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Study of Consumer Demographics, Awareness, Perceptions and beliefs as Determinants of Consumer Acceptance of Foods with Health Claims in India

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ABSTRACT

Globalization and urbanization have brought about considerable changes in the composition of human diets leading to the consumption of processed foods. The excessive consumption of such foods has resulted in damaging consequences in the form of lifestyle diseases which have grown in epidemic proportions worldwide imposing severe socio-economic costs. It is in such a scenario a category foods termed as "functional foods" have emerged having both nutritive as well as therapeutic properties. The functional foods claim to be the panacea for the consumers helping them achieve their nutritional as well as health objectives. However the consumer acceptance of functional foods is not unconditional. The central aim of this research paper is to analyse which factors drive the consumer acceptance of functional foods in the context of the Indian consumers specifically. The paper one of the first study in the context of the Indian consumer market attempts to investigate how demographic factors such as age, gender, income & educational levels account for the heterogeneity in consumer tastes and preferences that influence the acceptance of functional foods.

Keywords: Consumer Demographics, Consumer Awareness, Knowledge & Beliefs, Sources of Information, Consumer Attitudes.

INTRODUCTION:

Globalization and urbanization have brought about considerable changes in the composition of human diets. This has led to an increased consumption of processed foods high in refined starch, sugar, salt and unhealthy fats. The deleterious consequences of such changes in the nutrition or dietary profile are more evident today than ever before. The more damaging aspect of the excessive consumption of such processed foods is widely evident in their manifestation in the form of various ailments termed as the "Lifestyle diseases". We are witness to a significant increase in the incidences of diabetes, coronary heart disease, hypertension, obesity & cancer to name just a few in epidemic proportions. Exacerbating matters further is the lack of exercise, sedentary & busy lifestyles accompanied by stress. India which is presently in the midst of a socio-economic-demographic transition is also displaying trends similar to those of the developed Western countries in terms of the growing

incidence of such lifestyle diseases or the NCD's. It is predicted that in the next two decades the lifestyle diseases or the non-communicable diseases (NCD's) will impose a severe economic and social burden. This burden of NCD's will particularly impose severe social and economic costs on the developing countries more, pushing many into poverty by impacting their quality of life & productivity, increasing the healthcare costs & thus straining the scare and precious resources which can be allocated elsewhere.

It is in the backdrop of such a scenario which has led to the emergence of several innovative categories of foods with nutritional and therapeutic properties with health claims that are scientifically termed as *"Functional Foods"*. Category of foods such as *Probiotics, Prebiotics, Fortified Cereals, Fortified Oils, Fortified Confectionery, and Fortified Snacks* belong to the *"Functional Foods"* segment. These foods which have both a nutritive as well as therapeutic function such as disease prevention have witnessed the largest growth rates among the various food categories.

The innovation, production & marketing of these functional foods with therapeutic benefits is a highly risky & challenging affair as it is involves very high costs from concept to product development to commercialisation (Kleef et al., 2002; Maynard and Franklin, 2003). The path to commercial success is full of hurdles & thus quite challenging Hollingsworth (2001) with consumer perception determining their acceptance & thereby its success or failure (McConnon et al. 2002).

To achieve and enhance the consumer adoption of functional foods by gaining their trust and loyalty requires a deep and insightful understanding of the aspects of consumer behaviour which would play a very crucial role (Frewer et al., 2003). It is essential to understand the role of demographic factors (Verbeke et al, 2006) and psychographic factors such as level of consumer motivation, their awareness, their attitudes, beliefs, norms & knowledge about these products, besides their lifestyles, health orientation & dietary patterns (Jong et al., 2003). The commercialization of functional foods remains a very challenging process & meeting customer expectations would thus play a very critical role in driving the consumer acceptance of these foods.

Definition: "Functional Food" term:

The term "functional" when applied to food means – A food, that provides an additional physiological benefit beyond that of meeting basic nutritional needs, the concept was first promoted in 1984 by Japanese scientists where a food category called FOSHU (Foods for Specific Health Use) was established in 1991 to reduce the health-care costs. They are technically defined as those foods that by virtue of the presence of physiologically-active components, provide a health benefit beyond basic nutrition these include whole, fortified, enriched or enhanced foods and should be consumed as part of a varied diet on a regular basis, at effective levels (Hasler, 2002) distinguishing them from drugs, pills or capsule making them a part of normal food consumed (Diplock et al., 1999; ILSI Europe, 2002).

Statement & Origin of the Research Problem:

The factors driving the consumer acceptance of functional foods are not only very complex but also very diverse in nature. Consumer demographic factors, psychographic variables like consumer beliefs, perceptions, knowledge, awareness & attitudes towards health and nutrition, their lifestyles, their current diet patterns and health status, familiarity with the "functional food" concept & the functional ingredients play a very significant role in achieving the consumer acceptance of functional foods.

Aspects such as the type of the nutritional claims used for functional foods, the extent to which sensory properties meet consumer expectations; the price and convenience related to food availability (Bech-Larsen & Scholderer, 2007); De Jong et al 2003; Frewer et al., 2003) all play a very influential role. Thus it would be inappropriate to generalize consumer characteristics that determine the consumer acceptance of functional foods.

