

Review Article

# Dietary analysis of traditional food cultures in India: An overview of 2600 BCE to the 21<sup>st</sup> century

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## ABSTRACT

Around 415 BC, Hippocrates proclaimed, “let food be thy medicine, and let medicine be thy food.” A report published in Elsevier’s Journal of Archaeological Science: Reports in 2021 by Archeological Survey of India (ASI), New Delhi, that ‘seven similar big-size brown ‘laddoos’ high protein, multigrain ‘laddoos’ (food balls)’ was found at the Harrapan site in Rajasthan India. Excavation results were surprisingly shocking to the world as many civilizations, sects & religions were not born then. Although India has capacity, if one Jute Sack of food grains is staked over another, they will reach moon and can come back and can still cover more than 1/3rd journey of the moon (2.347 times moon distance capacity). But even in 21st century scientific community are still talking about global hunger. Unfortunately, in the 2021 Global Hunger Index, India ranked 101st out of the 116 countries in 2021 GHI scores and fell under the serious group with a score of 27.5. Poshan Abhiyaan’s convergence mission to address malnutrition must be implemented through ensured community mobilization and participation. Multigrain Ladoos were used in ancient times need to be in the mainstream again to alleviate the hidden hunger. The research concludes that India in the past may have more food security than present India. Hence, ayurvedic foods are recommended for different health disorders as diet plays the most critical role in maintaining health parameters.



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## INTRODUCTION

The number of people suffering from severe food insecurity worldwide is more than 2.5 times (precisely 2.56 times) from the earlier which is 135 million to 345 million since 2019 as the onset of COVID-19 (United Nations 2021; World Food Programme 2022). Several studies showed that lockdown hardly hit the farming community vis-à-vis their production, livelihoods, and food security (Acharya, 2020; Azim Premji University, 2020; Cebellos et al., 2020; Harris et al., 2020; Jaacks et al., 2021; Totapally et al., 2020; Vikas Anvesh Foundation 2020; Lal et al., 2021; Lindsay et al., 2021). The scores are improving while comparing the earlier Global Hunger Index (GHI) data. India has a Buffer stock of Wheat (602.91 lakh MT) & Rice (299.25 lakh MT), making the pooled value of food grains (902.16 lakh MT) as of June 2021 which is enough to meet the operational need for food grains and exigencies at any moment (Food Corporation of India, 2022). With this capacity, if India stake one Jute Sack of food grains over another, they will reach the moon and can come back and still cover more than 1/3rd journey of the moon (2,347 times moon distance capacity). But the irony is that recently, India ranked 101st out of 116 nations in the Global Hunger Index (GHI) 2021 (IFPRI, 2022). It is estimated that 537 million people are currently suffering from diabetes and this number is estimated to increase globally as time passes with current projections showing this number may rise up to 783 million globally by 2045 (Statista, 2022). India is often referred as the “Diabetic capital of the world” and it accounts for 17% of total diabetic patients globally currently close to 80 million people in India are living with diabetes (Times of India, 2022). Due to this fast lifestyle in the 21<sup>st</sup> century diabetes is increasing and ultra-processed food being in trend in this day and age that has increased obesity (NIH, 2019). The use of palm oil in developing countries in fast food and fried snacks has drastically increased the risk of cardiovascular disease (Zuckerman, 2018). But, fact of the matter is India has the traditional wisdom of Ayurveda. Ayurveda is a union of 2 words from the Sanskrit language, ‘ayus’, meaning ‘life’ and ‘veda’, which denotes ‘science’; thus, Ayurveda precisely means the

‘science of life. There are different food habits of the Indian population. Different food habits have their own pros & cons. Every Ayurvedic food is traditional, but every traditional food cannot be called Ayurvedic in nature. Mostly, traditional & Ayurvedic foods are considered the same, but there is a pinpoint difference between these, which has been discussed in detail in this manuscript. Ayurvedic foods are very useful and are found to be balanced & best for consumption for a healthy lifestyle. Ayurvedic foods can prevent various diseases. This study focuses on the traditional food culture prevalent in our country.

