of live weight. There is a high positive correlation between live weight of poultry with slaughter yield, content of edible parts of the body, number of muscles of the chest and legs, feed consumption, carcass category. As the live weight increases, the fleshiness of the keel, thigh, shin, mass index, and chest angle increase.

Influence of feeding. The optimal amount of protein is necessary for intensive growth of a bird. Protein malnutrition is one of the main causes of poor growth and increased care of birds. However, an excess of protein in the diet is impractical, as protein in this case is not fully used, harms the body, delaying its development [33].

Increasing the energy value of feed mixtures contributes to a significant improvement in the quality of meat. Animal and vegetable fats are used as fatty impurities. Fatty impurities are not only carriers of energy, but also a set of fatty acids.

Mineral nutrition is important for the normal growth and development of birds. Excess minerals and their wrong ratio, as well as lack, causes disease in birds, delays the growth and use of nutrients in the diet.

Practice impurities in the feed mixture, which contribute to the growth of poultry productivity and improve the taste, smell, appearance, safety of products. These are enzyme preparations, antibiotics, antioxidants, drugs (for prophylactic purposes), growth stimulants, flavors (to improve feed consumption) and others.

Various growth stimulants, antibiotics, and drugs are eliminated from the bird's diet at least a week before slaughter to avoid residual meat.

Yellow carcasses are especially in demand. Such carcasses can be obtained by using yellow corn, grass flour, especially alfalfa, for feeding poultry.

Influence of the method of retention. When kept in a cage, the growth of young birds is more intense than when kept on the floor, the carcasses are fatter. Broilers with caged content have a live weight at the slaughter age higher by an average of 10 - 16%, feed payment is better by 5 - 17%, the yield of carcasses of category I fattening is higher by 10 - 37% than when kept on the floor.

Planting density. As the stocking density of poultry increases, the number of products per unit area increases, but the increase in poultry decreases, feed costs increase, and meat quality decreases. The optimal stocking density of birds is determined by their age, safety, feed payment, final live weight, meat quality, yield per unit area [19, 30, 54].

One of the most important indicators characterizing the meat productivity of poultry is the category of carcass. The fact is that a live bird is divided by weight and fatness only into standard and non-standard.

In accordance with GOST 18292-85 "Poultry for slaughter. Specifications", a bird intended for slaughter, is divided into adults and young.

At this time, the largest share in meat poultry is the production of broiler meat. This is largely due to the high yield of meat in the carcasses of broiler chickens.

Carcasses of broiler chickens have a very high yield of edible parts: in roosters it is 82.3%, and in chickens - 82.7%, including muscle yield - 61.8% and 61.9%, respectively.

Due to the high meat qualities of broiler carcasses, they can be obtained by deep processing into various portions, as well as a wide range of products with a high yield of boneless meat.

The biological value of poultry meat depends on the quality of protein components, their ability to digest, the balance of amino acid composition. Biological value is determined taking into account the indicators of absence of harmful effects, nutritional value, biological activity, organoleptic properties [7].

Safety is characterized by the absence of specific and non-specific toxicity of poultry meat to humans.

The effectiveness of enzyme preparations in poultry. Enzymes are protein compounds formed from long amino acid chains and complex molecular compounds. Enzymes are specific proteins that act as biological catalysts in metabolic processes in living organisms [15].

All chemical processes in nature occur with the participation of enzymes. Enzymes are specific proteins that act as biological catalysts in a living organism. Enzymes, in contrast to hormones, biostimulants do not act on the body of birds, but on the components of feed in the gastrointestinal tract, they do not accumulate in the body and poultry products. By breaking down or synthesizing substances, the enzymes themselves may not change. They are not part of the final reaction products, are not consumed in the process and after the end remain in the same amount. Artificially added enzymes to feed are eventually digested and do not accumulate in animals and poultry [46].

The most important reason for the use of enzymes in the feeding of farm animals is the fact that they improve the absorption of nutrients in the diet. Despite the fact that enzymes are produced by animals, the efficiency of the digestive process is very low. The addition of enzymes to feed increases the efficiency of the digestive system, reduces unnecessary feed costs per unit of output, and minimizes the impact on the environment by reducing nitrogen and phosphorus emissions from animal feces, which is a significant factor in improving the environmental situation.