Research Gap:

The central aim of this research paper is to analyse which factors drive the consumer acceptance of functional foods in the context of the Indian consumers specifically. The paper attempts to investigate how demographic factors such as age, gender, income & educational levels account for the heterogeneity in consumer tastes and preferences that influence the acceptance of functional foods. The paper also attempts to analyse how varying levels of consumer awareness & knowledge about nutrition and health, consumer perceptions, beliefs, attitudes, their purchase preferences & interests about health and nutrition interplay with each other as determining factors influencing the consumer adoption/acceptance of functional foods with health claims across different segments of Indian consumers.

Brief Overview: Indian Functional Foods & Beverages Market, Trends & Future Potential
The sales of fortified functional foods grew about 15% and achieved a sales of Rs131 billion in 2014 & is estimated to reach a sales of Rs166 billion by 2019. The functional beverages grew by about 14% to record sales value of Rs191 billion in 2014 and projected to achieve sales of Rs238 billion by 2019. Some of the major functional food categories where significant growth has been witnessed in the Indian market are fortified functional cereals and staples such as bread, cereals & biscuits, fortified dairy products like Pro/Prebiotic yogurt, fortified confectionery. This indicates that the initial response from the consumers has been positive enabling them to choose products and beverages with value added nutrition with health ingredients. However it remains a significant challenge for the marketers & manufacturers if they will be able to sustain this initial momentum & expand the market further.

REVIEW OF LITERATURE:

Functional Foods: Diet -Disease Relationship & Consumer Awareness, Beliefs & Attitudes – Check to modify
Sustained public health awareness & education campaigns through various information and sources of media has resulted in an increased awareness & understanding amongst the consumers today about the diet-health-disease linkage (Childs, 1997). This has strengthened their belief that nutrition plays an important role in providing good health & prevention of disease (International Food Information Council (IFIC), 2002). There is an increasing unanimity among the consumers eating healthy is a more effective way to prevent & treat or manage ailments than consuming medicines (Childs, 1997). This has fuelled amongst the consumers an increasing demand for foods which help to prevent, manage or treat an ailment or reduce the risk of disease (Toner & S. Pitman, 2004). The HealthFocus survey identified a segment of consumers termed as the "Food as Medicine" segment ranging in the age group between 35-64 years of age. This segment was chararcterised with certain common traits such they were better educated, belonged to the higher income groups, demonstrated a concern for their long-term health aspects, (Childs & Poryzees, 1997) and the women in particular showed more involvement and displayed significant higher belief in the value added health benefits of foods as compared to the consumers belonging to the younger age groups.

Research has established that consumer attitudes alongwith with motivating factors and knowledge are important predictors of and provide information that is essential for behaviourial change. Though formal definitions about attitude vary among most theorists, but there is broad agreement among today that attitude is the tendency to respond to an object with some degree of favorableness or unfavorableness (Ajzen & Fishbein, 1973); (Osgood, Suci, & Tannenbaum, 1957); (Petty & Cacioppo, 1986). Consumer research related to nutrition has regularly studied about aspects such as their belief in the diet-health linkage, the significance they attach to nutrition over other food attributes, the importance of adhering to specific dietary requirements and their perceived barriers to dietary change. Research by Frazao posits that an awareness of the linkages between diet and health (diet-disease relationship) coupled with consumer attitudes and beliefs play an important role in shaping their consumption behaviour. Research carried out by (Bhaskaran & Hardley, 2002) reaffirms the finding that an increased consumer understanding & knowledge of diet-health relationships influences and shapes their dietary habits. However a point of noteworthy significance is that the consumer understanding, awareness & knowledge of the diet-health-disease relationship varies across demographic age groups, gender (Saher, Arvola, Lindeman, & Lähteenmäki, 2004) age, race, income & education levels playing a significant role in influencing the consumer beliefs and attitudes about the diet-disease relationship and shaping their consumption habits.

Functional Foods: GENDER & AGE
Several research studies have consistently highlighted the fact that when it comes to matter related to food, health & nutrition women display far higher levels of involvement and show strong beliefs in the health benefits of foods (Childs & Poryzees, 1998) & thereby perhaps strong intentions to consume or purchase foods products with disease prevention attributes (Childs & Poryzees, 1997). When it concerns the dietary & health related issues, women as compared to men, are more discerning, reflective, confident with uncritical and traditional view of eating (Beardsworth, et al., 2002); (Gilbert, 1997); (Verbeke, 2004). Experts in the field of consumer research related to nutrition & health aspects attribute the greater involvement of women perhaps due to the fact that women are the primary food shoppers for the household, shoulder a greater responsibility in decision making related to the selection, purchase, preparation of food for the household (Bech-Larsen & Scholderer, 2007) & thus consequently for the overall health and wellbeing of the household. A cross country study of adults and college going youth primarily from Belgium, France, USA and Japan, revealed that the respondents

who most identified food with health and least with pleasure were the Americans. While the French, were high on food-pleasure orientation but least on the food-health orientation (Rozin, 1999). However a common trend that was observed across all four nations was that women showed more resemblance in attitudes & beliefs with the Americans i.e. more health oriented beliefs than the French i.e. pleasure oriented aspects related to food consumption (Rozin, 1999). An important socio-demographic indicator influencing the decisions related to food choice consumption is the presence of young children in the household (Maynard & Franklin, 2003) & the relatives' loss of good health or any previous history of disease among them.

