Development of a nutrigenomic product and checking the acceptance of public opinion for consumption

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Abstract

Nutrigenomics is a new discipline within nutrition sciences that aims to understanding how food components influence health status by affecting gene expression to eventually help maintaining health and prevent disease. Post human genome revelation observes the emergence of 'Nutrigenomics' as one of the exciting scientific advancement influencing mankind around the world. More precisely 'nutrition' has the major impact in defining the cause, response, interaction between nutrient (diet) and human health. On the basis of 'nutrigenomic' development promote on advent in transcriptomics, genomics, proteomics and metabolomics as well as insight into food as health supplement. Interaction of selected nutrient with associated genes in specific organ or tissue necessary to understand that how individual's genetic structure (DNA transcribed into mRNA and then to proteins) respond to particular nutrient. . It provided new opportunities to incorporate natural bioactive compounds into food for specific group of people with similar genotype. Thus, targeting such proteins by modifying or improving the nutritional availability or uptake may help to devise novel food, supplements, or nutraceuticals.

Product development by using selection of pea, carrot, soybean, cabbage, ginger which have natural ingredients for making the nutrigenomic badi. In the laboratory it was tested that nutrients present in this product were vitamin A, zinc, folic acid etc. Previous study shows that these nutrients were helpful to overcome to life style related problem, because herbal products were minimizing the health problems. It has been proven that nutrigenomic badi may be a betterment option for lowering the life style related problems. Through questionnaire of score card (hedonic rating scale) checked the acceptance of the herbal product; they were very pleasant for using herbal product for consumption. Nutrigenomics has become important both for unhealthy as well as healthy people to improve health using modification of diet. This acceptance was analyzed on software SPSS version 20.

Keywords: Nutrigenomics, Nutrition and health, Human genome, DNA transcription, Nutrigenomic badi.

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Introduction

People hold a nearly association with the nutrition that they are expended. It doesn't give nourishment yet in addition give the necessary fuel to the body; it also conveys solid hedonic and social qualities. Unmistakably sustenance just not give caloric esteem (i.e. amount) yet it likewise the more particular nutritious structure (i.e. quality) of the eating routine. It has a tremendous effect of on the physical execution and wellbeing status. More than two-three decade of human sustenance inquire about feature a solid enthusiasm for how nourishments and supplements influence a human body and its execution. The primary doctor Hippocrates officially depicted how nourishment shaped the body's 'intrinsic warmth' [1], and perceived the significance of legitimate sustenance as he prompted: "let your nourishment be your solution". Afterward, the purported Chemical Revolution prompted the disclosure of nourishment's principle components or macronutrients of sugars, proteins and fats [2], after that natural period comes they tells about micronutrients like vitamins and minerals, and the elements of sustenance segments at sub-atomic level [1]. Healthful research has created from the body as unit of concentrate towards progressively little units like tissues, organs, and cells, joined by the investigation of perpetually particular physiological procedures.

"Nutrigenomics will revolutionize wellness and disease management. By being able to elucidate genetic profiles of individuals, diets will be formulated from crop to fork to confer prevention or retard disease progression. As basic science advances converge with e-commerce, new opportunities will emerge to deliver to consumers, whose genetic susceptibility to specific diets and diseases are known, products tailored to individual dietary needs."(Guy Miller M.D., Ph.D.)

The human genome initiation furnishes life science with a diagram including objectives of essential research and chance to make an interpretation of this exploration to enhancements in human wellbeing [3]. Nutrigenomics, as a subset of the bigger territory of genomics, it effectively addresses the hereditary premise of reaction to abstain from food and, the varieties in dietary responsiveness among people that are transferable to genotype. Much like pharmacogenomics sees its legitimate interpretation-custom-made foundation of a more customized way to deal with eating routine and wellbeing. Be that as it may, consume less calories has a significantly more extensive

approval than just corrective therapeutics of ailment. Eating routine as an essential of a person's general condition affects wellbeing in the largest sense, from the aversion of ailments to execution, delight, and the general personal satisfaction. Nourishments will be the bearers of this esteem once science has related the different parts of wellbeing to eat less carbohydrate. Understanding both the part of eating routine in the fluctuating articulation of a genome and the part of hereditary qualities in the shifting reactions to eat less are central to understanding human wellbeing.

