

Project theme name: AP13068280 "Development of enriched feed using highly nutritious, easily digestible and natural plant components to obtain high-quality and safe quail products."

Relevance: A new branch of poultry farming for North Kazakhstan - *quail* farming - is one of the sources of satisfying the needs of people in such poultry products as eggs and meat. It is only known for certain that modern quail farming as a branch of industrial poultry farming arose in the 50s of the last century in Japan. This bird appeared in Europe and America later. The beginning of industrial quail farming in our neighbor country Russia is considered to be 1964 and then the quails were brought to Kazakhstan. Now, this industry has not become widespread in Kazakhstan, the main reason is that successful maintenance requires high-quality feed, mainly produced abroad, and their retail cost is quite high. According to experts, the "quail market" in Kazakhstan and the CIS countries has been developed by no more than 20%, but there is a noticeable increase in the population's demand for quail products, in particular for eggs and meat, i.e. it can be argued about the prospects for the development of quail breeding.

The production of poultry products is increasing every year in our country. This is due to the transition of the population of our country to a healthier diet. People are increasingly choosing high-quality, bio-safe foods such as quail meat and eggs.

The main idea and uniqueness of the project is the development of enriched feed using extruded and natural plant components that stimulate physiological and biological processes, improve overall health and improve the digestion of feed, which will make it possible to obtain safe, high-quality quail products. At the same time, the processes of digestion, the morpho-biochemical status of blood and metabolism, an increase in meat and egg productivity, and biologically valuable products will be optimized.

Also, a preliminary patent search showed analogues in foreign countries (Russia, China, South Korea), however, at the moment, enriched feed for quails from domestic raw materials with the use of extruded and biologically valuable plant components has not been developed in the Republic of Kazakhstan.

Purpose: Development of enriched feeds using highly nutritious, easily digestible and natural plant components to obtain high-quality and safe quail products with scientific justification for their effective use.

Expected Results:

As a result of the project:

- An analysis of literature sources, results of patent information research with a search depth of up to 20 years will be carried out, 3 formulations of fortified feeds have been developed;
- The safety of the developed enriched feeds of various compositions zootechnical parameters of feeding, keeping of quails in the basic farm will be studied;
- The safety of feed and the chemical composition of the feed mixture used in the base farm will be studied;
- The effect of the developed enriched feeds on the pre-slaughter and live weight, the weight of the half-gutted carcass, the slaughter yield, the weight of the skin with subcutaneous fat, the weight of the pectoral and leg muscles, the weight of internal organs, the intensity of egg production, average, the weight of eggs will be studied;
- The effect of the developed enriched feeds on the intensity of egg production, average, egg weight will be studied;
- Hematological and biochemical parameters of quail blood, qualitative indicators of productivity and its safety will be studied;
- Qualitative indicators of quail products and their safety will be studied;
- A recommendation on the use of the developed enriched feed will be developed;
- Booklets and information sheets will be developed, with the posting of information on social networks on the use of the developed enriched feed;
- 1 patent of the Republic of Kazakhstan for a utility model will be obtained,

- will be published at least 2 (two) articles and (or) reviews in peer-reviewed scientific publications on the scientific direction of the project, indexed in the Science Citation Index Expanded database of Web of Science and (or) having a CiteScore percentile in the Scopus database of at least 35 (thirty-five);

- it will be published as a minimum of 2 articles in peer-reviewed journals from foreign or domestic CCSES (Committee for Control in the Sphere of Education and Science) or RISC,

- it will be published as a minimum of 2 articles or thesis in the international scientific-practical conferences,

- An advertising video about the developed enriched feed will be prepared;

- 1 seminar or round table with agricultural producers will be held;

- At least 1 graduation master's work will be prepared.

Achieved results in 2023:

4 recipes of enriched feeds were developed, scientific justification of each component used was given. As a result of the work, 4 formulations (Start, Grower, Finish, Layer) and production conditions have been developed, which include enriched natural plant components to increase the productivity of quails and improve the quality of quail products (meat, eggs).

The composition in different proportions, depending on the age and direction of productivity of quails, includes: extruded cucumbers and wheat, soybean and rapeseed meal, fish meal and other fillers.

The safety and quality assessment of the components of the developed enriched feeds of various compositions, zootechnical parameters of feeding, quail content in the basic farm were studied. The following methods were used for food safety studies: biotesting (protozoa, guppy fish, laboratory animals), determination of mycotoxins using rapid tests (ICA) Rida Quick Aflatoxin RQS ECO Rida Quick DON RQS ECO, radiological methods. To study the zootechnical parameters of feeding and maintenance, generally accepted methods in poultry farming were used. Feed analysis on the FOSS2500 analyzer. The temperature and humidity in the room and cells are controlled automatically using measuring instruments (thermometer, luxmeter, hygrometer).

