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Short Note

Effect of blending and storage on the organoleptic quality of rice based weaning mixes

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Abstract

In the present investigation, nine different weaning foods were formulated using locally available cereals and pulses such as rice (*Oryza sativa*), green gram (*Vigna radiate*), Bengal gram (*Cicer arietinum*), amaranth (*Amaranthus sp.*), skim milk and jaggery. Domestic processing technique like roasting and popping were used to process cereals and pulses for development of weaning foods. The prepared mixes were stored in poly bags and were organoleptically evaluated fresh and after a period of 15 and 30 days. All the formulations were rated 'good' by the panelist on 9 point hedonic scale.

Key words: Blending, Organoleptic quality, rice based weaning mixes.

Weaning is the process of introduction of a range of solid foods into the diet of an infant. Every infant is different, and weaning typically takes place around 4-6 months of age(Gupte, 1991).The weaning process allows the infant to discover new tastes and textures, and to experience different types of foods (Minhas, 2006).

Cereals and pulses constitute an important source of dietary calories and protein for many of the world's population. Cereals are considered "unbalanced" in terms of amino acid composition because generally they lack in sufficient amount of lysine content of wheat protein. It is, therefore, a nutritional compliment to conventional cereals (NAC, 1984). The solution of the problem of malnutrition in our country fortunately does not call for expensive protein concentrates or other factory processed foods. So home based baby foods are easy to prepare and are nutritious.

Therefore, the present study was undertaken to formulate weaning foods from locally available cereals and pulses by employing roasting and popping as processing technique.

a) Procurement of material: Amaranth grains were procured from CSK HPKV, Palampur. The other ingredients i.e. rice flour, green gram, bengal gram, skim milk powder and jaggery etc. were procured from the local market.

b) Preparation of cereals, pulses and amaranth seeds

Rice flour: Flour was roasted in a cauldron (*karahi*) till light brown in colour.

Green gram: Green gram was purchased from the local market. The grains were cleaned manually and were roasted and milled in the willy mill.

Roasted Bengal gram: Roasted bengal gram was purchased from local market and was ground to a fine powder.

Amaranth seeds: The grains were cleaned manually and dried in the sun. The popping of amaranth samples was achieved by heating amaranth grains on a preheated cauldron up to desired temperature i.e. 220^0 C till all grains were properly popped. When the treatment was completed, the product was removed, allowed to cool and then ground to a fine powder. The ground samples were stored in airtight containers for further use.

c) Preparation of weaning foods: The formulations were selected in such a way that each weaning food could provide 300 Kcal, 6-9g protein and 6-9 mg iron per 100g per day. The following foods were developed:

1. Roasted rice (45 g), Roasted Bengal gram (25 g), Jaggery (30 g).
2. Roasted rice (40 g), Roasted green gram (20 g), Skim milk powder (15 g), Jaggery (25 g)
3. Roasted rice (35 g), Roasted Bengal gram (20 g), Amaranth (10 g), Skim milk powder (10 g), Jaggery (25 g)
4. Roasted rice (35 g), Roasted green gram (20 g), Amaranth (10 g), Skim milk powder (10 g), Jaggery (25 g)
5. Roasted rice (38 g), Roasted Bengal gram (22 g), Amaranth (15 g), Jaggery (25 g)
6. Roasted rice (38g), Roasted green gram (22g), Amaranth (15g), Jaggery (25g)
7. Roasted rice (40g), Roasted green gram (25g), Amaranth (20g), Jaggery (15g)
8. Roasted rice (40 g), Roasted Bengal gram (25 g), Amaranth (20 g), Jaggery (15 g)
9. Roasted rice (20 g), Roasted Bengal gram (20 g), Amaranth (25 g), Skim milk powder (20 g), Jaggery (15 g).

The above formulations were mixed and then stored in plastic poly packs and kept at room temperature. As per nutrient analysis the developed weaning foods contained 9.37 to 14.19g protein, 1.17 to 4.93g fat, 1.81 to 2.19g ash, 1.76 to 4.71g crude fiber and 321 to 350 Kcal energy per 100g which are at par with the commercially available weaning mixes.

d) Organoleptic evaluation: All recipes were prepared fresh by mixing with previously boiled and cooled water before serving .and presented to a panel of 10 judges for organoleptic evaluation. Specific sensory characteristics of each recipe (colour, flavour, taste, texture and overall acceptability) were rated separately on a scale of 1 to 9. Scores were defined as: 1- Very poor, 2-3- Poor, 4-5- Fair, 6-7- Good and 8-9- Excellent.