Research by (Saher, Arvola, Lindeman, & Lähteenmäki, 2004) finds that people tend to show greater involvement in matters related to food, nutrition & general health as their age increases. The study found that respondents above 55 years of age showed greater acceptance of health enhancing foods or foods with disease prevention attributes, less doubtful of manufacturer claims, showed greater involvement & higher levels of awareness related to nutrition and health issues. The respondents in the higher age bracket proactively chose foods that had health enhancing or properties related to disease prevention perhaps influenced by their perceived vulnerability to the risk of chronic ailments compared to the younger individuals. The younger respondents due to their lower perceived vulnerability to the risk of health impairment due to diseases based their food choice decisions primarily based on factors such as price, taste and promotional offer. They were also sceptical & less accepting about the manufacturer's health claims related to the food attributes thus displaying resistance to shift to such products and preferred to consume as an example low fat products for weight loss compared to consuming high fibre and calcium fortified foods and (Bhaskaran & Hardley, 2002).

Study conducted by (Childs & Poryzees, 1998) reveals that the respondents' belief in the diet- health relationship is positively correlated with the rise in their income & education levels i.e. higher the income & education level greater is their belief in the diet-health linkage as compared to those with lower income & education level. On the other findings of a study conducted by Shepherd et al. (1996) state that positive attitudes towards eating a healthy diet are expressed by people of all income levels, which appear to contradict the findings of the former. Shepherd observes that a decrease in income has a destabilising effect on food consumption habits. A long-term reduction in income probably leads to a greater proportion of income being spent on food, however contrastingly an increase in income does not necessarily lead to an increased expenditure on food nor does it improve the overall diet quality.

Functional Foods: Health Claims, Trust & Communication

The healthiness attribute inherent in a product has to be clearly & distinctly communicated to the prospective consumer. Healthiness being a credence attribute is not perceived directly by using the product itself (Nelson, 1970); (Oude Ophuis & Van Trijp, 1995). Since men and women display varying levels of interests and beliefs in functional foods with men showing interest in foods with energy boosting effects compared to women (Saher, Arvola, Lindeman, & Lähteenmäki, 2004). There is a need to achieve a balance between gaining the attention and trust of the consumer (Lähteenmäki, 2004) as the acceptance and purchase of the functional foods among men and women is strongly dictated or influenced by the underlying confidence-related aspects (Poulsen, 1999); (Verbeke, 2004) about these products and beverages.

Key Research Objectives:

To understand how the demographic factors influence the consumer's relationship between lifestyle, health & nutrition and thereby account for the heterogeneity in consumer preference and tastes which drives the acceptance of functional foods (foods with health claims) among Indian consumers.

1) To study how the various demographic factors namely age, gender, education and income -
    1.1) Influence the level of consumer awareness, information & knowledge about health and nutrition to explain/determine the heterogeneity in consumer preference and tastes.
    1.2) Influence the level of information & knowledge about functional foods to explain/determine the consumer acceptance of foods with health claims i.e. functional foods.
    1.3) Influence the consumer beliefs about nutrition & health leading to the acceptance of foods with health enhancing claims.
2) To study the various sources of information of consumers about functional foods & the trust enjoyed by them & their influence on the consumer
3) How the different levels of consumer awareness, information & knowledge about functional foods influence consumer beliefs that drive the acceptance of functional foods among the Indian consumers.
4) How the different levels of consumer awareness, information & knowledge about functional foods influence consumer attitudes that drive the acceptance of functional foods among the Indian consumers.

5) To enable the policy makers, food manufacturers and marketers to gain insights into the behaviourial aspects of the Indian consumer

RESEARCH METHODOLOGY:

An extensive review of literature about aspects relating to the arena of functional foods was carried out. The various dimensions relating to functional foods such as its market size, potential, innovation & product development, commercialisation was done. Also studied were the legal and regulatory aspects related to defining functional food products segments across different markets worldwide. With special reference to my study an extensive review of literature concerning the consumer aspects was done spanning atleast over a decade. Research literature relating to the field of consumer behaviour such as beliefs, perceptions, awareness levels, their orientations to health, nutrition & disease, communication strategies, consumer attitudes and personalities, retailing and distribution to name a few was extensively and thoroughly carried out which also included a study of the various methodologies by experts worldwide. A thorough review of literature helped me gain an understanding of what are the potential factors that can emerge as threats and challenges and what factors are crucial to drive the acceptance of the functional foods successfully among the consumers.

For the purpose of collecting the data from the consumer households of Pune city a structured questionnaire as tool for collecting data was employed. The data collection methodology used was face to face personal interview with the respondent during the field survey. As a part of the sampling design methodology the city of Pune was geographically divided into six different regions. The sampling frame was classified based on several criteria whether the population resided in in industrial clusters or pure residential clusters. The population was further sub classified based on their location into- either upscale; working class suburbs-middle-income localities etc. Using the simple random stratified sampling technique a total of 1222 completed questionnaires were selected out of total 1800 respondents surveyed. The questionnaire was divided into nine segments namely, consumer demographics, consumer information & knowledge of nutrition and health, Consumer Information & Knowledge of Functional Foods, Consumer Sources of Nutrition Information of Functional Foods, Consumer Beliefs about Nutrition and Health, Consumer Health & Exercise History, Current Consumption Habits & Purchase Patterns, Consumer Beliefs about Functional Foods, Consumer Attitudes about Functional Foods (Buyers & Non Buyers section). Appropriate scale testing & validation was employed to test for the reliability and internal consistency of the various items employing a 7-point Likert scale.

