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Bringing Food and Nutrition ideas to life

FICCI

Innovation in Food & Nutrition

Towards a Healthier India

October, 2021

INDIA FOOD & NUTRITION INNOVATION SUMMIT 2021

27-28 Oct 2021 | Virtual



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Foreword



Rinka Banerjee
Founder
Thinking Forks Consulting

India is going through a rapid demographic and nutrition transition. Consumers in India like elsewhere in the world are looking for active healthier lifestyle solutions through food & beverages. This strong stated need has also been accelerated due to the COVID19 pandemic. This has also led to the growth of categories like Functional Foods & Nutraceuticals. Equally, India also has the double burden of Malnutrition on one end and Over nutrition on the other leading to Non Communicable Diseases such as Diabetes, Over Weight, Cardiovascular diseases and so on. The Food industry is innovating like never before to meet the growing consumer needs and provide healthier choices in Food & Beverages through extensive R&D in Functional Ingredients, Novel Processing Technologies, Industry-Academia collaborations. Greater Market access through various go-to-market channels is providing a great opportunity for Food innovators. In this report there are insights on some of the Key trends, Nutritional need gaps and Innovations in the Indian marketplace. This report also provides a glimpse of the Technologies from Industry and Academia ecosystem that is enabling growth in Food & Nutrition related products, charting the path forward towards a Healthier India.



Message from



MINISTRY OF FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

Date : 25th October, 2021

MESSAGE

The Food processing industry is a major source of employment and income generation for both rural and urban areas. The industry is going through significant growth with growing awareness of consumers to 'Eat Healthy' and "Eat Right'. This increasing need for Food products which are healthier, safe and provide the right nutrition is leading to a wide portfolio of innovative new food products coming into the market which are addressing nutritional gaps as well as enhancing our nutritional status. Research & Development by both Academia and Industry is going to play a key role to ensure we harness innovative new technologies in Food processing to bring to market food products that are healthy, safe and sustainable.

I am happy to note that to further highlight the emerging consumer needs, Nutritional gaps and new technologies available both at an Academia and Industry level, this report 'India Food & Nutrition Innovation' is being released.

This report identifies the growing consumer trends and needs which will drive growth, Key Nutritional Challenges both for Malnutrition and Over Nutrition, how the industry which has a large host of MSME's is playing a key role in bringing to market innovative new products, and some of the enabling technologies being worked on by Academia and industry which is ready for the industry to commercialize. I expect the report to further enhance collaboration in the ecosystem to drive growth and deliver safe and healthy food choices for consumers in the years to come.

Manoj Joshi

(MANOJ JOSHI)
SPECIAL SECRETARY
M/o. Food Processing Industries

Message from



MESSAGE FROM
Federation of Indian Chambers of Commerce & Industry

The food processing industry in India is expected to touch USD 535 bn (INR 40 Lakh Crore) by 2025-26. By 2030, Indian annual household consumption is expected to treble, making India the 5th largest consumer market. India has progressed from food shortage to food surplus. However, given India's billion plus population, glaring nutritional challenges in both Malnutrition and Over nutrition leading to deficiencies on one hand and incidence of Non communicable diseases like Diabetes, Overweight, Cardiovascular disease on the other, the food processing industry has a much wider role to play in the coming years.

With the impact of COVID19 pandemic, consumers demand for healthy and safe food has increased. The food processing industry, besides its core role of increasing shelf life of food, preserving nutrients and food safety in the supply chain, needs to constantly innovate and offer to consumers food choices which have a long-term positive impact on the health and nutrition status of the country. In other words, the industry needs to play a very important role in moving towards a "Healthier India". It is in this backdrop that FICCI, in collaboration with Thinking Forks, has put together a platform 'India Food & Nutrition Innovation Summit' to bring the Food and Nutrition ecosystem which through strong collaborative efforts will drive Innovation in this sector and bring in innovative, healthier food choices for the Indian consumer.

This report 'India Food and Nutrition Innovation' aims to bring to you the key gaps when it comes to nutrition, emerging consumer and market trends that are driving consumer choices in Food and Beverages including Functional Foods and Nutraceuticals and innovative new products. It also highlights the disruptive technologies that the new age companies are bringing to market, technologies from the industry and Academia which are ready for commercialisation, and last but not the least the regulatory frameworks that are evolving to enable the potential to innovate towards providing healthier food products.

The Food industry ecosystem needs to actively collaborate to make this dream a reality for a 'Healthier India'

I am confident that this joint effort by FICCI & Thinking Forks will be instrumental in promoting active collaboration in the Food & Nutrition ecosystem between Industry, Academia and Regulators to drive sustainability, technological innovations that will provide consumers with safe and nutritious food.



Dilip Chenoy
Secretary General
FICCI

Acknowledgements

We would like to express our thanks and gratitude to FICCI for partnering with Thinking Forks to prepare the report on 'India Food & Nutrition Innovation'. We would also like to thank our knowledge partners "Protein Food & Nutrition Development Association of India (PFNDAI) and Mintel to support this initiative by providing insightful data on the Nutrition status of India, emerging consumer needs, and impact of COVID19 on consumer behaviour with Food.



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PFNDAI PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA

MINTEL

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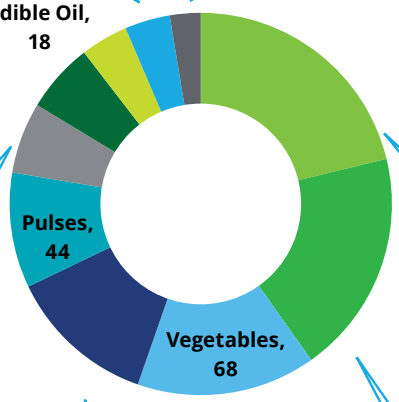
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Food Production: INDIA

- India tops the world in milk production with about 200 million tonnes in 2019-20.
- As per Economic survey of India 2020-21, total food grain production was about 300 million tonnes for FY 20.
- While India topped millet production globally, it was second largest producer of rice and wheat. It was also largest producer of total pulses.
- In vegetables India ranks #2 in production of many vegetables like cabbage, green beans, green peas, cauliflower, eggplant, potato etc while topping in okra.
- While it leads in some fruit production including bananas, mango, guava, papaya, lemons & lime, it is among top five producers in the world for coconut, tomato, apple, oranges and watermelons.
- While it is topping in spices production, it is also leading in cashewnuts and peanuts at second place.

Major Food Segments in India – FY 17

Segments in 2016 (USD BN)



Other Packaged Food, 17

Item	USD BN	CAGR 2020
Savoury snacks	5	30%
Biscuits	4	20%
Confectionaries*	3	18%
Baked Goods	2	10%
Pasta. Noodles & Soup	1	9%
Others	2	18%

Beverages, 12

Item	USD BN	CAGR 2020
Carbonates	4.3	8%
Tea	2.5	4%
Bottled Water	2.2	16%
Juices & Concentrates	2	10%
Coffee	1	10%

Sugar, Salt and Spices, 27

Item	USD BN	CAGR 2020
Sugar	14	2%
Salt	1	2%
Spices	10	17%
Pickles/ ingredients	2	20%
Pasta. Noodles & Soup	1	9%
Others	2	18%

Dairy, 95

Item	USD BN	CAGR 2020
Liquid Milk	44	15%
Ghee	22	14%
Others	29	14%

Animal Protein, 56

Item	USD BN	CAGR 2020
Fish and Seafood	10	10%
Chicken	12	12%
Mutton	10	12%
Beef and Veal	7	10%
Eggs	5	13%
Pork	3	15%

Cereals, 85

Item	USD BN	CAGR 2020
Rice	42	2.40%
Wheat Products	21	6%
Others	21	4%

(Source: Industry 4.0. in Food Industry. India Food Report. Deloitte, January, 2018)

Dietary & Demographic changes: INDIA

- Demographic projections suggest that India will be 50% urbanized by 2050. Much of this transition will conce trate in medium - and small-sized cities-with less than one million residents-that are also gro ing the fastest in India
- Infrastructure, market access, percentage working women in urban areas, and norms and institutions have a statistica lly significant influence.
- National food consumption statistics suggest that this impending urban transition can lead to large-scale dietary changes.
- Urbanization influences co sumers to move away from traditional staples, towards increased consumption of fruits and vegetables, meat, food prepared away from home, and processed/pac aged foods.

(Source: Urbanization and food consumption in India. Nature, 14th October, 2020)

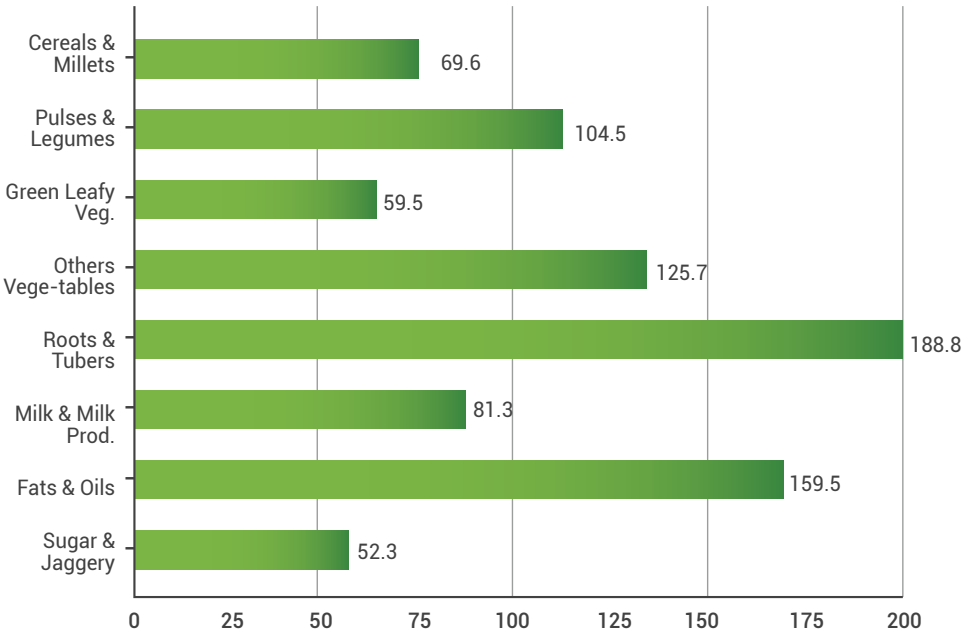


Household Food Consumption: INDIA

- As per latest National Nutrition Monitoring Beurau (NNMB) study, analysis of average household consumption of foodstuffs to determine the % Recommended Dietary Intake was done.
- Cereals & millets, green leafy vegetables and milk and milk products were found to be consumed less than recommended.
- When compared to the nutrients consumed, it was found that except for vitamin C and folate, all the other nutrients intake was less than recommended.
- Protein, Calcium, iron, vitamin A, thiamine, riboflavin, and niacin were all consumed less than the recommended levels.

(Source: Status of Nutrition in India. Paper by Dr. B Sesikeran & Dr. JS Pai, PFNDAI)

Average household consumption of foodstuffs as % RDI



(Source: National Nutrition Monitoring Bureau report, 2017)

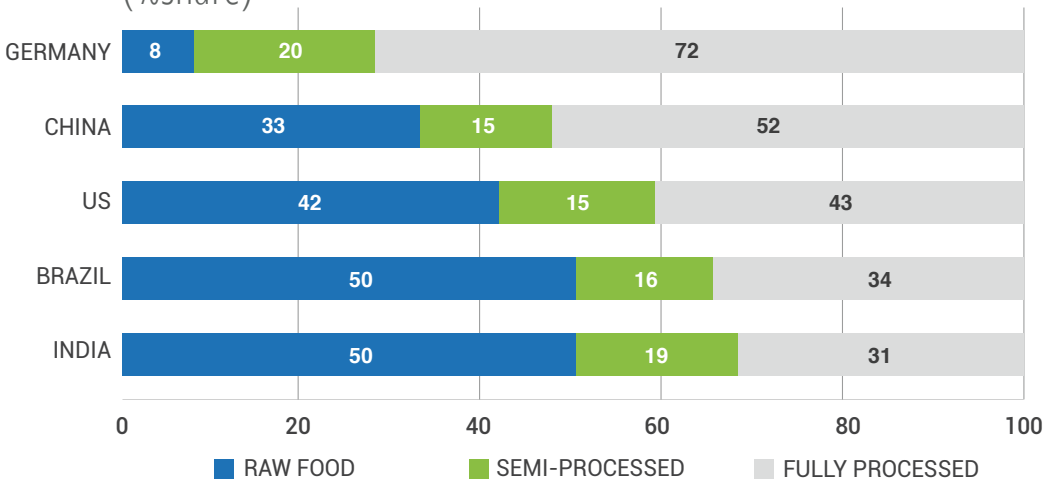


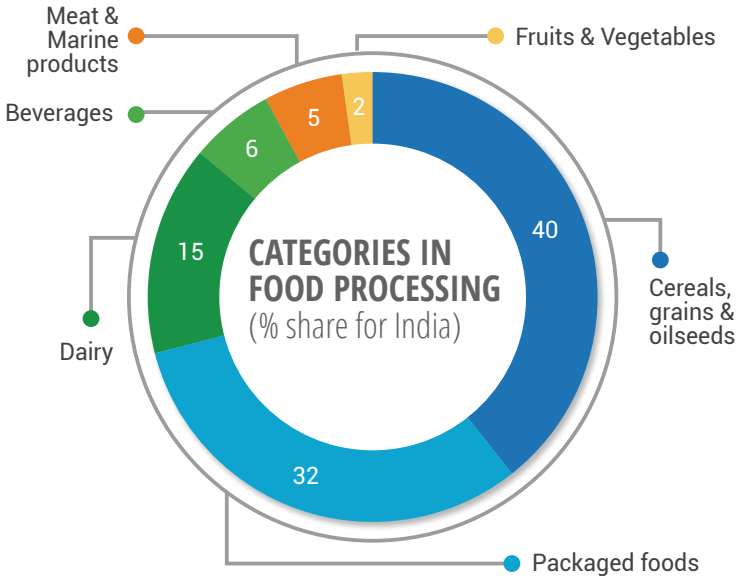
Food Processing Sector: INDIA

- India's food processing sector is one of the largest in the world and its output is expected to reach $535 bn by 2025-26.
- By 2030, Indian annual household consumption to treble, making India 5th largest consumer

