frontiers | Frontiers in Animal Science

TYPE Editorial
PUBLISHED 04 April 2023
DOI 10.3389/fanim.2023.1191259

OPEN ACCESS

EDITED AND REVIEWED BY
David L. Harmon,
University of Kentucky, United States

*CORRESPONDENCE
Catarina Stefanello
catarina.stefanello@ufsm.br

SPECIALTY SECTION
This article was submitted to Animal Nutrition, a section of the journal Frontiers in Animal Science

RECEIVED 21 March 2023
ACCEPTED 29 March 2023
PUBLISHED 04 April 2023

CITATION
Stefanello C, Chen X and Pekel AY (2023) Editorial: Ingredients for poultry. *Front. Anim. Sci.* 4:1191259. doi: 10.3389/fanim.2023.1191259

Editorial: Ingredients for poultry

Catarina Stefanello[1]*, Xixi Chen[2] and Ahmet Yavuz Pekel[3]

[1]Department of Animal Sciences, Federal University of Santa Maria, Santa Maria, Brazil, [2]Department of Animal Breeding and Husbandry, Nutribins, LLC, Walnut, CA, United States, [3]Faculty of Veterinary Medicine, Istanbul University Cerrahpasa, Istanbul, Türkiye

KEYWORDS

broiler, corn, fruit pomace, intestinal health, meat composition, protease, sorghum

Editorial on the Research Topic
Ingredients for poultry

There are many available ingredients to include in dietary formulations for poultry, which present different nutritional compositions, market availability, energy and nutrient utilization, and anti-nutritional factors. In broiler diets, energy represents the major cost in feed formulations, followed by protein, and phosphorus. Additionally, the demand for more cost-effective energy and protein sources has increased along with the cost of ingredients and supplies. In this context, the poultry industry has been evaluating alternative ingredients aiming to reduce the final cost of diet formulation and to increase the profitability of production.

Alternative ingredients have been included in poultry diets specifically to partially replace corn and soybean meal (SBM), which are the main sources of energy and protein, respectively. Vegetable sources have been selected according to their nutritional composition, costs, characteristics that contribute to feed processing, and availability in different regions and countries. In animal-origin ingredients, energy and nutrient composition as well as protein digestibility and mineral bioavailability are more subjected to variability due to the type of raw materials used in its production, processing conditions, and variety of processing tissues and residues. Therefore, more research has been done to better understand the optimal recommended inclusion levels, nutritional matrix of vegetable or animal-origin alternative ingredients, their possible association with feed additives, and the standardization of their composition.

1 Ingredients for poultry

Even though energy and protein composition in alternative sources have been extensively studied, the effects of many other compounds have also been evaluated in different ingredients such as the omega-3 fatty acids as published by Tamasgen. Dietary omega-3 polyunsaturated fatty acids are essential for normal development and the maintenance of optimal health. The authors evaluated the effects of replacing SBM with a linseed meal in broiler diets on blood parameters, meat chemical composition, fatty acid profiles, and sensory characteristics. Linseed meal is a rich source of protein and energy, presenting high levels of fatty acids. The SBM replacement with increasing levels of linseed meal, from 0 to 26%, in broilers diets did not affect blood hematology, serum oxidative enzymes, meat sensory analyses, and the proximate composition of breast and thigh meat. However, the conclusion of this study indicated that breast meat linolenic acid and total

polyunsaturated fatty acids increased when 26% linseed meal replaced SBM, whereas thigh meat palmitic acid, stearic acid, and total fatty acids decreased with increased levels of linseed meal.

The inclusion of fruit pomaces as ingredients for poultry diets was reviewed by Mnisi et al. since global fruit production has almost one-third disposed of as waste. This includes a variety of pomaces such as apple, grape, watermelon, pomegranate, pineapple, citrus, and mango pomaces. Although there is variability in the composition of pomaces, the optimal inclusion levels and their effects on animal performance need further studies; the utilization of fruit pomaces as ingredients for poultry provides biologically active substances that could help to deliver efficient and sustainable poultry production.

Still focusing on vegetable ingredients for poultry, sorghum, millet, and cassava meal as alternative dietary energy sources to replace corn for quails were addressed by Mnisi et al. The authors indicated that productive performance, egg quality, meat quality, and economic efficiency can be influenced when these ingredients are used in diets for quails. Based on the authors` review, millet, crushed sorghum, and cassava meals would allow for sustainable quail intensification; however, it is important to establish their optimum inclusion levels, which can be combined with feed additives to ensure enhanced nutrient utilization.

The increasing costs of protein sources led to increases in protease supplementation. The growth performance of broilers fed with corn-SBM or corn-SBM-meat and bone meal diets supplemented with protease was studied by Vieira et al. Currently, there is a decrease in protein feedstuffs suppliers due to the growing demand for protein to feed humans worldwide. The increased public concerns regarding the environment and sustainability have also been putting pressure on the reduction of the waste generated by poultry production. For this reason, proteases have been used in broiler diets to improve protein digestibility and reduce nitrogen excretion. As demonstrated in this publication, commercial diets supplemented with 10,000 or 30,000 New Feed Protease/kg of feed lead to improvements in the feed conversion ratio of broiler chickens.

Plant-based extracts have been increasingly used to improve growth performance or improve intestinal health in broilers reared without or with intestinal challenges. The study conducted by Yin et al. evaluated the effects of *Galla chinensis* extract on growth performance, carcass traits, serum antioxidation, immune function, and gut microbiota of broilers. This extract has polyphenolic compounds, which contain gallotannins and gallic acid as the main bioactive components. Lower concentrations of *G. chinensis* extract supplementation (250 or 500 mg/kg) provided improvements in performance, serum antioxidants, anti-inflammation, and gut microbiota of broiler chickens compared to higher levels (1,000 or 2,000 mg/kg).

All the publications presented on this Research Topic can be seen as attempts to improve ingredient utilization for poultry or its association with feed additives. The ingredients` choice can present an impact on feed efficiency, economic parameters, and the sustainability of poultry production. More data is needed to create databases to formulate diets for broilers, quails, breeders, and laying hens, whereas all this information will contribute to a more accurate determination of active compounds, energy and nutrient utilization, and the effects on intestinal health of variable ingredients. Therefore, it can contribute to improving the precision of feed formulations, reducing nutrient excretion, and improving the efficiency of the feed industry worldwide, or at least enhancing poultry nutrition for regional development.

Author contributions

CS wrote the first draft of the manuscript. All authors contributed to the manuscript revision and approved the submitted version.

Conflict of interest

Author XC is employed by Nutribins, LLC, United States.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note