Digestive enzymes, which are synthesized in the body of birds, are released into the gastrointestinal tract and participate in the breakdown of feed nutrients into their simple components: proteins - to amino acids, fats - to glycerin and fatty acids, starch - to glucose. These low molecular weight substances can be absorbed through the mucous membrane and are used by the body to maintain vital functions and synthesis of products. However, plant foods contain some components that are resistant to the digestive enzymes of the stomach. This is primarily fiber and the so-called non-starch polysaccharides - beta - glucans, pentoses, mannans, galactans, pectins and others. By increasing the content of non-starch polysaccharides in feed, they play the role of anti-nutrients, as they increase the viscosity of chyme in the digestive tract, complicating the function of digestive enzymes and absorption of nutrients, create a physical barrier for enzymes to access carbohydrates, proteins and fats. Morphological structure of the mucous membrane of the digestive tract. To break down and reduce the negative impact of non-starch polysaccharides on the body of birds, it is advisable to use enzyme preparations [11, 46].

Disruption of membranous crops (barley, oats) reduces fiber levels, but does not solve the problem of beta - glucans and pentosans. Therefore, compound feeds that contain a high level of such crops also need to be enriched with appropriate enzyme preparations.

Enzyme preparations - products of microbiological synthesis, which contain the main enzyme, a number of other enzymes and ballast impurities. The use of enzyme preparations in the diet promotes the breakdown of substances that prevent the utilization of feed, improves the absorption of starch, proteins, non-starch polysaccharides, phytate fiber complexes, which are not completely broken down by the body's own enzymes. If enzymes that hydrolyze fiber are added to the feed, they begin to work in the gut, opening access to valuable nutrients that would be undigested. In addition, cereals (wheat, rye, oats, barley and other crops) contain large amounts of soluble fiber, which is an anti-nutrient factor, forms a gel in the intestines of animals, with high viscosity, which inhibits the activity of the body's own enzymes, absorption processes are more difficult, the risk of developing pathogenic microbes increases. All these negative phenomena are eliminated by adding feed enzymes, they accelerate the chemical reactions of metabolic processes [41].

Preparations that contain enzymes such as amylase and proteases activate the enzymolysis of starch and proteins, promotes digestibility and absorption of carbohydrates and protein feed.

Enzyme preparations - are products of microbiological synthesis, which contain a complex of enzymes - xylanase, beta - glucanase, cellulase, protease, amylase and others. Multienzyme preparations, breaking down hard-to-reach feed components into smaller fragments, reduce their negative impact on the body of poultry and increase the energy and nutritional value of plant feed by 3 - 8%, increase the content of feed components such as barley, wheat, wheat bran, peas, lupines. In enzyme preparations, depending on their direction (for the cleavage of which component they are intended), the main enzyme (or several), such as xylanase or beta - glucanase, has a higher activity, and there are associated enzymes (eg protease, amylase and others) - lower. This expansion of the spectrum of activity of the enzyme preparation also contributes to better digestion of feed. Enzyme preparations can be universal, ie intended for introduction into compound feeds containing various plant feeds with non-starch polysaccharides: wheat, barley, oats, sunflower, soy or with a predominant focus on individual ingredients.

Enzyme preparations have also been developed to increase the absorption of minerals, primarily phosphorus. In grain feeds, phosphorus is contained mainly in the composition of phytin complexes and is absorbed by poultry only by 20-30% [54].

The choice of the type of drugs needs special attention. Enzymes are characterized by narrow specificity and selective action on a single substance or substrate. For example, pepsin acts on proteins of plant and animal origin, and is inert to fats, starch, polysaccharides, so the choice of enzymes depends on the composition of feed, the quality of its components. To increase the effectiveness of the application and achieve the expected result, it is very important to choose the dose of enzymes. This should take into account the age of the bird, the level of grain maturity, the level of metabolic energy. With an increased level of metabolic energy relative to the amino acid background, productivity decreases during the use of enzymes, and with a slight deficit of metabolic energy, the use of enzymes will reduce the cost of feed, improve feed conversion, increase productivity. Only when changing the wheat variety, the diet of broiler chickens will reduce the energy value by 80 - 100 kcal per kilogram, and the use of an effective enzyme preparation can eliminate this nutritional deficiency. Freshly harvested grain creates viscosity problems and leads to reduced bird productivity, poor health and preservation. To prevent this, it is advisable to increase the dosage of the enzyme preparation.