Nourishment is awesome opportunity and it is most troublesome test will be in building up these fundamental connections and applying them to enhancing the strength of all people, at various ages, with the most justifiable objective to accomplish counteracting malady. Nutrigenomics can just choice to give personalized eat less carbohydrate. Other non-genetic factors are additionally personally engaged with an individual phenotype, wellbeing status, and their dangers of and directions toward various ailment states. To comprehend the post genomic and posttranscriptional occasions from single cells to entire body conduct ought to likewise partake in logical underneath of customizing eating regimen and wellbeing. Whenever eating regimen and wellbeing are comprehended, nourishments should be the focal supplier and esteem generator of this frameworks way to deal with customizing eating routine and wellbeing.

Methodology

After the development of product awareness about functional foods and nutraceuticals was checked through questionnaire to the respondent. The scale was used on the awareness on functional foods and nutrigenomic badi on the basis of score card of hedonic rating agreement level for the herbal product acceptance. This product was developed with pea, soybean, cabbage, ginger, carrot and black pepper.

Table 1. *Appearance, taste, smell, texture, aroma and acceptance*

Rating	Appearance/ colour	Taste/Flavour	Smell/Odour	Texture/ Mouthful	Aroma	Overall Acceptance
Like extremely	_	_	_	_	_	_
Like very much	_	_	_	_	_	_
Like moderately	54	4	_	26	_	20
Like slightly	20	64	22	58	46	50
Neither like nor dislike	18	22	58	6	30	14
Dislike slightly	_	10	10	10	16	16
Dislike moderately	8	2	10	_	6	_
Dislike very much	–	–	–	–	–	–
Dislike extremely	–	–	–	–	–	–

Scale was based on the color, flavor, odor, mouthful, aroma and overall acceptance. This was conducted on those people who were participated in the targeted population in the awareness.

For the product preparation used ingredients were carrot, cabbage, ginger, and soybean, pea, salt and spices.

Results

A total of 122 respondents to checked the product quality on the consumption. Approximately 65% of the respondents were male and 35% were female, nearly half were in the age range of 50-60 years. Most respondent were least intermediate and some college education.

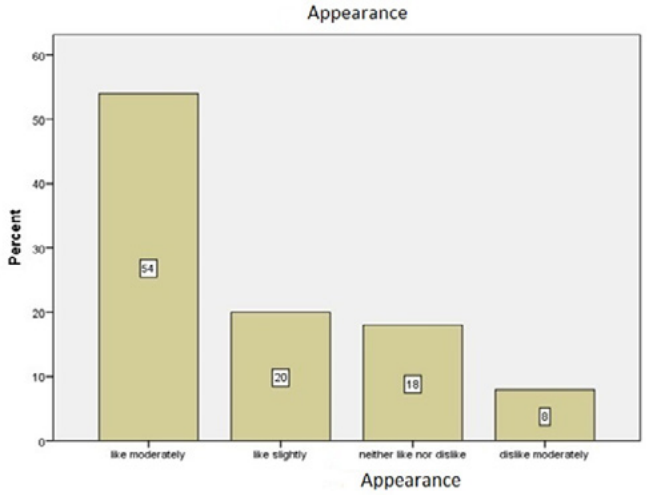

Figure 1. *This bar graph shows appearance scale for the product.*

Figure 1 shows that 54% respondent were likely moderately, 8% respondent dislike moderately. This data was reveal on the basis of the public opinion on the time of survey for checking the quality of the product for acceptance.

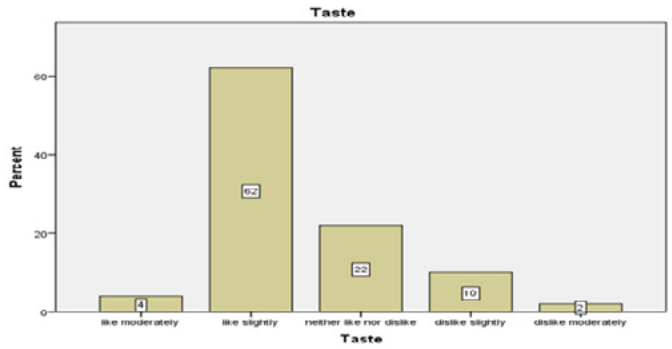

Figure 2. *This graph for taste of the product.*

Figure 2 shows that taste of the product checking of the respondent 62% people likes the taste. This review was drawn by publically by taste on bites of product consumed at the time of acceptance was checking. On the basis of this result the l

