



The Effect of Storage on the Nutrient Composition of Some Nigerian Foodstuffs: Banana and Plantain

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ABSTRACT: Changes in the nutrient composition during storage of plantain, banana, yam and cocoyam using different storage methods have been investigated. It has been shown that there was an increase in moisture content of banana and plantain during storage in open air, (28.2 ± 0.10 to $30.2 \pm 0.03\%$ for banana and 31.6 ± 0.18 to $34.1 \pm 0.2\%$ for plantain) after 9 days of storage. These were followed by a slight decrease in the deep refrigerator storage and then an over all increase in the deep freezer storage. Small changes were observed in crude protein and ether extracts during open air storage of banana and plantain as well as yam and cocoyam. A general trend of lowest nutrient values during deep freezer storage has been observed. It thus seems that storage of banana, plantain is better in a refrigerator than open air probably due to the minimized nutrient loss caused by metabolic activities such as respiration and sprouting. It should however be noted that for these food items, open air storage was in fact better than deep-freezer storage provided consumption is hastened since the deep freezer subjected the food stuffs to chilling injury and nutrient loss. @JASEM

The essential nutrients of food are carbohydrates, fat, protein, minerals, vitamins, fiber and water (Uddoh, 1980). Foodstuffs such as sweet potatoes, cassava, cocoyam and which are crops provide man with energy that enables him carry out his daily activities and constitute the main source of starch to the greater part of the tropical population. (Onwueme, 1978) other foodstuffs which are also of importance to man include fruits and vegetables. Seasonal harvest of foodstuffs is a pattern in most parts of Nigeria and bumper- harvests by farmers without adequate means of storage constitutes a waste of valuable nutrient.

MATERIALS AND METHODS

Materials: Samples of the four foodstuffs used were purchased fresh from Mile 1 Market in Port Harcourt. They include yam, cocoyam, plantain, and banana were all washed and dried before the study commenced. Various methods have been utilized during storage and include storage in open air (on shelves etc); storage in ordinary refrigerator and storage in deep freezer cabinets. These have their different effects on food items stored. The aim of this work is therefore to examine and determine amount of changes in the nutrient composition of four well-utilized Nigerian foodstuffs during different types of storage.

Storage of foodstuff: They were stored under three different conditions, open air, ordinary Refrigerator and deep freezer cabinet. Ten of each of the samples were stored in each case for a period of nine days for plantain and banana. Samples were drawn everyday/week for proximate analyses. The foodstuffs were ground and stored in airtight bottles prior to analysis. Moisture contents were determined by differential weight after subjecting them to oven treatment at 105°C for 24 hours. Crude protein was by Kjeldahl method (Arthur, 1975) Crude fiber was by the association of official Analytical Chemists (AOAC) method. (Arthur, 1960). The ether extract was determined by the soxhlet extraction method (Hulan, 1976). The ash content and the nitrogen free extract were done by Cockerell et al (1975).

RESULTS AND DISCUSSION

Percentage crude protein: The results got are shown in table 1. There was an overall increase in the crude protein content of banana and plantain stored in open air in contrast to a lower content found in ordinary refrigerator and deep freezer storage. During the open-air storage, normal metabolic activities must have been going on including protein synthesis as both the ripe fruits and the unripe ones. These activities were however disrupted in the refrigerator and deep freezer cabinet.