In Table 1, in case of fresh samples the minimum score for colour was 6.10 given to product 6 and the maximum score scored by weaning mix number 1 i.e. 6.80. After 15 days of storage the minimum score was 6.10 and maximum of 6.90 and after 30 days of storage the minimum score was 6.30 and the maximum score of 6.90. The developed weaning mixes showed non-significant differences among themselves at different levels of storage.

The flavour scores (Table 2) of nine different weaning mixes when fresh, varied from 5.90 to 7.70, whereas after 15 days the flavour scores ranged from 5.70 to 7.10. After 30 days of storage the flavour scores ranged from the minimum of 5.90 to the maximum of 6.50. With the advancement in storage period the declining trend was observed in the mean flavour scores. The decrease in score may be due to the presence of skim milk powder.

Table 1. Colour scores of weaning mixes at different levels of storage

Products	0 days	15 days	30 days
1	6.80	6.60	6.50
2	6.70	6.10	6.50
3	6.20	6.80	6.30
4	6.20	6.70	6.40
5	6.80	6.80	6.90
6	6.10	6.50	6.40
7	6.60	6.90	6.70
8	6.50	6.60	6.60
9	6.60	6.30	6.50
CD (P=0.05)	NS	NS	NS

Table 2. Flavour scores of weaning mixes at different levels of storage

Products	0 days	15 days	30 days
1	7.70	7.10	6.50
2	6.40	6.30	6.30
3	6.30	6.00	6.00
4	6.50	6.10	5.90
5	6.10	6.40	5.90
6	6.30	6.30	6.20
7	5.90	5.90	6.00
8	6.00	5.70	5.90
9	6.30	6.30	6.00
CD (P=0.05)	1.00	0.86	NS

The texture scores presented in Table 3 for the fresh samples varied from the minimum of 5.90 to the maximum of 7.40. After 15 days, the scores ranged from 6.30 to 7.20 and after 30 days the values of texture lies between 6.10 and 7.40. The texture score differed non-significantly with the increase in storage period.

Taste scores of different weaning mixes are presented in Table 4. The taste scores of weaning mixes when the samples were fresh, varied from 5.40 to 7.60. After 15 days of storage, the taste scores varied from 5.60 to 7.60 where as after 30 days the minimum score was 5.20 and the maximum was 6.80 as given by the panelists. The variation was due to the sensory evaluation scores given by the panel of judges. The overall acceptability scores of rice based weaning mixes at different levels of storage. The storage of weaning mixes for 30 days resulted in non- significant changes in organoleptic traits and all weaning mixes were found to be acceptable till the 30th day of storage. Anand and Malhotra (2010) reported that wheat based weaning mixes remained acceptable even after storage of 30 days. Amankwah *et al.* (2009) reported that the formulations of weaning foods from maize, rice, soybean with or without fish meal can be produced and had acceptable sensory qualities after 30 days. Similar results were reported by Dahiya and Kapoor (1994) except for taste and aroma of bajra based supplements and all the supplements containing

whole wheat, pearl millet, bengal gram, green gram grain and amaranth leaves were found to be acceptable. Reddy *et al.* (1990) also reported that weaning mixes remained acceptable even after being stored for a period of one month.

The results of the present study show that these developed weaning foods being economical, easily available and nutritious, could be very effective in ameliorating the common symptoms of protein energy malnutrition.

Table 3. Texture scores of weaning mixes at different levels of storage

Products	0 days	15 days	30 days
1	7.40	7.20	7.40
2	6.90	6.90	6.80
3	5.90	6.50	6.10
4	6.40	7.00	6.20
5	6.20	6.30	6.30
6	6.10	6.60	6.20
7	6.20	6.50	6.50
8	6.20	6.30	6.30
9	6.20	7.10	6.40
CD (P=0.05)	0.84	NS	NS

Table 4. Taste scores of weaning mixes at different levels of storage

Products	0 days	15 days	30 days
1	7.60	7.60	6.80
2	5.80	6.80	6.50
3	6.80	6.00	5.70
4	6.40	6.20	6.10
5	5.90	6.10	5.20
6	6.00	5.60	5.50
7	6.00	6.30	6.10
8	5.40	6.50	6.00
9	6.50	6.70	6.10
CD (P=0.05)	1.15	1.02	0.72

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