ajfand SCHOLARLY, PEER REVIEWED
AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
Volume 20 No. 7 December 2020
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Afr. J. Food Agric. Nutr. Dev. 2020; 20(7): 16957-16968 https://doi.org/10.18697/ajfand.95.20005

ACCEPTABILITY OF A MUSHROOM ENRICHED COMPOSITE FLOUR AND PORRIDGE AMONG CHILD/MOTHER DYADS (6-24MONTHS) AT NABONGO DISPENSARY, KAKAMEGA COUNTY, KENYA

Mithamo FN[1], Kamande PW[2]*, Konyole SO [3], Musotsi AA[3] and AJ Sigot[3]

Mithamo Francis

Kamande W Purity

*Corresponding author email: wambuikamande@gmail.com

[1]Department of Health and Social Sciences, Ganana Institute of Medical Sciences and Technology- Garissa- Kenya

[2]Department of Health Promotion and Sport Science, Masinde Muliro University of Science & Technology, Kakamega- Kenya

[3]Department of Nutritional Sciences, Masinde Muliro University of Science & Technology-Kakamega-Kenya

ajfand SCHOLARLY, PEER REVIEWED AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT Volume 20 No. 7 December 2020 PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST ISSN 1684 5374

ABSTRACT

There has been increased emphasis on the consumption and utilization of affordable, and locally available indigenous foods in formulating food supplements due to the evidence-based nutritional and pharmacological value. Several studies have been devoted to how best these foods can be prepared, singly or as composites to come up with safe and nutritious foods that are acceptable to the target population. One of such composites that include oyster mushrooms and orange-fleshed sweet potatoes, millet, pumpkin seeds, and milk powder has been successfully developed at Masinde Muliro University of Science and Technology, Kenya. The flour with the acronym MMUSTMUG is rich in thiamin, fiber, low in fat, sodium free, good source of iron, and high in vitamin A. Acceptability of this flour is, however, key to it being embraced by the target population. The objective of the current study was to assess the acceptability of both the flour and its porridge in a cross-sectional study among 50 mother-child dyads at Nabongo dispensary in Kakamega County. Questionnaires on the appreciation of the food were administered to establish sensory liking and general acceptability of the porridge and the flour by the caregivers. These were assessed on a five-point hedonic scale. General comments by the mothers/caregivers were recorded verbatim. The porridge was considered acceptable if the child consumed at least 75% of the 100mls served. Means and standard deviations were calculated for the liking of the sensory attributes of the food. Among the participating children, 76% (n=38) consumed ≥75 mls of the served porridge. The means and the standard deviations of the liking for the sensory attributes of the porridge by the parents/caregivers were: (4.78±0.58) for color, (4.76±0.48) for aroma, (4.82±0.44) for taste and (4.80±0.50) for texture whereas the sensory evaluation of the porridge by infants stood at (4.14±1.20) on first sight of the porridge, (2.72±1.58) when child first received porridge and (4.38±0.97) on subsequent offers of the porridge. The color, aroma and texture of the flour were also highly rated. There was a positive correlation (Pearson's correlation) between the age of the child and the amount of porridge consumed. Both MMUSTMUG flour and porridge were acceptable to the study population and because of the better nutritional value should be promoted in the target population to help manage malnutrition.

Key words: Composite flour, Sensory, Acceptability, Children, Caregivers, Porridge, Mushroom, Sweet Potato

ajfand SCHOLARLY, PEER REVIEWED AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT Volume 20 No. 7 December 2020 PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST ISSN 1684 5374

INTRODUCTION

Proper nutrition allows children to live a healthy, active and productive life while malnutrition robs them of their future and leaves them disadvantaged for life [1]. The interaction between under-nutrition and diseases creates a potentially lethal cycle of worsening illness and deteriorating nutritional status [1]. Poor nutrition during the first 1000 days of a child's life can also lead to stunted growth, which is irreversible and associated with impaired cognitive ability and reduced work performance [2]. A previous study on the effects of undernutrition on the cognitive development among school-going children established that those who were undernourished had deficits in attention, calculation, intelligence, executive functioning, long term learning and memory [3].

