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Baobab as a Natural Micronutrient Dietary Complement for Nutrition Security

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Introduction

Micronutrient malnutrition influences negatively the normal body development and health of more than 2 billion people worldwide (1). Many of them suffer from multiple deficiency problems. Iron deficiency anaemia affects 1.62 billion people with severe implications on the physical and neurophysiological development of children (2). Adequate Zinc is essential for body growth, immunity and cognitive development because of its involvement in DNA and protein synthesis; 17% of world population particularly children suffer from its deficiency (3). Recent survey shows that more than 3 billion of the world population is at risk of calcium deficiency (4). Muscular and heart problems are associated with magnesium deficiency, which is on the rise (5).

Indigenous forest fruit trees are natural and traditional supplements to staple diets. Baobab represents one of those which are used for this purpose. Some studies that are conducted to evaluate its nutritional value vary widely (6, 7). It is therefore decided to analyze the nutrient composition of baobab botanical parts which are used as diet supplement in East Africa.

Materials and Methods

Dry baobab pulp samples are randomly collected from different sites along virtual transects in Kilifi county, Kenia. Subsamples are transported to Justus-Liebig-University of Giessen, Germany, where their mineral content is analyzed using the method described by AOAC. The same procedure is applied on leaves and seeds (6, 7).

Results and discussion

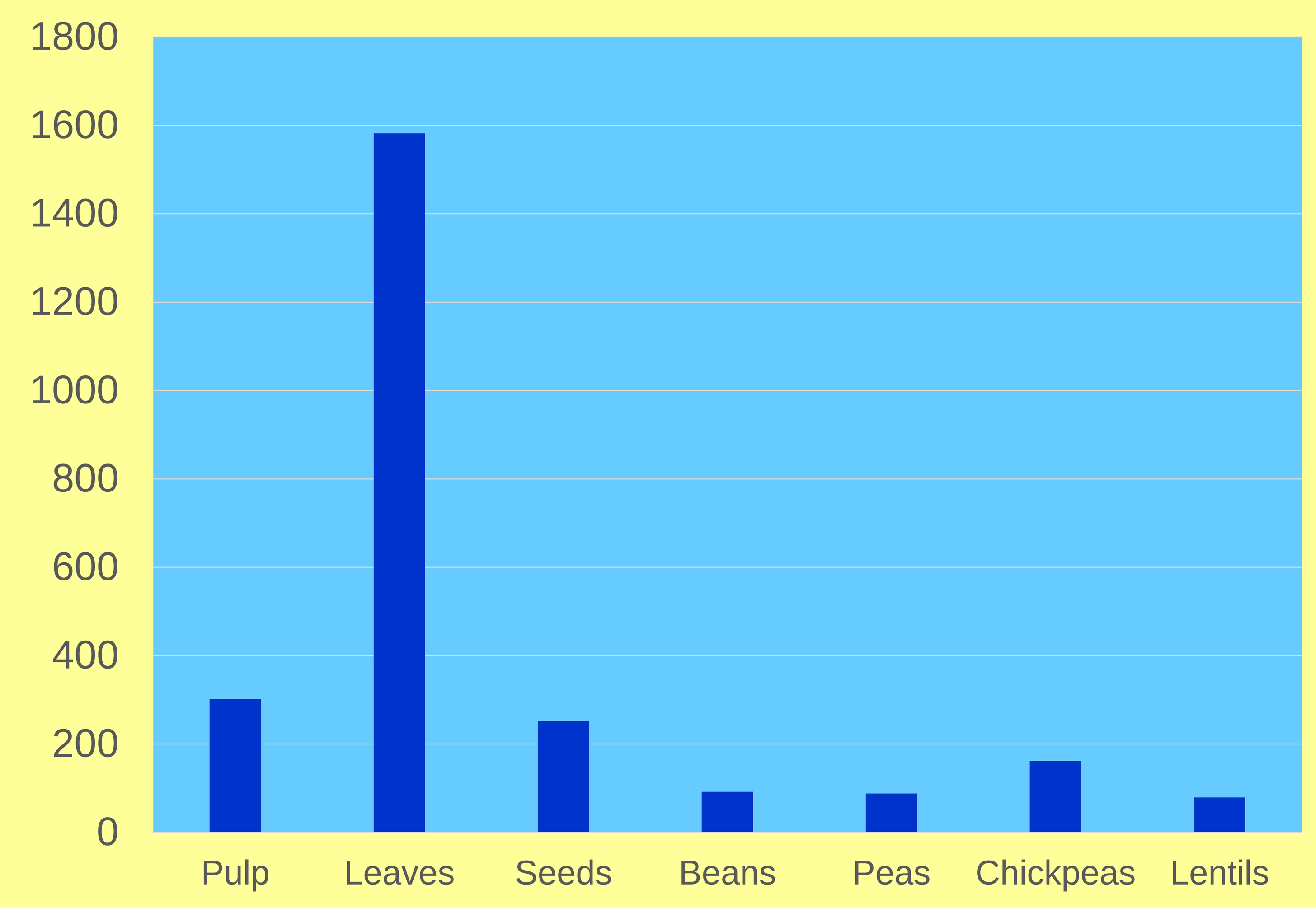

Figure 1. Calcium content of baobab parts and pulses (mg/100gDM)