## History

Urbanization began in the Indus plains in the Indian subcontinent around 2600 BC. The world’s largest metropolises at that era were Harappa and Mohenjo-Daro, which rose to prominence around 2600 BCE (Ahamed et al., 2019). The Harappan folks consumed protein-rich, multigrain “laddoos” (edible balls) more than four thousand six hundred years ago (4600 years ago), according to a scientific investigation of the discovered material in the course of excavation in Rajasthan, which reveals the residents of Harappa practiced agriculture under favorable climatic circumstances. In 2017, while excavating a Harappan archaeological site at a settlement, seven “laddoos” were found in village 4 MSR (4 MSR is the name of a village and has no specified full form; 29°12’ 24.48” N, 73°09’ 20.16” E) (formerly called Binjor) in Anupgarh Tehsil in Sri Ganganagar district of western Rajasthan near the Pakistani border amid 2014 & 2017 (Agnihorti et al., 2021; Tewari, 2021). At the Harappan site in the Anupgarh Tehsil of Rajasthan, seven large brown “laddoos,” two bull sculptures, and a hand-held copper adze (implement similar to an axe for shaping & cutting wood) were discovered. These well-preserved food balls, which date to roughly 2600 BCE, were discovered. (Agnihorti et al., 2021; TFPJ, 2021). Moong dal, millet, cereals and other legumes were the main ingredient in these laddoos. Finger millet was the richest source of calcium and iron. Calcium deficiency leads to bone and teeth issues; while iron deficiency

leads to anaemia and these anomalies can be reduced by incorporating finger millet in one's daily diet (Pragya & Rita, 2012). Later, complete organic-geochemistry of laddoos was carried out at BSIP (Birbal Sahni Institute of Palaeosciences) & NBRI (National Botanical Research Institute), Lucknow, India. Multinutritious compact "laddoos" were consumed by the people of Harappa as a meal supplement for immediate nutrition. Multigrain Laddoos used in ancient times, need to be in the mainstream again to alleviate the hidden hunger.

## MATERIALS AND METHODS

Analysis of data that has already been acquired by others is referred to as secondary data analysis (Srivastava & Lal, 2021). In this research, secondary data were used to show the changing scenarios of the country's nutritional status with various parameters from the primary data collected by the Ministry of Health and Family Welfare (MoHFW) and the International Institute for Population Sciences (IIPS & ICF, 2021). National Family Health Survey (NFHS-5), 2019-21; and the hunger status of various countries from the primary data collected by the International Food Policy Research Institute

(IFPRI) in the Global Hunger Index Report (IFPRI, 2022) have also been investigated.

## RESULTS AND DISCUSSION

The world hunger is increasing and people are suffering from malnutrition and scarcity of food. Due to this people die and become vulnerable to many health problems. Situations like COVID-19 global pandemic, and the Russia-Ukraine war drastically escalated the problem of hunger and food insecurity globally.

### World Hunger Index 2021

The Global Hunger Index computes hunger globally, regionally, and by nation. As shown in Table 1, India ranked 101 among 116 countries in the World Hunger Index of 2021, scoring 27.5, thus falling under the "serious" category.

In Fig. 1, different categories have been shown vis-à-vis the condition of the countries based on their ranking in the World Hunger Index 2021, as shown in Table 1 (IFPRI, 2022).

### Breastfeeding Status in India

Breastfeeding is the most effective way to ensure children's health & survival right from the birth

**Table 1.** World Hunger Index Ranking in the 21<sup>st</sup> century.

2021 Rank	Countries	2000	2006	2012	2021
101	Republic of India	38.80	37.40	28.80	27.50
102	Papua New Guinea	33.60	30.30	33.70	27.80
103	Islamic Emirate of Afghanistan	50.90	42.70	34.30	28.30
103	Nigeria	39.50	32.50	30.40	28.30
105	Republic of Congo	34.90	34.60	28.50	30.30
106	Mozambique	48.00	38.20	31.50	31.30
106	Sierra Leone	57.70	52.70	34.70	31.30
108	Timor-Leste	-	46.10	36.20	32.40
109	Haiti	42.00	43.60	35.20	32.80
110	Liberia	48.10	40.00	35.00	33.30
111	Republic of Madagascar	42.80	41.60	34.30	36.30
112	The Democratic Republic of the Congo	50.60	45.30	42.30	39.00
113	Republic of Chad	50.80	51.20	45.70	39.60
114	Republic of Central Africa	48.90	48.00	40.50	43.00
115	Republic of Yemen	41.00	38.80	38.40	45.10
116	Federal Republic of Somalia	58.10	57.90	65.10	50.80