Worldwide, 7.3% of children below the age of five years are wasted while 21.9% are stunted [1]. In Eastern Africa, the prevalence of wasting stands at 6% with that of stunting at 35.2% [1]. Although the Global Hunger Index has been improving year after year from 29.9% in the year 2000 to 21.8% in 2017, there is still a long way to go before zero hunger is realized [4]. In Kenya, the national prevalence of underweight among children below the age of five years was at 11% [2]. As a county, Kakamega, where this study was conducted, had a rate of 12.5% and 28.4% for severe and moderate stunting, respectively. The prevalence of severe and moderate wasting in this county was at 0.5% and 1.8%, respectively while prevalence of severe and moderate underweight was 2.2% and 10.1% in that order [2].

Malnutrition remains one of the leading causes of mortality and morbidity among children under-five in Kenya [2]. Manifestation of malnutrition presents in two forms: protein-energy malnutrition and micronutrient deficiency. Though there has been a reduction in the national prevalence of wasting in Kenya, the progress has been considerably slow as it has reduced to only 4% by the year 2017, from 7.1% in 1990 [4]. Kenya is among the top twenty countries affected by multiple micronutrient deficiencies globally, with a prevalence of 51.7%, ranking second after Niger [5]. According to Kenya Demographic Health Survey (KDHS) [2], the levels of wasting are highest among children in the age groups 6-8 months and 9-11 months (each seven percent). Eleven percent of the Kenyan children are underweight, with 2% classified as severely underweight [2]. By the age of 6 months, the infant has grown and has doubled their birth weight [6]. Due to this, there is increased demand for energy and other nutrients. Early age is a period of rapid growth and in turn, the protein requirements for younger infants are high, for example the reference nutrient intake (RNI) for protein of a 6-9months old child is 13.7 g/day. An infant requires, on average, 108kCal/kg/day compared to adults who require 30-40kCal/kg/day [7]. At 6-12months, there is decreased growth but increased activity.

As established by KDHS 2014, 80 % of children in Kenya are introduced to complementary feeding at the WHO recommended age of six months. It was also noted that nationally 4% of under-fives were wasted and 1% were found to be severely wasted [2]. This may be attributed to low-quality complementary foods. Brown and co-workers revealed that porridge, mainly made of cereals only and other forms of food given to children less than five years, are inadequate [8]. To meet the high energy and nutrient

demand, it calls for food supplementation using acceptable locally available nutrients rich foodstuffs like orange-fleshed sweet potatoes and mushroom, among others.

Vitamin A deficiency is a micronutrient deficiency that leads to blindness, retarded growth and death, particularly in developing countries. In these countries, vitamin A deficiency affects mostly preschool children, pregnant and lactating mothers and the rural poor. It is predicted that the prevalence of vitamin A deficiency for 36 sub-Saharan African countries is currently at 19.1% [5]. Notably also is that Kenya has the second-highest prevalence of vitamin A deficiency in the world (84.4%) [9].

Different strategies including vitamin A supplementation, food fortification and dietary diversification have been used in an effort to combat the problem of child malnutrition. However, these strategies are not sustainable due to their high cost [10]. The use of affordable indigenous foodstuffs and industrial processing procedures for the improvement of complementary foods has been previously recommended [11]. Complementary foods developed from locally available food materials are possible and when well-formulated are appropriate for resource-limited settings. Affordable complementary food formulations are needed, but such new formulations must be acceptable and should not be associated with any adverse health effects among target children [12]. Improvements of quality foods that can be used as complementary food has received substantial efforts by researchers and the evaluation of acceptability is among them. Understanding the eating attributes of a food is important as it provides a general picture of its utilization by target consumers.

Orange –fleshed sweet potato (OFSP) (*Ipomoea batata* L.Lam), an ingredient of our flour product is a low-priced crop, which is part of staple foods in most of sub-Saharan Africa and can be a year-round source of vitamin A [9]. Different varieties of OFSP have been found to have high amounts of β-carotene retention after cooking with the lowest having 76.6% retention [13]. Previous analysis of the nutrient content of a fermented cereal-legume weaning food enriched with 50% orange-fleshed sweet potato was found to contain 13.4% protein, 4.8% β-carotene (104.78 ug/g). The food provided 381.7 kcal per every 100 grams of dry matter [14]. Acceptability evaluation of the cereal-legume food containing varying proportions of orange-fleshed sweet potatoes was done using trained panel judges who found it to be acceptable [14]. These studies present OFSP as a nutritionally rich food that can be used to improve the nutritional value of daily family foods. Previously, sensory attributes of OFSP complementary food especially the yellow color have been found likable by caregivers [15]. Bread made from OFSP puree was found acceptable among consumers who also demonstrated a willingness to pay for this bread [16].