We mainly distinguish two groups of exogenous enzymes. Some enzymes inactivate, break down anti-nutrient substances contained in feed. Such substances that reduce digestion, for example, are in wheat husks - xylan and glucans, the solution of the fraction of which in water impairs the digestion and absorption of nutrients. The use of the enzymes xylanase and glucanase in Northern Europe and the United Kingdom has been ongoing for several decades. In Hungary, their use is mainly justified when the presence of coarse grain products increases in compound feeds instead of corn.

The percentage of wheat introduction is growing [1, 46].

Another large group of enzymes are drugs that contribute to the fact that along with somatic enzymes completely undigested or only poorly digestible nutrients were also available to animals as well as widely used in Hungary phytase enzyme, which promotes better absorption of minerals, calcium, phosphorus, trace elements, and those enzymes that break down various fractions of fiber (cellulase, hemicellulose), helping to improve the availability of other nutrients. Various exogenous proteases, lipase and amylase promote digestion of birds, increasing the amount of assimilated nutrients.

The new generation of enzyme additives is required to have its activity calculated per unit of enzyme protein, if necessary, high; that there was a high enough stability against heat treatments; to be active under pH-specific pH conditions and to be stable even at normal ambient temperatures. Nowadays, there are already such phytase drugs, which even at a granulation temperature of + 90 ° C show an activity of 70 - 90%. The use of enzymes in the form of capsules also provides protection against heat treatment [52].

According to the number of declared activities, enzymes are divided into mono-enzymes and multi-enzyme complexes, which contain several enzymes that act on non-starch polysaccharides. The market of feed additives presents multi-enzyme complexes with different sets of enzymes, each drug is individual in quantity, composition and activity of enzymes, with different spectrum of action, which allow to introduce into the diet of cheap components with higher levels of fiber. A good effect of the enzyme preparation should be considered its ability to cause sequential enzymatic hydrolysis, on the principle of "cascade", when each subsequent enzyme is included in the work after the previous one. For example, the presence of phytases and proteases in one preparation will provide a consistent effect on phytates and then on proteins that have been released from phytatid bonds with phosphorus. An enzyme preparation that acts in a temperature range that coincides with the body temperature of animals and the acidity of the gastrointestinal tract is considered ideal. Effective enzymes begin to work in the oral cavity, retain their activity in the acidic environment of the stomach and show maximum activity in the small intestine. The use of complex enzyme preparations allows to increase the use of sunflower meal in the diets of broilers, partially replacing it with more expensive soybean meal and cake, as well as bran, barley, oats with films and rye [18].

Enzyme preparations are available in powder and liquid form and are added to premixes or compound feeds at the same time as other additives. Shelf life - from 6 months to 1.5 years, depending on the form of the drug and the manufacturer's recommendations.

Enzyme preparations of various manufacturers, mainly foreign, are presented on the market of Ukraine. Approximate norms for the use of enzyme preparations are from 0.2 to 1 kilogram per ton, depending on the

specific preparation and the content of difficult-to-digest components in the feed. They should be used according to the manufacturer's instructions.

According to research by N. Slobodyanyuk [41], it was found that the use of the enzyme preparation avizim in poultry feeding had a positive effect on their growth and development. This indicates that under the influence of enzymes in the body of the bird is increased digestibility and absorption of nutrients, which significantly affects the replenishment of energy and the intensification of synthetic processes in the body.

When feeding enzyme preparations of the appropriate spectrum of action in the gastrointestinal tract of birds there is an increase in the processes of fermentolysis and microbial fermentation of nutrients (starch, proteins, fats), increase their digestibility and therefore increase the background of energy nutrition.

Celosim is used as a feed additive to increase protein digestibility, starch digestibility, raffinose and stachyose. The drug is optimal for diets high in corn, wheat, soy and processed products.

It contains a number of enzymes, the main of which are:

- amylase - 1000 units / g;
- protease - 5000 units / g;
- endo-1,4-beta glucanase (cellulose) -1700 IU / g;
- endo-1,4-beta xylanase - 500 IU / g;
- α -galactosidase - 20 units / year.

The drug is a light brown powder with a slight specific odor. In the body due to the action of a complex of hydrolytic enzymes contained in the drug, reduces the viscosity of chyme, increases the digestibility of feed nutrients, reduces the negative effect of anti-nutrient factors on poultry productivity and feed conversion.

