

TO NIGERIAN FOOD SCIENCE AND TECHNOLOGY SOCIETY

**RAW MATERIALS DEVELOPMENT FOR THE
SURVIVAL OF NIGERIAN FOOD AND ALLIED
INDUSTRIES IN THE 21ST CENTURY**



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PERFORMANCE EVALUATION AND EFFICIENCY DETERMINATION OF FIRO DESIGNED
AND FABRICATED AFRICAN LOCUST BEANS DEHULLER/SEPARATOR FOR THE
PRODUCTIN OF DAWADDAWA.

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INTRODUCTION

Dawadawa is the right Housa name for the fermented soup and stew condiment or flavouring agent produced from African Locust Bean seed *Parkia biglobosa* Ogbadu et al. It is known as "Iri" in Yoruba, "Ogiri-Igala" in Igbo land. It is regarded as the most important food condiment in the entire savannah region of west and central Africa with different names. Odunfa². About 200,000 tons of African locust beans are gathered in Northern Nigeria alone yearly. But unfortunately Dawaddawa which is produced from this African locust beans is losing its popularity to other flavouring agents whose nutritive value cannot be compared.

In order to increase the acceptability of dawadawa, it is essential to modernise the production process, so as to upgrade the production level and present the product in a more hygienic and convenient form in the market. The unit-operations involved in production of Dawadawa include: -

- (i) Cooking;
- (ii) Dehulling/Separation
- (iii) Fermentation/conditioning
- (iv) Post fermentation treatment

The local method of doing all these is unhygienic, tedious and time consuming, hence FIRO decided to design, fabricate an equipment and modernised this method of Dawaddawa production.

MATERIALS AND METHOD

The designed and fabricated Dehuller/Separator works on the principles of rotation and floatation. It consists of a cylindrical barrel on a four-legged stand. Inside the barrel, is a shaft carrying a conical shaped wood enclosed by a rough perforation of stainless sheet formed to fit it which effects the dehulling through rubbing. The shaft has an extended handle outside for rotating it which is attached to the barrel with bearings.

For the evaluation, the cooked locust beans were introduced into the equipment with measured quantity of water. The dehulling process was effected by rubbing of the beans between the barrel and the conical shaped mechanism of the shaft by rotating the handle. The separation was by the flotation of the higher chaff on top and settling of the heavier (dehulled) beans below. The cleaned beans were then collected through the gate valve for further processing to dawaddawa. At every interval of operation, a sample was withdrawn to determine the level of dehulling and separation. Chemical composition analysis of FIRO sample and locally produced samples randomly selected was carried out.

RESULTS AND DISCUSSIONS

Table 1 presents the result of operation time of the equipment and hence the performance efficiency. From the table it was observed that after 90 minutes of operation, the cleaning was very close to 100%. The dual purpose equipment had drastically reduced the dehulling and separation period as established by Adewuyi³ and Odunfa² as 4-6 days and 12 hours respectively to just under four hours operation.

Table 2 gives the results of proximate chemical composition of fermented locust bean (Dawaddawa) local samples and FIIRO samples on moisture free basis. The variation in crude protein content of both samples could be due to some microbial contaminant involved in local fermentation process. The prevention of contaminant increases the fat level, and reduces the carbohydrate level in FIIRO Dawaddawa sample. The modernised fermentation process and the microbes involved did utilised the carbohydrate which actually brought out the desired flavour.

Apart from elimination of boring routine practice; reduction in production time to just below 4 hours and production of cleaner and better products; Dawadawa can now be produced at commercial scale using FIIRO's equipment and the new improved method.

Table 1: Efficiency of the Wet Dehuller/Separator

SN	Time of operation (mins.)	Approx. Percent recovery (dehulled seed)	Undehulled seed	Broken Seed
1	30	45	55	NIL
2	60	70	30	NIL
3	90	85	15	NIL
4	120	95	5	NIL
5	>120	100	NIL	NIL

Table 2 : Comparative Proximate Chemical Composition Of Dawadawa Produced Locally And FIIRO Samples

Components	Locust Beans Unfermented (%)	African Locust beans Dawadawa local sample	Processed % Dawadawa FIIRO
Samples	30	44.2	45.2
Crude protein	15	28.4	31.2
Fat	49	17.4	15.9
Carbohydrate	3.1	6.9	4.6
Crude Fibre	2.9	4.1	3.0
Ash			

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