Mushroom on the other hand provides numerous macro and micronutrients. Laboratory analysis of oyster (*Pleurotusostreatus*) grown on hardwood sawdust indicated 26.67% protein content of dry weight matter. The micronutrient levels of the oyster mushrooms incorporated into the flour (mg/100g) were 3.51, 3.51, 22.81, 10.36, 1.25, and 0.96 for Ca, Na, K, P, Mg and Zn, respectively [17]. Daily food items like wheat flour *chapattis* supplemented with oyster mushroom were found to be acceptable among adult rural farm consumers [18]. β- glucans found in numerous mushroom species have been reported to

have immune-stimulating effects and anti-allergy properties [19]. Hence, this study determined the acceptability of mushroom enriched composite sweet potato flour and porridge among infants aged 6-24 months and their mother dyads.

MATERIALS AND METHODS

Study design, setting and population

Affective analysis of the flour, porridge and their sensory attributes was conducted using a cross-sectional study design. The study was conducted at Nabongo dispensary in Kakamega town in the western region of Kenya. The population was a representative of a low income setting that are more likely to suffer from malnutrition and would, therefore, mostly benefit from the complementary food like the one under this study [20]. The study population was mother-child dyads (6-24 months) attending Nabongo dispensary at the time of the study. Respondents were recruited continuously for three days until the sample size of 50 mother-child pairs was reached. Only healthy children brought to the health facility for regular child welfare clinic visits were recruited into the study with mothers' consent. Further inclusion criterion was that the caregiver had accepted to assess the flour samples and also taste the prepared porridge samples while feeding the same to the infant/child appropriately for tasting. The participants were those without any diagnosed illness, not allergic to any ingredients of the porridge and had visited the facility for routine growth monitoring. The mother/caregiver had to be above 18 years to give consent. For the children included, they were within the age of 6-24 months and had begun complementary feeding.

Efforts were made to modify the room where the study was being conducted so that it did not appear like a laboratory to the children. The room was well arranged and cleared of all clinical tools and equipment that would have increased the negative effect on the response of the study participants. The cooking pots and other dishes created a 'kitchen-like' environment. Nevertheless, the researchers acknowledge that even after modification, the room could not fully match the natural conditions that are found at home. The researchers ensured that it was made clear that there would be no reward for participating in the study, to ensure minimal bias in responses from the respondents.

The porridge was prepared as per the recipe given by the manufacturer on the packaging material. This was done in a room within the health facility, that had been offered to serve as a kitchen for the whole period of the study. A constant amount of table sugar and water were added in every preparation to ensure no variation in taste. One feed of 100 milliliters was served for each child. The porridge was served in a calibrated plastic cup for children and mothers asked to feed the child using the cup for 10-30 minutes or until the child refuses for two consecutive offers. Forced feeding was discouraged and this eliminated spillage and allowed determination of amount consumed from subtracting the remainder (if any) from the volume served. A sample of about 100g flour put in an almost flat bowl was presented to every mother for sensory rating. A similar container of the above-mentioned weight was used to ensure uniformity amongst the caregivers. All the processes were in a well-lit room to allow for adequate light to make the observations on both the flour and the porridge for purposes of recording color.

ajfand SCHOLARLY, PEER REVIEWED AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT Volume 20 No. 7 December 2020 PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST ISSN 1684 5374

The flour contains the following components: millet, OFSP, pumpkin seeds, milk powder and mushroom in the ratio 4:2:0.5:0.5:0.5 per kilogram respectively. In addition, it provides an average of 400kcal, 80g of carbohydrates, 11g of protein and 0.5g of fat per 100g. This composition is in line with the recommended nutrient intake for children aged 6-24 months who constituted the study population [7].

Data collection techniques

The acceptability of flour and porridge was assessed on a five-point hedonic scale as: 1. Dislike extremely, 2. Dislike slightly, 3. Neither like nor dislike, 4. Like slightly, 5. Like extremely

Acceptability by mothers/caregivers: each mother was asked to rate the following attributes of the porridge on the 5-point hedonic scale: color, aroma, taste and texture and overall preference. Caregivers also rated the color, aroma, and texture of the flour on the same scale, and the ratings recorded on questionnaires by the researcher. These indicators have previously been used to evaluate the acceptability of food among a similar population [21, 22].

Child acceptability: recommended food amount consumed and facial expressions, for example, and not limited to cue asking for more and a frowning face expressing rejection were used to evaluate the acceptability of the porridge among the child respondents. These non-verbal cues have previously been used in similar studies [23,24,25]. Similarly, the use of non-verbal cues is the practice of choice in the baby food industry [26].