Interdisciplinary Relevance of the Study:

The various major stakeholders such as the food industry, consumers, the healthcare sector professionals, and governments have differing but strongly interconnected interests (McConnon et al., 2002). The development and the commercialisation of functional foods is a very expensive process and one will have to rely upon more than just technology to achieve success, given the high failure rates in the area of new product development. It is thus highly imperative for these stakeholders to gain a critical insight into consumer behaviour to understand the factors driving the consumer acceptance to gain their trust and loyalty. This would enable them to achieve a sustainable and long term success in creating a market for these foods.

Originality/Value of the Study:

This is the first ever study to be conducted on Functional foods in the context of the Indian consumer market and to specifically understand the nuances of the Indian consumer with special reference to the functional foods & the factors that drive its acceptance. This study is not only first of its kind, but no such study previously has been planned and executed in India on such an extensive scale that attempts to explain/determine the heterogeneity of consumer preference and tastes, the challenges, the opportunities, potential that underscore the acceptance of functional foods (foods with health claims) across various consumer demographic groups in India.

Key Hypotheses:

H_2: [There is no significant difference in the levels of information/awareness and knowledge about nutrition and health (IKNH) across Age groups]

**Table 1.18: Factors affecting Consumer Awareness, Information,
Knowledge about Nutrition & Health Vs AGE**

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	3.05	5	0.61	1.114	0.351
Within Groups	1206.471	2203	0.548		
Total	**1209.521**	**2208**			

The analysis of variance (ANOVA) reveals that (Sig.value 0.351 > 0.05; dF = 5; F = 1.114), the demographic variable age has no significant difference upon the respondent's levels of general information/awareness and knowledge about nutrition and health (IKNH) or in other words it is independent of age, therefore the null hypotheses is accepted.

H_1: [There is no significant difference in the levels of general information/awareness and knowledge about nutrition and health (IKNH) across Genders]

**Table 1.19: Factors affecting Consumer Awareness, Information,
Knowledge about Nutrition & Health Vs GENDER**

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	30.573	1	30.573	57.233	0.000
Within Groups	1178.948	2207	0.534		
Total	**1209.521**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.000 < 0.05; dF =1; F= 57.233), the demographic variable gender plays a very significant role in influencing the respondent's levels of general information/awareness and knowledge about nutrition and health (IKNH) or in other words the amount of consumer knowledge varies across genders, the null hypotheses is hence rejected. This is a finding that is also in line with the findings of several studies carried out in the international arena.

H_3: [The level of education has no significant impact upon the levels of general information/awareness and knowledge about nutrition and health (IKNH)]

**Table 1.22: Factors affecting Consumer Awareness, Information,
Knowledge about Nutrition & Health Vs Education**

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	16.958	4	4.24	7.835	0.000
Within Groups	1192.563	2204	0.541		
Total	**1209.521**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.000 < 0.05; dF =4; F= 7.835) the demographic variable, level of education plays a very significant role in influencing the respondent's levels of general information/awareness and knowledge about nutrition and health (IKNH) or in other words the amount of consumer knowledge varies with respondent's level of education & therefore the null hypotheses is rejected.

H_4: [The level of income has no significant impact upon the levels of general information/awareness and knowledge about nutrition and health (IKNH)]

**Table 1.24: Factors affecting Consumer Awareness, Information,
Knowledge about Nutrition & Health Vs Income**

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	3.578	4	0.894	1.635	0.163
Within Groups	1205.943	2204	0.547		
Total	**1209.521**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value $0.163 > 0.05$; dF = 4; F = 1.635), the demographic variable level of income has no significant impact upon the respondent's levels of general information/awareness and knowledge about nutrition and health (IKNH) or in other words it is independent of level of income, the null hypotheses is hence accepted. This is probably indicative of the fact that people are more health conscious and would like to stay updated about aspects relating to nutrition & health.

This study in an attempt to understand level of consumer awareness about factors affecting their information, knowledge about functional foods, which in turn influences the consumer acceptance of functional foods & beverages in the context of the Indian consumer, puts forth the following research hypotheses.

H_{2a}: [There is no significant difference in the levels of information/awareness and knowledge about functional foods (IKFF) across age groups]

Table 1.33: Factors affecting Consumer Information, Knowledge about Functional Foods (IKFF) Vs AGE

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	76.104	5	15.221	24.877	0.000
Within Groups	1347.88	2203	0.612		
Total	**1423.984**	**2208**			

The ANOVA test reveals that as the (Sig.value $0.000 < 0.05$; dF = 5; F = 24.877), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable "age" of the respondent plays a very significant role in influencing the respondent's levels of Information & Knowledge about functional foods (IKFF), thus in other words, the consumer's level of Information & Knowledge about functional foods (IKFF) varies with the age of the respondent.

H_{1a}: [There is no significant difference in the levels of information/awareness and knowledge about functional foods (IKFF) across genders]

Table 1.30: Factors affecting Consumer Information, Knowledge about Functional Foods (IKFF) Vs Gender

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	0.022	1	0.022	0.034	0.854
Within Groups	1423.962	2207	0.645		
Total	**1423.984**	**2208**			

The ANOVA test reveals that as the (Sig.value $0.854 > 0.05$; dF = 1; F = 0.034) the null hypotheses which states that the demographic variable gender has no significant impact upon the respondent's level of Information & Knowledge about functional foods (IKFF) is accepted or in other words the consumer's level of Information & Knowledge about functional foods (IKFF) is independent of the differences in gender.

