

**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<sub>6</sub> 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<sub>6</sub> 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<sub>6</sub> 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

ABSTRACT.....	i
ACKNOWLEDGEMENT .....	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES .....	xiii
LIST OF PLATES.....	xiii
LIST OF FIGURES.....	xiv
CHAPTER 01.....	1
1.0 INTRODUCTION.....	1
CHAPTER 02.....	6
2.0 REVIEW OF LITERATURE .....	6
2.1 NUTRITION .....	6
2.1.1 Nutrients.....	6
2.1.1.1 Carbohydrates .....	6
2.1.1.2 Protein .....	7
2.1.1.3 Fats .....	8
2.1.1.4 Vitamins .....	8
2.1.1.5 Minerals.....	8

2.1.1.6 Water .....	9
2.2 NUTRITION IN INFANCY .....	9
2.2.1 Growth pattern of infant in Sri Lanka .....	10
2.3 MAJOR NUTRITIONAL PROBLEMS IN SRI LANKA .....	10
2.3.1 Malnutrition. ....	10
2.3.2 Protein- Energy Malnutrition (PEM) .....	11
2.3.3 Micro Nutrient Malnutrition in Sri Lanka .....	11
2.4 NUTRITIONAL STATUS OF INFANTS IN DEVELOPING COUNTRIES ..	11
2.5 COMPLIMENTARY FEEDING .....	12
2.5.2 Weaning time .....	13
2.6 TYPES OF WEANING FOODS IN SRILANKA .....	14
2.6.1 Homestead based preparations.....	14
2.6.2 Thripasha .....	14
2.6.3 Commercial weaning foods .....	14
2.7 FORMULATION OF WEANING FOODS.....	16
2.7.1 Dry powder type infant foods.....	16
2.7.2 Reference pattern for vegetable weaning food mixtures.....	17
2.8 CEREAL AND PULSE-BASED PRODUCTS.....	18

2.8.1. Porridge-type products.....	18
2.9 CEREALS AND THEIR SIGNIFICANCES.....	21
2.9.1 Rice ( <i>Oryza sativa</i> ).....	21
2.9.1.1 Rice as staple food.....	21
2.9.1.2 Nutrients in Rice.....	22
2.10 PULSES.....	24
2.10.1 Importance of Pulses.....	24
2.10.2 Food Value of Pulses.....	24
2.10.3 Green gram ( <i>Vigna radiata</i> ).....	25
2.10.3.1 Nutritional value of green gram.....	25
2.10.3.2 Utilization for foods.....	26
2.10.4 Black gram ( <i>Vigna mungo</i> ).....	27
2.10.4.1 Nutritional value of black gram.....	28
2.10.4.2 Utilization.....	28
2.10.5 Cowpea ( <i>Vigna unguiculata</i> ).....	29
2.10.5.1 Nutritional value of cowpea.....	30
2.10.5.2 Utilization.....	30
2.11 TECHNOLOGY OF ROASTING.....	31
2.11.1 General Review.....	31

2.11.2 Principles Applied in Roasting .....	32
2.12 PEPPER ( <i>Piper nigrum</i> ).....	32
2.13 CUMIN ( <i>Cuminum cyminum</i> ) .....	32
2.14 COCONUT MILK.....	33
2.15 SHELF LIFE OF PRODUCTS.....	33
2.16 MAJOR MODES OF FOOD DETERIORATION .....	34
2.17 PACKAGING.....	34
2.17.1 Functions of packaging.....	34
2.17.2 Flexible plastic films.....	35
2.17.3 Polyethylene.....	36
2.17.4 Polypropylene .....	37
2.17.5 Polyvinyl chloride (PVC) .....	37
2.17.6 Laminated films .....	38
2.18 QUALITY PARAMETERS OF DRIED AND RELATED PRODUCTS.....	39
2.19 MICROBIOLOGICAL EXAMINATION .....	40
2.19.1 Total plate count .....	40
2.20 SENSORY EVALUATION .....	41
2.20.1 Testing area.....	42
2.20.2 Testing set up .....	42

2.20.3 Lighting.....	42
2.20.4 Testing schedule .....	42
2.20.5 Selection and training of panelists .....	43
2.20.6 Hedonic Rating test.....	43
2.20.7 Qualities assessed by sensory tests .....	43
2.20.7.1 Colour.....	44
2.20.7.2 Flavour .....	44
2.20.7.3 Texture .....	44
2.20.7.4 Taste .....	44
2.20.7.5 Mouth feel .....	45
2.20.7.6 Overall acceptability .....	45
CHAPTER 03.....	46
3.0 MATERIALS AND METHODS .....	46
3.1. Materials .....	46
3.1.1 Materials Used for the Study .....	46
3.1.2 Material Collection .....	47
3.2 Methods .....	47
3.2.1 Preparation of raw materials for porridge.....	47
3.2.2 Preparation of pre-gelatinized rice.....	48



3.2.3 Preparation of instant porridge mixtures.....	48
3.2.4 Tested treatments; .....	48
3.3 Sensory analysis .....	49
3.3.1 Materials used for the Sensory Evaluation .....	49
3.3.2 Coding the Samples .....	49
3.3.3 Serving of Samples .....	50
3.4 Physico-chemical Analysis.....	51
3.4.1. Determination of Moisture.....	51
3.4.1.1. Principle .....	51
3.4.1.2. Materials.....	51
3.4.1.3. Procedure.....	51
3.4.1.4. Calculation .....	52
3.4.2. Determination of Minerals.....	52
3.4.2.1. Principle .....	52
3.4.2.2. Materials.....	52
3.4.2.3. Procedure.....	52
3.4.2.4. Calculation .....	53
3.4.3. Determination of Protein .....	53
3.4.3.1. Principle .....	53

3.4.3.2. Materials.....	53
3.4.3.3. Procedure.....	54
3.4.4. Determination of Fat.....	55
3.4.4.1. Principle .....	55
3.4.4.2. Materials.....	56
3.4.4.3. Procedure.....	56
3.4.4.4. Calculation .....	56
3.4.5. Determination of Total Sugar Content.....	56
3.4.5.1. Principle .....	57
3.4.5.2. Materials.....	57
3.4.5.3. Procedure.....	57
3.4.5.4. Calculation .....	58
3.4.6. Determination of Crude fibre.....	58
3.4.6.1. Principle.....	58
3.4.6.2. Materials.....	58
3.4.6.3. Procedure.....	58
3.4.6.4. Calculation .....	59
3.5.1 The selected blends for storage studies.....	59
3.5.2 Packaging material used for storage studies .....	60

3.7.1 Materials .....	61
3.7.2 Procedure: .....	61
3.7.3 Total plate count .....	61
3.7.4 Procedure .....	62
3.7 Statistical analysis.....	62
CHAPTER 04.....	63
4.0 RESULTS AND DISCUSSION .....	63
4.1 Preliminary Studies.....	63
4.1.1 The List of Treatments as follows: .....	63
4.2 Nutritional Analysis.....	64
4.2.1 Moisture content .....	64
4.2.2 Protein Content .....	65
4.2.3 Total sugar .....	66
4.2.4 Crude fibre .....	67
4.2.5 Mineral.....	67
4.2.6 Fat content.....	68
4.3 Sensory evaluation of the infant porridge mixtures.....	70
4.3.1 Colour .....	71
4.3.2 Aroma .....	71