Data analysis

Data were entered into and analyzed using Statistical Package of Social Sciences, SPSS (Versions 20 and 22) and presented in tables. Means and standard deviations were calculated for the rating of the sensory attributes of both the porridge and flour by the mother/caregiver and tested for any significant difference ($p \leq 0.05$). The means and standard deviation of the amount of porridge eaten by the child were also calculated. Significant difference was also tested ($p \leq 0.05$) in the liking of the porridge on first sight, initial and subsequent offers by the child as observed by the researcher. General comments by the mothers/caregivers were recorded *verbatim*.

Ethical and Logistical Considerations

Ethical clearance was obtained from Masinde Muliro University of Science & Technology Institutional Ethics Review Committee (MMUST/IERC/63/19). Written permission to carry out this study was obtained from both Lurambi Sub-County nutritionist and the clinical officer-in-charge of Nabongo dispensary. Only mothers/care givers 18 years and above were included in the study. The purpose of the study and the right to withdraw at will were explained orally to the study respondents before participating. Informed consent was obtained after which they signed a consent form. Furthermore, mothers were assured that failure to participate in the study will not deny them of the services they sought in the health facility at any time.

ajfand SCHOLARLY, PEER REVIEWED AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT Volume 20 No. 7 December 2020 PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST ISSN 1684 5374

RESULTS AND DISCUSSION

A total of 50 child-mother/caregiver dyads participated in the study with males and females comprising 52% (n=26) and 48% (n=24), respectively. This study's findings were similar to a study conducted in 2012 in the same county where the larger proportion of the participating children were male [12]. Thirty four percent (34%) (n=17) of the children respondents were of the ages between 6 to 12 months with the rest 66% (n=33) aged between 13 to 24 months.

The rating of the various sensory attributes of the flour and porridge by mothers/caregivers was as shown in Tables 1 and 2, respectively. The overall preference of the flour and porridge by mothers and caregivers scored highly with 96% and 90%, respectively.

It was important to involve mothers in the current study as it is important to ensure that there is maternal acceptability if a complementary food is to be widely used as was found by Muroki [21]. Previous studies have shown that in the case of intensity rating of sensory attributes, there is a hedonic bias which has been attributed to the intensity of data requiring an analytic mindset, which interferes with the synthetic mindset required in the overall evaluation [27].This might have contributed to the extreme overall liking of the flour and porridge by mothers who may have disliked one or more of the sensory attributes. Mothers seemed to enjoy the thick consistency of the porridge and regarded it as satisfying and easy to feed using a cup, which is the recommended mode as has been found by similar findings in previous studies [21]. Foods evaluated in a resource-limited setting like this one are likely to be unreasonably rated high. This may be attributed to the participants' mentality that some take-home food would be offered as a result of participating in the study [24].

The sensory acceptability of the porridge by the children as judged by their facial expression at different stages of feeding is presented in Table 3. Out of the 50 children, 38 (76%) of them consumed ≥ 75mls.The ambiance of the environment in which food is tested has been found to influence responses [28]. The hospital set up, therefore, may have contributed to poor acceptance of the porridge by some of the participating children as supported by a previous similar study [12]. Consumers' food acceptability is better evaluated at home where the respondents' eating habits are less likely to be influenced [12]. However, this would require good monitoring to ensure the respondents prepare the food as required or else there may be variations in sensory attributes, hence varied acceptability among food prepared by different caregivers resulting in the wrong conclusion.

Poor acceptance of the porridge by the children when they first received it may be partly attributed to the fact that some mothers described their children as generally hating porridge and others reported that feeding times were difficult for their children. Repeated exposure to a food has been demonstrated to effectively increase its acceptance and this may explain the increased liking of the porridge by the children on subsequent offers [29]. Although time-of-the day and level of liking were not compared in the current study, previous studies have shown that foods are likely to be rated higher when they are

eaten at the time of the day that corresponds to the typical eating time of the product [25]. Therefore, the lower liking by a small percentage of the participating children might have happened during the afternoon because porridge is typically eaten during the morning hours of the day [30].

The results of this study suggest acceptance of the food. Acceptance of both the mushroom enriched flour and porridge by the bigger proportion of the study participants is attributable to the fact that these locally available ingredients used are familiar to them [31]. The addition of sugar in the porridge during cooking improved the taste of the porridge and thus its acceptability among the study participants as supported by a previous study [32].