The calcium content of the baobab fruit pulp is about 30% that of baobab leaves but double that of milk and 3 to 4 times that of leafy vegetables. The staple diet in sub-Sahara Africa consists largely of cereals, roots and tubers, which are low in Ca and rich in tannins and other polyphenols that hinder Ca absorption. Baobab pulp can complement the diet with its relatively high concentration of Ca and ascorbic acid that increase the bioavailability of the mineral. The baobab leaves can serve the same purpose.

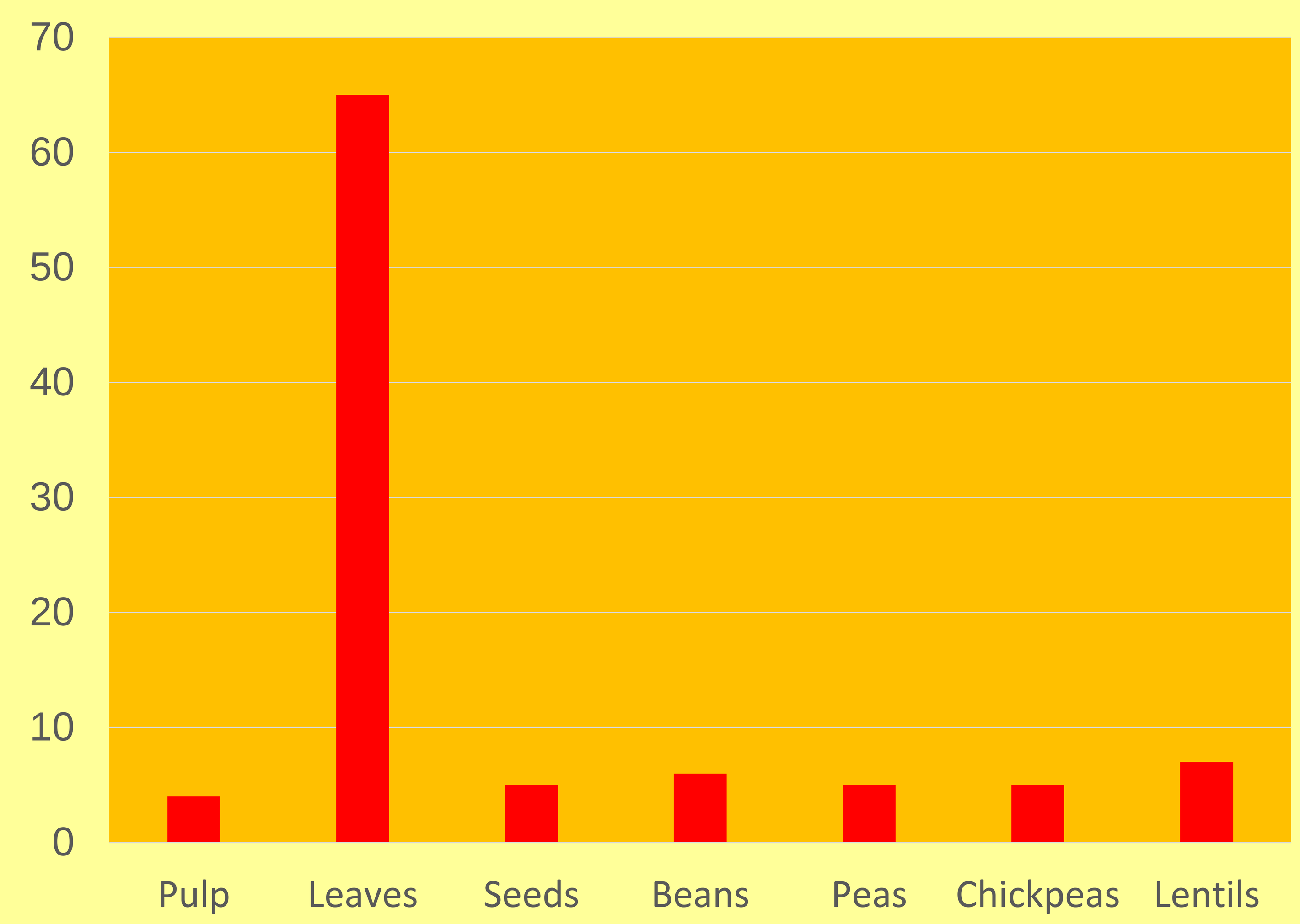

Figure 2. Iron content of baobab parts and pulses (mg/100gDM)

Baobab leaves contain more than 5x the iron in the richest conventional foodstuffs, the legumes, and more than 10x that in meat. The iron concentration of the pulp is similar to that in meat, however, its rich vitamin C content that promotes Fe bioavailability makes the pulp a desirable complement of the diet in eastern Kenia and West Sudan.