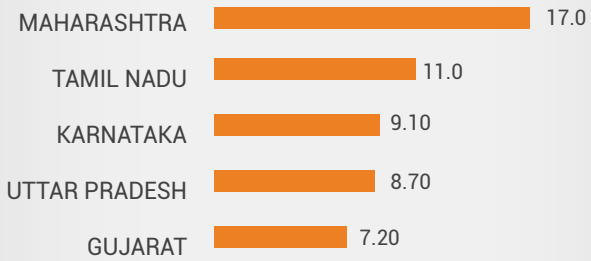
(Source: Indian Food Processing industry. Growth opportunities post the COVID 19 pandemic, KPMG | May 2021)

INDIA vs WORLD
(%share)





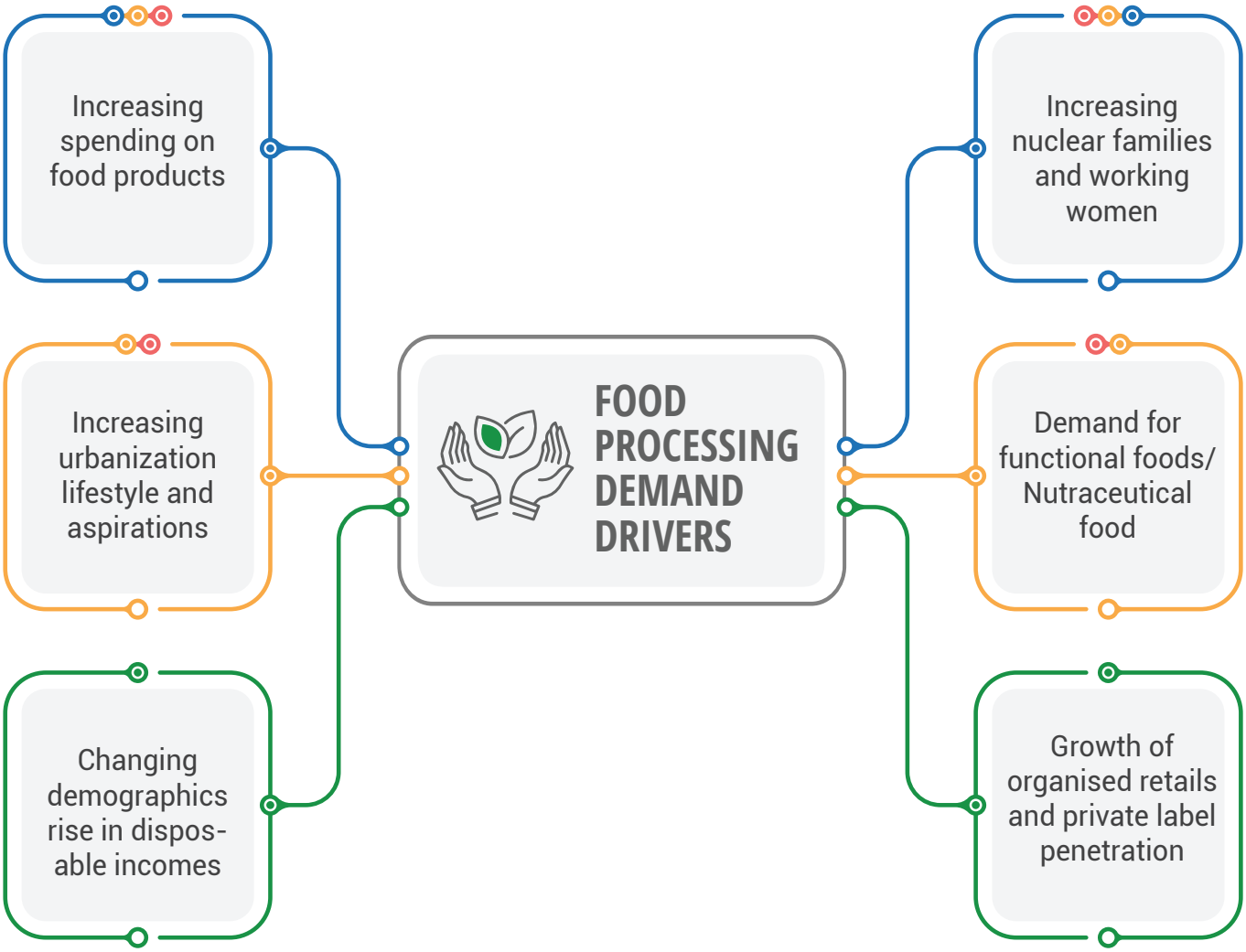
STATE-WISE SHARE IN FOOD PROCESSING
(% share top 5 states)



(Source: Indian Food Processing industry. Growth opportunities post the COVID 19 pandemic, KPMG | May 2021)

Drivers of Growth in Food Processing: INDIA

- The Ministry of Food Processing Industries (MoFPI) is making all efforts to encourage investments across the value chain.
- Under PMKSY, 41 Mega Food Parks, 353 Cold Chain projects, 63 Agro-Processing Clusters, 292 Food Processing Units, 63 Creation of Backward & Forward Linkages Projects & 6 Operation Green projects across the country have been approved.

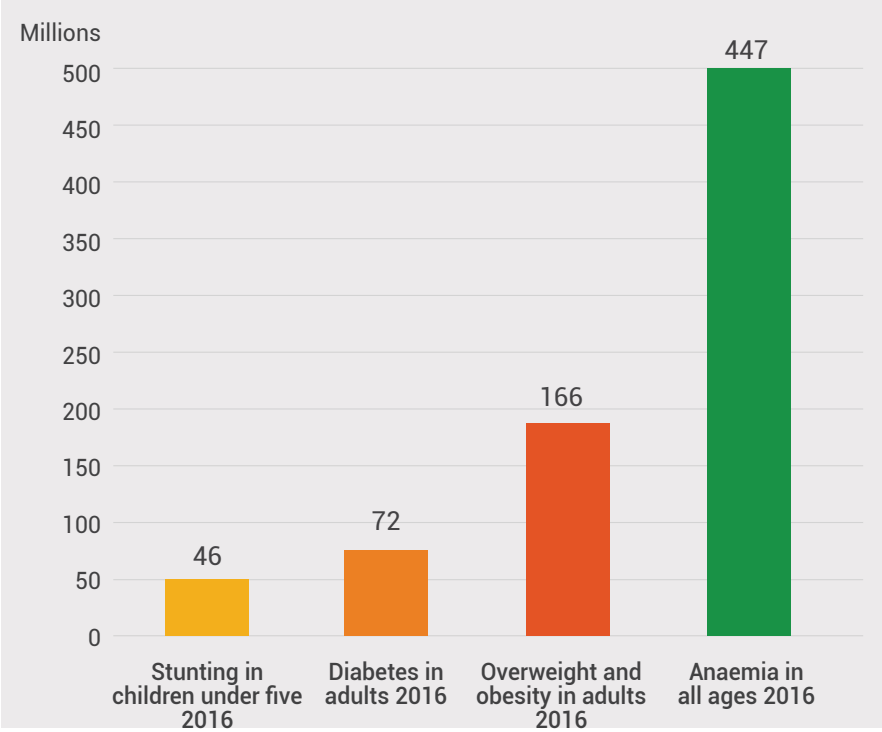


(Source: Invest India, National Promotion and Fecilitation Agency. https://www.investindia.gov.in/sector/food-processing)

NUTRITION STATUS OF INDIA

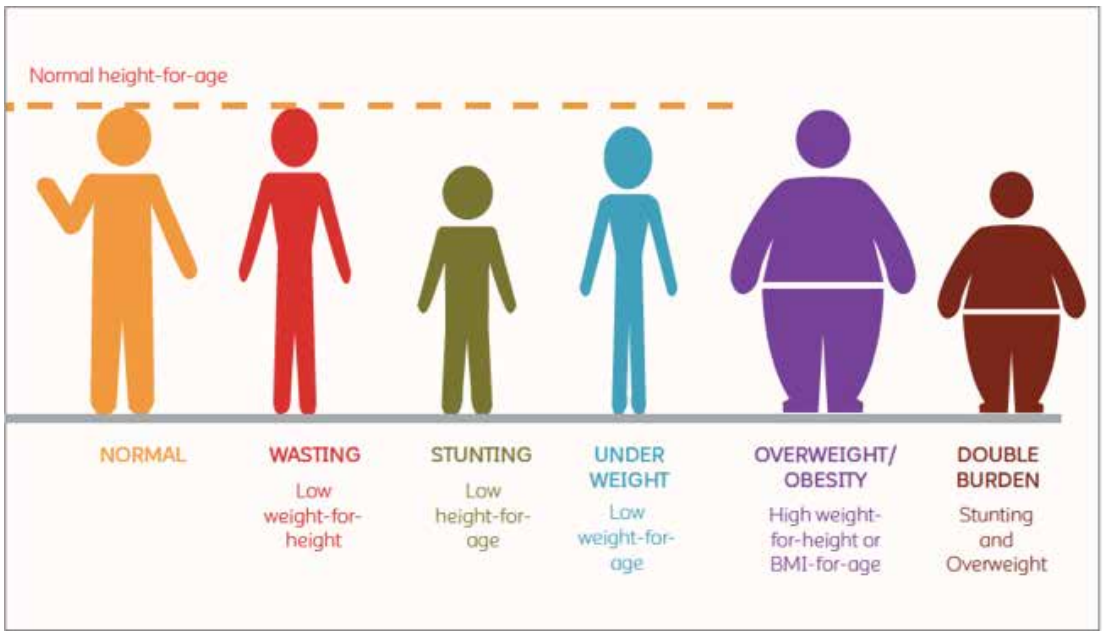


Nutrition Challenges: Double Nutrition Burden



Sources: Stunting - Joint Child Mainutrition Estimate, 2019; IDF DIABETES ATLAS, Eighth edition 2017; Overweight and obesity - Global Health Observatory (GHO) data, 2018; Anaemia - The Global Burden of Anemia, 2016 and Global Burden of Disease Study, 2013.

Types of malnutrition and reference measures, India, CNNS 2016-18



Source: Comprehensive Nutrition Survey Report, Ministry of Health & Family Welfare, 2016-2018

Nutrition Challenges: Underweight & Stunting

Underweight and Stunting

- Comprehensive National| Nutrition Survey (CNNS) 2016-2018 by Ministry of Health & Family Welfare on children from infancy to adolescence and published in 2019 indicates very high level of deficiencies in many micronutrients.
- Chronic malnutrition (stunting) in children under five was reduced by just 1/3 between 1992 and 2016 and it still very high with 38.4% of children still stunted. 35% of Indian children up to age of 4 years were stunted. Higher prevalence was found in rural areas compared to urban. The problem was severe in poorest economic class with 49% stunting.
- About 17% of Indian children up to 4 years of age were wasted showing similar trend in economic classes. About 33% of Indian children up to age 4 years were underweight.

Anemia

- Anaemia is still a severe problem in India among women, adolescent girls and young children.
- Besides increased morbidity and weakness/fatigue, it is associated with delayed mental and psychomotor development and high risk of maternal mortality. Poor nutrition causing iron deficiency, is the main factor in over 60% anaemia cases.
- Over half of all women of reproductive age and children under 5 years were anaemic.
- India accounts for about 25% of global anaemic with an estimated 447 million people with anaemia.

Micronutrient deficiency

- 41% pre-schoolers, 24% of school-age children and 28% adolescents were found to be anaemic. Anaemia was most prevalent among infants up to 2 years. Among adolescents, females had higher prevalence at 40% compared to male (18%).
- Anaemia was mostly due to iron deficiency with 32% preschoolers, 17% school children and 22% adolescent being iron deficient. Among adolescent, females (31%) had higher prevalence than males (12%).
- Iron deficiency was found to be more prevalent in urban than in rural areas.
- Vitamin A is essential for immune function. Its deficiency was found in 18% preschoolers, 22% school children and 16% of adolescents. Severe deficiency could cause night blindness.
- Vitamin D was found to be deficient among 14% preschoolers, 18% school children and 24% adolescents. Vitamin D is essential for bone health as well as immune function.
- Zinc, deficiency was seen in 19% pre-schoolers, 17% school children and 32% adolescents. This deficiency may cause growth retardation, loss of appetite and impaired immune function.
- Vitamin B12 was deficient among 14% preschoolers, 17% school children and 31% adolescents whereas for folate deficiency these figures are 23%, 28% and 37%. Both B12 and folate are necessary for formation of healthy red blood cells, and for synthesis of| DNA. Their deficiency may also cause anaemia.
- Iodine was found to be adequate in all children and adolescents.



