



# GROWTH, DEVELOPMENT AND EGG EFFICIENCY OF THE PARENTAL FORM OF THE DOMINANT D-149 CROSS

Kaniyazova A. A.

Research Institute of Animal Husbandry and Poultry

Email: albinakaniazova@gmail.com

## Abstract

This study investigates the growth dynamics, developmental characteristics, and egg efficiency of the parental form of the Dominant D-149 cross, a highly productive egg-laying line originally bred in the Czech Republic and successfully adapted to the climatic conditions of Uzbekistan. Experimental observations were conducted on the Research Institute's experimental farm under standardized management conditions. The study evaluates live weight progression, egg-laying performance, and feed conversion ratio to determine economic efficiency and adaptability. Results show that the parental stock exhibits stable growth patterns, early maturity, and high egg-laying persistence with over 92% peak productivity. These findings highlight the genetic and environmental interactions that determine poultry performance in Uzbekistan's agro-industrial systems.

**Keywords:** Livestock management; poultry nutrition; disease control; biosecurity; agricultural economics; rural development; food security; sustainable farming; modern poultry technology.

## Introduction

Poultry farming refers to the commercial or domestic rearing of birds in a controlled environment, where they are fed, bred, and managed to produce poultry meat (broilers) or eggs (layers). The Importance of poultry farming provides a major source of protein (meat and eggs), creates employment and income for rural and urban farmers as well as contributes to food security and economic growth. The most comfortable side of that is that uses less land compared to cattle or sheep farming. In recent years, poultry farming in Uzbekistan has undergone rapid transformation through modernization programs, governmental support, and genetic improvement of poultry breeds. The Decree of the President of the Republic of Uzbekistan (No. PP-238, 2024) emphasizes enhancing poultry production by introducing advanced breeding and feeding technologies. The Dominant D-149 cross, imported from the Czech Republic, represents a dual-purpose line that combines high egg productivity with strong physiological adaptability. Studying the parental form is crucial to understanding its genetic stability, reproductive efficiency, and adaptability to local climatic and nutritional conditions. This research aims to evaluate the growth and egg efficiency of the Dominant D-149 parental form to provide baseline data for its use in breeding and commercial production.

## Materials and Methods

The experiment was conducted in 2025 at the experimental poultry farm of the Research Institute of Animal Husbandry and Poultry. The parental flock of the Dominant D-149 cross was maintained under uniform housing, feeding, and lighting conditions. Birds were fed balanced rations formulated according to zootechnical standards. Live body weights were recorded weekly using electronic scales. Egg production was registered daily and analyzed monthly. Feed intake was measured per group to calculate feed conversion ratios (FCR). Biometric data were processed following Merkureva (1983), and physiological assessments followed the methods of Kondrakhin (1983). Exterior traits were measured according to Pakhomov and Razumovsky (2007). Statistical analysis included mean, standard deviation, and correlation coefficients between body weight and egg production parameters.



## Results

The growth of the Dominant D-149 parental form followed a typical sigmoidal pattern (Figure 1). Body weight increased rapidly from 0.25 kg at 4 weeks to 2.45 kg by 32 weeks, indicating efficient feed utilization. Egg production began at approximately 18–20 weeks of age, reaching a peak of 92% at 24 weeks (Figure 2). Feed conversion efficiency improved from 4.0 kg feed/kg egg mass in early laying to about 2.0 kg feed/kg egg mass during peak performance (Figure 3). The hens maintained high productivity with minimal seasonal decline, demonstrating strong adaptation to Uzbekistan's continental climate. The overall survival rate exceeded 95%.