The enzyme preparation is non-toxic, has no contraindications, does not interact with other substances.

Many years of experience and research in the field of poultry farming have shown that effective animal husbandry today is impossible without the use of enzyme preparations in different types of diets. Properly selected enzyme preparation increases the availability of energy and nutrients in the diet, resulting in increased productivity of poultry [11].

The purpose and objectives of the research are to study the effectiveness of the enzyme preparation "Celozyme" and its impact on the productivity of broiler chickens, for which a scientific and economic experiment was conducted.

The task was to study the following indicators:

- the effect of feed additives on the productivity of poultry;
- the effect of the drug on the slaughter performance of poultry;
- to investigate the condition of the internal organs under the action of feed additives;
- calculate the economic efficiency of the use of enzyme preparation.

Research methodology. The aim of the study is to study the effectiveness of the use of a new feed additive in the feeding of broiler chickens.

Object of research: live weight, growth intensity, slaughter rates, internal organs, enzyme preparation "Celozyme".

For the production of this experiment, 100 heads of broiler chickens of the Cobb cross - 500 four - day - old were selected. From them on the principle of analogues 2 groups on 50 heads are formed. The duration of the experiment is 42 days.

The first group - control, the second - experimental. The bird was kept on the floor with free access to water and feed in accordance with zootechnical standards for this species, the material for the litter was sawdust.

The birds of the control group throughout the rearing period received the basic diet (compound feed TM "West Mix"), balanced according to the norms of feeding.

The experimental group as an additive in addition to the main diet was fed the enzyme preparation "Celozyme" at a dose of 0.015% by weight of feed. The scheme of the experiment is presented in table 1.

Table 1

The scheme of the experiment

Group	Duration of the period, days	Number of chickens	Features of feeding
1 - control	42	50	OR (complete feed)
2-experimental	42	50	OR + "Celozyme" at a dose of 0.015% by weight of feed

Note. OR - the main diet.

The composition of the main diet: corn, wheat, soybean meal, sunflower meal, vegetable oil, limestone, monocalcium phosphate, vitamin-mineral mixture, coccidiostatic.

The enzyme preparation "Celozyme" is used as a feed additive to increase the digestibility of protein, digestibility of starch, raffinose and stachyose. The drug is a light brown powder with a slight specific odor. The enzyme preparation is not toxic, there are no contraindications, does not interact with other substances.

Live weight of broiler chickens was determined by individual weighing each week and calculated absolute, average daily and relative gains. To do this, we used the appropriate formulas, according to which we obtained indicators of live weight of birds.

They recorded the consumption of feed daily, respectively, for the entire period of cultivation.

At the end of the experiment, a control slaughter was performed, selecting 4 heads from two groups.

The following indicators were determined:

- before the slaughter mass;
- weight and yield of uncoupled carcass;
- weight and yield of semi-gutted carcass;
- weight and yield of gutted carcass;
- the mass of internal organs of various body systems.

Student's t-test was used to determine the differences between the mean values. The difference was considered probable, compared with the control at * P < 0,05; ** P < 0,01; *** P < 0,001 [39].

Research results. Growth and development of experimental birds. One of the main indicators that characterize the level of meat productivity during the life of the animal is body weight and growth energy. In this regard, the study of the intensity of growth and development of the organism, as well as their management remains relevant in poultry to this day. Growth reflects the quantitative side of the body's development, is usually expressed through live weight and average daily gains. Development, on the contrary, reflecting the qualitative characteristics of growth intensity, is reflected in the exterior and interior of the animal.

The growth of a living organism is a complex process that subtly responds to any changes in feeding and housing conditions. The mechanism of growth is so sensitive that even the slightest changes in external factors can lead to changes in the fluctuations of live weight of an animal or bird.

Live weight is the main indicator of growth and development of poultry, which reflects the conditions of feeding and keeping in which broiler chickens are raised [5].

Feeding the enzyme preparation "Celozyme" to broiler chickens of Cobb-500 cross during the whole growing period had a positive effect on the intensity of their growth. The dynamics of the live weight of broiler chickens cross KOB-500 during the experiment is shown in table 2.

