Effects of Dietary Inclusion of Fermented Sludge from a Broiler Processing Plant on Performance and Carcass Composition of Broilers

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Abstract

An experiment was conducted to evaluate the effects of dietary inclusion of a fermented sludge from a broiler processing plant (FSBPP) on growth performance and processing yields. A total of 420 36-day-old birds were randomly assigned in three treatments with 10 replicates per 14 birds each. Treatments consisted of FSBPP inclusion at levels of 0 (control), 5, and 10% in each of the rearing diets. Feed and birds were weighed weekly up to 42 d to determine bodyweight (BW), feed intake (FI), and feed conversion (FC). Birds were processed (42 d) and major carcass parts deboned. The weight of carcass and deboned meat was recorded and the dressed carcass yield (DCY) and deboned meat yield (DMY) calculated as a percentage from BW prior to processing.

Introduction

• Around 70% of total costs of poultry production are attributable to feed cost (North, 1984). Consequently, availability of feed ingredients at reasonable prices has been a major concern of the broiler industry worldwide.

• Being located on an island, the Puerto Rican broiler producers have to deal with high feed cost and unreliable availability of feedstuffs.

• On the other hand, the industrial sector has to deal with increasingly stricter anti-pollution laws that force them to spend large amounts of their resources and capital on waste disposal.

• The local broiler industry produces annually approximately 35,000 Tons of liquid waste to be treated. The latter produces around 30,000 Tons per year of a viscous sludge containing 75% water that is disposed in landfills.

• Since more than half of feed ingredients used in Puerto Rico have been closed in recent years due to non-compliance with EPA regulations (AOF, 2004), it is urgent to find cost effective and biologically sound alternatives to transform this sludge from broiler processing plants (SBPP) into a viable resource.

• Studies with sludge from a tissue processing plant have shown it is possible to ferment this by-product and in doing so, increasing its value as a feed as well as producing a material that could be used for the production of feedstuffs.

• Thus, it is reasonable to hypothesize that fermented sludge from a broiler processing plant (FSBPP) could be useful as a feed resource on broiler diets, replacing part of the traditional ingredients (corn and soybean meal) of these diets.

Objectives

• To test the suitability of FSBPP for incorporation into broiler diets.

• To determine the effect of replacing part of the typical energy (corn) and protein (soybean meal) sources in the diet with FSBPP on growth performance and carcass composition of broilers.

Materials and Methods

Treatments

• Treatments consisted of incorporation of FSBPP at levels of 0% (control), 5, and 10% in the diets.

• All diets were formulated to be isoproteic and isocaloric among treatments according to NRC (1994) standards for broilers (Table 1).

FSBPP Production

Preceding to the experiment, FSBPP was produced mixing SBPP with 20% of cane molasses (w/w). Mixtures were stored under anaerobic conditions and maintained at room temperature (28-30 °C) for a period of 21 days. After this period, FSBPP was oven dried, ground to small particles, and stored on plastic sealed bags.

Table 1. Crude Protein and Metabolizable Energy contents of broiler diets.

<table>
<thead>
<tr>
<th>Content</th>
<th>Starter (1-14 days)</th>
<th>Grower (15-28 days)</th>
<th>Finisher (29-42 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein (%)</td>
<td>22.5</td>
<td>20.5</td>
<td>20.0</td>
</tr>
<tr>
<td>Metabolizable Energy (Mcal/kg)</td>
<td>3.10</td>
<td>3.10</td>
<td>3.10</td>
</tr>
</tbody>
</table>

Results

The effect of replacing part of the typical energy (corn) and protein (soybean meal) sources in the diet with FSBPP on growth performance and carcass composition of broilers.

An inclusion of up to 10% FSBPP could be used in broiler diets to replace part of the energy and protein sources in it without compromising growth performance and health while sustaining adequate processing yields.

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