(Source: Status of Nutrition in India. Paper by Dr. B Sesikeran & Dr. JS Pai, PFNDAI)

Strategies to Overcome Malnutrition



DR. B. SESIKERAN,
EX-DIRECTOR NATIONAL INSTITUTE OF NUTRITION, HYDERABAD

"Food fortification may not be the best solution unlike a balanced and nutritious diet which is desirable. However, in the prevailing situation, it may be difficult to achieve this ideal rapidly. The immediate solution would be fortification as it would be effective and there is enough evidence across the world . It is also a cost effective solution and has been shown to be safe. The neglect or delay in solving malnutrition problems may cause irreversible damage to the population especially the young and the women in childbearing age. Fortification can yield significant results in a short period of time. Especially fortification of staples like wheat flour, rice, oil, milk etc. is considered good public health policy/strategy to provide micronutrients to reduce dietary deficiencies across population groups"

Nutrition Challenges: Non Communicable Diseases

- Indians have a fairly high prevalence of some of the non-communicable diseases such as cardio-vascular disease, diabetes, hypertension, hypercholesterolemia etc. Some of these problems have come about in last few decades when our diets and lifestyles have changed.
- We have started consuming food products made with refined ingredients to make them look and taste better. Also our intakes of fat especially saturated and trans fat, sugar and salt have gone up substantially while we have reduced our intake of dietary fibre and some vitamins and minerals that would come through less refined ingredients.
- We have reduced intakes of millets, brown or parboiled rice, whole wheat products.
- In addition, we have also reduced our physical activity spending too much time watching TV or using smart phones.
- Prevalence of Overweight and Obesity among urban adults,was more among women (29.7 to 59% with national average 44%) compared to men (21.3 to 42.5% with average 33.8%).
- Prevalence of diabetes was found to be more in urban men (12.9 to 34% with national average 21.5%). Women had prevalence varying from 12.8 to 29.8% with average 19.4%.
- The high LDL cholesterol was more prevalent among urban women (8.9 to 51.4% with average 25.2%) while men had from 10.8 to 40.6% with average 23%. High triglyceride was consistently prevalent among urban males with average of 40.4% compared to 27.7% for women.

(Source: Indian Food Processing industry. Growth opportunities post the COVID 19 pandemic, KPMG | May 2021)



"Fat, sugar and salt are the ingredients that add taste to food products and people can get used to them and want more of it. These are the substances that can cause health problems if consumed in excess. Hence industry must try to resist using too much and try to reduce them where necessary and possible. There are newer technologies available regarding how to reduce the fat, sugar and salt contents in food products. Also one can use alternatives or substitutes.

It is very essential to have dietary fibre as refined ingredients like wheat flour, white rice, clarified juices remove fibre from them. Using ingredients with higher nutritive value will go a long way to reducing the risks of many non-communicable diseases.

Making slight changes in formulations or ingredients used, and processes applied can make the food products that are still tasty and flavourful but much safer"

DR. B SESIKERAN, FORMER DIRECTOR, NATIONAL INSTITUTE OF NUTRITION (ICMR)



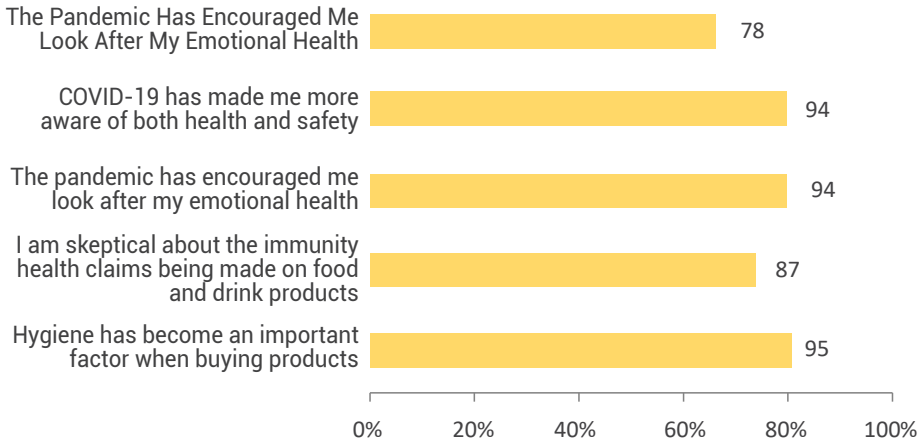
CONSUMER TRENDS

DRIVING CONSUMPTION

An awakened Indian consumer

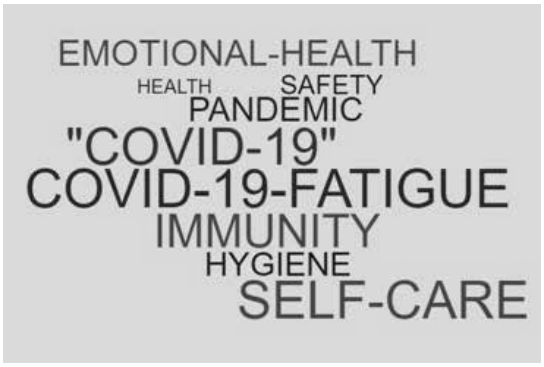
COVID-19 has increased anxiety levels, with concerns about general health and wellbeing, thereby prompting more interest in self-care.

INDIA: AGREEMENT WITH SELECT STATEMENTS ABOUT COVID-19, 2021



Base: 1,000 internet users aged 18+

Source: Dynata/Mintel



Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

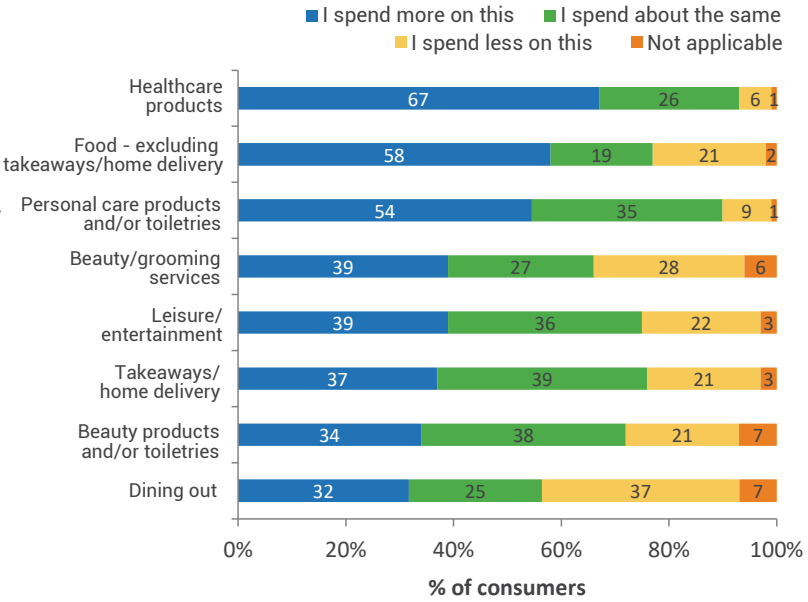
Economic slowdown is changing the way consumers shop

The COVID-19 outbreak has placed financial pressure on the global economy. As of July 2021, a majority of Indians (48%) are worried that COVID-19 will negatively impact the economic situation.

Tighter budgets will impact the way they shop and make purchase decisions. Additionally, many consumers are spending less on discretionary purchases such as dining out (37%) and beauty and grooming services (28%) and demanding higher value-for-money products.

Health-related products are definitely the ones consumers want in their baskets as 67% are spending more on them compared to 12 months ago. Mintel predicts that this trend is likely to continue.

INDIA: SPENDING PRIORITIES, 2021



Source: Dynata/Mintel, Mintel's Global COVID-19 Tracker, 25 Aug - 2 Sep 2021

COVID-19 has prioritized healthy eating for consumers

COVID-19 has reinforced the idea of healthy living along with the importance of having a healthy immune system. This has in turn led to heightened interest in functional food and drink. The market has responded with the emergence of new food and beverage types (eg vitamin water, functional snacks) resulting in the blurring of traditional categories.
As consumers have learned that their susceptibility to the virus is dependent on their physical health, healthy eating has become an even greater focus for many. In August 2021, 50% of Indian consumers agreed that as a direct result of the COVID-19 outbreak, they are currently eating more healthily. Beyond the physical aspects of health, the worries of lock-downs, working from home, economic downturns and restrictions on social contact have made many people also look to support their mental wellbeing.



Focus on healthy living is on the rise; more is expected of food and beverages than ever before



COVID-19 has brought to the forefront the importance of physical and mental health. 50% of Indians agreed that as a direct result of the COVID-19 outbreak they are currently eating more healthily.
Apart from the regular activities of frequent hand washing and mask wearing, consumers are making healthier diet choices to keep themselves healthy and protected from the virus.
In order to meet this growing demand from consumers, food and drink brands have stepped in with convenient and functional products offering not just immunity benefits but also energy, relaxation and stress relief.

Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

COVID-19 and economic downturn has adversely impacted consumer nourishment, paving the way for brands to innovate

Even before COVID-19, over 135 million people suffered from acute hunger globally, but the pandemic is estimated to have doubled that number. With nearly 200 million under-nourished people in India, the devastating COVID-19 has reversed the country's efforts to reduce malnourishment.

As a step to counter this, the Prime Minister in his Independence Day address emphasised the need to ensure "poshan" (nutrition) to the country's women and children. He announced that by 2024, rice provided to the poor under any government scheme will be fortified.

With the government leveraging science to battle malnutrition, particularly for low-income and vulnerable sections of the society who cannot afford balanced diversified diets, there is a great opportunity for brands to innovate.



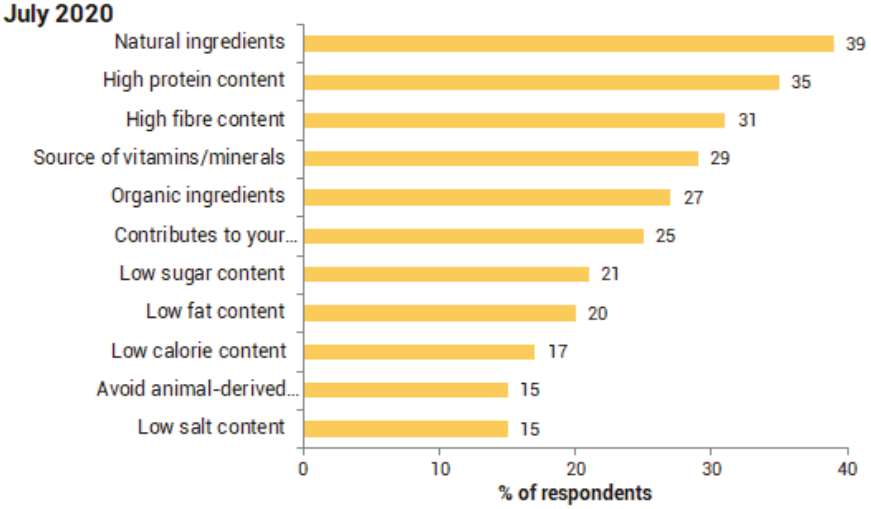
Consumers focus on health when shopping for food

Health is high on the agenda for Indian consumers. As part of post-COVID-19 food and drink resolutions, 48% of consumers* say they would follow a diet that reduces the risk of 'lifestyle diseases' (eg hypertension, diabetes).

Consumers are also prioritising natural ingredients, high protein and high fibre content in food.

The growing shift towards healthy eating should encourage brands to innovate with healthier snacks – without compromising on taste.

India: most important factors when consumers* shop for food, July 2020



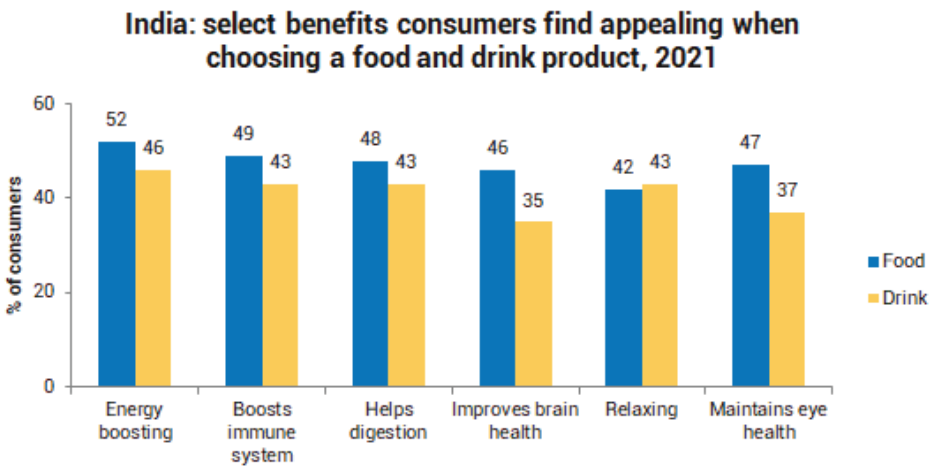
Base: 1,000 internet users aged 18+

Source: Dynata/Mintel

Source: Atttitudes to Functional Food & Drink, Indian Consumer Report | Mintel, 2021

Consumers want: Holistic health benefits

Brands can start looking beyond immunity propositions and think about eye, bone and brain health.
Ingredients with antioxidant properties have proven appealing across generations, making them a key pairing with eye health-related products.
Stress relief and relaxation are key claims, given rising anxiety levels due to the ongoing pandemic and unsureness about the future.