H_{3a}: [The level of education has no significant impact upon the levels of information/awareness and knowledge about functional foods (IKFF)]

Table 1.32: Factors affecting Consumer Information, Knowledge about Functional Foods (IKFF) Vs Education

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	40.541	4	10.135	16.15	0.000
Within Groups	1383.442	2204	0.628		
Total	**1423.984**	**2208**			

The analysis of variance (ANOVA) test was conducted to prove the above hypothesis which states that the demographic variable education has no significant impact upon the respondent's level of Information & Knowledge about functional foods (IKFF). The ANOVA test reveals that as the (Sig.value $0.000 < 0.05$; dF = 4; F = 16.15), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable

"education" of the respondent plays a very significant role in influencing the respondent's levels of Information & Knowledge about functional foods (IKFF).

H_{4a}: [The level of income has no significant impact upon the levels of general information/awareness and knowledge about functional foods (IKFF)]

Table 1.31: Factors affecting Consumer Information,
Knowledge about Functional Foods (IKFF) Vs Income

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	6.933	4	1.733	2.696	0.029
Within Groups	1417.051	2204	0.643		
Total	**1423.984**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.029 < 0.05; dF = 4; F = 2.696), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable "income" of the respondent plays a very significant role in influencing the respondent's levels of Information & Knowledge about functional foods (IKFF), thus in other words, the consumer's level of Information & Knowledge about functional foods (IKFF) varies with the income level of the respondent.

H_{5a}: Age has no significant impact upon the consumer trustworthiness about the sources of information about functional foods (SIFF)

Table 1.44: Consumer Trustworthiness about the Sources of Information
about Functional Foods (SIFF) Vs AGE

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	60.804	2	30.402	13.966	0.000
Within Groups	4802.044	2206	2.177		
Total	**4862.847**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.000 < 0.05; dF = 2; F = 13.966), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable "age" of the respondent plays a very significant role in influencing the respondent's levels of trustworthiness about the various sources of information about functional foods (SIFF) thus in other words consumer levels of trustworthiness about the various sources of information about functional foods (SIFF) varies with age of the respondent.

H_{5b}: [There is no significant difference in the levels of consumer trustworthiness about the sources of information about functional foods (SIFF) across Genders]

Table 1.45: Consumer Trustworthiness about the Sources of Information
about Functional Foods (SIFF) Vs GENDER

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	0.189	2	0.094	0.385	0.680
Within Groups	539.811	2206	0.245		
Total	**540.00**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.680 > 0.05; dF = 2; F = 0.385), the null hypotheses is accepted, which states that there is no significant difference in the levels of consumer trustworthiness about the sources of information about functional foods (SIFF) across different Genders or in other words independent of the gender differences. This is probably due to the fact that both genders have access to the same sources of information in the age of media proliferation where the information overload phenomenon is quite commonly prevalent.

H_{5c}: The level of education has no significant impact upon the levels of consumer trustworthiness about the

sources of information about functional foods (SIFF)

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.000 < 0.05; dF = 2; F = 20.905), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable "educational level" of the respondent plays a very significant role in influencing the respondent's levels of trustworthiness about the various sources of information about functional foods (SIFF).

Table 1.46: Consumer Trustworthiness about the Sources of Information about Functional Foods (SIFF) Vs Education

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	42.242	2	21.121		
Within Groups	2228.861	2206	1.010	20.905	0.000
Total	**2271.104**	**2208**			

H_{5d}: The level of income has no significant impact upon the levels of consumer trustworthiness about the sources of information about functional foods (SIFF)

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.005 < 0.05; dF = 2; F = 5.274), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable " level of respondent income" plays a very significant role in influencing the respondent's levels of trustworthiness about the various sources of information about functional foods (SIFF) thus in other words consumer levels of trustworthiness about the various sources of information about functional foods (SIFF) varies with the varying income levels of the consumer.

Table 1.48: Consumer Trustworthiness about the Sources of Information about Functional Foods (SIFF) Vs Income

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	10.663	2	5.331		
Within Groups	2229.869	2206	1.011	5.274	0.005
Total	**2240.531**	**2208**			

H_{7a}: [The age has no significant impact upon the levels of consumer belief in nutrition and health (CB-NH)]

Table 1.56: Levels of Consumer Beliefs about Nutrition & Health (CB- NH) Vs Age

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	13.646	2	6.823		
Within Groups	4849.201	2206	2.198	3.104	0.045
Total	**4862.847**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.045 < 0.05; dF = 2; F = 3.104), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable "age of respondent" plays a very significant role in influencing the respondent's beliefs about nutrition and health (CB-NH).

H_{7b}: [This study hypothesizes that the gender has no significant impact upon the levels of consumer belief in nutrition and health (CB-NH)]

Table 1.57: Levels of Consumer Beliefs about Nutrition & Health (CB- NH) Vs Gender

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	1.167	2	0.583		
Within Groups	538.833	2206	0.244	2.388	0.092
Total	**540.000**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.092 > 0.05; dF = 2; F = 2.388), the null hypotheses is accepted, which states that the demographic variable gender has no significant impact upon the levels of consumer belief in nutrition and health, or in other words the consumer beliefs about nutrition and health related issues is independent of the differences in gender.

H_{7c}: [The level of education has no significant impact upon the levels of consumer belief in nutrition and health (CB-NH)]

Table 1.59: Levels of Consumer Beliefs about Nutrition & Health (CB- NH) Vs Education

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	6.447	2	3.224		
Within Groups	2264.657	2206	1.027	3.140	0.043
Total	**2271.104**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.043 < 0.05; dF = 2; F = 3.140), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable namely the "level of educational attainment of a respondent" plays a very significant role in influencing the respondent's beliefs about nutrition and health (CB-NH).

