



Impact of COVID-19 spread on buyers' behaviour towards Functional Food and Beverages

Shikha Jain¹, Suraj Kamble^{2,*}

¹Director, DES's IMDR, Pune, India

²Associate Professor, DES's IMDR, Pune, India

Email: suraj.kamble03@gmail.com

ABSTRACT

Consumption of a particular type of food and its impact on health has always been related strongly. The Covid-19 spread has impacted all aspects of day-to-day human life which also includes food consumption. To be healthy one must eat healthy food and the outbreak of Covid-19 has made people prefer a certain type of food. Functional food is a food that has an additional new ingredient or more of existing ingredients. Buyers have started concentrating on the consumption of Minerals, Vitamins, Proteins and Metals. This study has attempted to find the impact of Covid-19 spread on buying behaviour and the consumption of functional food & beverages through the data collected from 203 respondents across the country using a standardized questionnaire. Statistical analysis tools such as percentage analysis, t-test, ANOVA, and regression were used to analyse the data and test the hypotheses. The major findings of the study indicated that there exists a difference between the gender and age category for giving importance to nutrition while consuming the food. Buyers have started consuming high nutritional food eating more vegetables and fruits, exercising more and purchase of milk and dairy product, poultry eggs and cereals have increased. Nutrition was the major factor that showed the difference in gender and age. The regression model predicted the dependent variable significantly.

Keywords: COVID-19, Buyer Behaviour, Functional food and beverages, factors influencing buying behaviour, Nutrition

Received 19.02.2022

Revised 25.03.2022

Accepted 02.04.2022

INTRODUCTION

People across civilizations and cultures have always shown interest in food consumption and its health impact. The beneficial effects of food consumption on overall well-being are not only on account of what people consume but also because of how they consume food and related social influencers [1]. In this context, functional foods which encompass an assortment of foods, like whole foods which may be fortified, enhanced, or enriched foods, have a potentially positive impact on health when their intake is regularly at certain levels.

In India, The Food Safety and Standards Act (2006) defined functional food in section 22 as, "foods which are specially processed or formulated to satisfy particular dietary requirements which exist because of a particular physical or physiological condition or specific diseases and disorders and which are presented as such, wherein the composition of these foodstuffs must differ significantly from the composition of ordinary foods of comparable nature, if such ordinary foods exist, and may contain one or more of the following ingredients, namely:

- I. Plants or botanicals or their parts in the form of powder, concentrate or extract in water, ethyl alcohol or hydroalcoholic extract, single or in combination.
- II. Minerals or vitamins or proteins or metals or their compounds or amino acids (in amounts not exceeding the recommended daily allowance for Indians) or enzymes (within permissible limits).
- III. Substances from animal origin.
- IV. A dietary substance for use by human beings to supplement the diet by increasing the total dietary intake"

The onslaught of COVID-19 has impacted all aspects of day-to-day human life which also includes food consumption. Researchers carried out research work to analyze two data sets consisting of food preparation recipes, the first data set (69,444) published before the lockdown period and the second data set (10,009) during the quarantine period. Using Artificial Intelligence tools, their study found apparent changes in the food consumption patterns before and during the COVID-19 pandemic [2]. World Health Organization (WHO) in its publication [3] propagated that healthy diets sustain immune systems. WHO

further added that a healthy diet was crucial during the COVID-19 pandemic and food consumption had an important bearing on the body's capability to avert, fight and recuperate from infections? Research work done over many years provided numerous and diverse viewpoints on consumers' preference of functional foods and acceptance of consequent health benefits. The outcomes of these studies helped functional food providers, marketers, and policymakers. The next section documented beliefs about the consumption of functional foods' nutrition and health link, purchase drivers and patterns, and individual attitudes.

LITERATURE REVIEW

Functional foods are whole, fortified, enriched, or enhanced foods that offer health benefits in addition to essential nutrients such as minerals and vitamins when the consumption happened at effective levels regularly. Not all food claims to be functional foods [4]. Biological markers which are easily measurable and are pertinent for the anticipated health benefits may be significant for gauging the efficacy of the action of a particular functional food [5]. Development of Functional food from concept to commercialization involves several distinct stages. Credibility of functional food was enhanced with supporting efficacy and safety data as it resulted in improved consumer awareness, formed the basis for health claims and regulatory approval [6].