Figure 1. Growth curve of parental form of Dominant D-149 cross

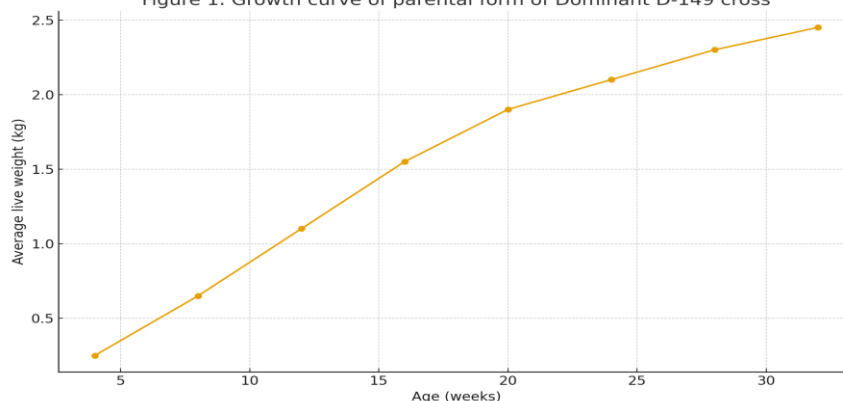


Figure 2. Egg production rate of Dominant D-149 parental hens

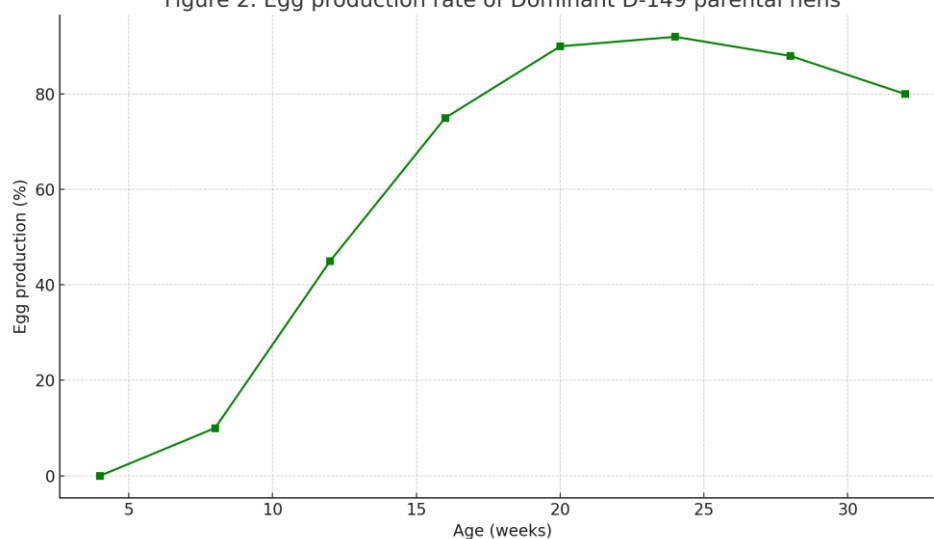
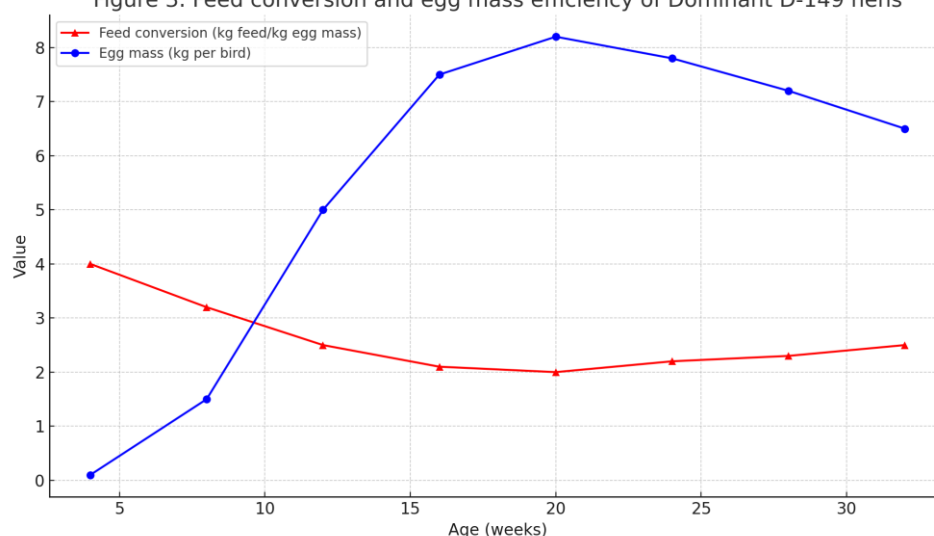


Figure 3. Feed conversion and egg mass efficiency of Dominant D-149 hens



## Discussion

The observed results confirm that the Dominant D-149 parental form is a highly resilient and efficient layer. The rapid growth and early onset of lay suggest strong genetic potential for reproduction. Similar findings have been reported in European studies on Dominant crosses (Alimbaev et al., 2022). The feed conversion ratios observed are within the range of commercial egg-type breeds, indicating that the D-149 can compete economically in both industrial and smallholder systems. The high survival rate and adaptability also underline its suitability for local climatic conditions, where temperature fluctuations and feed resource variability can impact performance. Furthermore, the consistency between parental performance and hybrid productivity demonstrates the genetic stability of the line, making it a valuable resource for future crossbreeding programs.

In conclusion, the parental form of the Dominant D-149 cross demonstrates superior growth, adaptability, and reproductive performance under Uzbekistan's environmental conditions. With over 92% egg-laying efficiency and strong survival rates, it serves as a promising foundation for hybrid production and sustainable poultry farming. The results underscore the importance of



continued genetic monitoring, nutritional optimization, and application of scientific methods to further enhance productivity and economic efficiency in domestic poultry breeding programs.

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