H_{7d}: [The level of income has no significant impact upon the levels of consumer belief in nutrition and health (CB-NH)]

Table 1.61: Levels of Consumer Beliefs about Nutrition & Health (CB- NH) Vs Income

	Sum of Squares (SS)	Degrees of Freedom (dF)	Mean Square (MS)	F	Sig.
Between Groups	13.726	2	6.863		
Within Groups	2226.805	2206	1.009	6.799	0.001
Total	**2240.531**	**2208**			

The analysis of variance (ANOVA) test reveals that as the (Sig.value 0.001 < 0.05; dF = 2; F = 6.799), the null hypotheses is therefore disproved and hence rejected. Therefore the demographic variable namely the "income level of a respondent" plays a very significant role in influencing the respondent's beliefs about nutrition and health (CB-NH).

H_{7a}: [The age has no significant impact upon the levels of consumer belief in functional foods (CBFF)]

The results of the Pearson's Chi square test of association interestingly reveals that the respondent's beliefs about functional foods and beverages is significantly influenced by his/her age. This is also statistically evident as the Pearson's Chi square value of 49.873 is statistically significant at a five percent level of significance (Sig.value 0.000 < 0.05; dF = 10), and therefore we reject the null hypotheses stating that age as a demographic variable has no significant impact or influence upon the level of respondent's belief about functional foods (CBFF).

Table 1.92: Consumer Beliefs about Functional Foods (CBFF) Vs Age

Chi Square Test of Association			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	49.873[a]	10	0.000
Likelihood Ratio	51.72	10	0.000
Linear-by-Linear Association	1.808	1	0.179
N of Valid Cases	2209		

H_{6a}: [The gender has no significant impact upon the levels of consumer belief in functional foods (CBFF)]

The result of the Pearson's Chi square test of association interestingly reveals that, the gender of the respondent significantly influences his/her beliefs about functional foods and beverages consumption. This is also statistically evident as the Pearson's Chi square value of 9.176 is statistically significant at a five percent level of significance (Sig.value 0.010 < 0.05; dF = 2), and therefore we reject the null hypotheses stating that the demographic variable gender has no significant impact or influence upon the level of respondent's belief about functional foods (CBFF).

Table 1.94: Consumer Beliefs about Functional Foods (CBFF) Vs Gender

Chi Square Test of Association			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.176[a]	2	0.010
Likelihood Ratio	9.162	2	0.010
Linear-by-Linear Association	2.042	1	0.153
N of Valid Cases	2209		

H$_{8a}$: [The level of education has no significant impact upon the levels of consumer belief in functional foods (CBFF)]

The result of the Pearson's Chi square test of association interestingly reveals that, the educational level of the respondent significantly influences his/her beliefs about functional foods and beverages consumption. This is also statistically evident as the Pearson's Chi square value of 78.626 is statistically significant at a five percent level of significance (Sig.value 0.000 < 0.05; dF = 8), and therefore we reject the null hypotheses stating that the demographic variable namely the level of educational attainment has no significant impact or influence upon the level of respondent's belief about functional foods (CBFF).

Table 1.96: Consumer Beliefs about Functional Foods (CBFF) Vs EDUCATION STATUS

Chi Square Test of Association			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	78.626[a]	8	0.000
Likelihood Ratio	74.486	8	0.000
Linear-by-Linear Association	3.357	1	0.067
N of Valid Cases	2209		

H$_{9a}$: [The level of income has no significant impact upon the levels of consumer belief in functional foods (CBFF)]

The result of the Pearson's Chi square test of association reveals that, the income level of the respondent significantly influences his/her beliefs about functional foods and beverages consumption. This is also statistically evident as the Pearson's Chi square value of 54.993 is statistically significant at a five percent level of significance (Sig.value 0.000 < 0.05; dF = 8), and therefore we reject the null hypotheses stating that the demographic variable namely the level of income has no significant impact or influence upon the level of respondent's belief about functional foods (CBFF).

Table 1.100: Consumer Beliefs about Functional Foods (CBFF) Vs INCOME STATUS

Chi Square Test of Association			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	54.993[a]	8	0.000
Likelihood Ratio	57.23	8	0.000
Linear-by-Linear Association	16.367	1	0.000
N of Valid Cases	2209		

H$_{7b}$: [The age has no significant impact upon the levels of consumer attitudes for functional foods buyers (CAFF-B)]

The results of the Pearson's Chi square test of association interestingly reveals that the respondent's attitudes about functional foods and beverages is significantly influenced by his/her age. This is also statistically evident as the Pearson's Chi square value of 26.408 is statistically significant at a five percent level of significance (Sig.value 0.003 < 0.05; dF = 10), and therefore we reject the null hypotheses stating that age as a demographic variable has no significant impact or influence upon the level of respondent's attitude among the buyers of the functional foods (CAFF-B). The above finding could be probably due to the fact that as people age people are becoming very health conscious.

