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NUTRITIVE VALUE OF PEARL MILLET GRAINS FOR POULTRY FEED–A REVIEW

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Abstract: Pearl millet grain could be considered an alternative feed ingredient for poultry. It contains crude protein ranges from 10.30 to 12.96 per cent. The available carbohydrate content of pearl millet was 59.80 per cent whereas in maize it was 62.00 per cent. The ME value of pearl millet, as reviewed from several works, ranged from 2642 to 3445 kcal/kg.

Keywords: Pearl Millet, Nutritive Value, Poultry feed, Alternative feed ingredient.

INTRODUCTION

Pearl millet crop can be grown in areas such as drought, low soil fertility and high temperature where other cereal crops would not survive. The production of Pearl millet grain has increased from 3.5 m tons in 1960s to 9.5 m tons in 2010. Incorporation of pearl millet in place of maize can reduce the dependency on maize and also the cost of poultry production. Therefore, the nutritive values i.e., Proximate composition, Fibre fraction, Mineral contents, Carbohydrate and Metabolizabe energy values of pearl millet were reviewed.

PROXIMATE COMPOSITION: Crude protein content of pearl millet ranged from 10.30 (Rama Rao *et al.*, 2004) to 12.96 per cent (Purushothaman and Thirumalai, 1995) with an exceptionally high value of 17.00 per cent reported by Abate and Gomez, (1983/84). Per cent ether extract content of pearl millet ranged from 4.30 (NRC, 1994) to 7.02 (Abate and Gomez, 1983/84). While Abate and Gomez (1983/84) reported a higher crude fibre value, which was 4.33 per cent, fibre content of pearl millet generally varied from 1.97 (Raju *et al.*, 2004) to 3.00 per cent (NRC, 1994). The total ash content ranged from as low as 1.60 (Abdalla *et al*., 1998) to 6.90 per cent (Sinha *et al*., 1980). The NFE content reported was more or less similar (78.20, BIS, 1980; 77.11 per cent, Purushothaman and Thirumalai, 1995).

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FIBRE FRACTIONS: Fisher *et al*. (1999) reported that the NDF and ADF content of pearl millet were 19.00 and 6.80 per cent, respectively. The NDF, ADF, hemi cellulose, cellulose and lignin content of pearl millet were 14.51, 6.64, 7.87, 5.49 and 1.03 per cent, respectively (Balamurugan, 2004).

MINERAL COMPOSITION: Range of calcium content in pearl millet was as low as from 0.01 – 0.08 (NRC, 1994 and Abdalla *et al.,* 1998) to 0.13 – 0.14 per cent (BIS, 1980 and Ramachandra *et al*., 2004). Earlier reports showed higher value (0.72 – 0.75 per cent) of total phosphorus (BIS, 1980; Sinha *et al*., 1980). More variation in composition of trace minerals with high values in iron (570.00 mg/kg) and zinc (62.00 mg/kg) reported by Ramachandra *et al*. (2004) while NRC (1994) gave lower (25.00 and 13.00 mg/kg) values. But copper content reported by NRC (1994) was higher (22.00 mg/kg) whereas a low value of 2.20 mg/kg was reported by Shyam Sundar *et al*. (2004).

FATTY ACIDS: The n-3 fatty acid content was higher in all three hybrid pearl millet samples (3.2, 3.5 and 3.2 per cent) compared to sorghum (1.60 per cent), leading to n-6: n-3 fatty acid ratio of 13.72, 12.68 and 14.13 in pearl millet compared to 28.43 in sorghum (Danny Singh, 2004).

CARBOHYDRATE AND AVAILABLE CARBOHYDRATE: Prasad *et al*. (1997) estimated the total carbohydrate content of pearl millet and maize and reported a value of 74.70 per cent in pearl millet against a closer value of 75.30 per cent in maize. Available carbohydrate contents were higher in maize (64.30 vs 60.80 per cent) than the pearl millet (Sharma *et al*., 1979).

STARCH, SUGARS AND SOLUBLE CARBOHYDRATE: The starch content of pearl millet ranged from 58 to 70 per cent (Abdalla *et al.*, 1998) and Prasad *et al.* (1997) reported a value of 63.90 per cent. Hoover *et al.* (1996) reported that the yield of the starch was in the range 53.10 - 56.50 per cent on a whole grain basis. Rama Rao *et al.* (2003) estimated the soluble carbohydrate of pearl millet as 0.73 per cent against a value of 1.80 per cent in maize.

METABOLIZABLE ENERGY (ME) OF PEARL MILLET : WHOLE GRAIN

The ME value of pearl millet, as reviewed from several works, ranged from 2642 to 3445 kcal/kg with the lower value reported by BIS (1980) and the higher value by Prasad *et al.* (1997). Recently, Rama Rao *et al*. (2004) reported that the ME value of pearl millet was slightly lower than maize (3439 vs 3494 kcal/kg) but were higher than the previous reported value of 2736 and 3389 kcal/kg of pearl millet and maize, respectively.

GROUND GRAIN: Prasad *et al*. (1997) estimated the ME content of the whole and ground pearl millet grains separately and the values were similar at 3445 kcal/kg both and also were slightly higher than maize (3356 kcal/kg) which may be due to varietal differences.

CONCLUSION

Based on the review, Pearl millet grains are promising energy source and it could be incorporated in Poultry feed.

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