

A REVIEW ON FORMULATED WEANING FOOD, USING HOME APPLIANCES AND COST EFFICIENT

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Abstract : Weaning food is a gradual introduction of solid and semisolid food to the infant. Along with breast milk infant requires more nourishment. Weaning food provided to the infant from the age of 0.5 months must include all the necessary nutrients, vitamins and minerals. It should be rich in protein, iron, calcium and calories to fulfil their daily energy requirement. Weaning food provides additional amount for the growth and development of the infant. This review paper highlights the research work carried out on preparation of infant food using different raw materials and worked on various parameters such as nutritional values, sensory & analytical evaluation, physical characteristics and other important aspects.

Keywords : infants, weaning food, nutritional value.

Introduction

Weaning food are infant foods, made from processed ingredients to provide with adequate amount of nutrients to fulfill the daily requirement of the child. The calories and energy are needed at high amount for the optimal growth and development during early period. This is the weaning stage. Consumed food at first stage is of little nutritional value. Breast milk alone cannot fulfill the daily requirement of infants. Weaning food (WFs) is semisolid in nature easy to feed through spoon. Consistency should be thin, smooth puree to allow the baby to use the sucking reflex. Biting and chewing action improves speech and coordination between brain and body movement. Force-full feeding will result in further rejection of food. It depends on the physical behavior of the baby to handle food's other than milk. Salivary amylase activity start to develop after 2-3 months of age, and the infants become ready to handle more complex starch and most of the proteins up to 4-6 months of age.

Literature review and related work

S.E.O. MAHGOUB 1999[1]: Proposed five weaning food formulation (F1-F5) based on sorghum, groundnut, sesame seeds, chickpeas and skim milk powder, work evaluated for composition

functional properties, protein quality and effects on feeding on rat liver. The result indicated that F3 (60% sorghum, 20% chickpeas, 5% sesame, 8.5% skim milk powder, 5% sugar and 1.5% vitamins and minerals) and F2 (55% sorghum, 15% chickpeas, 5% groundnuts, 10% sesame, 8.5% skim milk powder, 5% sugar and 1.5% vitamins and minerals) formulation had composition and properties comparable to those of Cerelac hence have a good potential for use as weaning foods.

Modu S et al. 2013[2]: Proposed the work on weaning food blend which was prepared from an improved variety of maize (Marggi Red) and cowpea. Standard method was used for the analysis. The protein content (12.68 ± 0.45) was not able to meet the recommended dietary allowance of infants of weaning age. The calcium content of the WFs blend (50.08 ± 0.09) was compared with commercial weaning food friso crem (52.00). Processing result increase in vitro protein digestibility (77.91±0.29 to 83.40±1.96) at 1 hour and (83.93 ± 0.05) at 6 hours of the composite meal. There is a need to improve on the protein content as well as the calcium and Zinc since they are essential for the growing child.

Neeru Bala, Anisha Verma and Shikha Singh 2014[3]: Their objective of the study was to formulate composite weaning food using malted cereals legumes vegetable powder and oil seed and

analysis them for sensory attributes as well as nutrients and cost of the prepared Products. wheat flour (MWF), malted lentil flour (MLF), linseed carrot and potato flour was used in different levels for blends () for formulated and was subjected to organoleptic analysis for testing various sensory attributes via 9.8 hedonic scale. ANOVA was used for the statistical analysis. Energy, protein, fat, Carbohydrate and calcium were high. The cost of infant baby food per 100 gram range from Rs 3.44 to 4.27. Efforts to provide home based complementary foods that can be more cost effective to the low income families.

Francisca I et al 2013[4] : A composite of 47% , cowpea, 40% ripe banana and 13% peanut was processed analyzed to compare the actual nutrient composition to that predicted by the software and compare with commercial WFs produced by gerber products company rice with banana (RB) and oats with banana (OB). Composition was determined by AOAC method. Protein and oil contains had values of 16.8 9% and 8.3 8% , 6.9 % and 1.10 % and 12.0 3% and 3.16 % for WF, RB, OB respectively. Amounting to 76.69% of the total fatty acid, 15.9 6 gram per 100 gram total sugar contain and in vitro digestibility was in the order OB, WF, RB.

Intiaz, H. , BurhanUddin, M. and Gulzar M. A. 2011[5] : The aim of their study was to develop weaning food for the children of Bangladesh by using available resources. Five weaning formulations (F1-F5) based on germinated wheat and Mungbean, sugar and skim milk powder were processed and evaluated. The proximate composition results indicated that the moisture (5.26 to 25.12), protein (28.62 to 17.35), Ash (3.14 to 2.60), crude fiber (1.86 to 1.321) and carbohydrate (69.56 to 60.24) work within the range of standard WF. The composition and functional properties of F3 (44 % wheat flour, 36% mung Bean flour, 10% skim milk powder and 10% sugar) and F2 (56% wheat flour ,24% mung Bean flour 10% skim milk powder and 10% sugar) formulation compared to standard specification have good potential for use as WF.

Mohammed A. Satter et al. 2013[6]: Reported their work prepared from rice flakes, skim milk powder, butter and vitamin premix. The nutritional values like moisture , Ash, fat, protein, Carbohydrate and energy 2.43%, 2.26 % 11.3 2%, 15.9 8% ,1.0 6%, 75.3 5% and 45 6.6 kilo calorie per 100 gram

respectively. Bacterial status was observed satisfactory. The cost of the developed weaning food is cheaper than commercial product of same quality and suitable for low income people of Bangladesh.

