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ORIGINAL PAPER



Strategies for fighting against malnutrition in children below five years

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Malnutrition is a public health problem in developing countries, especially among children under five years. According to the National Health Survey 2019-2021, India has the problem of malnutrition in children with 7.7 % severely wasted, 19.3 % wasted and 35.5% stunted (GNR, 2021). Anaemia among children under-5 has become significantly worse with the current prevalence as 67.1% compared to 58.6% according to NFHS-4. GNR 2021 reported that Indian children do not meet the recommended dietary intake for essential food groups. Further, the Indian diet is significantly low in fruits, vegetables, legumes, nuts and milk which are crucial for optimum growth, development and prevention of malnutrition in children. WFP report revealed, that almost 21.25% Indian population lives on USD 1.90/day with a huge spectrum of inequality and social exclusion (GNR, 2021). Due to this reason, low-cost complementary foods which can be affordable with a large population will be the best solution to alleviate malnutrition in children of India. The following are recipes for low-cost foods formulations to eradicate malnutrition.

PREPARATION OF FOOD MATERIAL

All food materials were prepared following the standard procedures of Ikese *et al.* (2016) for broken wheat, Bazaz *et al.* (2016) for rice flour, Dipnaik and Bathere (2017) for germinated green gram flour and Dhiman *et al.* (2017) for ripe pumpkin flour. The pictorial flow sheet for showing the preparation of each food material is depicted in Plate. 1, 2, 3 and 4. The flours/grits of wheat, rice and green gram were roasted separately in a non-stick pan for 2-3 minutes till light brown to improve taste and remove beany flavour and antinutritional factors. The roasted flours were mixed with other food ingredients like pumpkin powder, sugar, spices and condiments depending on the recipe for the preparation of ready to cook instant weaning mix for infants and children.