Preliminary experiments were conducted on the use of the developed 3 formulations of enriched feeds to determine the effect on pre-slaughter weight and egg production. To set up a preliminary experiment to determine the effect of the developed 4 recipes, 2 groups of quails were formed in 4 basic farms, an experimental group (EG) and a control group (CG), weight was measured weekly, pre-slaughter weight at the end of fattening, egg productivity daily, statistical data were processed.

The safety and quality assessment of components of the developed feeds of various compositions, zootechnical parameters of feeding, the content of quails in the basic farm were studied. Preliminary experiments were conducted on the use of the developed 4 formulations of enriched feeds to determine the effect on pre-slaughter weight and egg production.

The meat and egg productivity of quails has been studied. The influence of the developed formulations of fortified feeds on pre-slaughter and live weight, semi-eviscerated carcass weight, slaughter yield, weight of skin with subcutaneous fat, weight of pectoral and leg muscles, weight of internal organs, intensity of egg production, average egg weight was studied.

All farms used the same research methodology. Two experimental groups were formed: control (CG) and experimental (OG).

Study group members:

№	FULL NAME	Main place of work, position	Hirsch index, identifiers Researcher ID, ORSID, Scopus Author ID (if exist)
1	Zhanabayeva D.K.	Project Manager	https://orcid.org/0000-0001-7499-347X , Researcher ID Web of Science N- O-4822-2017
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7	Musagieva D.K.	Laboratory assistant	https://orcid.org/0000-0003-1639-0253

List of publications and patents published within the framework of this project: (with links to them):

1. Султанаева Л., Исабекова С., Мурзакаева Г. Влияние обогащенного экструдированного корма на химический состав яиц перепелов // Қазақстанның ауыл шаруашылығына еңбек сіңірген қызметкері, академик Қалдыбек Сәбденұлы Сәбденовтың 90 жылдығына арналған «Ғылымдағы сабақтастық - аграрлық ғылым мен өндірістің тұрақты дамуының негізі» атты жас ғалымдар мен студенттердің халықаралық ғылыми-тәжірибелік конференциясының мақалалар жинағы 20-21 сәуір 2023 жыл 1-бөлік. Алматы, - 2023. С. 171-175.

2. Жұмаш Т.Е., Жанабаева Д.К., Майер Е.Г. Елімізде бөдене шаруашылығының дамуы // Материалы международной научно-практической конференции «Сейфуллинские чтения-19», посвященной 110-летию м.а. Гендельмана». Астана, - 2023. - С.114-116.

3. Issabekova S., Zhanabayeva D. The effect of developed highly digestible feed on the quails' egg productivity// World Conference on Agriculture and Animal (WCAA-23) 12th -13th May 2023, Istanbul, Turkey. -P. 14.

4. Патент РК на Полезную модель «Комбикорм для несушек перепелов» по заявке №2023/0207.2.

5. Учебное пособие. Д.К. Жанабаева Құс өнімдерін ветеринариялық-санитариялық сараптау / С.Сейфуллин атындағы ҚАТЗУ. Астана, -2023. 135-138 б.

6. Исабекова С.А., Жанабаева Д.Қ., Паритова А.Е., Мурзакаева Г.К., Сенкебаева Д.Т. Влияние разработанного обогащенного корма на морфологические показатели яиц перепелок // Сәкен Сейфуллин атындағы Қазақ агротехникалық зерттеу университетінің ғылым жаршысы (пәнаралық) = Вестник науки Казахского агротехнического университета имени Сакена Сейфуллина (междисциплинарный).- Астана. - 2023. – №2(117). – С. 128-137.

7. Султанаева Л.З., Исабекова С.А., Жанабаева Д.Қ., Балджи Ю.А. Бөденелерді өсіру кезінде экструдталған компоненттермен азықты пайдалану тиімділігі.- Многопрофильный научный журнал «3 Intellect, idea, innovation».-№2.-2023. С.42-47.

8. Султанаева Л.З., Балджи Ю.А., Жанабаева Д.К., Исабекова С.А. Применение фитобиотических добавок в рационах перепелов (обзор) // Птицеводство.-№5.-2023 – С. 47-52. doi: 10.33845/0033-3239-2023-72-5-47-52

9. Мусагиева Д.К., Султанаева Л.З., Жанабаева Д.К., Балджи Ю.А. Контроль безопасности экструдированных кормов "BioFeed" для перепелов. Материалы международной научной конференции FOOD QUALITY AND FOOD SAFETY. Астана. 2023. С. 67-69

Information for potential users: enriched feed for meat and egg quails will be developed.
Information for quail breeders.