CONCLUSION

The researchers found both the enriched flour and porridge acceptable among the study population as shown by the mean scores of all the sensory attributes and overall preference by mothers. More than three-quarters of the participating infants consumed ≥75mls of the served porridge and this too suggested acceptance.

Future studies on food acceptability among a similar target population should consider performing the evaluation in study participants' homes. As the mushroom and orange flesh sweet potato porridge is nutritious and acceptable, the researchers recommend the porridge for complementary feeding to help meet the dietary needs of children for proper growth and development. It is also recommended that recommended nutrition education and counseling be provided to mothers and caregivers of children under 5 years concerning proper infant and young child feeding practices, where this product and similar ones would be included to ensure proper nutrition among this age group. Future studies should also consider carrying out a similar study amongst the various age categories in order to deduce if there exists a difference in the acceptability amongst the same.

ajfand SCHOLARLY, PEER REVIEWED AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT Volume 20 No. 7 December 2020 PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST ISSN 1684 5374

Table 1: Sensory attributes of flour as rated by mothers

Color	Aroma	Texture
4.80±0.54	4.80±0.45	4.88±0.33

Mean ± SD, n=50

Table 2: Sensory attributes of porridge as rated by mothers/caregivers

Color	Aroma	Taste	Texture
4.78±0.58	4.76±0.48	4.82±0.44	4.80±0.50

Mean± SD, n=50

Table 3: Acceptability of porridge by children

Child facial expression on first sight of porridge	Child facial expression when first received porridge	Child facial expression on subsequent offers
4.14±1.20	2.72±1.58	4.38±0.97

Mean ± SD n= 50

https://doi.org/10.18697/ajfand.95.20005

REFERENCES

1. **UNICEF, WHO, International Bank for Reconstruction and Development/ The World Bank**. Levels and trends in child malnutrition: key findings of the 2019 Edition of the Joint Child Malnutrition Estimates. Geneva: World Health Organization, 2019.

2. **Kenya Demographic and Health Survey**, 2014. Nutrition of Children and Women. 157-182.

3. **Handa R, Kesari KK and R Prasad** Effects of Undernutrition on the Cognitive Development of Children. IJFNPH. 2010; **3**(**2**): 14.

4. **Von Grebmer K, Bernstein J, Hossain N, Brown T, Prasai N, Yohannes Y, Patterson F, Sonntag A, Zimmermann SM, Towey O and C Foley** Global Hunger Index: The Inequalities of Hunger. Washington, DC: International Food Policy Research Institute; Bonn: Welthungerhilfe; and Dublin: Concern Worldwide, 2017; 11.

5. **Muthayya S, Rah JH, Sugimoto JD, Roos FF, Kraemer K and RE Black** The Global Hidden Hunger Indices and Maps: An Advocacy Tool for Action. PLoS ONE. 2013; **8**(**6**): 4.

6. **Neumann CG and M Alpaugh** Birth weight Doubling Time: A Fresh Look. *J.Pediatr*. 1976; **57**(**4**): 471-472.

7. **British Nutrition Foundation.** Department of Health, Dietary Reference Values for Food Energy and Nutrients for the United Kingdom, HMSO, 1991. SACN Vitamin D and Health, 2016.

8. **Brown KH, Dewey K and L Allen** Complementary Feeding of Young Children in Developing Countries: A Review of Current Scientific Knowledge. Geneva: WHO, 1998.

9. **Fekadu G, Shimelis H and M Laing** The potential of Orange-fleshed Sweet potato to prevent vitamin A deficiency in Africa (abstract), *Int J Vitam Nutr Res*. 2014; **84**: 1-2.

10. **Dewey KG and KH Brown** Update on Technical Issues Concerning Complementary Feeding of Young Children in Developing countries and Implications for Intervention Programs. *Food Nutr Bull*. 2003; **24**(**1**): 5-25.

11. **WHO.** Summary of guiding principles for complementary feeding of the breastfed child, 2002.

12. **Konyole SO, Kinyuru JN, Owuor BO, Kenji GM, Onyango CA, Estamble BB, Friis H, Roos N and VO Owino** Acceptability of Amaranthus grain-based Nutritious Complementary Foods with Dagaa Fish (*Rastrineobolaargentea*) and Edible Termites (*Macrotermessubhylanus*) Compared to Corn Soy Blend Plus Among Young Children/Mothers dyads in Western Kenya. *J Food Res*. 2012; **1**(**3**): 111.

