The Chemical Composition and Nutritive Value of Mulberry Leaf as a Protein Source in Poultry Diets

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ABSTRACT

A study was conducted to determine the chemical composition of mulberry (*Morus alba*) leaf meal (MLM) and its nutritive value as a feed ingredient in diets of broiler and layer chickens. The crude dry matter, protein, ash, fat, crude fibre, NDF, ADF, Ca, P and gross energy contents were 89.3%, 29.8%, 11.8%, 11.1%, 32.3%, 22.8%, 0.28% 2.7% and 4220kcal/kg respectively. The amino acids composition of MLM indicates it is a good source of essential amino acids especially lysine 1.88% and leucine 2.55%. The overall ileal true amino acids availability was similar between layers and broilers. The digestibility coefficients of individual amino acids for aspartic acid, glutamic acid, tyrosine, histidine, argnine, glycine and tryptophan was significantly ($p<0.05$) higher for layers compared to those for broilers. However, the digestibility of methionine was higher ($P<0.05$) in broilers than layers.

Key words: mulberry, leaf meal, digestibility, amino acids, layers, broilers

INTRODUCTION

Mulberry grows well in the tropics and subtropics, and is reported to have excellent nutritional value. It is grown extensively for leaves, which are used for raising silkworms in the sericulture industry. Mulberry leaves are very rich in protein (15-35%), minerals (2.42-4.71% Ca, 0.23-0.97% P, 1130-2240 kcal/kg metabolitezable energy and absence of anti-nutritional factors (Omar *et al*., 1999; Sanchez, 2002, 2000; Saddul *et al*., 2003; Sarita *et al*., 2006). Its protein quality is comparable to those of soybean meal (Machii, 1989). Excellent results have been obtained with mulberry leaves as ruminant feed (Rojas & Benavides, 1994; Oviedo *et al*., 1994; Esquivel *et al*., 1996; Gonzalez, 1996). Published values on the digestibility of amino acids and chemical components for chickens are lacking. Thus the objectives of this study were to determine the nutrient composition and amino acid availability to chicks.

MATERIALS AND METHODS

Birds and Housing

Fifteen layer (Isa-brown strain) and fifteen male broiler (cobb strain) 17 weeks and 42 days old respectively were used in the experiment to determine amino acids availability of MLM. The birds were assigned to individual cages, during which time they were fed on a commercial layer and broiler finisher diet.

Diets

A basal diet (adaptation diet) which contained MLM as the sole source of dietary protein and DL- methionine was added at 0.12% in the basal diet. This diet was formulated to contain 16 % CP, 2850 kcal ME/kg. Assay diet was the same with basal diet except for the elimination of synthetic methionine. A protein-free diet was also formulated specifically to allow the determination of endogenous flows of amino acids. All diets were fed in mash form. Chromic oxide was included in all diets as an indigestible marker. The composition of the basal, assay and protein-free diet and its amino acid contents are shown in Table 1 and Table 2 respectively.

Feeding Trial

The chickens were offered the basal diet *ad libitum* for three days adaptation period, which is considered sufficient to eliminate the carry-over effect between the two different diets (Kadim *et*