Low	Moderate	Serious	Alarming	Extremely Alarming
(≤ 9.9)	(10.0–19.9)	(20.0–34.9)	(35.0–49.9)	(≥ 50.0)

**Fig.1.** Colour-coded World Hunger Index Continuum (Low to Extreme)

to up to 6 months. As in this time span child is solely dependent on the mother and breast milk for their proper physical & mental development. Breastfed children perform better on IQ test (WHO 2022).

The percentage of new-borns who were breastfed within 1 day of birth has been shown in Fig. 2. India has been divided into 6 zones viz., North, Central, East, West, South, and North-East, as per breastfed nature of the new-born. The breastfeeding status of the states having the maximum and the minimum percentage per zone is given. In the North zone, Ladakh had the highest breastfeeding percentage (92.5%) while Chandigarh had the lowest breastfeeding percentage (73.4%). For the Central zone, Chhattisgarh has the highest (92.1%), and Uttar Pradesh has the lowest (81.0%) percentage. In the East zone, Odisha accounts for the highest (93.3%) & Bihar for the lowest (84.5%). In the Northeast zone, Meghalaya has the highest (94.6%) & Arunachal Pradesh has the Lowest (81.7%) percentage. Goa has the highest (92.6%) in the West zone, whereas Gujarat has the lowest (85.9%) percentage. For South zone, Lakshadweep has the highest (99.1%), and

Telangana has the lowest (87.8%) value. The overall breastfeeding status country stands at 86.8% (NFHS- 5, 2021).

At Fig. 3 unveiled the different reasons for which growing children require nutrition, viz., for development, physical activities, learning, and better immunity. In the COVID-19 pandemic, immunity played a vital role which is directly related to good nutrition.

### Comparison of Nutritional Status of Children (NFHS-4 vs. NFHS-5)

The frequency of stunting and under-weight has dropped since 2015-16. As shown in Fig. 4, stunting reduced from 38% in 2015-16 to 36% in 2019-21 during the last 5 years. The prevalence of wasting has decreased during the same time frame, falling from 21% in 2015-16 to 19% in 2019-21.

Now it's time to think a way out to overcome from this vicious cycle of hunger. For this problem, awareness programme like National Nutrition Week will come handy.

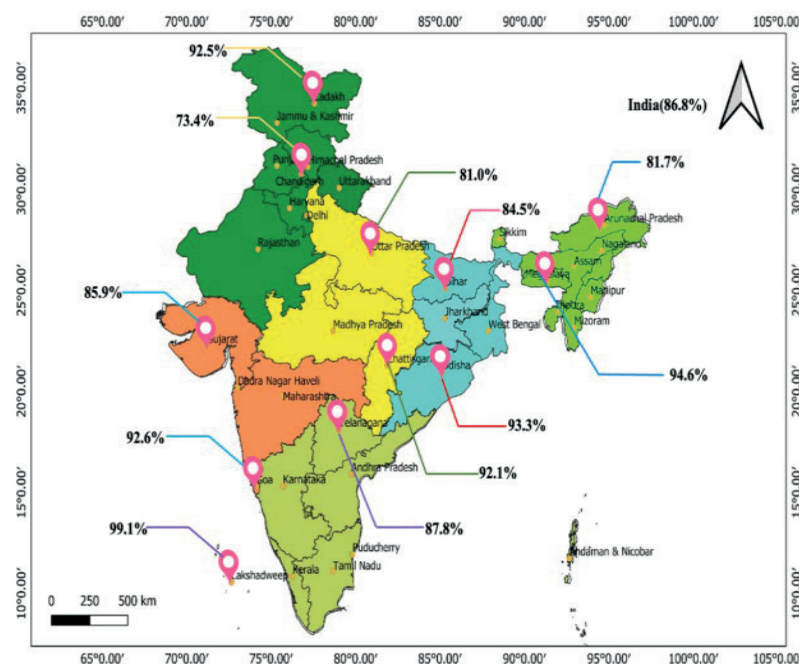


Fig. 2. Percentage of the new-born who was breastfed within 1 day of birth (Source: NFHS- 5, 2021)

