



Mini Review

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# Alternative Foods for Slow-Growing Broilers in the Amazon Region



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## Abstract

The creation of slow-growing broilers gradually increases throughout the world due to the requirement of the consumer demanding to have meat of differentiated quality at its table, produced in an ecologically sustainable way with new standards of well-being for the birds. In order to maintain this fragile production chain in amazon region, the search for a reduction in production costs is a constant, so the search and use of new ingredients that have the potential to feed the birds will bring productive and economic benefits especially to small and medium-sized producers. In this way, this review aims to present three alternative ingredients used by slow - growing chicken breeders from the Amazon region, the açai seed, the coconut meal and the palm kernel/oil cake.

**Keywords:** Agro-industrial co-product; Free range chicken; Sustainability

**Abbreviation:** BAPA: Brazilian Animal Protein Association; BATS: Brazilian Association of Technical Standards; NBR: Technical Notes; MALFS: Ministry of Agriculture Livestock and Food Supply; NPHP: National Poultry Health Program

## Introduction

In recent years, poultry farming has been the most productive sector, probably due to the remarkable technological progress that has taken place in several areas, with the increase of the main zootechnical indexes, which has resulted in an improvement in production volume, efficiency in production processes and quality to the final product [1,2]. According to the Brazilian Animal Protein Association (BAPA) in the year 2016 the production of chicken meat was 12.6 million tons. Therefore, it is necessary to use commercial strains genetically selected for high growth rate and excellent feed efficiency with the use of certain chemotherapeutic agents, growth promoters and anticoccidials.

## Discussion

The high competitiveness among large companies and the intensive production of broiler chicken [3] contributed to the emergence of the global trend that has emerged in recent years: that of consumers of products called "natural" or "organic", which have strengthened the market appearance of products with the least use of artificial techniques that may in any way influence the final product. As an example, we have the "green cattle" and the "hickory chicken" as options that have emerged in the last decades, being differentiated proposals for consumers concerned about health, food safety, the environment, sustainable ecology and a differentiated flavor of meat [4,5].

In Brazil, in order to resolve doubts regarding the many existing denominations, the Brazilian Association of Technical Standards (BATS), through NBR 16389, defined that slow-growing birds, to be inserted in the context of alternative poultry farming, need to be obtained from poultry breeding establishments registered with the Ministry of Agriculture, Livestock and Food Supply (MALFS) and that comply with the regulations of the National Program of Poultry Health (NPPH), and to provide other measures on the species [6].

Although slow-growing broilers strains has less potential for development, zootechnical performance and yields of noble meat parts than commercial broilers, their creation is justified by differentiated attributes in meat quality that are closer to those demanded by the emerging consumer market [7], as a differentiated flavor, firmer meat texture when compared to fast-growing broiler, and a much more pronounced meat color [8]. Slow-growing chickens have a high cost of production because they do not present a good feed conversion, as a result of the late slaughter age [9]. These birds allow some adaptations in the breeding system, due to the great rusticity and resistance when compared to fast-growing industrial chicken; which is one of the important aspects associated with this system, the fact that birds can feed on alternative products without prejudice to their performance [10]. In the course of science several researchers have

been developing works with the use of alternative food for birds. The investigations address the digestibility of the ingredients, their seasonality and clarify doubts in the way of supplying them, as well as their chemical composition. The results provide the justification for whether or not to use alternative food and, if there are negative factors in this use, how to reduce them. Thus, the good performance of the chicken is the primary objective [11].

One of the key factors in choosing an alternative ingredient is its availability throughout the year, so it is important to seek regional foods that have potential for use in animal feed, as a way to value local production, to destine the residue of industries, to reuse by-products, increase the culture of the population, and find a low-cost alternative to encourage small and medium-scale production. At this point, the northern region of Brazil stands out for its richness and diversity in products of plant origin, which have potential for use in poultry diets [12]. Thus, we highlight three potential low-cost alternatives to diet formulation for slow-growing broiler chickens, açai seed, palm kernel/oil cake, and coconut meal.

Açaí (*Euterpe oleracea* Mart.) is present throughout the Amazonian estuary, with higher concentration in the States of Pará, Amapá and Maranhão [13]. Different methods have been investigated for the use of açai agroindustry residue, such as its use for energy generation, for fertilizer production [14] and for antioxidant extraction. In animal feed, the use of the açai seed has aroused the interest of several producers, in some cases it has been occurring in an empirical way [15-17]. Also known as palm oil cake or almond pie, palm kernel cake (Guinean Elaeis) is generated by extracting almond oil from palm oil. It has a good amount of residual oil [18], because it is a potentially cheaper food, due to the absence of antinutritional factors, the levels of protein (14-19%), ethereal extract (3-20%), crude fiber (14-21%) palm oil pie was considered as a very competitive by-product in animal feed [19-21] and has been tested in the feeding of several species. And, the exploration made by the industries of the fruit of the coconut palm (*Cocos nucifera*) left a by-product, coconut meal, which presents with a possible chemical composition to be used as a food ingredient in nutritionally complete diets for poultry, pigs and fish [22].

To make better use of these unconventional foods, it is necessary to study their chemical composition and the metabolizable coefficient of their nutrients in order to produce balanced diets with adequate nutritional levels. The results of the metabolizable studies already justify the use of a particular ingredient and how to mitigate possible negative effects that may arise [11]. In addition, the evaluation of intestinal histomorphometry has emerged in the studies, since a higher villus height is related to the performance results, in which the birds present greater weight gain and better feed conversion, a fact related to intestinal mucosal integrity and metabolic process, which gives the characteristic of the bigger the size of the villi, the greater the capacity of digestion and absorption of nutrients, due to the greater area of contact and enzymatic effectiveness in the level of mucosa and intestinal lumen [23].

## Conclusion

Alternative feeding is a reality in the production of non-ruminants, especially slow-growing broilers, to reduce production costs. It is necessary to intensify research on the discovery and classification of potential alternative ingredients produced in the Amazon region, mainly effects on bird performance, bromatological composition and levels of inclusion.

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## Conflict of Interest

The authors declare that they have no conflict of interest.

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