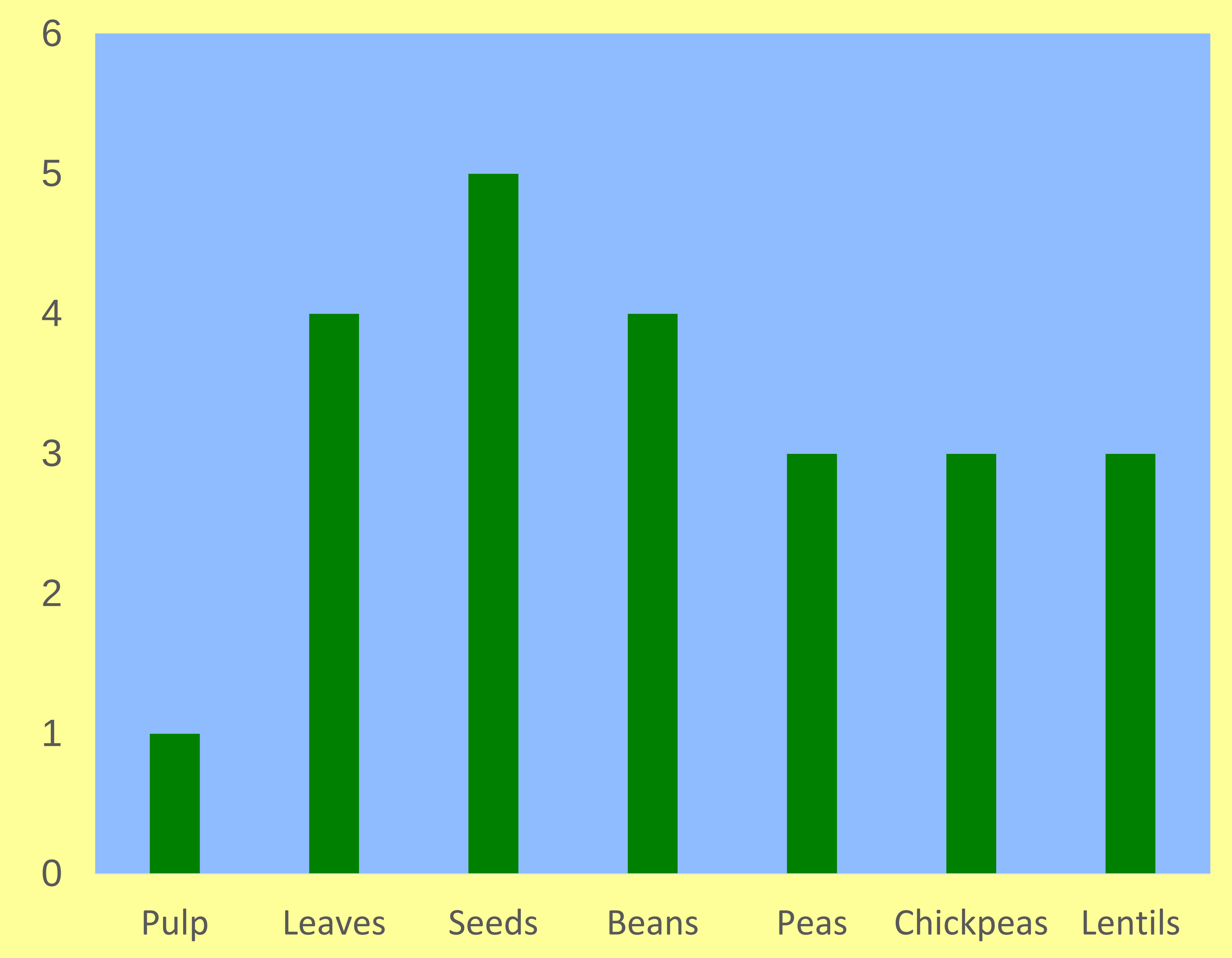

Figure 3. Zinc content of baobab parts and pulses (mg/100gDM)

The leaves and seeds of baobab contain significantly more Zinc than legumes and meat. They therefore have high potential of rectifying the widely spread deficiency that results in retarded growth and dermatitis in children and adolescents.