Table 1.104 (A1): Consumer Attitudes about Functional Foods (CAFF) Vs AGE

Chi Square Test of Association			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	26.408[a]	10	0.003
Likelihood Ratio	26.594	10	0.003
Linear-by-Linear Association	1.874	1	0.171
N of Valid Cases	2209		

The consumer's give primacy to their health concerns and to consuming diets that are not only nutritious and taste good but also play a significant role in contributing to their health and wellbeing & incorporating such diets into their lifestyles. By doing so, they try to delay or prevent the early onset of several lifestyle related diseases through nutritious, and appropriate healthy dietary choices thus trying to maintain optimum wellness and fitness. This observation is particularly more relevant in the case of households with the elderly where the ageing members of the household feel that due to their age factor they are at a more perceived risk and vulnerability to age related ailments, hence they prioritise their consumption of healthy diets to maintain optimum wellness and fitness and increase their longevity.

H6$_b$: [The gender has no significant impact upon the levels of consumer attitudes for functional foods buyers (CAFF-B)]

Table 1.106 (A1): Consumer Attitudes about Functional Foods (CAFF) Vs Gender

Chi Square Test of Association			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	2.992[a]	2	0.224
Likelihood Ratio	2.997	2	0.223
Linear-by-Linear Association	0.084	1	0.773
N of Valid Cases	2209		

The results of the Pearson's Chi square test of association interestingly reveals that gender as a demographic variable does not significantly impact the respondent's attitudes about functional foods and beverages. This is also statistically evident as the Pearson's Chi square value of 2.992 is statistically significant at a five percent level of significance (Sig.value 0.224 > 0.05; dF = 2), and therefore we accept the null hypotheses stating that gender as a demographic variable has no significant impact or influence upon the level of respondent's attitude among the buyers of the functional foods (CAFF-B).

H$_{8b}$: [The level of education has no significant impact upon the levels of consumer attitudes of functional foods buyers (CAFF-B)]

Table 1.108 (A1): Consumer Attitudes about Functional Foods (CAFF) Vs EDUCATIONAL STATUS

Chi Square Test of Association			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	59.448[a]	8	0.00
Likelihood Ratio	56.011	8	0.00
Linear-by-Linear Association	0.744	1	0.389
N of Valid Cases	2209		

The results of the Pearson's Chi square test of association reveals that the educational attainment level of the respondent's significantly impacts or influences his /her attitude towards functional foods and beverages. This is also statistically evident as the Pearson's Chi square value of 59.448 is statistically significant at a five percent level of significance (Sig.value 0.000 < 0.05; dF = 8), and therefore we reject the null hypotheses stating that educational attainment as a demographic variable has no significant impact or influence upon the level of respondent's attitude among the buyers of the functional foods (CAFF-B).

H9$_b$: [The level of income has no significant impact upon the levels of consumer attitudes of functional foods buyers (CAFF-B)]

The results of the Pearson's Chi square test of association reveals that the "income" level of the respondent's

significantly impacts or influences his /her attitude towards functional foods and beverages. This is also statistically evident as the Pearson's Chi square value of 23.094 is statistically significant at a five percent level of significance (Sig.value 0.003 < 0.05; dF = 8), and therefore we reject the null hypotheses which states that the demographic variable income has no significant impact or influence upon the level of respondent's attitude among the buyers of the functional foods (CAFF-B).

Table 1.112 (A1): Consumer Attitudes about Functional Foods (CAFF) Vs Income Status

Chi Square Test of Association			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	23.094[a]	8	0.003
Likelihood Ratio	23.288	8	0.003
Linear-by-Linear Association	0.297	1	0.586
N of Valid Cases	2209		

Summary Table of Key Research Hypotheses & Findings

		IKNH	**IKFF**	**SIFF**	**CBNH**	**CHPP**	**CBFF**	**CAFF-B**
Age	H_O	ACCEPT: Age does not significantly influence the respondent's IKNH	REJECT	REJECT	REJECT	REJECT	REJECT	REJECT
	H_A	REJECT	ACCEPT Age does significantly influence the respondent's level of IKFF	ACCEPT Age does significantly influence the respondent's trust level about SIFF	ACCEPT Age plays a significant role in influencing the levels of CB -NH	ACCEPT Age does significantly influence the respondent's CHPP	ACCEPT Age plays a significant role in influencing the levels of CBFF	ACCEPT Age does significantly influence the CAFF-B
Gender	H_O	REJECT	ACCEPT: Gender does not significantly influence the respondent's IKFF	ACCEPT: Gender does not significantly influence the trust level about SIFF	ACCEPT: Gender does not significantly influence the levels of CB -NH	REJECT	REJECT	ACCEPT: Gender does not significantly influence the CAFF-B
	H_A	ACCEPT Gender significantly influences the respondent's IKNH	REJECT	REJECT	REJECT	ACCEPT: Gender significantly influences the respondent's CHPP	ACCEPT: Gender does significantly influence the levels of CBFF	REJECT

Summary Table of Key Research Hypotheses & Findings

		IKNH	**IKFF**	**SIFF**	**CBNH**	**CHPP**	**CBFF**	**CAFF-B**
Education	H_O	REJECT	REJECT	REJECT	REJECT	REJECT	REJECT	REJECT
	H_A	ACCEPT Education significantly influences respondent IKNH	ACCEPT Education significantly influences respondent IKFF	ACCEPT Education significantly influences respondent trust about SIFF	ACCEPT Education plays a significant role in influencing CB -NH	ACCEPT Education significantly influences the respondent CHPP	ACCEPT Education plays a significant role in influencing CBFF	ACCEPT Education plays a significant role in influencing CAFF-B
Income	H_O	ACCEPT: Income does not significantly influences the respondent IKNH	REJECT	REJECT	REJECT	ACCEPT: Income does not significantly influence the respondent CHPP	REJECT	REJECT