Functional food, which was first promoted in 1984 by Japanese scientists, developed as a concept while studying the interrelationships between satisfaction, fortification, nutrition, and modulation of physiological systems [7]. A Study revealed that a research project on food functions conducted during the early 1980s to 1990s in Japan led to the creation of the world's first policy which legitimized functional food as "food for specified health use" (FoSHU). A functional food product was to be approved as a FoSHU underwent stringent scrutiny and corroboration to ensure the product's efficacy and safety [8].

Functional Foods also found deep roots in the history of many cultures. Ancient Indian science of Ayurveda preached the medicinal value of food according to different seasons. Health foods, directions and procedures that govern the making of food, and method of consuming have been discussed in detail in the ancient literature and have been established after having been tested repeatedly for centuries in each Indian family [9]. Ministry of Health of the People's Republic of China disseminated in June 1996 the document on "the provision of functional foods administration". This document defined functional food as food that performs distinct health functions. Accordingly, the document stated that functional foods were appropriate for consumption by specific groups of people and performed the function of regulating the human body, however, they may not be used for therapeutic purpose [10].

Over the years many researchers found increasing consumer awareness and consciousness towards functional foods. A team of researcher described an effective, educational methodology to expand consumer awareness of healthy food choices. They recommended that it be adopted for improved dissemination of information regarding health foods on a mass scale and at a lower cost [11]. Consumers were increasingly sensitive to the product assertions about nutritional elements. These may include calorific value and the presence of nutrients such as fats, sugars, carbohydrates, minerals, fibres, vitamins, etc. The research proclaimed that consumers were also conscious of product safety and certifications [12].

Increasing awareness, coupled with emerging opportunities in the market triggered researchers to understand consumer behaviour and motivation towards functional foods. Diverse factors having an impact on the consumer purchase decision of functional foods and beverages and went on to propose an integrated functional food and beverages model for the Indian market. The researchers proposed that this model could be acted as a guideline for both marketers and policymakers [13]. Market research was carried out on consumer behaviour and key demand metrics in Brazil and found that while social marketing was crucial for fortified staple foods scaling up in commercial markets, other elements such as public and social sectors engagement and clear governance were also important for long-term impact [14].

Longer time spent on looking at a claim, lower price and higher perceived healthiness and tastiness of the product increased the likelihood of the purchase of the product are the major factors influencing buying behaviour [15]. Greater awareness and knowledge were the most frequently reported factors that promoted the consumption of functional foods, and the favoured sources of information were newspapers, magazines, books, and food labels and very high incidence of functional food consumption among respondents, [16].

Consumer demand for such foods that fit into specific health and lifestyle needs was likely to increase. This, in turn, impacted all sectors related to food processing and manufacturing [17]. Italian consumers were confused about functional foods but were aware of foods that had intrinsic health benefits.

Consumption of such foods was directly related to the education of the consumer and the existence of the health condition of a family member [18].

Consumers with diverse attitudes regarding health and hedonic features of foods had different reactions to information about the source of functional food constituent. Providing information about the source of the functional element created undesirable taste expectations and impacted the willingness to purchase [19]. Most important factors in consumer decision making regarding functional foods included earlier consumption experience, the functional nutrients, their quality, and price. As food supplements were complex products it was difficult for the consumers to assess product quality at the point of purchase. The reliability of the information source impacted the customer's decision making [20].

Irish consumers had limited knowledge of functional ingredients and exact health benefits. They consumed because of a perception of positive health benefits [21]. Functional food consumers were categorised into two groups. The first group was health-oriented consumers who were well-informed, and the second group cared less about health discussions surrounding food. Based on the categorization the study recommended different marketing approaches for product promotion [22].

In Hungary was found that the maximum respondents were of the view that it was justified to consume functional foods for the prevention of non-communicable diseases such as digestive problems, high cholesterol level, and a weakened immune system [23]. A study found that 93% of the respondents consumed functional food. The research further reported that increased awareness and knowledge was the most testified factor that promoted the consumption of functional foods [24].