Base: 3,000 Internet users aged 18+

Source: Ipsos Observer/Mintel

Stress is a growing concern around the world

30%

of **UK consumers** would like their diet to improve their mood

54%

of **US women with a child under the age of 18** would wish to be stress- or worry-free if a genie could grant them three wishes

40%

Of indian consumers suffering from psychosocial stress are interested in foods with added benefits to help them cope with stress

Base: : India: 3,000 internet users aged 18+, July 2019; UK: 2,000 internet users aged 16+; US: 1,001 internet users aged 18+ with a child under the aged of 18 in the household
Source: Peru: Offerwise/Mintel; UK and US: Kantar Profiles/Mintel

Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

Increased screen time is leading to poor sleep quality

The cocooned lifestyles are characterised by low physical activity and high screen-time, which are negatively impacting health-related quality of life. Consumers are more likely to look for products to help protect their eyes from blue light. Functional ingredients (eg Lutein, Zeaxanthin) are emerging as practical solutions to addressing eyesight decline. Additionally, excessive screen time can also affect sleep quality and mental health. According to Mintel's 2021 Food & Drink Trend Feed the Mind, mentalhealth is fast emerging as a top health concern as a result of our imbalanced lifestyles. Functional formulations and emotionally engaging multisensory products will help food, drink and foodservice brands command a larger share among myriad mental and emotional health options.



Feed the Mind

- Innovative food and drink formulations will be accepted as solutions for mental and emotional wellbeing, predicts the 2021 Global Food & Drink Trend Feed the Mind. New formulations will help people learn how diet can impact mental and emotional health, which will lead to new interest in psychology-based approaches to healthy eating.

Mintel's 2021 Food & Drink Trend Feed the Mind

Functional food and drink will play an important role in caring for consumers mental wellbeing



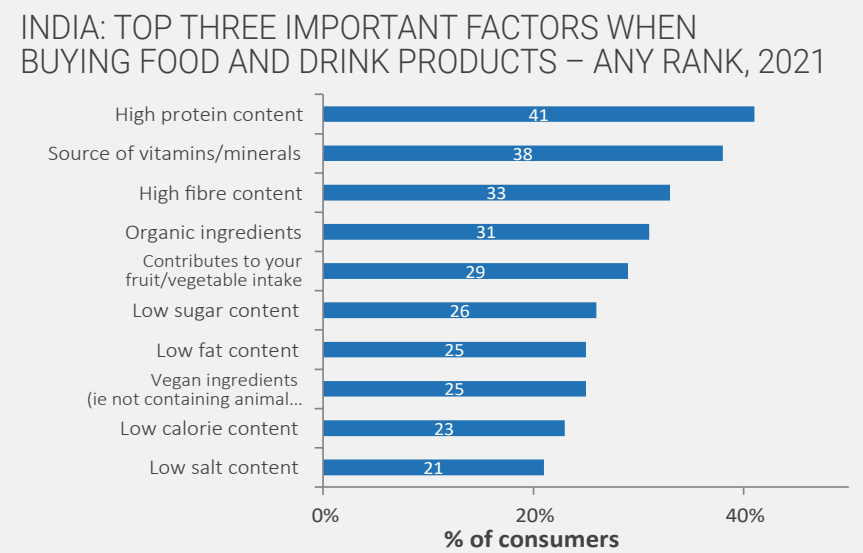
The pandemic has forever changed the way consumers view health and safety. The impact will be holistic, addressing not only physical wellbeing but also mental and emotional wellness. 97% of 18-24 year olds agree that the pandemic has encouraged them to look after their emotional health.
51% of Indians strongly agree that mental health is as important as physical health and 47% of Indian consumers say that 'lack of sleep' is the main symptom of stress.

Getting enough sleep is a part of wellness and can have far-reaching health benefits, including improving energy, reducing stress and improving overall mood.
There are opportunities for brands to support consumers' sleep goals with food and drink that supports quality sleep and thereby reducing stress.

Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

Protein remains the most sought-after feature in food and drink purchase

Protein as a health ingredient is well-established in consumers' minds. 89% of Indians are aware of protein as a health ingredient. The share of launches with high/added protein claims among all food and drink launches rose from 3% in 2016/17 to 8% in 2020/21.
The growing interest in proteins and increasing awareness among Indian consumers has prompted brands to focus on the source and quality of proteins, which can be used to stand out in the increasingly crowded space of high/added protein products.

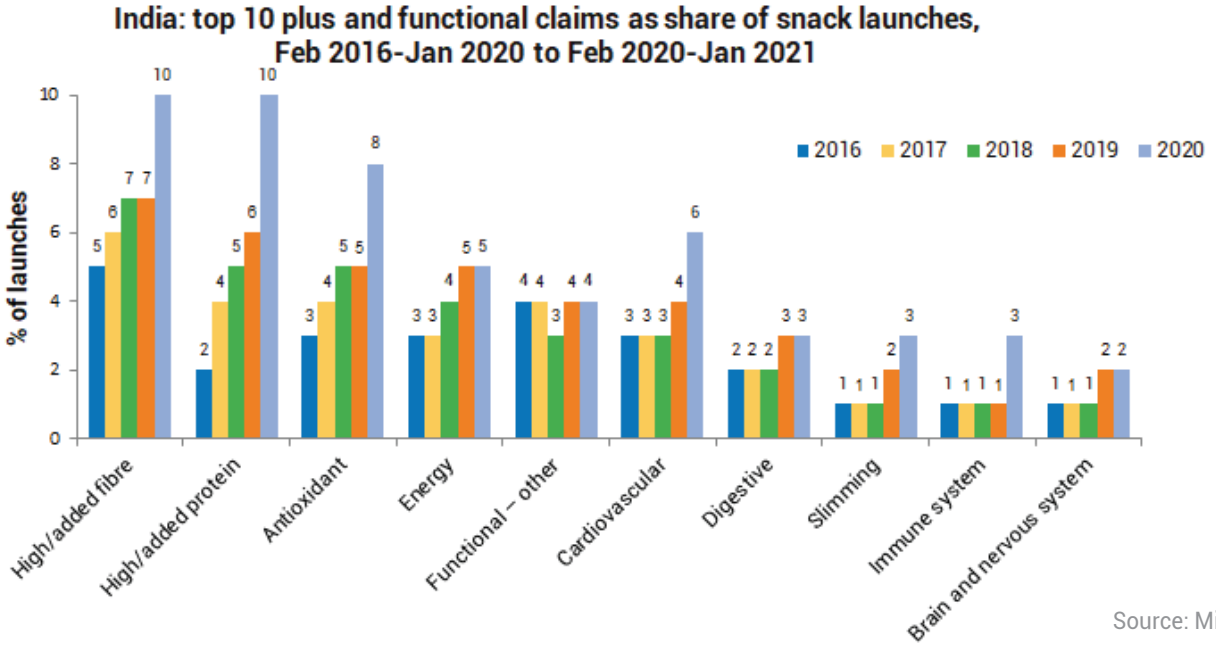


Base: 3,000 internet users aged 18-65+ **Source:** Ipsos Observer/Mintel, June 2021

Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

Protein and Fibre claims saw steep uptick in 2020

There is an opportunity for snack brands to position themselves as a 'healthy indulgence' by adding nutrients and health benefit claims.

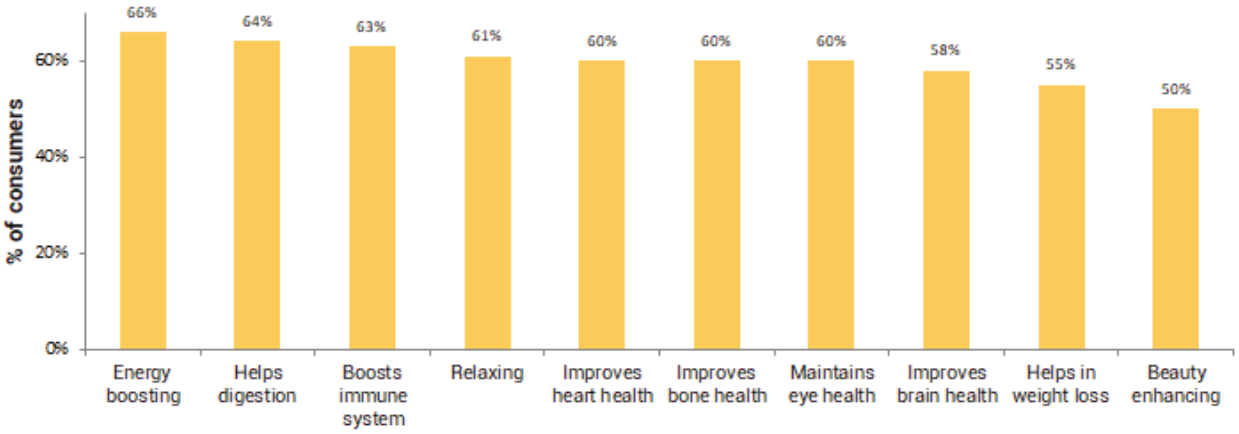


Source: Mintel GNPD

Energy, digestive health and immune support are the most sought-after functionalities from food and drink

Consumers look for a range of functionalities to improve performance, prevent lifestyle diseases and ways to self-care.

India: health benefits sought in food and drink products, 2021



Base: 3,000 internet users aged 18-65+

Source: : Ipsos Observer/Mintel

Millennials are aware users, but price is a concern



Younger millennials aged 18-24 are more likely to priorities health benefits over taste but the perception of healthier foods being expensive is a better to tackle.

HEALTH VS TASTE

48%

of younger Millennials agree that the health benefits are more inportant than the taste vs **35%** of 18-24 year olds

EXPENSIVE

41%

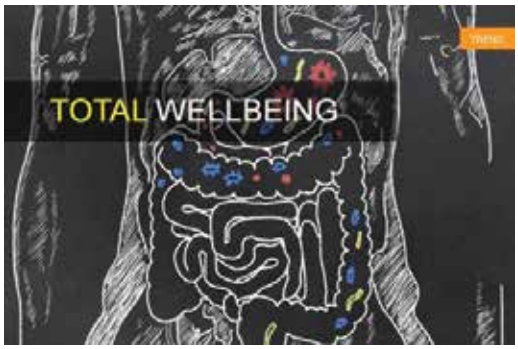
Of **Millennials** think most food and drink products with added health benefits are too expensive to be consumed regularly

Base: 3,000 Internet users aged 18-65+

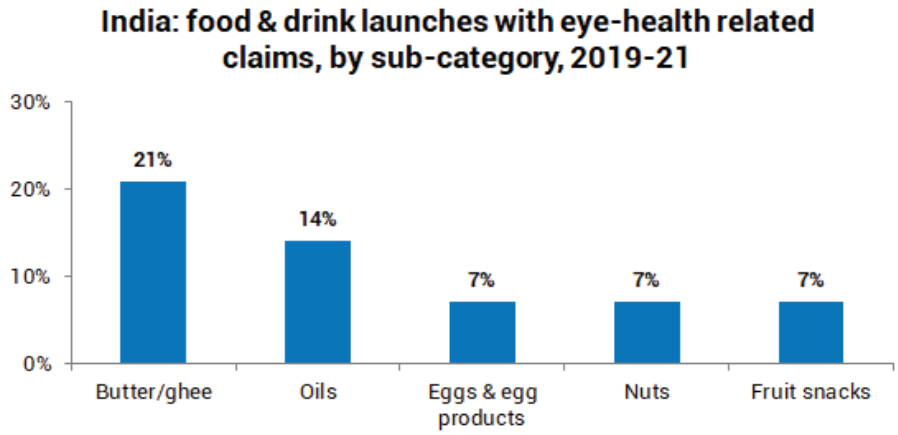
Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

Focus on preventive health creates an opportunity for functional food and drink

As discussed in Mintel Trend Total Wellbeing, consumers globally are now treating their bodies like an ecosystem and seeking holistic solutions that complement their personal health and evolving needs. Health is the area a majority of Indians are giving priority to, considering that 94% of Indians agree that COVID-19 has made them more aware of both health and safety. This is especially true for consumers in the older age groups because they are the most vulnerable to the virus. With a focus on health and 50% of consumers eating more healthily (eg focusing more on nutrition, reducing salt/sugar/-fat intake, etc), functionality in food and drink is now finding its place within consumer routines.



Eye health claims are not fully explored in mainstream categories



Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

Children need nutrition to help with eye development, but adults living with technology need it to help them protect their vision, especially now with increased screen time.
Eye health claims need to be expanded to new categories to fit consumption needs of adults (eg energy drink, meal replacement and snacks).

Start-ups and mainstream brands are exploring new ways to make functional food and drink convenient to consumers









Source: : ITC Nutrilite; Sting Energy drink; Bevzilla Coffee Cubes; Beyond Water

Traditional ingredients create familiarity

To encourage higher usage and consumption of functional food and drinks, brands can expand into using traditional Indian herbs that combine both flavour and function. Turmeric or Ayurvedic herbs are familiar flavours, which can encourage consumption. Looking towards tradition also means using formats that are already commonly found in Indian households, such as tea and toppings. With these convenient, easy-to-find formats, consumers can easily make pantry items into functional meals.



Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

During times of stress, consumers turn to snacking for comfort

The pandemic, lockdown and the economic uncertainty has shifted consumer lifestyles, routines and behaviours. This has triggered the search for comfort and familiarity, attributes that the snacking occasion is well-positioned to offer consumers.
As consumers stay at home, 39% of Indian consumers say their snack consumption has increased. Mintel predicts that in the next 12 months, as consumers transition into the next normal, foods that support their emotional wellbeing will continue to be in demand. Associating brands with moments of joy will resonate with consumers in the current climate; maximising taste, indulgence and enjoyment will be essential in driving usage.
In the short term, consumers will focus on affordability and value when buying snacks. Larger pack sizes have seen increased demand for in-home consumption – especially in metro cities. However, as consumers grow conscious of their snacking habits, smaller packs can help consumers reduce the guilt of snacking.