		IKNH	IKFF	SIFF	CBNH	CHPP	CBFF	CAFF-B
H_A		REJECT	ACCEPT Income significantly influences respondent levels of IKFF	ACCEPT Income significantly influences respondent trust about SIFF	ACCEPT Income plays a significant role in influencing CB -NH	REJECT	ACCEPT Income plays a significant role in influencing CBFF	ACCEPT Income plays a significant role in influencing CAFF-B

SUMMARY OF KEY OBSERVATIONS & FINDINGS:

The influence of consumer demographics on the acceptance of functional foods i.e. food with value added health claims helps us understand the following aspects

Age:

As people age people are becoming very health conscious. The consumer's give primacy to their health concerns and to consuming diets that are not only nutritious and taste good but also play a significant role in contributing to their health and wellbeing & incorporating such diets into their lifestyles. By doing so, they try to delay or prevent the early onset of several lifestyle related diseases through nutritious, and appropriate healthy dietary choices thus trying to maintain optimum wellness and fitness. This observation is particularly more relevant in the case of households with the elderly where the ageing members of the household feel that due to their age factor they are at a more perceived risk and vulnerability to age related ailments, hence they prioritise their consumption of healthy diets to maintain optimum wellness and fitness and increase their longevity.

Gender:

An attitude of being health conscious is all pervasive especially in the light of the fact that several preventable lifestyles diseases that are evident in increasing numbers among men & women of all ages. Of particular concern is the onset of these lifestyle related diseases among people of all age groups at a considerably younger age which have significant morbidity & mortality rates associated with them, besides the loss of productivity & high medical costs. The people are increasingly aware that their lifestyle choices in particular their dietary preferences have significant potential to not only affect their health & also their lifestyles. People would like to maintain optimal health & fitness, without compromising on their lifestyles and with minimal adjustment in their daily routines. Functional foods & beverages which have the potential to help achieve optimal health & fitness by integrating them into the people's daily routine & lifestyles conveniently without having to compromise on price, taste & nutritional aspects have a significant chance of consumer adoption irrespective of the differences in gender and thus helping them achieve a healthy and disease free lifestyle. This ability to integrate functional foods and beverages with consumer lifestyles helping achieve their health and nutritional priorities with added convenience & minimal adjustment in their daily routines & lifestyles has led to development of positive attitudes among the consumers irrespective of their genders. The consumer's positive attitude is not only a crucial indicator of the adoption of functional foods & beverages but also their long term sustainability, growth and success in the context of the Indian consumer market in particular. This undoubtedly has significant implications for the marketers as well as the manufacturers of such products who have to win the confidence of the consumers with such food product innovations with health claims.

Education:

With better levels of education people display better knowledge and understanding through access to a wide range and variety of information, about aspects related to health, diet & nutrition. This enables the respondents to show a greater involvement and control over the decisions related to their heath and dietary choices through enhanced awareness, thereby influencing their beliefs and attitudes about functional foods and subsequently his or her consumption habits and purchase preferences. These are thus vital indicators of the long term and sustainable adoption of functional foods and beverages by consumers. Thus the onus is on the marketers to create enhanced awareness in the minds of the consumers through better education about the health enhancing properties about the functional foods & beverages helping them to position these products as excellent alternatives helping them to achieve their health, dietary & nutritional related priorities thereby gaining their loyalty.

Income:

The finding that the income influences the consumer beliefs & attitudes about functional foods and beverages is

probably due to the fact with rising incomes; the people acquire different lifestyles & consumption habits. Due to their incomes the consumers possess significantly enhanced purchasing power and affordability. They are also probably aware that due to their lifestyles which are hectic with significant time pressures they may be at an enhanced risk of lifestyle related disease which is increasingly evident throughout the world today. Hence they would like to keep up & achieve their health and wellness related priorities by making appropriate dietary choices using the affordability & the purchasing power that their income provides for optimum wellness. These findings have significant marketing implications from the point of view pricing these products appropriately matching with the respective target group of consumer segments aligned with their respective health, nutritional & dietary goals. The optimal pricing strategy also helps achieve brand differentiation, brand positioning strategy & creation of image in the consumer's minds as compared to the conventional alternatives, thereby enabling the marketers create unique category of products with health claims with a sustainable competitive advantage in future.

KEY IMPLICATION FOR THE STAKEHOLDERS:

Marketers:
It is imperative for the marketer to build consumer involvement by leveraging the right sources of communications, identify the right target segment & build a strong and sustainable competitive differentiation. This will enable the marketers to win long term consumer trust and loyalty & successfully develop a market for their value added innovative products.

Manufacturers:
The development and commercialisation of functional foods is a very expensive process and one will have to rely upon more than just technology to achieve success, given the high failure rates in the area of new product development. It is thus highly imperative for these stakeholders to gain a critical insight into consumer behaviour and adapt their food product innovation to consumer tastes, health and nutritional priorities. This will help increase the chances of consumer adoption and minimize product failure rates.

Food Policy Makers/Food Regulatory Authorities:
They must proactively influence consumer awareness & opinions for adopting healthy lifestyles by consuming products with health enhancing potential through public awareness health campaigns. The food regulatory authorities must proactively regulate, validate & certify the product claims ensuring their credibility & help prevent spurious products & products with frivolous claims entering the market and damaging the consumer trust & credibility which would prove detrimental to the growth of the market in the long run and consequently hurt all the stakeholders' interests.

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