### Themes of National Nutrition Week

National Nutrition Week is celebrated annually from 1<sup>st</sup> to 7<sup>th</sup> September in India, and since 2018 the Government of India has been celebrating National Nutrition Month (Lal and Kumari, 2022). The week is celebrated to raise awareness among people regarding proper nutrition and diet. Table 2 exhibits the themes of National

Nutrition Week for the past 10 years.

Five Keys to a healthy diet are recommended by WHO (2020), as shown in Fig. 5. If one follows these 5 keys, then the propensity for healthy life and body increases.

Every Ayurvedic food is traditional, but not every traditional food can be Ayurvedic.



Fig. 3. Nutritional requirements of growing children

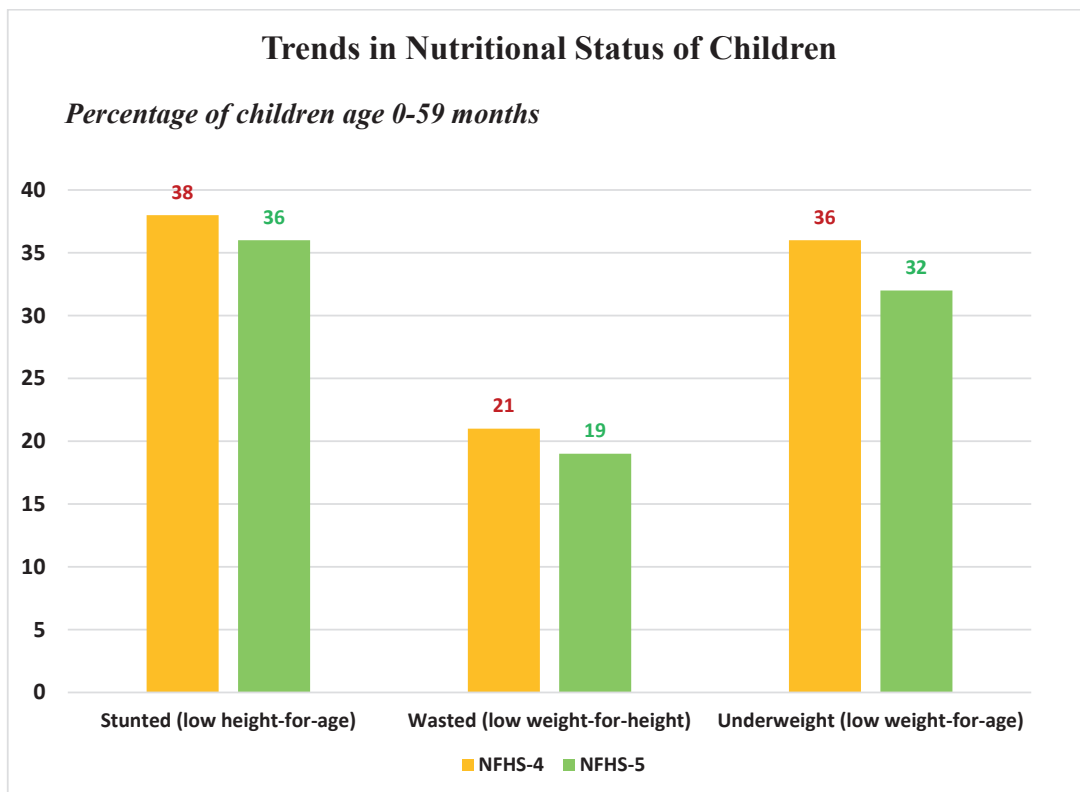


Fig. 4. Trends in nutritional status of children (Source: NFHS- 5, 2021)