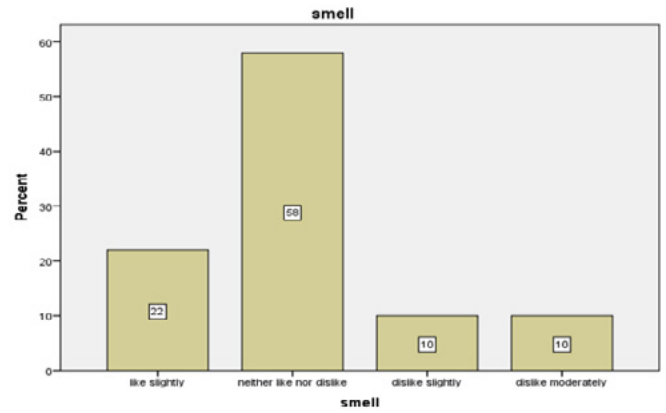

Figure 3. *This bar graph represents the smell of the product.*

Figure 3 represent the smell of the product developed for the consumption to the respondent. The respondent reaction was noticed and gives their response on the score based sheet of the hedonic rating scale. This was found that 58% of the reaction was positive in sense of smell of the product for consumption

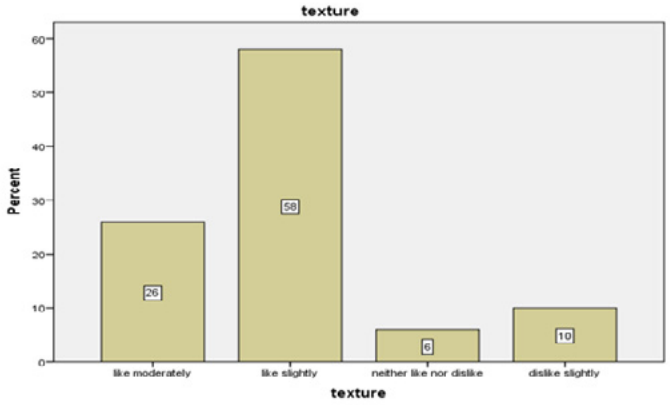

Figure 4. *This is the representation of texture of the product.*

Figure 4 represent the texture of the product (nutrigenomic badi). This graph shows that 58% of the respondent gives them like slightly to product for the texture. This conclusion was drawn by the score system on the hedonic rating scale 0-9 points l

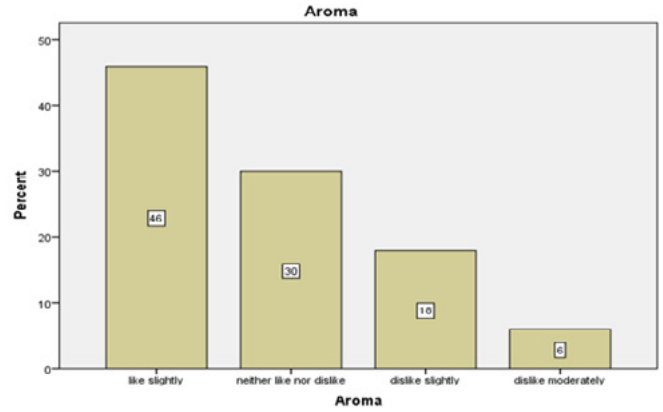

Figure 5. *This graph shows the aroma of the product.*

Figure 5 shows the result of aroma related to the product which was developed for the consumption to the population. That was checked by the public respondent that was selected on the time for checking awareness of the respondent for that scale aroma of product given by the respondent was 46% like slightly for this.

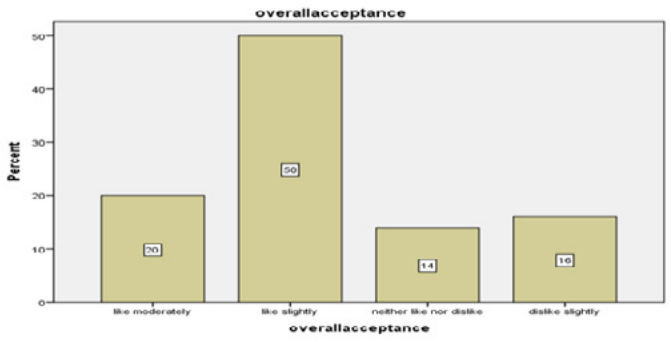

Figure 6. *This bar graph represents the overall acceptance of the product.*

Figure 6 shows overall acceptance of the product which was developed. This acceptance was based on the like, taste,

smell, texture and aroma on the hedonic rating scale. Overall acceptance were given to the product by respondent was 50% like slightly.