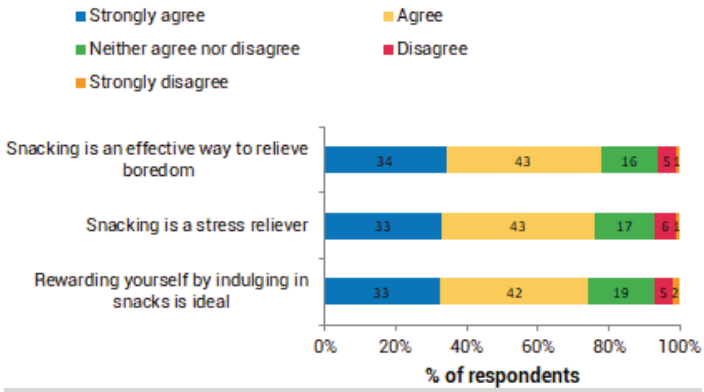
Source: Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021

Consumers want: snacks to relieve stress and boredom

Emotions are a powerful driver of snacking and leveraging emotional connotations in marketing and brand communications is key for snack brands to appeal to Indian consumers.
Women, equally across age groups, associate snacking with emotional needs such as rewarding oneself, relieving stress or tackling boredom.
Younger men aged 25-34 are more likely to see snacking's link with emotional needs. For example, 39% of men aged 25-34 (vs 33% of total) "strongly agree" that snacking is a stress reliever.
This presents an opportunity for the snacking category to leverage its position as mood food as consumers look for ways to manage their emotional wellbeing given the ongoing uncertainties around COVID-19 and economic slowdown.

Source: : Ipsos Observer/Mintel

India: agreement with select attitudes to snacking, Dec 2020



Base: 3,000 Internet users aged 18-65+

Source: : Ipsos Observer/Mintel

Snackification of meal occasions can unlock new opportunities

India: percentage of respondents who replace meals with snacks, by city tier and employment/gender, Dec 2020



Base: 2,982 internet users aged 18-65+ who typically have snacks

Source: : Ipsos Observer/Mintel

While taste remains non-negotiable, health sweetens the deal

It is important for snack brands to deliver on indulgence first, but health can also play a part. The growing prevalence of lifestyle diseases in India and the accelerated momentum of health consciousness caused by COVID-19 has opened up opportunities for snacks that are both healthy and indulgent.

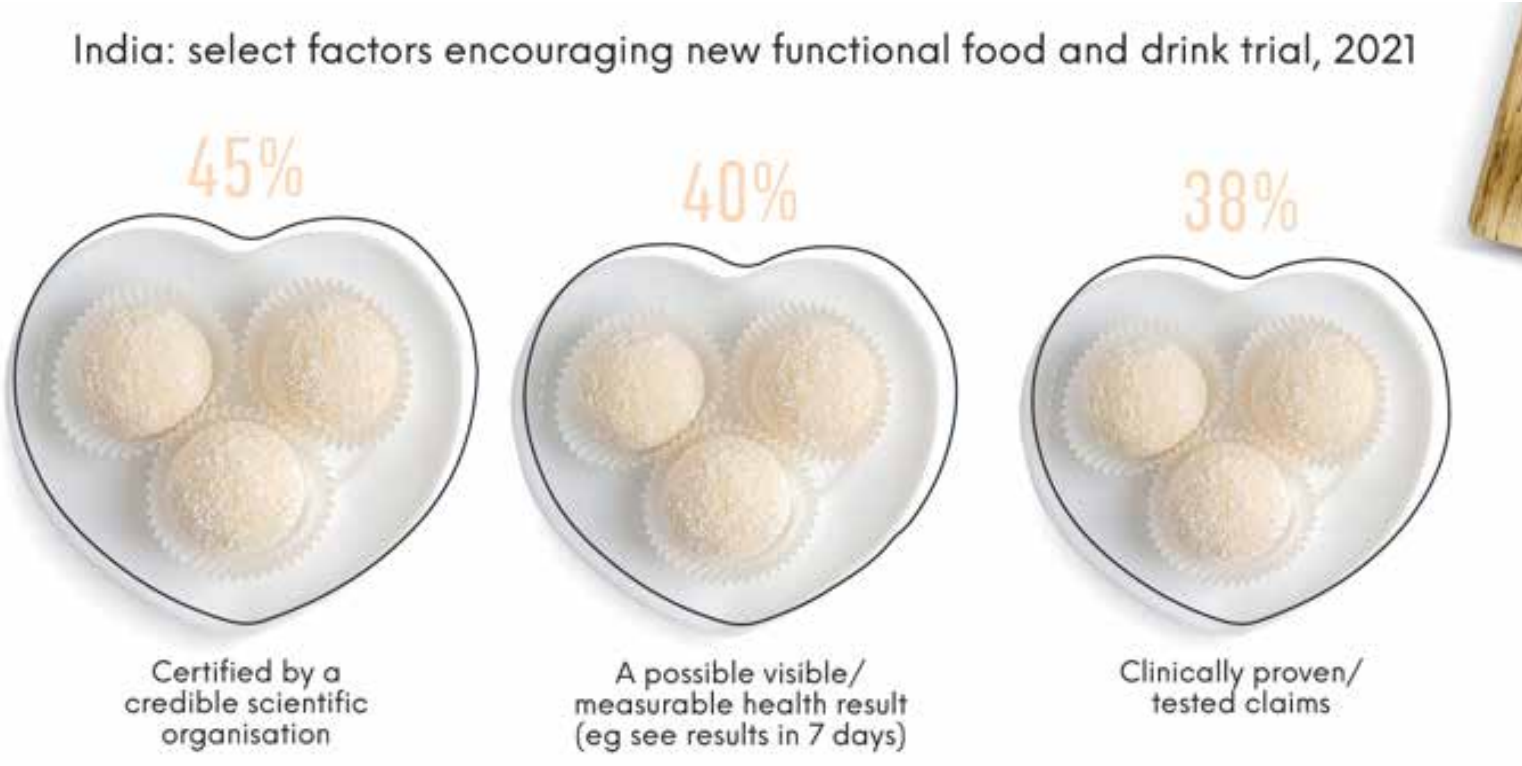
71% of consumers say taste is more important than how healthy the snack is. Even so, **85%** of consumers also feel the need for healthy snack options. Addressing this taste and health conundrum is a challenge for new product development to tackle.

One way to do that is to lessen the guilt associated with snacking. Clean label claims and innovations that support conscious consumption can make snack products more accessible and permissible.



(Source: Attitudes to Snacking – Indian Consumer Report | Mintel, 2021

Consumers want: trust and transparency



Base: 3,000 Internet users aged 18+

Source: : Ipsos Observer/Mintel

Source: : Attitudes to Functional Food & Drink – Indian Consumer Report | Mintel, 2021



KANWALJIT SINGH
FOUNDER & MANAGING PARTNER, FIRESIDE VENTURES

"We are seeing an increase in both awareness of and accessibility to healthy eating and better for you consumption. There is willingness and curiosity among consumers to experiment and try new things – right from functional food to ethically sourced products to demographic specific food. This is really allowing start-ups to be innovative. E-commerce growth supplemented with levers of distribution, logistics, supply chain management are also providing a good bedrock for the start-up ecosystem. What's been really interesting is that marketplaces are also extending support to start-ups to showcase their products and give them space to brand their products even globally."

Fireside F&B Portfolio companies



INNOVATIONS
IN THE MARKET PLACE



VIKAS GUPTA
GLOBAL HEAL R&D,
TATA CONSUMER
PRODUCTS LIMITED

Among various megatrends which are influencing consumer preferences globally - digitalisation, sustainability, individualisation and health & wellness have been most exciting for me. I am particularly impressed with how consumers are increasing their health and wellness targets post global pandemic. Today the spectrum of health strategies straddles from "no to bad stuff" and "yes to good stuff". What started as phenomenon of 'reductionism' for consumers to limit or reduce product / ingredients (e.g. sugar, fat, salt or artificial ingredients) has now evolved into phenomenon of 'functionalism'. Consumers are making healthy choices with products that positively boost nutrition or benefit (e.g., high in protein, superfoods)

Emerging Food & Nutrition product portfolios

Functional Food

- Functional foods that changes the way the body functions. Indians are already comfortable with fermented foods like Dahi which are rich in probiotics, Foods that help you sleep better or increase bone density is a space that's increasing

  e.g Wellbeing Nutrition.

Food for beauty

- Skin and hair care cosmetics are increasingly relying on ingredients that you would find in your kitchen cabinets or in the fridge. Onion oil, turmeric face washes, pomegranate masks, coffee face scrubs all natural products have active ingredients that are good for your skin and hair

  e.g Mamaearth.

Ayurveda & healthy but tasty food

- Story of the Brand origin, transparency, and authenticity, even factors like local provenance. Responsible consumption i.e. Use of less packaging, use of recyclable packaging, ingredients sourced locally, believe in fair trade"

  e.g Kapiva, Slurp Farm

Source: Fireside Ventures

Fortification – Vitamins A, B, C, D, Zinc, Calcium

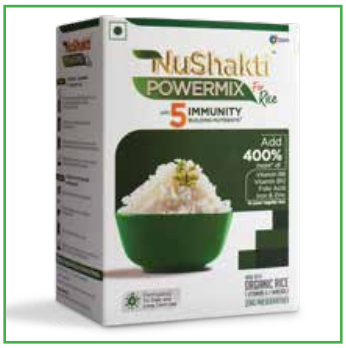
Milklane Dairy Services

Nutrinos - Dairy and Fruit based Yogurt for children. Rich in Protein, Calcium, Vitamin A & D



DSM Nutritional Pvt Ltd

NuShakti Fortified Rice Kernels with Vitamins B1,B3, B6, B12, Folic Acid, Iron, Zinc



Mother Dairy Milk fortified with vitamin A and D



Traditional medicine boosts functional claims

andMe PCOS tea

is made with all the traditional ingredients that are important for a healthy PCOS Diet. It helps in balancing hormones in women, regularises periods, manages weight gain due to PCOS and helps reduce acne. It also helps in boosting energy levels.



Kapiva Tadka Masala Supergrain Mix

is described as a high-protein and high-fibre snack and contains three Ayurvedic herbs: brahmi, kaunch beej and turmeric (India).



Auric Weight Balance Juice

with Garcinia, Beetroot, Curcumin



Natural actives for Emotional Wellbeing (Stress, Sleep, Ageing)

Anveshan Organic Pumpkin Seeds

are claimed to improve sleep and fight anxiety & depression, and contain a natural source of tryptophan, an amino acid that can help promote sleep (India).



VAHDAM Turmeric Ashwagandha

for Stress Relief and Anti Ageing



Latte Moon Brew (India)

has been developed based on 5,000 year old holistic sleep aid recipes. It is made from ashwagandha, nutmeg, turmeric, cinnamon, noringa, cardamom & beetroot.



Functional Foods & Nutraceuticals

Wellbeing Nutrition

Enhances Iron absorption and Higher Hb. Boosts RBC levels. Improves energy levels.



SETU Nutrition

Promotes Healthy And diverse Gut microflora Boosts immunity. Fights indigestion & healthy bowel movements.



Dr. Reddy's

Celevida Nutrition Health Drink for Diabetes Control & Immunity Support. Clinically Proven.



High Protein & Fibre

Yogabar

20g Protein Bar
All Natural, High Protein Snack



Wicked Gud

with 18gm protein and 14gm of fiber per 100gm



Manna GoGrains

is a High Protein beverage mix with 7 grains: Millets – Ragi, Jowar & Bajra; Cereals - Wheat, Maize and Barley; & milk proteins & enriched with 24 micro nutrients



Plant based Nutrition

White Cub

Dairy Free Icecream - Vegan, 100% Plant Based, Dairy Free, Lactose Free.



Good dot

Plant based meat alternatives.



Bright Lifecare

MuscleBlaze MB BGreen Chocolate Flavoured Plant Protein is 100% vegan, is made with natural ingredients. It provides 20g protein, herbal energy blend, & contains omega, vitamins, minerals & 2 billion CFU probiotics



No Artificial ingredients and Cleaner Labels

Tasty Tales

Homestyle, Ready to cook curry pastes with No Artificial Preservatives, Colours, or Flavours



Whole Truth Foods

Nothing artificial, No added sugar, No soy, No gluten. 100% Natural. Made with only 4-5 ingredients



No additives or preservatives is the top claim connected with clean label in the Indian snack space.

As the clean eating trend evolves, some brands are naming specific ingredients such as maida and palm oil and nasties like trans fat and cholesterol on packs.

As products with free-from claims on pack raise consumer awareness about specific ingredients to avoid, the demand for more free-from formulations will rise.

Millets as Hero ingredients

Southern Health Foods Pvt Ltd

100% Natural nutrition with Cereals, Pulses & Millets (Ragi, Bajra, Jowar, Corn, Wheat, Barley, Red Rice, Sago, Green Gram, Bengal Gram).