A group of researchers highlighted the necessity to fully evaluated functional foods to ensure that they comply with scientific and regulatory standards. They stated that functional foods are intentioned to meet consumers' needs and lifestyle requirements and self-medication may be one of the reasons for their use [25]. Healthy food consumption was given a preference by respondents with regards to a healthy lifestyle. Foods acted as deterrents, producing a beneficial health effect on people, while the performance-boosting impact of these foods was allied with consumers' trendy and modern concept [26]. Objective and specific knowledge were the most significant elements in the consumer knowledge index which distinguished experts from others. Age, gender, income, and education served as backgrounds for the consumers' knowledge of functional foods. This in turn affected attitudes towards health and wellness which consequently impacted buying behaviour [27].

Consumer attitude towards functional food has a bearing on their willingness to consume. Healthy lifestyle does not have an impact on the attitude towards functional food. Their findings also supported a better comprehension of differentials in healthy lifestyles between men and women and further, how these differentials influenced attitudes toward functional foods [28]. Health consciousness and subjective norm pointedly augment consumers' attitudes towards the purchase of functional yoghurts [29]. Food choice is a composite process, which is influenced by myriad factors. These factors may be in relation to the product, the consumer of the product, and the consumption context [30]. Consumers' knowledge of established food nutrients and their health effects was high as compared to those food nutrients which were recently launched. They also found that there existed a positive relationship between the purchase of functional foods and consumer income and education [31].

OBJECTIVES

1. To study COVID-19 spread impact on the consumers' attitudes and perception regarding Functional Food and beverages
2. To assess COVID-19 spread impact on the reasons and motivation for buying Functional Food and beverages
3. To find out Suitable channels to communicate on Functional Food and beverages based on popular sources of information and purchase decision influencers

RESEARCH METHODOLOGY

Research Gap: Researchers attempted to study the spread of Covid-19 and its impact on the buying behaviour and consumption of functional food and beverages. Covid-19 has changed the buyers' perception of consuming foods and beverages. Buyers have shifted towards consuming foods and beverages which has an additional new ingredient or more of existing ingredients such as Minerals, Vitamins, Proteins, Metals, etc. Many researchers from various countries have attempted to find an impact on the buying behaviour and consumption of functional food post-Covid-19. There was a dearth of literature specifically concentrating on the Indian context. This study is specifically built around the Indian context and Indian buyers' behaviour towards functional foods and beverages.

Research Design: This research work is descriptive and empirical and is based on secondary and primary data.

Sampling: Researchers have selected 203 respondent buying functional foods and beverages across the Nation. Two stage convenient sampling was used to select the sample. The data has been collected through a structured questionnaire containing 15 questions including several sub-questions. A survey questionnaire was used and was filled using personal interaction as well as was sent through email with an invitation to participate in the survey.

Time Period: In India, the spread of Covid-19 was severe from March 2020 and the lockdown was implemented followed by this spread. Researchers chose to study buyers' behaviour from January 2021 to June 2021 to capture the actual impact in its entirety and not as a typical reaction to the COVID-19 spread. The intention was to enable an adequate time period to effectively gauge behavioural responses, ensuring sifting of the noise impact from the actual impact.

Limitations: This study is limited only to Functional foods and beverages. Buyer sentiments will be affected by the spill-over impact of the Covid-19 spread.

Data Analysis: To analyse the primary database and test Hypotheses, Researchers have used statistical tools such as Percentage analysis, t-test, ANOVA and Regression and ANOVA. Percentage analysis was used to figure the inclination of buyers towards the various parameters under the study. T-test and ANOVA were used to figure the difference in the response of buyers. Regression was used to find out the impact of independent variables on the dependent variable and variation in the dependent variable