Table 2

Live weight of chickens of broilers of a cross of KOB-500, (M ± m, n = 50)

Age of animals, days	Groups	
	And-control	II-experimental
1	45,5±0,68	45,37±0,59
7	173,7±10,25	180,6±6,64
14	436,3±21,31	484,3±14,73
21	924,4±32,68	1035,6±27,33*
28	1588,7±39,65	1783,1±29,50***
35	2236,2±69,70	2468,1±69,66*
42	2769,4±70,83	3141,2±57,96***

Note. Probability of difference: * P < 0,05; *** P < 0,001.

In the first 3 weeks of rearing chickens broilers of the 2nd experimental group are not reliable, but prevailed in terms of growth intensity of their peers in the control group.

From the third week, the advantage in terms of growth intensity of the 2nd experimental group was significant. Thus, broiler chickens at the age of 21 days by live weight prevailed by 111 g (* P <0,05), which is 11.2%, at the age of 28 days by live weight of the birds of the experimental group prevailed by 194.4 g (***) P <0,001), which is 12.2%.

A similar trend was observed at the age of 35 and 42 days, the live weight of the experimental bird exceeded its peers in the control group by 231.9 g (* P

<0.05), respectively, which is 10.3% and 371.8 g (***) P <0,001), which is 13.4%.

Feed consumption and growth are the two main features for summarizing the results of the development.

To determine the payment for feed in increments during the entire growing time, the feeding was recorded: the amount of given feed and uneaten leftovers was taken into account by the method of control weighing.

Accounting for feed consumption and live weight gain of the experimental bird allowed to calculate the amount of feed conversion during the experiment (Table 3).

Table 3

Feed conversion by the experimental bird (M ± m, n = 50)

Indicator	Група		
	Units of measurement	1-control	2-experimental
Total in the group	kg	254	270
On one head	kg	5,09	5,40
Per 1 kg of gain	kg	1,84	1,75

During the period of raising broiler chickens up to 42 days of age in the second experimental group was spent on 1 kg of gain 1.75 kg, and in the control group 1.84, which is 0.09 kg or 4.9% less.

Thus, the introduction of enzyme additives "Celozyme" to broiler chickens to complete feed helped to increase the intensity of their growth and reduce feed consumption per 1 kg of growth for the entire growing period.

Slaughter and meat performance of experimental birds. The main indicator that characterizes the meat qualities of poultry is their fatness. Birds of different fatness differ in the ratio in the carcasses of muscle, fat, bone and connective tissue.

In well-fed poultry, compared to under-fattened birds, the proportion of adipose tissue in carcasses increases, the proportion of muscle tissue decreases slightly and the proportion of bones, cartilage and connective tissue decreases significantly. As the ratio of tissues changes, the chemical composition of meat for industrial processing changes. In addition, with excessive fat content of meat deteriorates its nutritional and culinary qualities, reduced digestibility.

Fattening of poultry, its meat qualities depend on age, weight, article, breed and direction of productivity. When assessing the meat qualities of young animals, the main indicator related to meat productivity and meat quality is their live weight. Intensively raised and fattened to high weight conditions, the young are characterized by high overall meat yield and increased meat content due to well-developed muscle tissue [7].

Young meat has an optimal ratio of protein and fat, contains high nutritional and dietary properties, is tender, juicy and high taste. Fat is white.

Slaughter birds must meet the requirements of veterinary legislation, the rules of veterinary inspection of slaughter animals.

The consumer value of meat is characterized by its taste and nutritional qualities, the yield of edible parts, the ratio of bones and flesh.

Slaughter yield - slaughter mass to live weight, expressed as a percentage. It depends on the species, breed, age, sex and fattening. It is determined by which parts of the body belong to the slaughter mass.

In poultry, the carcass weight depends on the features after carcass processing: in ungutted poultry, it is the highest, as it includes the mass of bloodless and plucked carcass with fat, head, legs and internal organs; in semi-gut - a mass of carcass with fat, but without intestines; with complete evisceration, not only blood, feathers, down and intestines are removed; but also all internal organs, also the head to the second cervical vertebra, legs to the metatarsus and wings to the elbow joint.

Gutted carcasses can be with lungs and kidneys, without other internal organs.

As a result of the conducted researches it was established that the tested enzyme additive provided improvement of slaughter indicators of experimental broiler chickens (table 4).

The addition of the enzyme preparation allowed broiler chickens of the experimental group to have significantly (** P <0,01) higher weight of semi-gutted carcass by 347.3 g or 15.8% and the weight of gutted carcass by 282 g or 14.3% and slaughter yield by 0.6%.