Slurrp Farm Pvt Ltd

Mixes for Children with Oats, Millets (Foxtail, Ragi, Little), Fruit Powders, Jaggery



Tata Sourlful

Breakfast Cereals, Snacks, and Smoothies with high levels of Ragi and other Millets



Better-for-you snacks come in small packages

Start-up snack brands focusing on healthy snacking are leveraging small pack sizes to manage price points

TagZ Popped Potato Chips

are popped potato chips that contain 50% less fat as compared to regular fried potato chips (India).
Popped chips: 30g pack priced at INR 60



Open Secret Choco Almond Butter Sandwiched Nutty Chips

are said to be protein packed and are baked, not fried. It is made of 40-50% nuts and retails in a 30g pack (India).
Nutty chips: 30g pack priced at INR 40



Healthy Cravings Pea Pops with Char-Grilled Spices

are described as 100% natural, slow roasted, low in sodium product, provide plant protein, contain 99 calories and retail in a 25g pack (India).
Pea pops: 25g pack priced at INR 30



(Source: Attitudes to Snacking – Indian Consumer Report | Mintel, 2021)

Personalisation can help maintain newness and offer variety

Allowing consumers to customise and personalise their snack can create the excitement and newness they crave. Indian snack and muesli brand True Elements, under its Make My Snack offering, allows consumers to personalise their snack.

On its intuitive website, the brand allows consumers to choose five nuts and seeds, two berries and fruits and one seasoning from a wide array of choices to make a snack pack. Consumers can also customise their snack to suit any of the five types of preferences: keto, antioxidant -rich, protein-rich, fibre-rich or masti (fun). It also allows consumers to opt for plastic-free packaging at checkout.

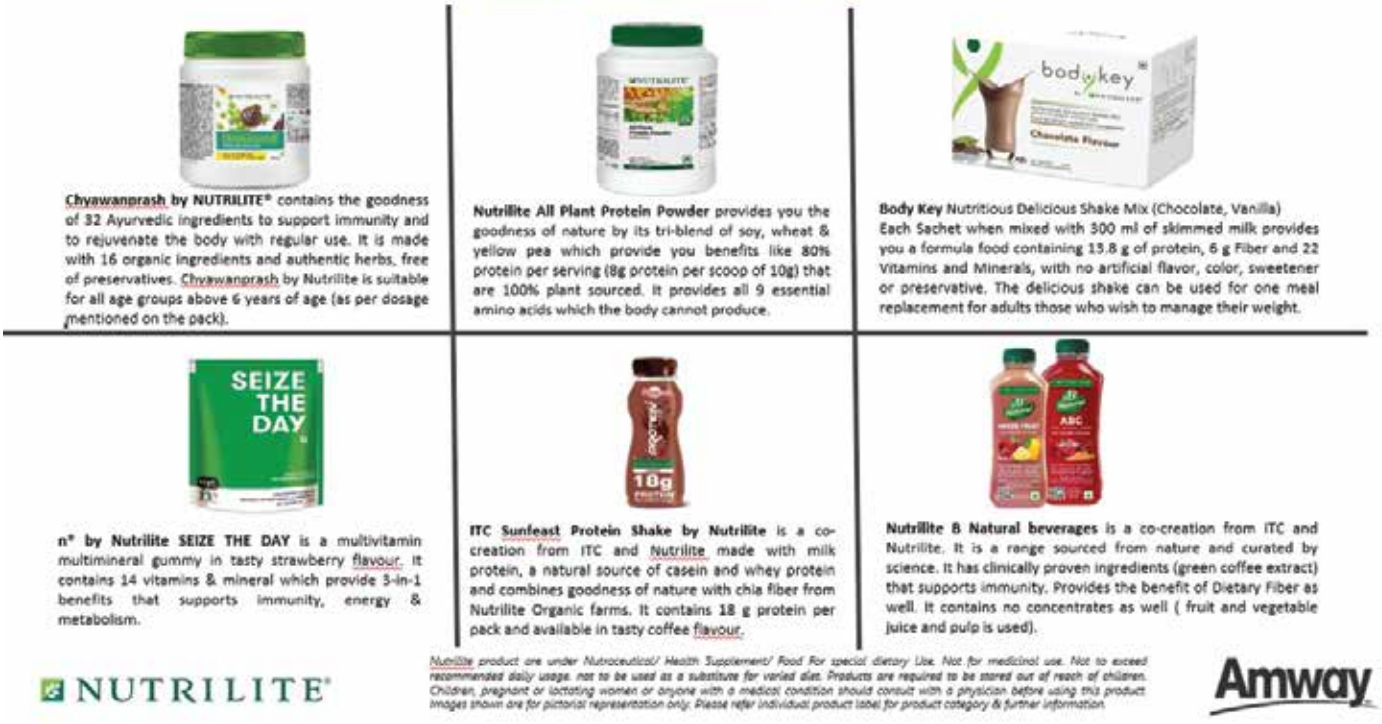
Not only does this initiative creates engagement and involve consumers in making crucial choices of what goes inside the snack, it also creates newness and variety that 49% of women aged 25-34 desire when they say they are always on the lookout for new snacks to try.





(Source: True Elements)

Innovative Food Formats



Scientifically substantiated benefits and proof of efficacy

Build trust especially among young consumers who believe in scientific substantiations and grow them into more regular users of functional food/drinks.

Nutrilite B Natural ABC "nutribev" promotes links with science and nature.

Nutrilite B Natural ABC is said to combine the goodness of fruit, vegetable and fibre offered by B Natural juices with Nutrilite's scientific expertise. It contains a clinically proven ingredient, green coffee extract, that supports your immunity.

(Source: Nutrilite B Natural ABC)



Nutrilite B Natural ABC



ENABLING TECHNOLOGIES

INDUSTRY & ACADEMIA



GOURINANDAN TONPE, CEO, THINKING FORKS CONSULTING

"Plenty of initiatives taken by the successive governments have transformed the country from being an importer of food grains to net exporter. While there has been a lot of work done and being done on the agriculture front, to increase productivity, quality and production of food, there is a big need to give impetus on food processing to make food available in right quantities and right quality across the country.

It is in this space, various academic institutes, and research organisations, can join hands with Ministry of Health and Family Welfare, Ministry of Food Processing and FSSAI, to develop technologies and products, which can make the difference to the consumers across the country.

Institutes like CFTRI, IIFPT, NIFTEM, IIP and NDRI, along with many other R&D organisations across the country, can play an important role in reducing the wastage of food due to losses in supply chain, enhancing the nutritional quality of the processed food, arresting the losses of essential nutrients on processing both by developing technologies and by shaping the regulatory framework in the country. It is important for the industry and the research organisations to work in collaboratively with one another, to address the problem of nutrition and food security faced by the country.

At Thinking Forks, it is our endeavour to work closely with the Industry and Academic ecosystem and bring innovations from ideas to market that can have a positive impact on the Health of the country "

Novel Technologies under development:

Novel Food Products			
S. No.	Research Technology	Contact	Name of Institute
1	NON-DAIRY SYNBIOTIC PRODUCTS	DR. R VIDYALAKSHMI	IIFPT
2	VITAMIN D FORTIFIED LASSI	PROF. MANJEET AGGARWAL	NIFTEM
3	INSTANT PROBIOTIC JUICE POWDER	DR. VIJENDRA MISHRA	NIFTEM
4	SAVORY GLUTEN FREE COOKIES	ER. ANAND KISHOR	NIFTEM
5	FUNCTIONAL CHOCO MUFFINS	DR. MURLIDHAR MEGHWAL	NIFTEM
6	ENRICHED GRANOLA BAR	DR. PRARABDH C BADGUJAR	NIFTEM
7	MULTIGRAIN SOY ENRICHED NOODLE	DR. RAKHI SINGH	NIFTEM
8	NUTRI BISCUITS AND MUFFINS	DR. KOMAL CHAUHAN	NIFTEM
9	NUTRITIOUS SEMOLINA MIXES	DR. SURESH DILIPRAO SAKHARE	CSIR-CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
10	BUFFALO CASEIN HYDROLYSATES	DR. RAJESH KUMAR	NATIONAL DAIRY RESEARCH INSTITUTE
11	MILLETS BASED CONVENIENCE FOOD	DR. P NAZNI	PERIYAR UNIVERSITY
12	NANOENCAPSULATION OF CURCUMIN	DR. BIMLESH MANN	NATIONAL DAIRY RESEARCH INSTITUTE
13	DIVERSIFIED MILLET PRODUCTS	DR. VINCENT HEMA	IIFPT
14	NON-DAIRY COCONUT ICE CREAM	DR. VINCENT HEMA	IIFPT
15	MORINGA LEAF POWDER	DR. VINCENT HEMA	IIFPT
16	POLYPHENOL RICH SEAWEED TEA	DR. PRARABDH C BADGUJAR	NIFTEM
17	HERBAL COOKIES	ER. ANAND KISHOR	NIFTEM
18	SATTU COOKIE	ER. ANAND KISHOR	NIFTEM
19	SUGAR FREE MUFFINS	ER. ANAND KISHOR	NIFTEM
20	MULTIGRAIN PASTA	DR. RAKHI SINGH	NIFTEM
21	MULTIGRAIN MUFFINS	ER. ANAND KISHOR	NIFTEM
22	LACTATION COOKIES	DR. KOMAL CHAUHAN	NIFTEM
23	MULTIMILLET SEMOLINA B.F.MIXES	DR. SURESH DILIPRAO SAKHARE	CSIR-CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
24	BARLI,DALIA FOOD PRODUCTS	DR. SURESH DILIPRAO SAKHARE	CSIR-CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
25	BAJRA JOWAR SEMOLINA	DR. SURESH DILIPRAO SAKHARE	CSIR-CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
26	NUTRITIOUS SEMOLINA MIXES	DR. SURESH DILIPRAO SAKHARE	CSIR-CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
27	MAHUA NUTRI BAR	DR. VINCENT HEMA	IIFPT
28	NUTRITIONAL CONVENIENCE FOODS	DR. JAYADEEP A	CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
29	COCONUT NEERA SUGAR CRYSTAL	DR. MAHENDRAN	IIFPT

(Source: FICCI. Food Processing.)

- Process for preparation of pure crystals of Zerumbone, a nutraceutical from Ginger which can have pharmaceutical benefits like anti-tumor, anti-inflammatory, analgesic - CFTRI, Mysore
- Smart Sensors for Grain Storage to improve warehouse management techniques for bulk storage of grains - IIFPT, Thanjavur
- Conversion of waste oil to Biodiesel – NIFTEM, Sonepat

Innovations in Food Engineering			
S. No.	Research Technology	Contact	Name of Institute
1	CONDUCTIVE HYDRO-DRYING	DR. JEYAN ARTHUR MOSES	IIFPT
2	MOBILE FOOD PROCESSING UNIT	DR. VINCENT HEMA	IIFPT
3	COCONUT WATER PROCESING SYSTEM	DR. N VENKATACHALAPATHY	IIFPT
4	COCONUT WATER EXTRACTION M/C	DR. VINKEL ARORA	NIFTEM
5	MEAT FROM CHICKEN SATELLITE	DR. SATYANARAYANA RENTALA	NA
6	N-3 PUFA RICH FISH OIL	DR. B D PRASANNA	NATIONAL INSTITUTE OF TECHNOLOGY SURATHKAL
7	MORINGA LEAVES SEPERATOR	Dr. S. ANANDAKUMAR	IIFPT
8	FOOD 3D PRINTING	DR. JEYAN ARTHUR MOSES	IIFPT
9	SMART SENSORS IN GRAIN STORAGE	DR. A AMUDHASURABI	IIFPT
10	SOLAR HYBRID DRYER	MS. VANMATHI MUGASUNDARI	IIFPT
11	BOONDI DISPENSER MACHINE	DR. VINKEL ARORA	NIFTEM
12	STUDIES ON DRYING TECHNIQUES OF SWEET POTATO IPOMOEA BATATAS AND CHARACTERIZATION OF ITS POWDER	DR. MURLIDHAR MEGHWAL	NIFTEM
13	DOMESTIC REFRIGERATOR LINUS	DR. VINKEL ARORA	NIFTEM
14	INNOVATIVE MEAT STORAGE SYSTEM	DR. PRARABDH C BADGUJAR	NIFTEM
15	VACUUM PRE-COOLER	DR. VINKEL ARORA	NIFTEM
16	EVACUATED TUBE SOLAR DRYER	DR. VINKEL ARORA	NIFTEM
17	LOW FAT SAMOSA	DR. PRARABDH C BADGUJAR	NIFTEM
18	EXTENDED SOFTNESS KHOA PEDA	DR. PRARABDH C BADGUJAR	NIFTEM

Food Safety & Quality Evaluations			
S. No.	Research Technology	Contact	Name of Institute
1	ECONOMICAL NANO-ANTIBACTERIAL	DR. DIVYA SACHDEV	NIFTEM
2	ACRYLAMIDE FREE POTATO SNACKS	DR. CHAKKARAVARTHI SARAVANAN	NIFTEM
3	SMART WAREHOUSES SYSTEMS	DR. S SHANMUGASUNDARAM	IIFPT
4	FORTIFICATION OF EDIBLE OIL	DR. BHASWATI BHATTACHARYA	NIFTEM
5	BIOSENSORS FOR QUANTIFICATION	DR. PANCHANAN PUZARI	TEZPUR UNIVERSITY
6	RAPID TESTS FOR MILK QUALITY	DR. RAJAN SHARMA	NATIONAL DAIRY RESEARCH INSTITUTE
7	ONION SPOILAGE SENSOR	DR. DIVYA SACHDEV	NIFTEM
8	UNIVERSAL RAPID BIOSTAIN	DR. NEETU K TANEJA	NIFTEM
9	SHELF LIFE EXTENSION IN GUAVA	DR. SUNIL PAREEK	NIFTEM
10	SHELFLIFE EXTENSION IN MANGOES	DR. SUNIL PAREEK	NIFTEM
11	BIOSENSOR: VIRGIN COCONUT OIL	DR. SHANMUGASUNDARAM	IIFPT
12	IN VITRO DIGESTION SYSTEM & GI	DR. JEYAN ARTHUR MOSES	IIFPT