DATA ANALYSIS

In this research, the data was collected from the male (57%) and female (43%), rural (9%), urban (77%) and semi-urban (14%). In the Likert scale of importance, it is observed that Nutrition (85.50%) and convenience (72.50%) are highly important parameters consider by buyers while purchasing food and beverages followed by cost (50%), taste (62%) and brand name (55.70%). The impact of the Covid 19 spread was observed on the lifestyle of people. Buyers mentioned that they have started consuming high nutritional food (79%), eating more vegetables (78.80%), eating more fruits (76.80%), exercising (76%) and controlled the consuming fat (46.70%) and taking supplements (32.50%). In the category of functional foods, it is found that the purchase of milk and dairy product (54.50%), poultry eggs (62%) and cereals (51%) were positively impacted but bakery product (35%), confectionery (28.60%) and beverages (29.60%) have not shown any growth in the consumption. In a response to the question related to the factors limiting the purchase of functional foods the result was noted as fear of the side effect (56.60%) was the prime reason behind not buying the functional food and on the other side, functional foods were found non-expensive (73.40%), good at taste (73%) and sufficiently available (72.40%). The high preference as a guide for purchasing nutritionally enriched food was given to friends and family (69.50%), health professionals (63%) and food labels (59%). Health association, product promotion and local stores were considered moderately (45%), dietician (35.50%) was least preferred by the respondents. medical doctors (71%), nutritional consultant (65.50%) and research institutes (62.60%) were considered as a highly authentic source of endorsement and consumer association (35%) and food retailers (26%) were considered as the less authentic source of endorsement.

HYPOTHESES

Ha1: There is a significant difference exist between the Male and Female for giving importance to various factors under the study.

Ha2: There is a significant difference exist in the age of respondents for giving importance to various factors under the study.

Ha3: There is a significant difference exist in the occupation of respondents for giving importance to various factors under the study.

Ha4: There is a relationship between the geographical region and the spread of Covid-19.

Ha5: Purchase of Functional food is dependent on individuals wish to stay healthy, to stay attractive, to retard aging, to avoid medical treatment, number of children in family, taste, Interest/curiosity, recommendations from others and being oneself Good

TESTING OF HYPOTHESES AND RESULTS

To test Ha1, a t-test was conducted to find is there any significant difference exist between the male and female for giving importance to various factors under the study (Table 1). The t value and significance (p) value were calculated. Cost (t =.214, p=.831), taste (t = -.944, p=.346), convenience (t = -1.710, p=.089), nutrition (t = -2.233, p=.027), brand (t = -1.867, p=.063). It is found that the difference exists only for nutrition wherein the mean values were noted for male = 4.18 and female = 4.43 and the p-value was observed as .027.

Table 1 - Independent Samples Test between Gender and Importance given to factors

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Cost	Equal variances assumed	.030	.863	.214	201	.831	.024	.114	-.201	.250
	Equal variances not assumed			.214	188.216	.831	.024	.114	-.201	.249
Taste	Equal variances assumed	1.590	.209	-.944	201	.346	-.104	.111	-.323	.114
	Equal variances not assumed			-.952	193.134	.342	-.104	.110	-.321	.112
Convenience	Equal variances assumed	6.428	.012	-1.666	201	.097	-.189	.114	-.413	.035
	Equal variances not assumed			-1.710	199.878	.089	-.189	.111	-.407	.029
Nutrition	Equal variances assumed	1.417	.235	-2.233	201	.027	-.249	.112	-.469	-.029
	Equal variances not assumed			-2.276	197.734	.024	-.249	.110	-.465	-.033
Brand	Equal variances assumed	.650	.421	-1.867	201	.063	-.210	.113	-.432	.012
	Equal variances not assumed			-1.875	190.361	.062	-.210	.112	-.431	.011

ANOVA test was conducted to test H02 (Table 2), is there any significant difference exist in the age of respondents for giving importance to various factors under the study. The F value and significance (p) value were calculated. Cost (F =.816, p=.444), taste (F = .169, p=.844), convenience (F = 1.750., p=.176), nutrition (F = 6.180, p=.002), brand (F = .722, p= .487). It is found that the difference exists only for nutrition (p=.002).