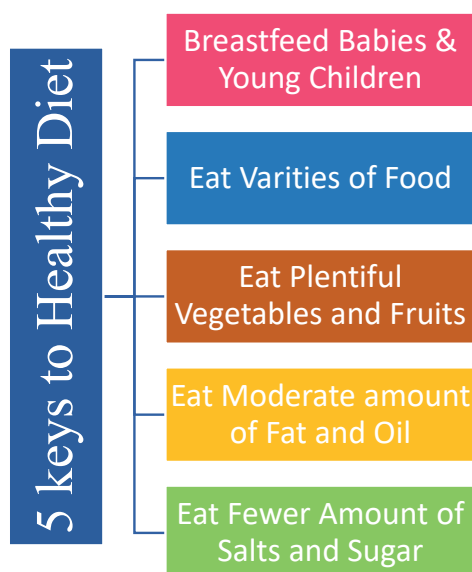
Ayurveda is one of the oldest healthcare systems that evolved in the Indian Subcontinent. The word Ayurveda encompasses 2 words- ayu (life) and veda (knowledge), it deals with various aspects related to health and wellbeing in their diverse aspects, such as happy life, healthy body, and longevity (Payyappallimana & Venkatasubramanian, 2016). Ayurvedic foods consists of satvika food and are thought to be pure and balanced food, offering feelings of calmness, happiness, and mental clarity. The word "sattvika" means "pure essence". Table 3 divulged the difference between Ayurvedic and Traditional Foods in India.

## CONCLUSION

After spreading awareness through National Nutrition Week, various government-sponsored schemes, and other awareness programmes, their impact must be accessed. For this proper questionnaire should be framed and by testing its reliability and validity by using various tools and techniques viz., Kappa coefficient, quartile method, intraclass correlation by Fisher. In comparing chief cereals, the finger millet grains have a much higher level of calcium (>300 mg/100 g). Finger Millet is treated as an orphan crop that may help in mitigating the calcium deficiency in the semi-arid tropics of Asia and Africa. So, nutritionally the finger millet is one the richest

**Table 2.** Theme of National Nutrition Week for the past 10 years

S.No.	Year	Theme
1	2013	Dinnertime Project – Eat, Cook, and Enjoy
2	2014	Nutritional Diet: Country's Foundation
3	2015	Better Nutrition: Key to Development
4	2016	Life cycle approach for better Nutrition
5	2017	Optimal Infant & Young Child Feeding Practices: Better Child Health
6	2018	Go Further with Food
7	2019	Nutrition Behaviour, Every home
8	2020	Eat Right, Bite by Bite
9	2021	Feed smart right from the start
10	2022	Celebrate a World of Flavors



**Fig. 5.** Five keys to a healthy diet (WHO, 2020)

source of Fe and Ca among all crops. In present India, millet festivals are still observed (Niyogi, 2018). The research concludes that a healthy, nutritious diet is the need of the mitigation both ends of the continuum i.e., from wasting (acute malnutrition) to obesity.

**Table 3.** Difference between Ayurvedic and Traditional Foods

S.No.	Particulars	Ayurvedic Food	Traditional Food
1.	Food Categories	Consists of only Satvika food	Consists of Satvika, Tamsika & Rajsika foods
2.	Therapeutic Effect	More	Comparatively less
3.	Immunity	Enhances immunity through Rasayana therapy	No therapy is used but can induce immunity
4.	Focus Area	More on health	More on taste & flavors
5.	Knowledge	Gained through ancient texts like Charaka Samhita & the Sushruta Samhita	Gained from ancestors and passed on from generation to generation
6.	Food Diversity	Less	More
7.	Principles	5 viz., Air, Water, Space, Earth, and Fire	No such principles
8.	Balance	Balancing diet depending on prakriti (Nature) of food	Balancing diet based on food ingredients
9.	Nutritional Element	Panchamahabhuta (5 elements)	Calories, protein, fats, carbohydrates, vitamins, minerals
10.	Variation according to region	Do not varies	Varies according to different regions
11.	Why we eat	To take in prana to live	Personal preference, habit, flavors etc.
12.	Dietary Recommendations	Depends on the nature of the food	Depends on the food groups
13.	Effect on	Body, mind and soul	Body specifically
14.	Importance	Deals with Tridosha namely vata, pitta, and kapha	Calorific value of food
15.	Documentation	More	Less
16.	Examples	Herbal rice drink, Bamboo shoot curry, Jaljira powder juice	Saag, Rabdi, Ginna

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