Nada A. FATHELRAHMAN et al 2015[7] : Reported their work prepared from wheat flour supplementary with defatted sesame flour. The study revealed that protein digestibility arranged from 87.8 6-9 5.51. With increase the amount of sesame flour in the formula the content and sources of all amino acid as well as the protein digestive liver significantly increased. Iron contain of the diet arranged from 5.14 to 14.50 mg per 100 gram. Strongly recommended further study to determine the feasibility of producing the diet commercially at a large scale.

Shrikant Baslinggappa Swami, N.J.Thakor, H.S.Gurav March 2013[8]: Their objective was to study hydration characteristics of finger millet, investigated at different temperatures of 30°C, 40°C, 50°C and 60°C experimental data was fitted with peleg model. The activation energy was in the range of 1.9 to 7.2 MJ mol⁻¹ and decreased with increasing temperature 30 to 60 degree Celsius. Finger millet malt was prepared at various germination time 8, 12, 16, 20, 24 hours as germination time increases. The protein contain also increases the protein contain was in the range of 14% to 17.5%..

Gigi Veereman-Wauters, Belgium 2005[9] : Presented the work on supplementing infant formula with prebiotics. The bifidogenic effect of oligofructose and insulin is demonstrated. Oligofructose in infants and toddlers long chain insulin 10% and galacto oligosaccharides 90% mixture in term and preterm. The addition of prebiotics to infant formula soften in stools but other putative effect remain to demonstrated. Studies published post marketing show that infant fed a long chain insulin/galacto oligosaccharide (0.8 g/dl) in formulation had no side effects. The functional effects of prebiotics on infant held need to be studied in control intervention trails.

Anupama Semwal, Anupama Singh et al 2015[10] : Presented weaning mix developed from underutilized crops of Uttarakhand (finger millet, barnyard millet, black soybean, amaranth grain). Produced from probiotic fermentation technology by using probiotic strain

Lactobacillus plantarum. The experiments design for three variables with three levels [blend ratio (cereals : legume:: 50:50, 60:40, 70:30), fermentation time (12 h, 24 h, 36 h), inoculums concentration (1%, 3%, 5%)] and four responses (protein, tannin, water absorption capacity, water absorption index). The probiotic fermentation resulted in favorable changes in nutritional profile

of weaning mix resulting 48.2% increase in protein and 92.3% decrease in tannin content. The optimized set of independent variables (cereals (FM+BM): legume: 70:30 fermented for 25 h with 2.9% inoculum concentration) obtained after statistical analysis, was used to develop final probiotic weaning mix.

Serial no.	Title of Research Paper	Name of Author	Remark
1.	Production and evaluation of weaning foods based on sorghum and legume	S.E.O. MAHGOUB	Reported Formulated weaning food based on cereals and legumes. studied effect of feeding on rat liver
2.	Production and evaluation of weaning meal from fermented red maize fortified with cowpea	Modu S, IbrahimZ, Hajjagana L et al.	Proposed Proximate and elemental analysis does not meet the recommended dietary allowance.
3.	Development of low cost malted cereal and legume based nutritious weaning food to combat malnutrition in rural areas	Neeru Bala, Anisha Verma and Shikha Singh.	Reported that Highest energy was found T4 450 6.1 kilo calorie. Carbohydrate content increases with increase in amount of banana peel powder
4.	Formulation and nutritional evaluation of weaning food processed from cooking banana supplemented with cowpea and peanut	Francisca.l, Bassey et al.	Reported Formulation intended to act as supplement two breast milk and a transition milk from breast milk two solid to solid family diet recommend. fortification with minerals
5.	Evaluation of weaning foods formulated from germinated wheat and mung bean from Bangladesh	Imtiaz, H., BurhanUddin M and Gulzar	Proposed The overall acceptability score finding show that formulation ranged from like slantly to like moderately
6.	Development of nutritionally enriched instant winning food and its safety aspects	Mohammed A. Satter et al.	Report Highest in protein vitamin A and Vitamin B1 and Minerals Iron and

			Calcium has most satisfactory result help to reduce my nutrition situation in Bangladesh
7.	Development of weaning food from wheat flour supplemented with defatted sesame flour.	Nada A. FATHELRAHMAN et al.	Proposed Defatted sesame flour is an acceptable protein and mineral supplement
8.	Effect of soaking and melting on finger millet grain	Shrikant Baslingappa Swami, N.J.Thakor, H.S.Gura	He Proposed that germination time increases the protein contain also increases. Activation energy was 48.121 kj mol ⁻¹ .
9.	Application of prebiotics in infants	Gigi Veereman-Wauters	Proposed Supplementing infant formula with prebiotics. Addition of prebiotics soften stools but other putative effect remain to demonstrated
10.	Quality Assessment of prebiotics mix from fermented cereal- legume blends	Anupama Semwal, Anupama Singh, Khan Chand* and N.C. Shahi.	Report Weaning mix was developed from underutilized crops of (finger millet, barnyard millet, black soybean, amaranth grain). Produced from probiotic fermentation technology by using probiotic strain Lactobacillus plantarum

Conclusion

Weaning foods prepared using variety of processed raw materials are highly nutritive, rich in protein and having high energy density. WFs provide all the nutrients required on daily basis to the infants along with breastfeeding as recommended by

AOAC. The proposed work using home appliances are inexpensive compared to commercial products. Presented formulation will overcome numerous health related problems in infants, as good food gives healthy body leading to better nation. Hence said “Sahi Poshan Desh Roshan.”

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