Table 4

The results of slaughter of experimental birds, g, (M ± m, n = 4)

Indicator	Groups	
	And-control	III-experimental
Pre-slaughter live weight	2788,7±52,2	3161,5±45,0**
Weight of half-gutted carcass	2184,7±36,1	2532,0±46,8**
Entrance %	78,3	80,1
The weight of the gutted carcass	1963,5±27,8	2245,5±54,3**
Slaughter yield,%	70,4	71,0

Note. Probability of difference: * P < 0,05; ** P < 0,01

Thus, to improve the slaughter properties of broiler chickens cross Cobb-500, it is advisable to use in feeding the enzyme preparation at a dose of 0.015% by weight of feed.

The condition of the internal organs under the action of feed additives.

In comparison with other species of farm animals, the bird has a high intensity of metabolic processes,

high ability to absorb and energy efficiency of feed, which contributes to precocity and high productivity.

In broiler chickens of the second experimental group, there was no significant difference in the mass of internal organs (heart, lungs, kidneys, liver, muscular and glandular stomach) relative to the control group (table 5).

Table 5

The mass of internal organs at the end of the experiment, (M ± m, n = 4)

Body	Group	
	And-control	II-experimental
Heart	12,9±0,97	16,7±0,36
Lungs	19,12±0,22	16,7±0,36
Kidneys	12,52±0,39	10,97±0,68
Spleen	2,60±0,05	2,63±0,09
Pancreas	6,73±0,17	6,14±0,39
Liver	68,0±4,35	65,23±1,22
Muscular stomach (without content)	42,70±2,12	50,33±3,49
Glandular stomach	8,07±0,43	9,73±0,34

Along with this there is a tendency to increase the weight of the heart by 3.8 g, which is 2.9%, the spleen by 0.3 g, which is 0.1%, the muscular stomach by 7.63 g, which is 15, 1%, glandular stomach at 1.66 g, which is 20.5%. Not a significant downward trend was observed in chickens of the second experimental group in terms of lung weight control by 2.42 g, kidney weight by 1.08 g, pancreas by 0.59 g and liver by 2.77 g.

In general, the feeding of the enzyme preparation "Celozyme" does not have a negative effect on the formation of internal organs. The mass of organs is within physiological norms, which is confirmed by the high level of growth intensity of birds.

The digestive system of poultry in its structure and functions is adapted to the reception and digestion of feed of plant origin. The system of birds' digestive organs consists of the following departments: main (pharynx); anterior (esophagus with goiter, stomach (glandular and muscular)); middle (duodenum with liver and pancreas, duodenum and ileum); posterior (two cecum, rectum and cloaca).

The main features of the digestive tract of birds: shortened intestines; weak morphological and functional differentiation of the intestine into departments.

The intestines in birds are relatively short, but the secretion of bile and pancreatic juice is intense. Bile in birds per unit live weight is released 7 times more than in other species. The breakdown of feed and absorption of nutrients is intense.

The large intestine in birds is represented by only 2 rectums. Absorption of nutrients is carried out almost along the entire length of the intestine due to the presence of villi. The two appendages function as organs of absorption. In the large intestine there is a bacterial fermentation and synthesis of B vitamins, but in very small quantities, due to which they more often than other species of animals registered beriberi group B. Feed through the digestive tract of birds passes for 24 - 36 hours. Fecal masses in birds are excreted with urine through the cloaca [15].

It is known that the study of the morphology of the digestive tract of poultry largely determines the prospects for improving the productivity of poultry. The mass and linear measurements of the large and small intestines of the experimental birds are shown in tables 6 and 7.

In the study of the mass and length of the small intestine, a significant difference between the experimental and control groups is not observed. In the birds of the second experimental group, the weight of the duodenum increased by 2.1 g. The weight of the jejunum and ileum decreased by 2.4 g and 0.6 g, respectively.

The use of the enzyme preparation contributed to an increase in the total length of the small intestine by 12.7 cm, including 12-fold by 4.5 cm, empty by 6.2 cm, ileal by 2.05 cm.