Table 2. ANOVA between Age and Importance given to factors

		Sum of Squares	df	Mean Square	F	Sig.
Cost	Between Groups	1.058	2	.529	.816	.444
	Within Groups	129.691	200	.648		
	Total	130.749	202			
Taste	Between Groups	.209	2	.104	.169	.844
	Within Groups	123.102	200	.616		
	Total	123.310	202			
Convenience	Between Groups	2.253	2	1.127	1.750	.176
	Within Groups	128.742	200	.644		
	Total	130.995	202			
Nutrition	Between Groups	7.441	2	3.721	6.180	.002
	Within Groups	120.411	200	.602		
	Total	127.852	202			
Brand	Between Groups	.926	2	.463	.722	.487
	Within Groups	128.295	200	.641		
	Total	129.222	202			

To test H03 - is there any significant difference exist in the occupation of respondents for giving importance to various factors under the study- ANOVA test was conducted (Table 3). The F value and significance (p) value were calculated. consuming less fat (F =.544, p=.653), eating more vegetables (F = .617, p=.605), eating more fruit (F = .272., p=.845), exercise (F = .914, p=.435), increase in consumption of nutritionally enriched food (F = 3.900, p=.010), taking food supplement (F = 1.604, p= .190). It is found that housewives are more prone to nutritionally enriched food (M=3.60) compared to self-employed people (M=2.82). It is found that the difference exists only for an increase in the consumption of nutritionally enriched food (p=.010).

Table 3. ANOVA between Occupation and Importance given to factors

		Sum of Squares	df	Mean Square	F	Sig.
Cost	Between Groups	.580	3	.193	.296	.828
	Within Groups	130.168	199	.654		
	Total	130.749	202			
Taste	Between Groups	.412	3	.137	.222	.881
	Within Groups	122.899	199	.618		
	Total	123.310	202			
Convenience	Between Groups	5.938	3	1.979	3.149	.026
	Within Groups	125.058	199	.628		
	Total	130.995	202			
Nutrition	Between Groups	11.935	3	3.978	6.830	.000
	Within Groups	115.918	199	.583		
	Total	127.852	202			
Brand	Between Groups	.908	3	.303	.469	.704
	Within Groups	128.314	199	.645		
	Total	129.222	202			

Researchers were interested to know is there is any relationship exist between the geographical region and the spread of Covid-19. To test the H04 Pearson chi-square test (Table 4) was conducted. Pearson chi-square (X^2) was noted 10.817 with a degree of freedom of 8 the significance (p) value was observed as .212 which was non-significant hence the null hypothesis (H04) is accepted at it is concluded that the spread of Covid-19 and its severity is irrespective of geographical region.

Table 4. Chi-Square Tests Between Severity of Covid-19 and Geographical Region

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.817 ^a	8	.212
Likelihood Ratio	12.413	8	.134
Linear-by-Linear Association	.075	1	.784
No of Valid Cases	203		

Regression analysis was conducted to find out the impact of various factors under the study on the purchase decision of functional food (H05). As shown in table 5, value of R-Square is 0.558 and value of adjusted R-Square is 0.537 ($F = 27.056$, $p = .000 < 0.05$), which indicated a good degree of correlation. The R-Square value indicates how much of the total variation in the dependent variable, Overall Purchase can be explained by the independent variables. The result showed that 55.80% can be explained, which is a good variation. This indicated that the regression model predicted the dependent variable significantly. Further, $p = 0.001$ is less than 0.05 and indicated that, overall, the regression model statistically significantly predicts the outcome variable (i.e., it is a good fit for the data).

Table 5. Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate
1	.747 ^a	.558	.537	.471

Table 6. Regression Coefficients

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.997	.398		-2.504	.013
	To stay healthy	.273	.065	.251	4.186	.000
	To stay attractive	.123	.047	.137	2.618	.010
	To retard aging	.095	.063	.080	1.504	.134
	For child/s	.039	.047	.045	.836	.404
	To avoid medical treatment	.149	.049	.164	3.030	.003
	For good taste	.208	.058	.186	3.615	.000
	Interest/curiosity	.041	.059	.038	.704	.482
	Recommendation	.097	.051	.097	1.922	.056
	For oneself Good	.290	.058	.304	5.019	.000

Note. Dependent Variable: Overall Purchase

As can be inferred from the table 6, coefficient analysis showed that Staying healthy ($t = 4.186$, $P = .000 < 0.05$), staying attractive ($t = 2.618$, $P = .010 < 0.05$), avoiding medical future treatment ($t = 3.030$, $P = .003 < 0.05$), for good taste ($t = 3.615$, $P = .000 < 0.05$), for oneself good ($t = 5.019$, $P = .000 < 0.05$) have showed the significant relationship with the purchase decision and hence the null hypothesis (H_0) partially rejected. On the other side retard aging ($t = 1.504$, $P = .134 > 0.05$), for child/d ($t = .836$, $P = .404 > 0.05$), interest/curiosity ($t = .704$, $P = .482 > 0.05$), recommendation ($t = 1.922$, $P = .056 > 0.05$) have showed non-significant relationship with the purchase decision and hence the Null hypothesis (H_0) is partially accepted.