13. **Surajit Mitra** Nutritional Status of Orange-Fleshed Sweet Potatoes in Alleviating Vitamin A Malnutrition Through a Food- Based Approach. Journal of Nutrition and Food Sciences. 2012; **2** (**8**): 2.

14. **Bonsi EA, Plahar WA and R Zabawa** Nutritional Enhancement of Ghanaian Weaning Foods Using Orange Flesh Sweet Potato (*Ipomea batata*). *AJFAND*. 2014; **14 (5**): 1951-1953.

15. **Pillay K, Khanyile N and M Siwela** Acceptance of an Orange-Fleshed Sweet Potato Complementary Food by Caregivers in KwaZulu- Natal Province- A Preliminary Study. *S.Afr.J.Child Health*. 2018; **12(3**): 102.

16. **Cecilia Wanjiru** Consumer Knowledge and Attitude Towards Orange-Fleshed Sweet Potato Bread in Kenya. Proceedings. Sweet Potato Marketing; Proceedings of the Fourth Annual Meeting held at Kisumu Kenya. 2017; 23.

17. **Bamidele OP, Ogundele GF, Salawu SW and IA Abdulraheem** Nutritional Composition of Oyster Mushroom (*Pleurotusostreatus*) Grown on Softwood (Daniella oliveri) Sawdust and Hardwood (*Anogeissusleiocarpus*) Sawdust. *Br J Appl Sci Technol*. 2017; **20**(**1**): 3-5.

18. **Mishra R, Mishra YD, Singh PP, Raghubanshi BPS and R Sharma** Nutritional and Sensory Evaluation of Oyster Mushroom Supplemented Daily Food Items. *Int J Curr Microbiol Appl Sci.* 2018; **7** (**8**): 1469.

19. **Rop O, Mlcek J and T Jurikova** Beta –glucans higher fungi and their Health Effects, Nutrition Reviews, 2009; **67**(**11**): 626-628.

20. **Kenya Bureau of Statistics (KNBS) and Society for International Development (SID).** Exploring Kenya's Inequality; Kakamega County, 2013.

21. **Muroki NM, Maritim GK, Karuri EG, Tolong HK, Imungi JK, Kogi- Makau W, and AN Maretzki** Involving rural Kenyan Women in the Development of Nutritionally Improved Weaning Foods: Nutribusiness Strategy. *J.Nutr.Educ*, 1997; **29**(**6**): 335-342.

22. **Wan Rosli WI, Nurhanan AR and Aisha** Effect of Partial Replacement of Wheat Flour with Oyster Mushroom (*Pleurotussajor-caju*) Powder on Nutritional Composition and Sensory Properties of Butter Biscuit. Sains Malaysiana. 2012; 1565-1570.

23. **Jacquier C and A Giboreau** Environmental effects of emotional state related to food appreciation at a restaurant: In a paper presented at the 5th European conference on sensory and consumer research, Bern Switzerland, 2012; 9-12.

24. **Ashbrook S and M Doyle** Infants' acceptance of Strong and Mild-flavored Vegetables. *J.Nutr.Educ*. 1985; **17**(**1**): 5-6.

25. **Birch L L, Billman J and SS Richards** Time of the Day Influences Food acceptability, Appetite, 1984; **5**(**2**): 109-116.

26. **Kevin K** You've Come a Long Way. Baby-Food. Food Process, 1995; **51**: 61-64.

27. **Popper R, Rosenstock W, Schraidt M and BJ Kroll** The Effect of attributes questions on overall liking rates. Elsevier. 2004; **15** (**7-8**): 853-858.

28. **Ali F and M Amin** The Influence of Physical Environment on Emotions, Customers Satisfaction and Behavioral Intentions in Chinese Resort Hotel Industry. *J.Glob.Bus.Adv.* 2014; **7**(**3**): 249-266.

29. **Sullivan SA and LL Birch** Infant Dietary Experiences and Acceptance of Solid Food. 1994; **93**(**2**): 273.

30. **FAO.** Street Food in Urban Ghana: A Desktop Review and Analysis of Findings and Recommendations From Existing Literature, 2016; 15.

31. **Gateri MW** The Untapped Mushroom Potential. Hortfresh Journal. 2012.

32. **Owino VO, Sinkala M, Amadi B, Tomkins AM and SM Filteau** Acceptability, Storage Stability and Costing of α-Amylase-treated maize-beans-groundnuts-bambaranuts Complementary Feeding Blend, *J.Sci*, 2007.