Broken wheat

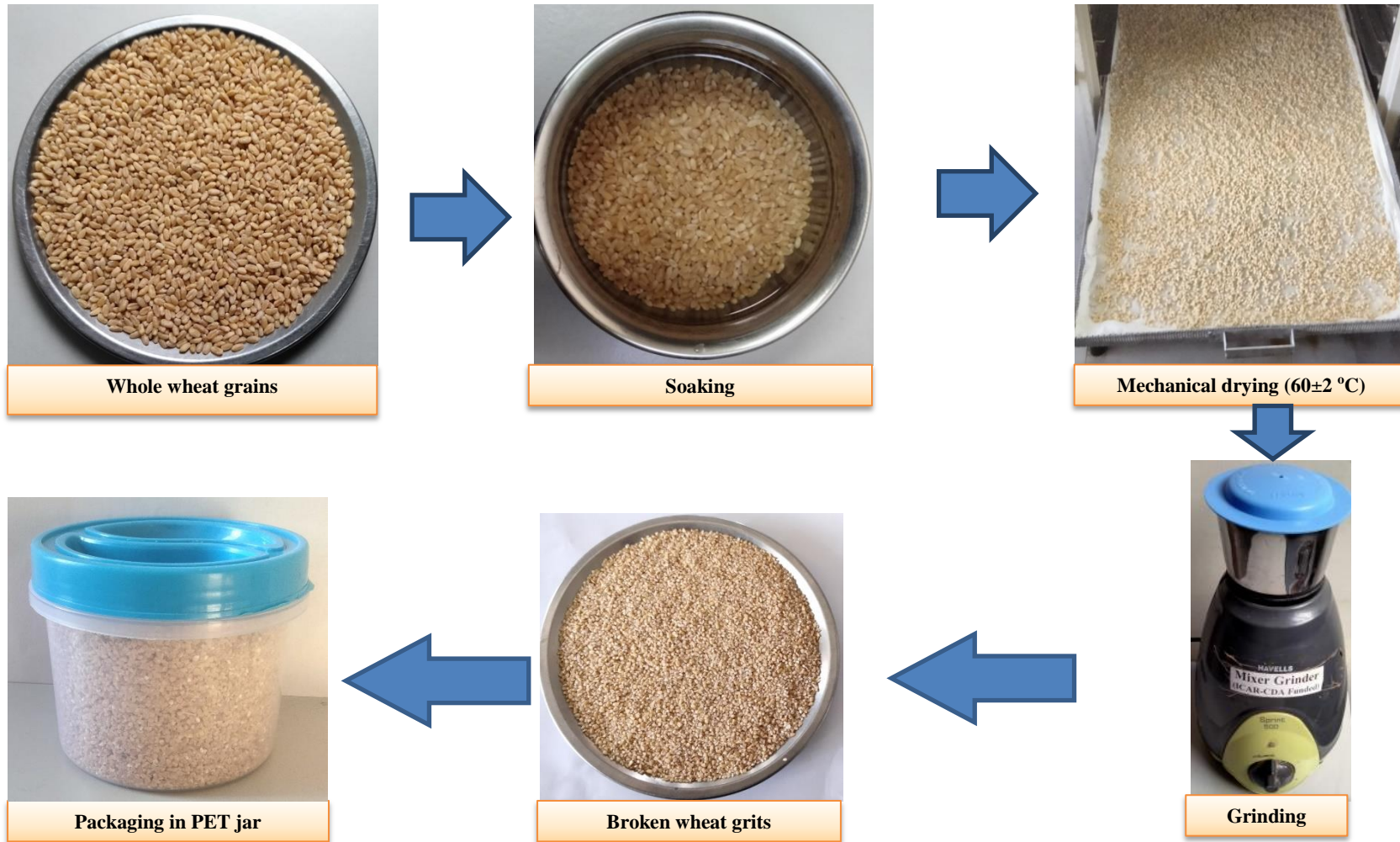


Plate 1: Unit operations for preparation of broken wheat grits

Rice flour



Plate 2: Unit operations for preparation of rice flour

Germinated green gram flour

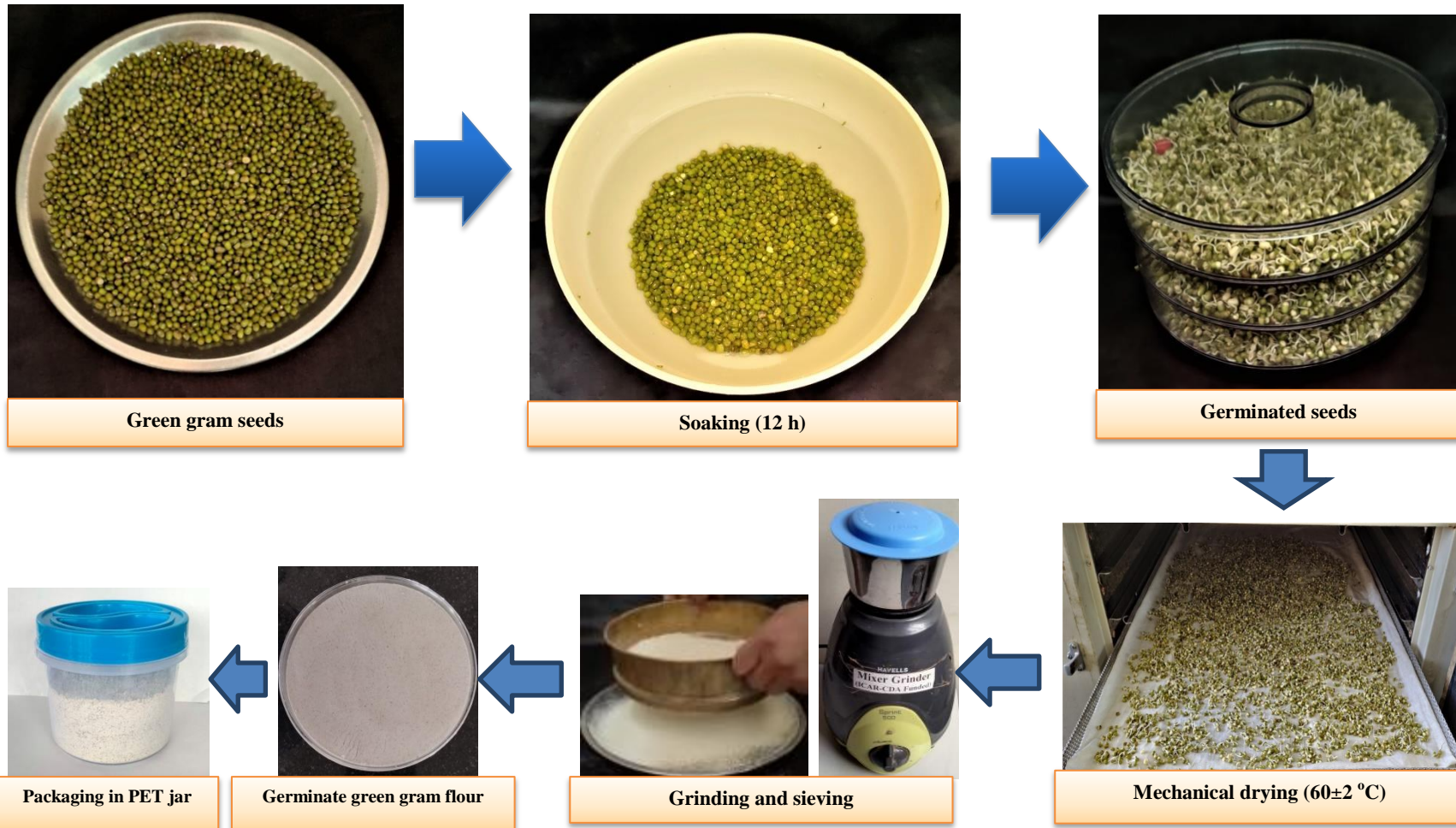


Plate3: Unit operations for preparation of germinated green gram flour

Ripe pumpkin powder

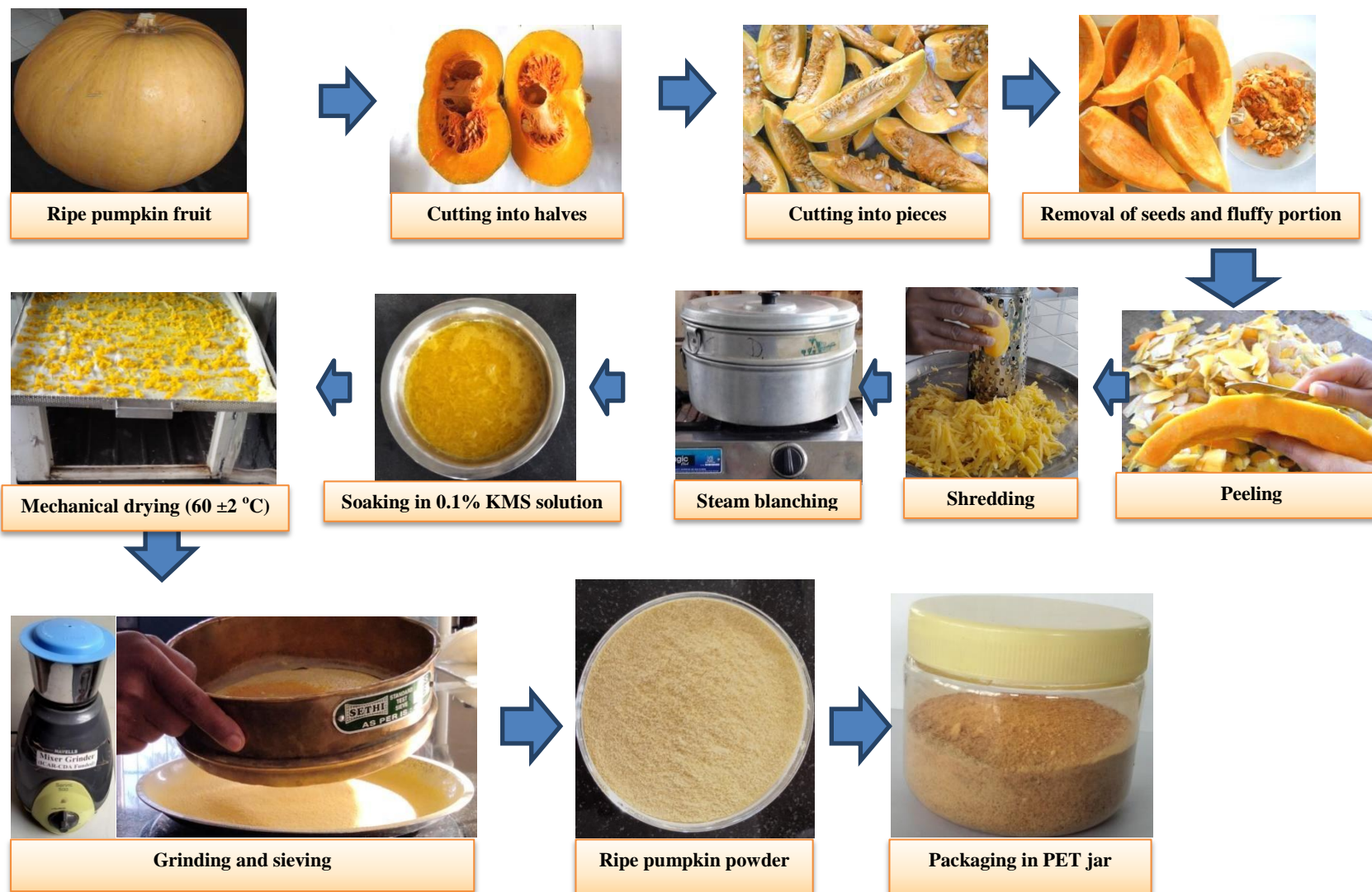


Plate 11: Unit operations for preparation of ripe pumpkin powder

Recipe 1: Ready-To-Cook Porridge (*Daliya*) Mix for serving**Ingredients:**

35 g broken wheat, 40g green gram flour, 25g pumpkin powder and 58 g sugar mix all food ingredients properly.

Preparation procedure:

Take 100 g of mix put it in a cooking pot, and add 600 mL of water and 16 mL of refined oil. Cook the mixture under medium flame with constant stirring for 15 minutes. Save to the children while lukewarm at least twice per day. This recipe is suitable for children of 9 months to 12 months (Chuwa, 2022).

Nutritional information of Ready-To-Cook Porridge (*Daliya*) Mix

- Moisture 2.90 %
- Protein 19.46 %
- Fat 4.91%
- Fibre 8.81%
- Carbohydrates 69.16 %
- β -carotene 3.04 mg/100 g
- Ash 2.34 %
- Energy 362.69 Kcal/100 g

Recipe 2: Ready-To-Cook Pancake (*Cheela*) Mix for serving**Ingredients:**

45 g rice flour, 30 g green gram flour, 25g pumpkin powder, 0.8 g table salt, 0.8 g black salt, 1.2 g garam masala and 0.8 g kitchen king masala, then mix all ingredients properly