FINDINGS AND RECOMMENDATIONS

1. It is observed that nutrition and convenience are highly important parameters considered by buyers while purchasing food and beverages followed by cost, taste, and brand name.
2. In the consumption and lifestyle pattern, it was observed that buyers have started consuming high nutritional food, eating more vegetables and fruits, exercising more, controlling the consumption of fast foods, and taking supplements.
3. In the Purchase pattern it was found that the purchase of milk and dairy product, poultry eggs and cereals were positively impacted but bakery product, confectionery and beverages have not shown any consumption growth. It was also noted that fear of the side effect was the prime reason behind not buying the functional food and on the other side, functional foods were found non-expensive, good at the taste and sufficiently available.
4. Buyers preferred friends and family, health professionals, food labels as a guide for purchasing nutritionally enriched food and medical doctors, nutritional consultant and research institutes were considered as the highly authentic source of endorsement.
5. Nutrition was the major factor that showed the difference in gender and age. Females gave more importance to nutrition compared to male and people below the age of 18 were different than the people in the age group of 25 to 40. Housewives are more prone to nutritionally enriched food compared to self-employed people.
6. The regression model predicted the dependent variable significantly. Staying healthy, staying attractive, avoiding medical future treatment, good taste, oneself good were the factors that influenced the purchase of functional foods and beverages and it also found that spread of Covid-19 and its severity is irrespective of geographical region.
7. As the nutrition is the most influencing factor on buyers' behaviour it is recommended that the functional food and beverages marketers should concentrate on adding the valuable nutrition to the products and promoting the same on it.

SCOPE FOR FUTURE RESEARCH

The spread of Covid 19 has impacted on every facet of life. Every individual, organisation, and society in large has been forced to change the way they were living their life. Researchers have tried to study the impact of the spread of covid 19 on the consumption of functional food and beverages and various factors

influencing on the buyers' behaviour. Further, this study can be carried out on consumption of regular food and beverages. The instruments are tested and can be used as it is with some minor modification as per the requirement of the study.

CONCLUSION

This study was directed towards studying the impact of the spread of Covid 19 on the consumption of functional food and beverages and various factors influencing the consumption. Researchers had selected 203 respondents and collected the data through a structured instrument developed by using the Likert scale. The data was analysed through descriptive and inferential statistics. The results showed that nutrition and convenience are highly important parameters considered by buyers while purchasing food and beverages, buyers have started consuming high nutritional food, eating more vegetables and fruits, exercising more, purchase of milk and dairy product, poultry eggs and cereals were positively impacted but bakery product, fear of the side effect was the prime reason behind not buying the functional food, friends and family, health professionals, food labels were preferred as the guide for purchasing nutritionally enriched food, nutrition is the most influencing factor on buyers' behaviour.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest

REFERENCES

- Holder M, D (2019). The Contribution of Food Consumption to Well-Being. *Ann Nutr Metab* 2019;74 (suppl 2): 44-52. <https://doi.org/10.1159/000499147>
- Eftimov T, Popovski G., Petković M., Seljak B.K., Kocev D. COVID-19 pandemic changes the food consumption patterns. *Trends in Food Science & Technology*. Volume 104, 2020, Pages 268-272, ISSN 0924-2244. <https://doi.org/10.1016/j.tifs.2020.08.017>
- #HealthyAtHome: Healthy Diet (2020). World Health Organization (WHO). Extracted from <https://www.who.int/campaigns/connecting-the-world-to-combatcoronavirus/healthyathome/healthyathome---healthy-diet>
- Clare M. H. (2002). Functional Foods: Benefits, Concerns and Challenges. A Position Paper from the American Council on Science and Health *The Journal of Nutrition*, Volume 132, Issue 12, December 2002, Pages 3772-3781. <https://doi.org/10.1093/jn/132.12.3772>
- Walter P., (2007). History and importance of functional foods. *Ther Umsch*. 64 (3):131-4. German. PMID: 17323283. <https://doi.org/10.1024/0040-5930.64.3.131>
- Jones, Peter, Jew and Stephanie (2007). Functional food development: concept to reality. *Trends in Food Science & Technology*. doi: 10.1016/j.tifs.2007.03.008
- Roberfroid M. (2000). A European consensus of scientific concepts of functional foods. *Nutrition*, Burbank, Los Angeles County, Calif. doi: 10.1016/S0899-9007(00)00329-4
- Shimizu M. (2014). History and Current Status of Functional Food Regulations in Japan. *Nutraceutical and Functional Food Regulations in the United States and Around the World: Second Edition*, 257-263. doi: 10.1016/B978-0-12-405870-5.00015-3
- Priyadarshini S. (2019). Concept of nutraceuticals and functional foods in Ayurveda. Conference: International Symposium on "Recent Trends In Processing & Safety of Speciality And Operational Foods" extracted from https://www.researchgate.net/publication/333786107_Concept_of_nutraceuticals_and_functional_foods_in_Ayurveda
- Yao, Chunyan, Hao, Ruiwen, Pan, Shengli, Wang and Yin, (2012). Functional Foods Based on Traditional Chinese Medicine. doi: 10.5772/27643
- Losasso C., Cibin V., Cappa V., Roccato A., Vanzo A., Andrighetto I. and, Ricci A. (2012). Food safety and nutrition: Improving consumer behaviour. *Food Control*, Volume 26, Issue 2, 2012, Pages 252-258, ISSN 0956-7135. <https://doi.org/10.1016/j.foodcont.2012.01.038>
- Martinovski S. (2016). Nutrition business models of consumer behaviour when purchasing self-explanatory food products. 16, 53-58. Extracted from https://www.researchgate.net/publication/313401766_Nutrition_business_models_of_consumer_behaviour_when_purchasing_self-explanatory_food_products
- Sheikh S., Bijuna M. (2017). Consumer behaviour in fortified food choice decisions in India. *Nutrition & Food Science*, 47, 229-239. doi: 10.1108/NFS-05-2016-0065
- Milani P., Carnahan E., Kapoor S., Ellison C., Manus C., Spohrer R., Berg G., Wolfson and Katharine J. (2017). Social Marketing of a Fortified Staple Food at Scale: Generating Demand for Fortified Rice in Brazil. *Journal of Food Products Marketing*, 23:8, 955-978. doi: 10.1080/10454446.2016.1266546
- Steinhauser J., Janssen M., and Hamm, U. (2019). Who Buys Products with Nutrition and Health Claims? A Purchase Simulation with Eye Tracking on the Influence of Consumers' Nutrition Knowledge and Health Motivation. *Nutrients*, 11(9), 2199. <https://doi.org/10.3390/nu11092199>
- Vella, M.N., Stratton, L.M., Sheeshka, J., Duncan, A.M., (2014), Functional food awareness and perceptions in relation to information sources in older adults. *Nutr J* 13, 44 (2014). <https://doi.org/10.1186/1475-2891-13-44>