Table 6

Mass and linear measurements of the small intestine of poultry, (M ± m, n = 4)

Indicator	Groups	
	And-control	II-experimental
Small intestine (gut mass, d)		
12-fold	13,6±1,55	15,7±0,47
empty	41,3±2,82	38,9±1,52
ileal	6,3±0,74	5,7±0,32
gut length, cm		
12-fold	30,5±1,53	35,0±1,82
empty	77,5±4,68	83,7±2,88
ileal	25,3±1,59	27,35±0,59

Under the conditions of the experiment there is an increase in the mass of the large intestine by 11.1 g, including the right blind by 5.6 g, the left blind by 4.9 g (** P < 0.01) and the direct by 0.6 g

Studying the length of the large intestine, we found an increase in the length of the right blind by 1.4 cm, left blind by 3.2 cm and straight by 2.9 cm (* P < 0.05).

Table 7

Mass and linear measurements of the large intestine of poultry, (M ± m, n = 4)

Indicator	Groups	
	And-control	II-experimental
Large intestine (gut mass, d)		
right blind	6,2±0,18	11,8±0,30
left blind	7,3±0,77	12,2±0,32**
rectum	6,6±0,37	7,2±0,75
gut length, cm		
right blind	21,1±0,94	22,5±0,74
left blind	17,5±0,74	20,7±0,73
rectum	8,1±0,37	11,0±0,62*

Note. Probability of difference: * P < 0,05; ** P < 0.01.

Therefore, when using the enzyme preparation at a dose of 0.015% by weight of complete feed, a positive effect on the formation of the digestive system of broiler chickens.

Economic evaluation of research results. In the production of broiler meat, the issue of adjusting the recommended programs for raising young animals in order to increase the intensity of their growth is relevant. In addition, it is very important to improve the

meat quality of poultry, as well as to achieve maximum economic effect.

The cost-effectiveness of the use of the enzyme preparation in the feeding of broiler chickens is shown in table 8.

As can be seen from the above data, the introduction of the enzyme preparation in the complete feed fed increased the gross gain and weight of gutted carcasses by 21.1 kg and 15.8 kg, respectively, compared to the control indicators.

Table 8

Economic evaluation of the addition of poultry feed additives (M ± m, n = 50)

Indicator	Group	
	1-control	2- experimental
Number of goals in the group	50	50
Saving,%	96	98
Gross live weight gain, kg	132,9	154
Weight of gutted carcasses, kg	94,2	110,0
The cost of 1 kg of feed, UAH	12	12
Additional costs for the drug, UAH	-	21
The cost of chickens (age 1 day), UAH	22	22
Feed costs for the whole period, kg	254	270
The selling price of 1 kg of gutted carcass, UAH	56	56
Total cost, UAH	4148	4565
Sales revenue, UAH	5275	6160
Profit from sales, UAH	1127	1595
Profitability,%	27,2	34,9

The enzyme preparation used in the feeding of broiler chickens causes an increase in sales revenue by UAH 885. compared with the control group.

The profit from sales for feeding the enzyme preparation was at the level of UAH 1,595, while in the control group it was UAH 1,127, which is UAH 468. Less.

The level of profitability of broiler farming using an enzyme additive was higher by 7.7% compared to broilers that received only complete feed.

Thus, the results of studies on the effect of enzyme preparations on growth rate, slaughter rates and economic efficiency of broiler meat production confirm the positive effect of their use.

Conclusions and prospects for further research.

1. On the basis of the conducted researches, the scientific approach concerning use of enzyme preparation in feeding of chickens of a cross of Cobb-500 is experimentally and theoretically proved, its influence on growth intensity, slaughter indicators and a condition of internals is studied.

2. An increase in live weight of poultry for 42 days of rearing by 371.8 g (***) $P < 0.001$, which is 13.4%, and a decrease in feed consumption per 1 kg increase by 0.09 kg or 4.9% .

3. The experimental group receiving the enzyme preparation in addition to the main diet had a higher weight of semi-gutted carcass by 347.3 g or 15.8% and the weight of gutted carcass by 282 g or 14.3% and slaughter yield by 0, 6%.

4. When using the enzyme preparation at a dose of 0.015% by weight of complete feed no significant changes were detected, all physiological parameters of the digestive system of broiler chickens were within the physiological norm.

5. The use of the enzyme preparation in the feed for broiler chickens is economically justified: an increase in revenue by 16.7%, profit from sales by 41.5% and the level of profitability by 7.7%

When raising broiler chickens on complete feed in order to increase their meat productivity, we propose to introduce an additional 0.015% by weight of feed enzyme preparation "Celozyme".

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