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Comparative study of chemical analysis and near infra red spectrophotometric data of proximate composition of rice polish

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Rice polish is widely used as a feed ingredient in livestock feed formulations.101 Rice polish samples were collected from rice mills at Anuradhapura, Polonnaruwa, Kuruneagala, Mahiyangana, Hambantota and Matara. Samples were analyzed by Near Infra Red reflectance analyzer (perten 8620) for proximate composition. After the NIR measurements of rice polish samples were subjected to chemical analysis for proximate composition. NIR analysis results and chemical analysis results were compared graphically and the linear regression was carried out to study the nature and the strength of relationship between chemical analysis data and NIR data.

77%of samples for Moisture, 47% of samples for Ash, 42% of samples for Crude protein, 47% of samples for Crude fat content and 34% of samples for Crude fiber showed a < 1% deviation from chemical analysis. The correlation coefficient (r) for NIR and Lab method was 0.870 for moisture content, 0.676 for Ash, 0.268 for Crude Protein, 0.790 for Crude fat and 0.644 for crude fiber. Coefficient of determinations (r^2) between two methods was 0.757, 0.457, 0.072, 0.625 and 0.415 respectively.

The Standard Error of difference for the mean values of Moisture for chemical method is 0.176 and 0.154 for NIR method. As these two values are low, it indicates that either method can be used for moisture determination. The values obtained were 0.389, 0.246 for Ash, 0.160, 0.190 for Crude Protein, 0.420, and 0.325 for Crude fat and 0.547, 0.483 for Crude Protein respectively.

These results indicate that the present calibration of NIR can be used only to predict moisture of Rice polish where as a new calibration is needed to predict Ash, Crude protein, Crude fat and Crude fiber.

There is a considerable variation in r^2 values of different areas for all the proximate components. That is suggests the variation in NIR results affect the factors other than chemical analysis variation specially in different areas.

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