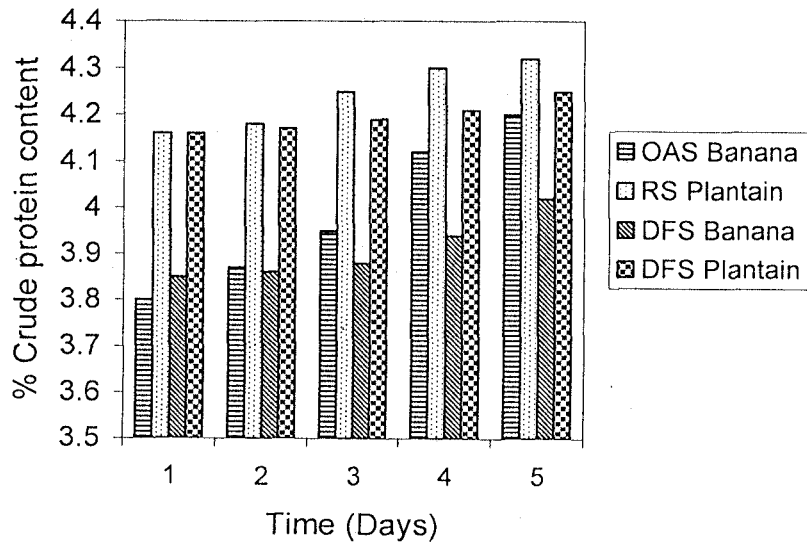


Fig 1. Percent Crude protein content of banana and plantain

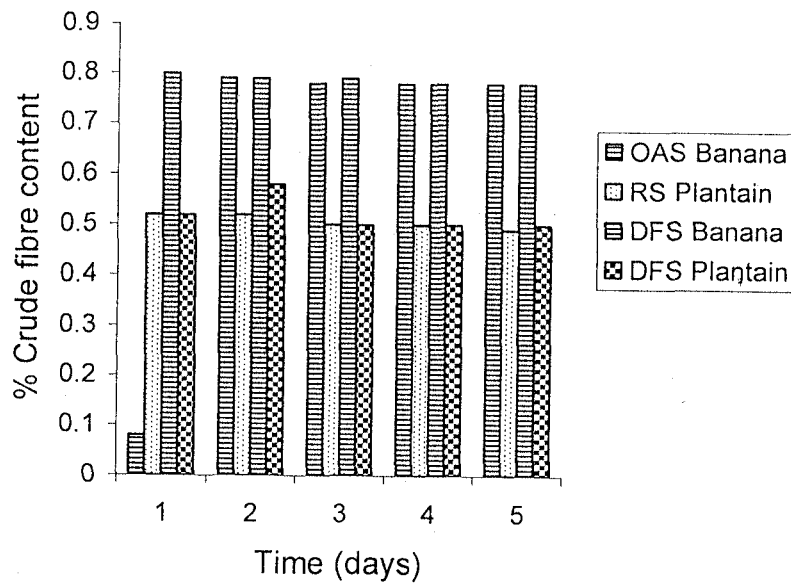


Fig 2. Percent crude fibre content of banana and plantain

There was a decrease in nitrogen free extract of banana and plantain stored in open air. The decrease is likely to be as a result of the provision for energy for certain metabolic activities during storage; for example ripening. This decrease is lower in refrigerator and deep freezer storage because of

temperature difference, which slowed down ripening. Cocoyam and yam followed the same trend.

Conclusion: It thus implies that storage of yam: plantain cocoyam and banansa can be made longer in a refrigerator than in open air. However, these

foodstuffs received slight physical changes due to chilling injury during their storage in the deep freezer cabinet.

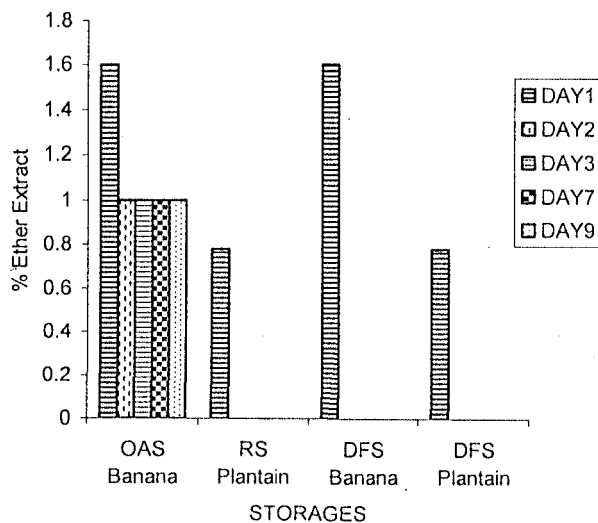


Fig 3. Percentage ether extract of banana and plantain

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