

GEMSBOK BEANS.

(Bauhinia esculenta Burch.)

By G. T. BRAY, A.I.C.

"GEMSBOK" beans, derived from *Bauhinia esculenta* Burch. (N.O. *Leguminosæ*), a plant indigenous to South Africa, are stated to be eaten by both the natives and animals of the South-West Protectorate of the Union of South Africa. No analysis of the beans appears to be on record, and the following results of the examination of a sample recently received at the Imperial Institute from South Africa are therefore of interest.

The beans were dark reddish-brown, roughly spherical in shape, and about $\frac{1}{2}$ to $\frac{3}{8}$ in. in diameter. They had a woody shell, the inner surface of which was covered with a thin layer of opaque, tough, white, horny material. The kernel was fairly hard, cream-coloured, and oily, and had a pleasant nutty flavour with a faint bitter taste. The beans were composed of 49 per cent. of shell and 51 per cent. of kernel. The average weight of a bean was 2 grms. and that of a kernel 1 grm.

The results of the examination of the beans are given below :

	Moisture.	Crude Proteins.	Fat (extd. with sodium-dried ether).	Carbo-hydrates, etc. (by difference).	Crude Fibre.	Ash.	Nutrient Ratio.	Food Units.
Husks alone (per cent.)	8.5	2.5	0.2	67.2	19.8	1.8	1 : 27.1	74
Kernels alone ,,	4.0	32.8	41.6	17.2	1.3	3.1	1 : 3.4	203
Whole beans ,,	6.2	18.0	21.3	41.6	10.4	2.5	1 : 5.0	140

The beans are free from alkaloids and cyanogenetic glucosides.

A quantity of oil was extracted from the kernels with petroleum spirit, and was a golden yellow, limpid liquid with a nutty odour and an agreeable taste. On analysis the following figures were obtained :

Specific gravity at 15/15° C. ...	...	...	...	0.9211
Acid value ...	...	...	...	0.6
Saponification value ...	...	...	...	190.0
Iodine value (Hübl, 17 hours) ...	...	...	...	95.6
Volatile acids (soluble*) ...	...	...	...	0.3
Volatile acids (insoluble*) ...	...	...	...	0.1
Unsaponifiable matter, per cent. ...	...	...	...	0.8
Refractive index, $(n)_D^{40}$...	...	...	...	1.464
"Titre" of fatty acids °C. ...	...	...	...	30.6

The residual cake left after the expression of the oil would have the following composition (when calculated on the basis of a 7 per cent. oil content): Moisture, 6.4; crude proteins, 52.2; fat, 7.0; carbohydrates, etc. (by difference), 27.4; crude fibre, 2.1; and ash, 4.9 per cent. Nutrient ratio, 1 : 0.83; food units, 175.

The above examination shows the kernels to be rich in crude proteins and oil. The oil is of good appearance, and has constants very similar to those of cottonseed

* Number of c.c. $\frac{N}{10}$ potassium hydroxide solution required to neutralise the acids from 5 grms. of oil.

oil, and should be of value as an edible oil. The cake left after the expression of the oil contains a very high percentage of protein and a low amount of crude fibre. Its value would probably be well above that of decorticated cottonseed cake, but it would be advisable to carry out feeding trials with it before making a definite recommendation.

In India the seeds of *Bauhinia esculenta*, and also those of other species of *Bauhinia*, are employed as food, whilst those of *B. Vahlia* are stated to have medicinal properties.

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