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Rice Mill Feed: An Agro-Industrial By-Product with Potential for Rural Development

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Abstract

Rice mill feed is the by-product of rice (*Oryzae glaberrima*) milling in West Africa and Nigeria in particular. It is often referred to as rice husk, rice bran or rice offal by rice millers and feed millers. Most rice farming communities have small scale rice mills or the rice is taken to the city centres for milling. To the farmers, the waste has no economic value. Rice mill feed is made up of bran plus hull and some broken rice. Its crude protein (CP) concentration ranges from 50 to 60 g kg⁻¹ dry matter (DM) and crude fibre ranges from 300 to 400 g kg⁻¹ DM, whereas its total digestible nutrient concentration ranges from 30 to 40%.

This study evaluated the nutrient composition of rice mill feed as a potential source of feed for monogastric animals. Amino acid profile, water insoluble and water soluble non-starch- polysaccharides (NSP) and mineral concentrations of rice mill feed were determined using standard methods. Organic matter content of rice mill feed was 688 g kg⁻¹ DM with glutamic acid representing 13% of CP. Gross energy was 16.59 MJ kg⁻¹ DM. Water insoluble NSP were 57.6%, while water soluble NSP were 1.3%. Mineral analysis indicated high phosphorous concentration (5.35 g kg⁻¹ DM) compared to maize (0.9 g kg⁻¹ DM) present as phytate. Calcium, magnesium, sodium and potassium were 0.96, 3, 0.14 and 3.53 g kg⁻¹ DM respectively. A digestibility trial with broilers after phytase supplementation showed improved total tract mineral digestibility and significantly ($p < 0.05$) reduced phosphorous excretion (data not shown). The presence of glutamic acid (a glucogenic amino acid) which is involved in gut health might indicate that including rice mill feed in monogastric diets has a potential of influencing energy metabolisability, while enhancing gut health.

Rather than have their animals scavenge for food, rural rice farmers can utilise rice mill feed as a concentrate supplement for small ruminants or in addition to household left over food, feed it to pigs and indigenous poultry. This way, their income as well as protein intake can be increased. Appropriate strategies need to be employed to alleviate poverty in rural rice growing communities.

Keywords: Monogastric animals, nutrient composition, rice mill feed, rural development