Preparation procedure:

Take 100 g of mix put it in a bowl and add 90 mL of water with constant stirring till thick and consistent paste. Fry in a nonstick pan for 5 minutes while adding 12 mL of refined oil by turning upside down to a light brown colour. Save to the children while lukewarm at least twice per day. This recipe is suitable for children of 1 to 5 years (Chuwa, 2022).

Nutritional information of Ready-To-Cook Pancake (*Cheela*) Mix

- Moisture 5.72 %
- Protein 16.44 %
- Fat 1.71 %
- Fibre 4.19 %
- Carbohydrates 72.71 %
- β -carotene 2.22 mg/100 g
- Ash 3.30 %
- Energy 365.37 Kcal/100 g

CONCLUSION

Malnutrition problems in infants and children can be solved using local food materials available in communities which can be accessed at a low cost with highly nutritive value. Soaking, germination, drying and roasting are very important for cereal grains and pulses to remove antinutritive factors such as phytic acid, protease inhibitors, polyphenols, saponins and tannins which hinder the absorption of minerals such as iron, zinc magnesium calcium etc. Apart from preventing minerals absorption, also affect protein digestibility and amino acid availability eventually Protein Energy Malnutrition (PEM). Authors recommend these recipes with preparation flow sheets for the alleviation of malnutrition in low and middle-income countries.

