Proximate traits of the seed and seed cake of shea butter tree (*Vitellaria pradoxa* C. F. Gaertn.) from Nigeria's savanna agroecological zone

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ABSTRACT

Introduction and objectives of the study: The shea tree has wide distribution in Nigeria. The seed fat has dietary, medicinal and commercial uses. However, proximate properties of the seed, much less the seed cake, of the Nigerian shea species have not been explored, which may partly explain the non-existent or low use of these products in the livestock feed industry. The objective of this study was to explore the proximate qualities of the seed and seed cake of the species across its distribution range in Nigeria.

Methodology and results: Proximate traits of the seed and seed cake of 8 accessions of *V. paradoxa* growing across the guinea and sudan savanna zones of Nigeria were investigated using standard laboratory procedures. Results indicated significant variation in all seed proximate traits except ash, across agroecological zones. In terms of the kernel cake, only moisture and fibre contents varied significantly with agroecological zone. All proximate traits of the seed/cake

varied remarkably across accessions. Variations in the energy and energy related proximate traits of the seed were 480.2 – 519.7 Cal/100g, 43.4 – 48.9% carbohydrate, 6.3 – 8.9% protein and 28.6 – 34.9% fat. Corresponding ranges for the seed cake were 305.2 – 348.6 Cal/100g, 58.4 – 71.9%, 7.6 – 10.1% and 2.8 – 4.0% for energy, CHO, protein and fat, repsectively. Principal component analysis identified energy related traits and fibre of the seed and all but fat of the seed cake as more discriminate traits for shea seed and seed cake classification on the basis of proximate quality. Substantial significant correlations occurred between the proximate traits of the seed and seed cake. Generally, the study established that shea seeds from Jalingo and Kachia locations had higher fat content. However, seed cake from Jalingo, Makurdi, Lokoja, Yola and Minna gave higher values of one or more of the energy related proximate traits of carbohydrate, protein, fat and energy.

Actual or potential application of findings: Results of this work are of interest to stakeholders seeking shea resources with high fat content in Nigeria and provide a basis for recommending shea seed and cake for the animal feed industry. It will also contribute to the effort to genetically upgrade the species in Nigeria.

Key words: Agroecology, nutritional content, principal component analysis, shea kernel, trait correlations.