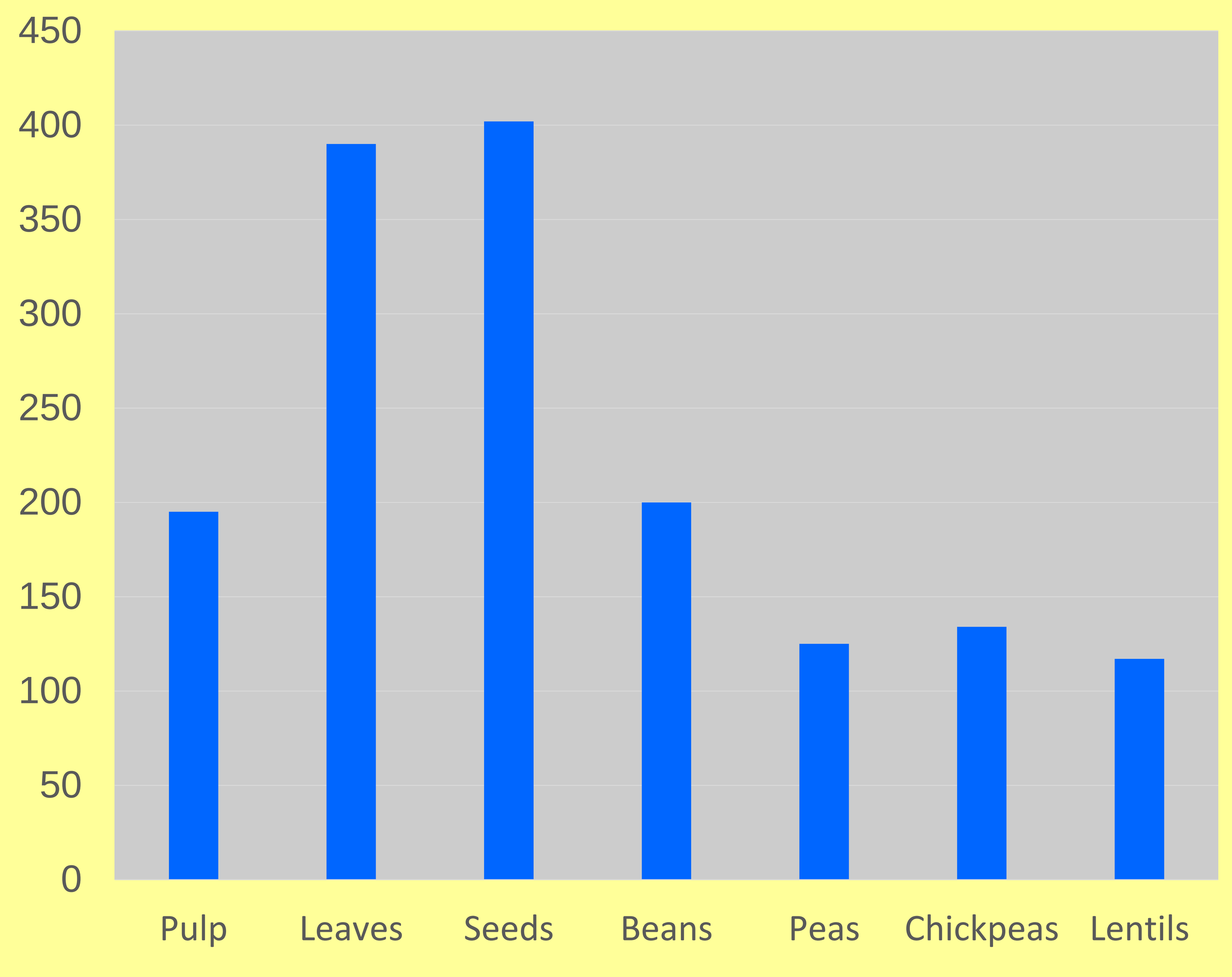

Figure 4. Magnesium content of baobab parts and pulses (mg/100gDM)

The magnesium content of baobab leaves and that of the seeds are in the order of 2.35x and 2.8x of pulses, the food ingredients commonly known as rich sources. Currently the average Mg content of the common diets in developing as well as developed countries is about 60% of the daily requirement. Recent evidence on the effect of Mg in relieving muscular pain, heart problems and its depleting effects, inflict the need for revision of old and unwarranted conviction that common diets contain adequate Mg.

Conclusion

Nearly half of the world population is at risk of mineral deficiency because of low availability and bioavailability. Baobab leaves that are characterized by extremely high content of calcium and iron, and the pulp with its moderately high concentration of calcium and high level of vitamin C, plus the seeds with high magnesium and zinc content, make the baobab a desirable complement of the daily diet.

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