REFERENCES

- Bazaz, R., Baba W. N and Masoodi, F. A. 2016. Development and quality evaluation of hypoallergic complementary foods from rice incorporated with sprouted green gram flour. *Cogent Food and Agriculture*, **2**:1-17.
- Chuwa, C. 2022. Low-cost complementary food formulations to combat malnutrition in infants and children. Ph. D. Thesis. Department of Food Science and Technology, Dr Yashwant Parmar University of Horticulture and Forestry, Nauni-Solan (HP). 239 pp.
- Dhiman, A. K., Vidiya, N., Attri, S and Ramachandran, P. 2017. Studies on development and storage stability of dehydrated pumpkin-based instant soup mix. *Journal of Applied and Natural Science*, **9**:1815-20.
- Dipnaik, K and Bathere, D. 2017. Effect of soaking and sprouting on protein content and transaminase activity in pulses. *International Journal of Research in Medical Sciences*, **5**:4271-76.
- Global Nutrition Report. 2021. India's nutrition profile and how to meet global nutrition target. Global nutrition report 2021 – India's nutrition profile and how to meet global nutrition target | ORF (orfonline.org). Accessed: 30th March, 2022.
- Ikese, O., Ubwa, S., Adoga, S., Lenka, J., Inalegwu, J., ocheje, M and Inegedu A. 2016. Proximate composition, antinutrients and some functional properties of a potential infant food made from wheat and groundnut. *International Journal of Food Science and Nutrition*, **1**:59-63.