

# The Impact of Broiler Feed on Growth and Performance by Valorisation of Olive Cake as By-product in the Ration

Hassan. A. F. Rahmy<sup>1,2</sup>, Salma Nour El-Deen<sup>2</sup>, Fatma Mohamed Abosamra<sup>2</sup>, Adel M. Khaled<sup>2</sup>

<sup>1</sup> Department of Animal Production, Faculty of Agriculture, Cairo University, Egypt

<sup>2</sup> Faculty of Organic Agriculture Heliopolis University for Sustainable Development

Keywords: Crude Fiber; olive cake; Circular economy; Broiler feed

Presenting author email: [Hassan.Awny@hu.edu.eg](mailto:Hassan.Awny@hu.edu.eg)

## Introduction

The goal of innovation in agriculture is to achieve a "zero waste" economy, in which waste from raw materials is used to produce new goods and applications (Mirabella et al., 2014). On the other hand, the fast-expanding chicken farming industry raises feed costs and consumption dramatically. Feed expenses account for over 70% of production costs in the chicken sector (Mikail et al., 2021).

As a result, numerous studies have been conducted to meet the growing demand for feed while lowering feed costs. Examining the possibilities for using alternate feed sources in poultry nutrition is one of the key topics highlighted in these studies. It is not advisable to feed animals items that are suitable for human consumption because this encourages competition overconsumption between humans and animals. Byproducts from the collection and processing of olives, which have long been a vital part of Egypt and the Mediterranean region's diets, may one day be used as substitute feed ingredients by the chicken industry. By-products including olive leaves, olive black water (wastewater), and olive pomace are created when olives are processed to make oil. Prior research on the viability of utilizing these by-products in animal nutrition and the resulting outcomes has demonstrated the possibility for other feed sources as well as significant financial benefits (Keser et al., 2010). Studies in the past have investigated the possibility that adding products from the olive industry to the diets of broilers could have a negative impact on growth performance metrics, but only up to a certain extent (Sayehban et al., 2020). The objective of this research was to use the solid-state fermentation method to bio-transform and valorize olive cake, a byproduct of the Egyptian olive industry, to add value to chicken feed. In this case, the challenge is to allow the complex fibers in the olive cake—lignin, cellulose, and hemicellulose—to decompose and be ingested by birds.

## Material and methods

The research was to use the solid-state fermentation method to bio-transform and valorize olive cake, a byproduct of the Egyptian olive industry, to add value to chicken feed. In this case, the challenge is to make the complex fibers in the olive cake—lignin, cellulose, and hemicellulose—easier for birds to digest.

The ISIS and SEKEM Company (Agricultural Seeds, Herbs and Plants Mixed Spices, Belbis, Sharkia governorate, Egypt) provided the by-product (olive cake), aromatic and herbal plants. In this study, three kinds of fragrant herbs—lemongrass, chamomile, and mint—were combined and administered as feed additives to treatment 2 at a rate of 4%.

The nutritional value of the ingredients was measured by applying the Association of Official Analytical Chemists (AOAC) Official Methods. Afterward, The Institutional Animal Care and Use Committee (CU-IACUC), Cairo University, Egypt, approved the animal housing and handling protocols. Feeding trials with The Broilers were kept in floor pens with similar growing conditions. Water and pelleted feed were always accessible. The broilers were given the control diet and the experimental diet included olive cake. Broilers were given Growing diets comprising 21 % crude protein. And study the effects of production on the growth rate, feed intake, European production index, blood parameters, and economic efficiency.

## Results and discussion

Regardless of the amount of OC, herbal and aromatic plant administration greatly boosted growth rate and enhanced output index. Regardless of the addition of OC at 20% and 30% to broiler diets had no discernible effect on feed intake, growth rate, or the European production index. Furthermore, regardless of OC level, supplementing with herbal and aromatic led to a considerable rise in the growth rate, of the European production index. Adding herbal and aromatic to meals with 20% and 30% OC significantly affects the blood parameters of the birds. Furthermore, Broilers-fed diets containing 20% -30 % reduce the feed cost.

## Conclusions

Even if the price of chicken ration is growing and animals are competing with humans for food, it is advised to use some of the waste portions of olives that humans do not eat as an alternative source of feed additives for poultry. Rations are administered when the appropriate processing processes are used since olive by-products can be put into broiler rations without impacting the animals' health, performance, digestibility, aroma, or nutrient content. The economical and efficient utilization of these byproducts will benefit businesses by reducing feed prices. It has been found that using these wastes as a feed component in broiler rations, together with the appropriate processing methods, can enhance broiler development performance, reduce the cost of producing broiler overall, and reduce the quantity of pollutants emitted into the environment.

## Acknowledge

The research leading to these results has received funding from the European Union's PRIMA Program for Research, Technological Development and Demonstration under grant agreement n°2013 and Basque Country government through the FEADER funds.

## References

- Mirabella, N., V. Castellani, S. Sala. 2014.** Current options for the valorization of food manufacturing waste: a review. *J. Clean. Prod.* 65:28-41.
- Mikail Y., Ayse G. F. and Gökhan F. 2021.** the effect of olive wastes for poultry feed on growth performance of broilers: a review. *J. Glob. Innov. Agric. Sci.*, 9(4):163-166
- Keser, O., Bilal, T. 2010.** Zeytin Sanayi Yan Ürünlerinin Hayvan Beslemede Kullanım Olanakları. *Hayvansal Üretim.* 51:64-72
- Sayehban, P., A. Seidavi, M. Dadashbeiki, A. Ghorbani, W. A. G. de Araújo, A. Durazzo, M. Lucarini, P. Gabrielli, B. Omri, L. F. T. Albino, E. B. Souto and A. Santini. 2020.** Olive Pulp and Exogenous Enzymes Feed Supplementation Effect on the Carcass and Offal in Broilers: A Preliminary Study. *Agriculture.* 10:359.