17. Annunziata A., Vecchio R. (2011). Functional foods development in the European market: A consumer perspective. *Journal of Functional Foods*, Volume 3, Issue 3, 2011, Pages 223-228, ISSN 1756-4646. <https://doi.org/10.1016/j.jff.2011.03.011>.
18. Azzurra A., Paola P. (2009). Consumers' behaviours and attitudes toward healthy food products: The case of Organic and Functional foods, Paper prepared for presentation at the 113th EAAE Seminar "A resilient European food industry and food chain in a challenging world", Chania, Crete, Greece, date as of September 3 - 6, 2009. Extracted from <https://core.ac.uk/download/pdf/6689738.pdf>
19. Gastón A., Giménez A., Gámbaro A. (2008). Does information about the source of functional ingredients influence consumer perception of functional milk desserts? *Journal of the Science of Food and Agriculture*, Volume 88, Issue 12, September 2008. <https://doi.org/10.1002/jsfa.3313>
20. Nikolett N. (2017). Factors Influencing Functional Food and Food Supplement Consumption. *Review on Agriculture and Rural Development 2017* Vol. 6 (1-2) ISSN 2063-4803. Extracted from <https://search.proquest.com/openview/60d34d8b77ad2f42c0939e0def182b03/1?pq-origsite=gscholar&cbl=4587113>
21. Ellie D., Liu G. and Amit J. (2018). An Investigation in the Key Ingredients in Health and Functional Foods. *HSOA Journal of Food Science and Nutrition*, 2018, 4: 035. doi: 10.24966/FSN-1076/100035. Extracted from http://www.heraldopenaccess.us/article_pdf/33/an-investigation-in-the-key-ingredients-in-health-and-functional-foods.pdf
22. Franz A., Nowak B. (2010). Functional food consumption in Germany: A lifestyle segmentation study. *Diskussionsbeitrag*, No. 1003, Georg-August Universität Göttingen, Department für Agrarökonomie und Rurale Entwicklung (DARE), Göttingen ISSN 1865-2697. Extracted from <https://www.econstor.eu/bitstream/10419/30324/1/623864681.pdf>
23. Brigitta P., Zoltán L., Gyula K. and Ágoston T. (2019). Consumer Evaluation of the Role of Functional Food Products in Disease Prevention and the Characteristics of Target Groups, *Nutrients*, 12(1), 69. MDPI Open Access Journals. <https://doi.org/10.3390/nu12010069>
24. Meagan N V., Laura M.S., Judy S. and Duncan A. (2014). Functional food awareness and perceptions in relation to information sources in older adults. *Nutr J* 13, 44 (2014). <https://doi.org/10.1186/1475-2891-13-44>
25. De Jong N., Klungel O. H., Verhagen H., Wolfs M. C., Ocké M. C., and Leufkens H. G. (2007). Functional foods: the case for closer evaluation. *BMJ (Clinical research ed.)*, 334(7602), 1037-1039. <https://doi.org/10.1136/bmj.39196.666377.BE>
26. Nagy S. (2007). Consumer behaviour on the market of functional food. Doi: 10.13140/RG.2.1.3575.3121. Extracted from https://www.researchgate.net/publication/278784607_Consumer_behaviour_on_the_market_of_functional_food
27. Sääksjärvi M., Holmlund M. and Tanskanen N. (2009). Consumer knowledge of functional foods. *The International Review of Retail, Distribution and Consumer Research*. DOI: 10.1080/09593960903109469. Extracted from https://www.researchgate.net/publication/247514903_Consumer_knowledge_of_functional_foods
28. Küster B., Vidal C. (2017). Consumer attitudes in the election of functional foods. *Spanish Journal of Marketing - ESIC*, Volume 21, Supplement 1, July 2017, Pages 65-79. <https://doi.org/10.1016/j.sjme.2017.05.002>
29. Nguyen N., Nguyen H. V., Nguyen P. T., Tran V. T., Nguyen H. N., Nguyen T., Cao T. K., and Nguyen, T. H. (2019). Some Key Factors Affecting Consumers' Intentions to Purchase Functional Foods: A Case Study of Functional Yogurts in Vietnam. *Foods (Basel, Switzerland)*, 9(1), 24. <https://doi.org/10.3390/foods9010024>
30. Kaya, I. (2016) Motivation Factors of Consumers' Food Choice. *Food and Nutrition Sciences*, 7, 149-154. <http://dx.doi.org/10.4236/fns.2016.73016>
31. Klaus M, Kai S. (2006), Consumers' attitudes and expectations concerning Functional Food. University of Applied Sciences of Weihenstephan Science Centre Straubing. Extracted from <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.464.7491&rep=rep1&type=pdf>

CITATION OF THIS ARTICLE

S Jain, S Kamble. Impact of COVID-19 spread on buyers' behaviour towards Functional Food and Beverages. *Bull. Env.Pharmacol. Life Sci., Spl Issue [1] 2022* : 415-423