# QUALITY AND STORAGE STUDIES OF INFANT PORRIDGE MIXTURES FORMULATED FROM RICE AND PULSES



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# ABSTRACT

Sound nutrition during infancy lays the foundation for the growth and development of children. Protein enriched cereal based food product is a promising alternative for people prone to Protein-Energy Malnutrition (PEM). The instant foods play a major role in the market and there is a good demand for them due to their convenience in preparation. Therefore, a research was set up to explore the possibilities of using locally available raw materials to develop a nutritious infant porridge mixture as a value added instant product and to evaluate the storage time using different packaging materials.

Seven types of blends were formulated in different proportions using 60% of red rice and 40% of pulses such as; black gram, green gram and cowpea. All the formulations had nutrient composition within the range of prescribed level for processed weaning foods and comparable to the marketed products. Instant porridge formulations were developed using pre-gelatinized rice and prepared flours. The weaning blends were evaluated for their nutritional, sensory attributes as screening steps to select the appropriate blend for storage studies.

Roasting reduces moisture content of the blends to an acceptable level and this is considered to be as safe for longer term storage. The use of pulses effectively increased the protein content of the weaning foods. The difference between means were compared using Tukey's studentized range test for sensory evaluation and Duncan's Multiple Range Test (DMRT), for physico-chemical and storage studies using Statistical Analysis System (SAS) software statistical package.

All the blends consisted of the required level of fat, total sugar, mineral and fibre content for weaning mixture. The results of the sensory analysis showed that, there were significance differences ($P<0.05$) between the treatments for sensory attributes except for consistency. The best four types of weaning mixtures were selected for further storage studies.

The selected weaning mixtures were stored in 4 types of packaging materials such as, low density polyethylene (LDPE), polypropylene (PP), polyvinylchloride (PVC) and laminates for a period of 3 months under ambient condition of average temperature of 30°C and relative humidity (RH) of 75-80%. Meanwhile laminate was found to be efficient packaging material compared to others. The results of the microbiological studies assured the safety of the weaning porridge mixtures. Storage study was carried out at 2 weeks interval and the results revealed declining trends for protein, fat, total sugars, mineral and fibre while an increasing trend was observed for the moisture content in all the packaged treatments. Despite these variations, all the supplements were found to be acceptable till 3 months of storage.

Treatment $T_6$ which made up of 60% red rice, 20% green gram and 20% black gram was identified as the suitable treatment in terms of nutrition, organoleptic and shelf life compared to other combinations. The treatment $T_6$ packaged in laminate consisted of 13.2% of protein, 2.8% of fat, 2.3% of total sugar, 2.4% of fibre and 3.1% of mineral at the end of the storage period. Therefore, treatment $T_6$ stored in laminate was the suitable combination to satisfy the nutrient requirement and shelf life of weaning foods. Study shows that, weaning foods which can be produced from the feasible materials in terms of economy and availability may be used as good palatable supplements for infants and it could provide affordable and convenient diet for lower income and malnourished consumers.

## TABLE OF CONTENTS