Discussion

In this survey, that product developed by using selection of pea, carrot, soybean, cabbage, ginger and black pepper which have natural ingredients for making the nutrigenomic badi. This product was checking for the public acceptance to the selected targeted population. The total number were under this survey 122 respondent, total no. of men 64% and female were 36% in this group. In this product after nutrient analysis was taken that the nutrients were found that zinc, folic acid, vitamin A, isoflavones.

The food and drugs organization has accepted a health claim for soy based on clinical trials and epidemiological data indicating that high soy consumption is associated with a lower risk of coronary artery disease. Soy foodstuffs have a group of compounds called isoflavones, with genistein and daidzein being the most credited to dietary isoflavones including a reduction in LDL (low density lipoprotein) cholesterol, an inhibition of pro-inflammatory cytokines, cell adhesion proteins and inducible nitric oxide production, potential reduction in the susceptibility of the LDL particle to oxidation, inhibition of platelet aggregation and an improvement in vascular reactivity [4].

Folate metabolism begins as folate crosses the cell membrane through the reduced folate carrier (RFC). RFC is a necessary folate transporter and functions as a bidirectional anion exchanger, taking up folate cofactors and exporting various organic anions. The reduced folate carrier carries a genetic polymorphism RFC-1 G80A which results in a histidine to arginine substitution at codon 27 [5] and has been associated with elevated RBC folates and amplified hazard of NTD (neural tube defects) birth defects and plasma MTX (methotrexate) concentrations, respectively. Folate (Vitamin B9, Folic acid, folinic acid, folacin, pteroyglutamic acid) is essential for life-sustaining processes of DNA (deoxyribo nucleic acid) synthesis, replication, and repair which are naturally present in common foods such as peas, oranges, broccoli, and whole-wheat products. Folate levels have been connected with birth defects, cardiovascular disease, and many other important healthcare issues, which have resulted in government-mandated food fortification to deliver minimum levels of intake.

For a prompt immune response against stressor agents and inflammation, macrophages produce cytokines, such as IL-1, IL-6, interferon (IFN)-α , and tumor necrosis factor (TNF)-α, which in turn provoke synthesis of MT (metallothioneins) in the liver but also cause an alteration in the zinc status [6]. These findings clearly indicate interplay between MT and the immune system. IL-1 affects MT mRNA (messenger-ribonucleic acid) in thymic epithelial cells by means of protein kinase C, which is, in turn, zinc dependent 41 and participates in metal-induced MT mRNA. [7] MT act both as a reservoir of zinc during zinc deficiency and as a zinc buffering protein in the presence of an excessive amount of zinc in order to prevent zinc toxicity [8].

Three types of nutritional factors offer or may offer protection against eye ageing: antioxidants, such as vitamins C and E or zinc; lutein and zeaxanthin, two carotenoids which accumulate specifically in the retina and lens; ω-3 PUFA (polyunsaturated fatty acid), and in particular DHA (docosahexaenoic), which have important structural and protective functions in the retina. Initial epidemiological observations, showing that high vitamin E plasma levels may protect against AMD (age-related macular degeneration) [9], have been confirmed by a large randomized clinical trial performed in the United States. In this study was performed on nearly 5,000 subjects, supplementation for 6 years with high doses of antioxidants (vitamins E and C, and carotene) and zinc significantly reduced the risk of developing advanced AMD by 34% in subjects with early AMD [10].

Conclusion

Changes in eating habits, availability of fast food, better living environment and work standard, easier life style with limited walking, better economic status and urbanization are some examples of current life style. This shift has improved present human living standards but has taken a fall on health status as shown by marked increase in mortality rates in last decade by non-communicable diseases. Also luckily there has been a greater invention in past decade regarding knowledge of human genome, besides various transcriptomics, genomics, metabolomics and other omics which has added nutritional and medical science researchers to counter the posed challenges. Nutrigenomics has become important both for unhealthy as well as healthy people to improve health using modification of diet. Multiple in vitro, in vivo studies along with clinical studies have been carried over worldwide that have increased chances of healthy living using dietary intervention. However important is need of high integrity and use of regulatory mechanism with ethical means to further nutrigenomic research.

Recommendation

- This survey might be on the large population that will improve the result on more accuracy.
- This might be for a long term goal nearly 5-6 years that will reveal all hidden barrier.
- It might be included all types population like LIG (lower income group), MIG (middle income group), HIG (higher income group). In this survey conducted mostly on MIG groups.

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Conflict of interest

There is no conflict of interest.

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