(Source: FICCI, Food Processing)

Food Industry Waste Utilization			
S. No.	Research Technology	Contact	Name of Institute
1	FOOD INDUSTRY WASTE TO BIOCHAR	DR. TRIPTI AGARWAL	NIFTEM
2	WASTE OIL TO BIODIESEL	DR. PRASANNA KUMAR GV	NIFTEM
3	ONION WASTE UTILIZATION	DR. VR SINIJA	IIFPT
4	HORTICULTURAL WASTE TO WEALTH	DR. AMIT ARORA	INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
5	VALUE ADDITION -JACKFRUIT	DR. R JAGAN MOHAN	IIFPT
6	AGRO BASED RTE HEALTHY SNACKS	DR. R JAGAN MOHAN	IIFPT

Food Packaging Solutions			
S. No.	Research Technology	Contact	Name of Institute
1	POMEGRANATE BASED EDIBLE FILM	DR. NEERAJ	NIFTEM
2	SUSTAINABLE FOOD PACKAGING	DR. VIMAL KATIYAR	IIT, GUWAHATI
3	EDIBLE FOOD COATING	DR. VIMAL KATIYAR	IIT, GUWAHATI
4	SHELF STABLE PORK PRODUCTS	DR. RAJENDRAN THOMAS	ICAR – NATIONAL RESEARCH CENTRE ON PIG
5	CHITOSAN BASED MANGO COATING	DR. KV HARISH PRASHANTH	CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
6	BIO PLASTIC PACKAGING MATERIAL	DR. ANANDAKUMAR SUGUMAR	IIFPT

(Source: FICCI, Food Processing)



Technologies of millet value added products



MILLETS PIZZA BASE

Description of the technology

Pizza is a RTE product which is prepared by mixing a mixture of flour, yeast, salt fat and flavoring ingredients (parsley) until the mixture gets converted into dough, which is followed by baking the dough.
Millet pizza have been prepared at IIMR using 50% sorghum, pearl millet, finger millet or foxtail millet flour, 50% fine wheat flour, adding superior quality fat,yeast, salt and sugar; and also adding all the millets together with varied proportions. Of all the pizza base made sorghum pizza base was highly acceptable.

Advantages and Uniqueness of technology/Product

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- Pizza base is fiber rich and beneficial for all age groups.
- Utility as snack food or breakfast food It is rich in magnesium, zinc, iron, dietary fiber and protein.
- It has a shelf life of 4 days when packed in MET packets.



MILLETS PIZZA

Description of the technology

Pasta is prepared using cold extrusion. This is very useful because of its low cost and continuous processing capability has been accepted as one of the most useful technologies during the recent years in the field of food processing. Sorghum/Finger millet /Foxtail millet /Pearl millet semolina and refined wheat semolina are blended in the mixing compartment of the vermicelli-making machine and blended with water for 30 minutes and extruded using a pasta die. Wheat is added as the less gluten content of millets requires minimum percentage of wheat for preparing pasta.

Advantages and Uniqueness of technology/Product

Pasta yield – 99%; By-product yield – 1% (negligible)

Advantages and Uniqueness of technology/Product

- Utility as breakfast food
- Can be stored for three months at ambient temperature; Finger millet /Foxtail millet /Pearl millet vermicelli shelf life studies are still in progress

(Source: Technologies of Millet Value Added Products. Centre of Excellence on Sorghum. ICAR - Indian Institute of Millets Research, Hyderabad)

Technologies of millet value added products



IRON RICH (GARDEN CRESS SEED) JOWAR PASTA

Description of the technology

Pasta is the RTC (Ready to cook) products prepared from cold extrusion of wheat semolina. The availability of advance technology made feasible to producing commercial products out of sorghum.

Iron rich Jowar pasta can be prepared by incorporation of processed garden cress seed powder, jowar semolina and wheat semolina through extrusion process. Processing of garden cress seed includes boiling of seed in three times water at exactly 90°C, removing of the slimy seed from the mixture after cooling and drying in tray dryer and powdering the seed.

It is used to prepare pasta in lieu of wheat/ refined wheat flour vermicelli to obtain nutritional benefits.

Advantages and Uniqueness of technology/Product

- Garden cress is rich in iron, magnesium, zinc, calcium and protein rich.
- It helps recover from atony, reduces muscle tension, increases appetite, helps asthma sufferers, alleviates breathing difficulties and purifies the lungs.
- Pasta is one of the convenient product in terms of easy preparation.
- Garden cress along with sorghum impedes enzymatic hydrolysis which is why it is suitable for diabetics.
- It has a shelf life of 4 months and shelf life studies are in progress.

(Source: Technologies of Millet Value Added Products. Centre of Excellence on Sorghum. ICAR - Indian Institute of Millets Research, Hyderabad)





DR. SRIDEVI ANNAPURNA SINGH
SDIRECTOR, CSIR, CFTRI, MYSORE

CSIR-CFTRI, a research leader in food science and technology, provides integrated solutions in food design, scale-up, analysis, human resource development, including training entrepreneur-farmers and mentoring incubates. We are enabling Atmanirbharata in Indian Food MSME sector to manufacture shelf-stable and sensorily acceptable products using indigenous produce, machinery, and optimized product specific and safe packaging. Market driven technologies are rigorously pursued, and convenience food formulations are being researched to deliver nutrition and health benefits. Traditional knowledge and unconventional food sources are being explored for scientific solutions to address global health problems of undernutrition, hidden hunger, and obesity related pathologies. By-products of food industry are being converted to value added wellness ingredients in functional foods. The institute has an ISO17025:2017 designated nodal referral laboratory recognized by FSSAI.

Low Glycemic Index Noodles

Central Food Technological Research Institute Mysore-570 020, India

Introduction: Noodles and Pasta are major group of food products consumed all over the world. Noodles are considered to be high glycemic foods because of its high release of sugars during digestion and absorption. Incorporation of low glycemic index ingredients to these noodles will lower the glycemic response. The reason for the same is due to increase in the dietary fiber and also protein content. Rajma is well known low GI ingredients and not used in noodle processing so far. Dietary fibers (both insoluble and soluble) from rajma shown to reduce the rise in blood glucose and increase insulin sensitivity following carbohydrate meals. The developed Low GI noodles formulation could be used for normal and diabetic population. The Low GI noodles have increased fiber content by 3-4% compared to normal noodles. It can be consumed along with tastemaker as a main course. Shelf life of the product is about 7 months.



(Source: CSIR, CFTRI, Mysore)

Shelf stable bread using natural ingredients as preservatives

Bread has shelf life of only few days. Use of chemical preservative are in practice to extend the shelf life of bread, however use of chemical preservatives is not found satisfactory due to its adverse effect on flavour and taste of bread as well as health issues. Hence, demand for the use of natural preservatives for the extension of shelf life of bakery products is increasing day by day. The bread with natural preservatives has good volume and soft texture. The breads packed in polypropylene bags have mould-free shelf life of 5 days. The shelf life is comparable with the commercial bread prepared using chemical preservatives.

Raw Material:
Wheat flour, yeast, salt, sugar, oil and natural preservatives.



(Source: CSIR, CFTRI, Mysore)



ROHIT TIPNIS
SENIOR DIRECTOR,
SALES & TECHNICAL SERVICE
ASEANI INGREDION
SINGAPORE PTE LTD

"At Ingredion our unique value proposition in the global ingredient space:

- An innovation accelerator from idea to solutions; making food taste better through texture.
- Using Food science, applications knowledge and rapid prototyping.
- Using Culinary expertise and sensory science to reduce the development time of Indian Customers.
- Co- Creating Innovative solutions virtually for Customers in India via Digital Plaform."



VIKRAM KELKAR
MANAGING DIRECTOR,
HEXAGON NUTRITION

"We believe with the advent of Covid-19, over 92% of medical bills are suggesting spending towards immunity boosters with alternate sources of proteins, boosting per capita spend on nutritional products in India which was mere $2, compared to over $40 in advanced countries. Growing efforts and growth can be felt in nutrition technologies towards Product Innovation, Targeted Nutrition, and an Ancillary Ecosystem where plant fibers can be seen replacing fats or sugars and individuals choosing AI, genetic markets, metabolism trackers for shaping their dietary choices instead of standard products. Replacing the age old method of dusting micronutrient premix on rice kernel to even more technologically sound method of developing the extruded Fortified Rice Kernel (FRK), making sure each Indian family to receive good levels of essential micronutrients"

HEXAGON NUTRITION

Hexagon Nutrition, as an eminent caterer to improve the nutrition globally pledge to continue working towards strong supply chains, procurement, and manufacturing with high standards and quality control.

New products Hexagon is monitoring:

- Ascorbyl Palmitate
- Plant-based DHA
- Veg.Vitamin D3
- Vitamin K2



"Implementing globally recognized food business standard to provide the discipline to do the right thing and a mechanism for continuous improvement builds organization resilience and future proofs your business".

RICHARD WERRAN
REGIONAL DIRECTOR FOOD AND RETAIL SUPPLY CHAIN –UK, EIRE, CENTRAL EUROPE AND IMETA, BSI

BSI engages with the Food Industry and through them to the consumers sharing knowledge of best practice Standards and the importance of complying with a range of food business standards to deliver safe, sustainable and socially responsible food. BSI partners with professional bodies like UKIBC, FICCI, CII and Scheme owners like BRCGS and FSSC to bring related webinars and information sharing sessions on important topics. BSI helps Organizations build resilience through achievement of Operational resilience, Information resilience as well as Supply chain resilience. Therefore, in addition to Food safety, Organizations must demonstrate commitment to Sustainability (Environment, Circle Economy, Carbon Footprint, Waste, Packaging, Biodiversity, water, and energy) and Social responsibility with regards to reputational risk, People, work conditions, ethics, and culture.

Current consumer studies reveal it is insufficient for food to simply taste good for it to be pleasurable, it must have meaning and trust. The meaning is providing the story behind the product about how it has been produced or supplied and ensuring trust; the third, vital ingredient to achieve higher premiums, is where BSI comes in with

bsi Food Assurance KITEMARK™

the world renown BSI Kitemark, the world's first and most highly respected consumer mark of trust. The Kitemark independently verifies the consumer promise

BSI Mark of Trust

bsi ISO 22000 Food Safety Management CERTIFIED

bsi FSSC 22000 Food Safety System Certification CERTIFIED

bsi HACCP & GMP Food Safety Management CERTIFIED

bsi Catering Food Safety Certification CERTIFIED

bsi ISO 14001 Environmental Management CERTIFIED

bsi ISO/IEC 27001 Information Security Management CERTIFIED

bsi ISO 45001 Occupational Health and Safety Management CERTIFIED



ENABLING REGULATORY FRAMEWORK

One Nation, One Food Law

- Have globally benchmarked food standards and practices.
- Ensure consistency in enforcement.
- Manage food testing with standardised testing methods and protocols.

Mandate of fssai is to ensure availability of safe and wholesome food for the people in India

FSSAI has been created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption

(Source: www.fssai.gov.in)

FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

Inspiring Trust, Assuring Safe & Nutritious Food

Ministry of Health and Family Welfare, Government of India



Food Safety Compliance System for Online licensing

Online Platforms by fssai for registrations, Training, access to information

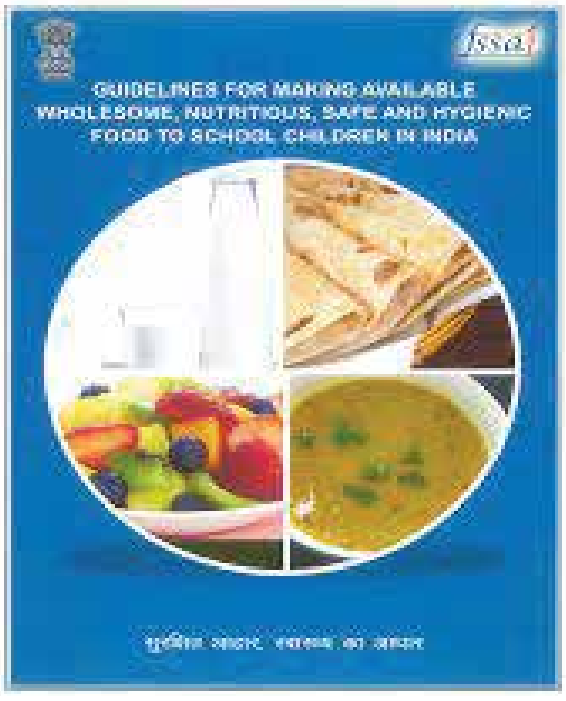
infoNet V2.0
Indian Food Laboratory Network

FoSTaC
Food Safety Training & Certification
fssai committed to build a culture of self compliance



Regulations to Improve Consumer Awareness and Choice

Regulations are playing an important role in building awareness amongst consumers and ensuring safe products for them



FORTIFIED
SAMPOORNA POSHAN SWASTH JEEVAN

VEGAN

Eat Right India
सही भोजन. बेहतर जीवन.

Jaivik Bharat

Regulations under discussion with industry for driving healthier food consumption

FSSAL notifies standards for fortification of processed food products.

