

**THE EFFECT OF TOTAL QUALITY MANAGEMENT
ON THE QUALITY OF LOCALLY PROCESSED RICE
IN SOUTHWESTERN NIGERIA**

BY

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ABSTRACT

This study examined quality of rice varieties, factors responsible for poor quality and appraised the total quality management (TQM) practices of rice farmers and millers in the rice producing communities of Osun and Ekiti States. This was with a view to developing a Total Quality Management framework for rice processing in the study area.

The research instruments used included questionnaire, interview schedule and observation. Twenty five paddy farmers and 25 rice millers patronizing the farmers were purposively selected through the extension workers of Agricultural Development Projects. Two hundred rice wholesalers and retailers and 300 rice consumers were randomly selected from the study area. Four types of questionnaire were designed according to functions performed by the stakeholders in rice processing and marketing chain. The first questionnaire for the paddy farmers elicited information on socio-economic characteristics of the farmers, varieties of rice planted and rice processing practices. The second questionnaire (complemented with interview schedule administered on the rice millers) elicited information on quality problems during processing, current processing techniques and quality management practices. The third questionnaire for wholesaler and retailers elicited information on varieties sold, specific quality attributes of the rice varieties (both imported and local), quality management during storage and transportation. The questionnaire for the rice consumers elicited information on customer satisfaction and quality preferences among others. Both local and imported rice samples were subjected to physicochemical analyzes and organoleptic tests using standard methods. The data generated were analyzed using descriptive and inferential statistics.

The results showed that there was no significant difference in moisture ($F = 2.7$, $p > 0.05$), protein ($F = 1.9$, $p > 0.05$) and crude fibre ($F = 1.5$, $p > 0.05$) of the local rice samples. However, there were significant differences in their ash contents ($F = 10.2$, $p < 0.05$) and carbohydrate contents ($F = 8.8$, $p < 0.05$). The grain sizes of the rice varieties were mainly long and medium except Osu, Erinmo stainless and Erinmo max varieties which were short. The 1000-grain weights and bulk densities of the various rice varieties ranged from 19.52 to 33.10 g and 0.57 to 0.66 g/ml, respectively. The water absorption capacities of the samples also ranged between 2.90 and 3.60 ml/g, respectively. The content analysis of the cause and effect relationships showed that poor operations management practices were responsible for low quality of rice such as high percentage of broken grains (12.62 – 38.06%), dockage (16.67 – 36.02%) and spotted grains (23.47 – 35.07%). Moreover, all varieties assessed were found to have similar mean gelatinization temperature (75°C) and peak viscosity (850 B.U.). Prominent technological and socio-economic factors responsible for variations in quality of rice included severity of steeping (above 48 hrs), steaming (above 30 mins) and drying treatments employed by processors, lack of quality standard program, financial constraints and low literacy level of the processor among others. The TQM elements implemented by rice processors which were poorly rated included team-work (7.7%), customer-supplier relationship (10.7%) and customer-focus (19.2%). The post harvest and TQM programmes were developed using these variables as inputs. The sensory evaluation of overall acceptability result showed that imported rice varieties were significantly different from the local ones in terms of aroma, taste, cohesiveness, colour and off flavour characteristics ($F = 10.15$; $p < 0.05$). Consumer's preferential quality characteristics which influenced their purchase decisions included among other long grain size (98%), absence of stone and foreign materials (91%), taste (83%), aroma (79%) and colour of grain (62%) when cooked.

In conclusion, the low quality of the locally processed rice was not due to their varietal characteristics but was attributable to poor quality and operations management practices by the stakeholders. The study also concluded that the developed post harvest and TQM programme will improve the quality of local processed rice.