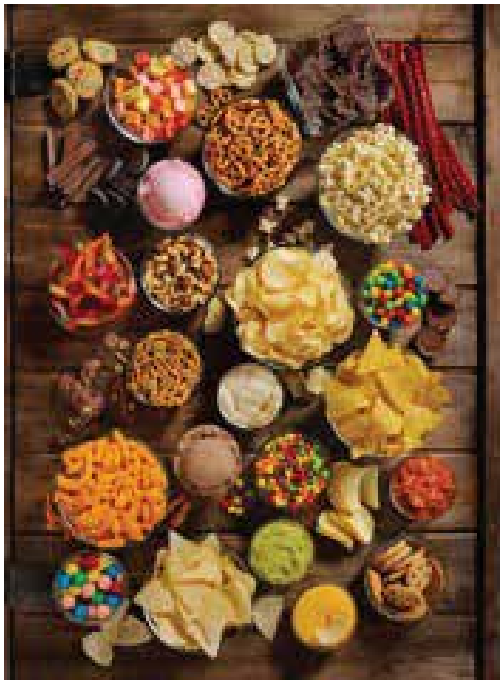
The FSSAI has restricted the amount of fortification that can be added to 15-30 per cent of the average daily dietary intake levels. This has been done to ensure balanced consumption of micronutrients fortified products. "The Fortified Processed Food shall provide 15-30 percent of the Indian adult RDA (Recommended dietary Allowance) of micronutrient, based on an average calorie intake of 600 kcal from processed foods

Food Fortification Resource Centre

(approximately a third of daily energy requirement for an adult)," it said.

High Fat Sugar Salt (HISS) Foods shall be excluded from Fortified Processed l'oods category. The definition of Ill'SS foods shall have the same meaning as speciied under the food Safety and Standards (labelling and Display) Regulations, 2020.

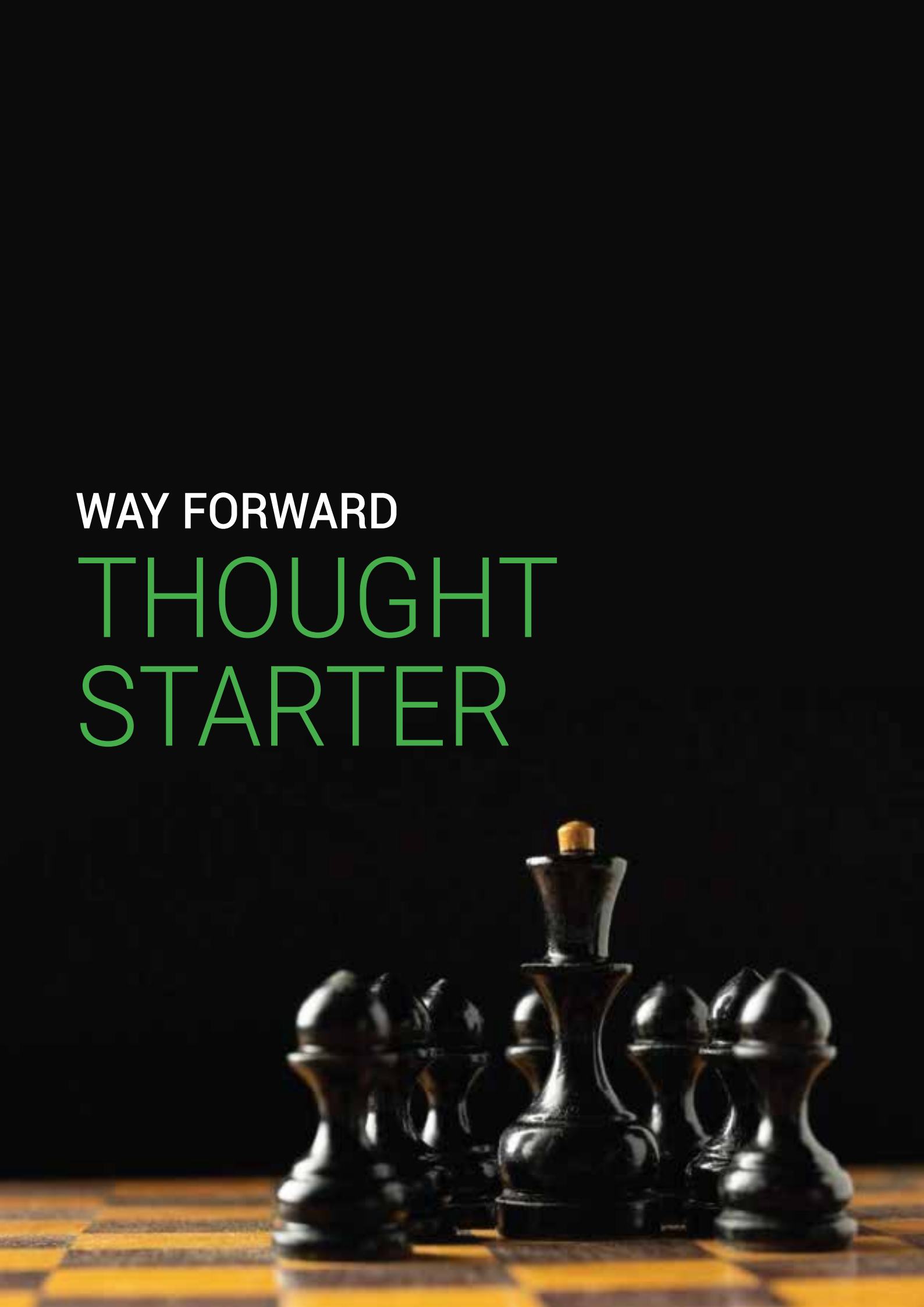
(Source: www.fssai.gov.in)





WAY FORWARD

THOUGHT STARTER





KANWALJIT SINGH
FOUNDER & MANAGING PARTNER, FIRESIDE VENTURES

"Areas of localizing technology, building warehousing facilities and creating a cold storage supply chain system are still in early stage of development in India"



DR. B. SESIKERAN,
EX-DIRECTOR NATIONAL INSTITUTE OF NUTRITION, HYDERABAD

"Food industry has opportunity to address the Nutrition challenges by actively complying with the FSSAI fortification programme to fortify staples and use the logo provided by FSSAI. Secondly other food products could also be fortified and approved claims could be made accordingly. Every effort to mitigate the nutrient deficiency counts. This would go a long way to improve the health of the consumers. Food industry must also reduce the levels of Fat, Salt, Sugar and making slight changes in formulations or ingredients used, and processes applied can make the food products that are still tasty and flavourful but much safer"



RINKA BANERJEE,
FOUNDER,
THINKING FORKS CONSULTING

"It is imperative to build strong Industry – Academia collaborations and bring to market products designed to meet the needs of Indian consumers at affordable price points and, utilise our large, nutritious and diverse agricultural produce including up-cycling of by-products and agricultural waste. It is our endeavour at Thinking Forks to work with a large ecosystem of partners to deliver R&D solutions in Food & Nutrition that drive healthier food consumption in India, greater collaborations and Market Access."



GOURINANDAN TONPE, CEO,
THINKING FORKS CONSULTING

Invest significantly in R&D at public and private level to develop new products and technologies relevant for the Indian consumer. Need for greater collaboration, in shaping the nutrition status of India, between Regulator, Academia and Industry. Robust science, consumer and go-to-market capability is key to developing products and technologies which is mutually beneficial for the consumer and the producer. Bring in ease of operations in adapting relevant technologies being developed around the globe through building partnerships. Technology development with the ability to sustainably scale at the right cost, implementation of the same with speed to market and backed by strong consumer insights should be the backbone of innovation or discovery in Food & Nutrition"

Appendix



About FICCI

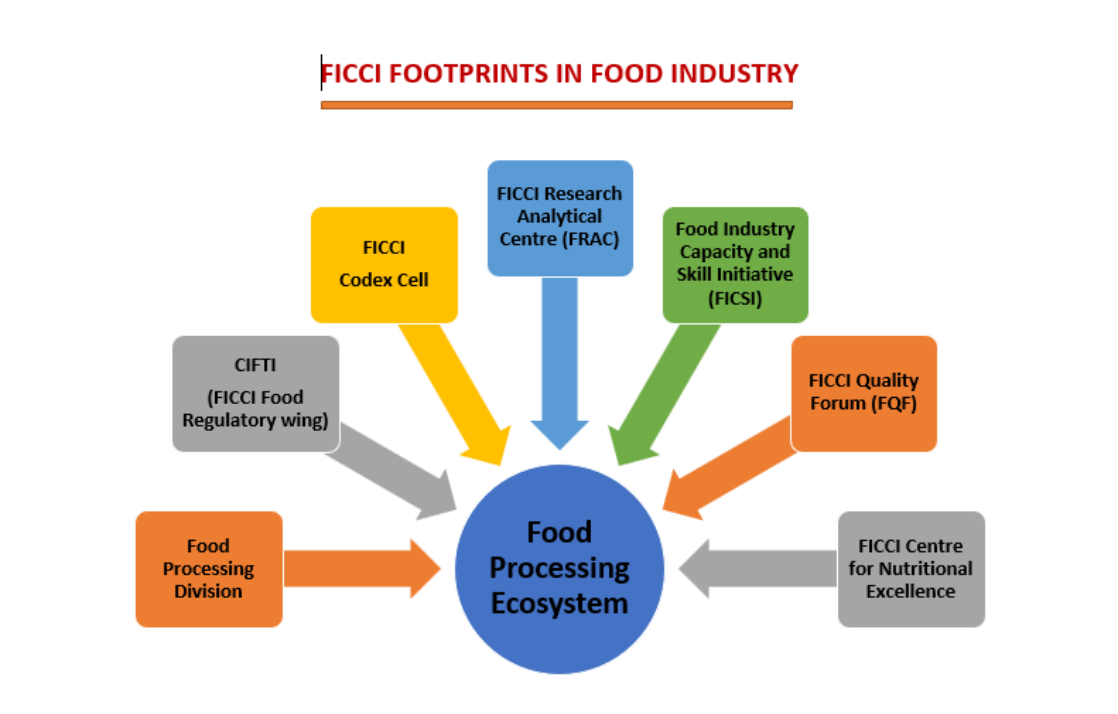
Federation of Indian Chambers of Commerce & Industry

- **Established in 1927, FICCI is the largest and oldest apex business organization in India. It has national network with more than 20 states and partnerships with 77 countries across the world which carry forward the initiatives in inclusive development, which encompass health, education, livelihood, governance, skill development, etc.**
- **Food Processing Division:** FICCI Food Processing Division plays a key role in dealing with policy issues to get an audience with the government and make industry's voice heard. It has been working very closely with industry captains for the growth and business sustainability of the food industry. Its objective is to provide a platform to the industry captains for the discussion on the key policy issues pertaining to the sector and chalking down the roa map for the growth of the sector.
- **Confederation of Indian Food Trade and Industry (CIFTI):** It is the Apex body which cater specifically to the need of Food Industry and Trade and thereby addressing the issues and concerns of the food industry at various fora. It not only provides institutional support at the national level but also plays a pivotal role in partnering the Government and the private sector in promoting the development of food processing on the global platform.
- **FICCI Centre of Nutritional Excellence:** It is established to review the agenda of nutrition in India and to work towards creating awareness among the stakeholders on the different key aspects of nutrition, fortification, reformulation, etc. FICCI has established Centre for Nutrition Excellence with an aim to Strengthen food nutrition ecosystem, debunking the myths among the stakeholders & informed choices to consumers about safe and nutritious food.
- **FICCI Research and Analysis Centre (FRAC):** It provides analytical services to all the industries; undertake research and development for quality improvement; help in providing quality to the consumers and raising the general standards of purity particularly in the small-scale sector. It is dedicated exclusively to analysis and research following ISO/ IEC 17025:2005 International Standards. Certified quality assurance and control program ensures that Test Results remain consistent across samples.



FICCI Footprints in Food Processing Ecosystem

Policy Advocacy	Food Regulatory Affairs	Trade Promotion	Business Advisory	International Trade	Media Advocacy	Capacity Building	Research & Analytical Services	Food Product Development



Policy Advocacy groups at FICCI

Food Processing Focused Groups

- Food Processing Committee
- FICCI Codex Cell
- Task Force on Tea Sector
- Task Force on 'Bear Alco-Beverage Sector
- FICCI Committee on Dairy
- FICCI Nutraceutical Committee
- FICCI Business Committee of Food Ingredients

Food Regulatory Working Group/ Task Forces

- Working Group on Ingredients
- Working Group on Flavourings
- Working Group on Sweeteners
- Working Group on QSR
- Working Group on Pet Food
- Working Group on Pesticides
- Working Group on RUCO

In the present competitive business environment with plethora of food laws and complex rules and regulations, trade associations like ours always act, as a front-runner were all work together in unison for mutual benefit to achieve their corporate goals and objectives. We also serves as a platform to meet and interact with the stalwarts in the food industry, share and learn from their experiences also. Write to Abhinav.singh@ficci.com for becoming member with CIFTI-FICCI.

About Thinking Forks Consulting

Thinking Forks is a Business solutions partner to the Food & Nutrition industry. We provide end-to-end R&D solutions to our clients, helping them define opportunities, develop new product concepts through to assisting them bring to market, a viable commercial product. Our solutioning is delivered by a team with strong domain expertise, proven business and technical credentials that has multiple decades of experience with leading global companies.



What we do

End to end R&D

NPD Strategy	Product & Packaging development	Consumer Validation
Nutrition & Regulatory	Plant Scale Feasibility & Shelf-life testing	Commercialization Support

Value Add Services

Product Roadmap Creation	Value Improvement (cost & quality)	Vendor Qualification
Regulatory, Nutrition & Health Advisory	Product testing: Sensory, Shelf-life, Specification	Training & Capability



Ms. Rinka Banerjee
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