

Ayurvedic Culinary Practices and Microbiome Health Aligning Ayurvedic Eating Practices with Chrononutrition: A Nutritional Perspective

Nagarjuna Reddy Aturi

Isha Yoga Teacher & Corporate Director, ISHA Foundation

Email: [emceearjun\[at\]gmail.com](mailto:emceearjun[at]gmail.com)

ORCID ID: 0009-0002-8978-013X ORCID record <https://orcid.org/0009-0002-8978-013X>

Abstract: Functional constipation is a common public health problem which may reduce one's level of productivity and quality of life. Chrono nutrition profile involves the relationship between one's circadian rhythm and the dietary pattern. The findings suggest an association with a poor chrono nutrition profile with the constipation status of the study population on a free day. Further advice can be given to subjects suffering from constipation to improve their lifestyle pattern consistently on both working and free days. Ayurveda elaborates about different dietary regimens including recopies advocated for health promotion, prevention of illness and also prescribed for management of diseases as well which further provide a great scope for the development of nutraceuticals and dietary supplements. The prerequisites to attain this include wholesome diet, conservation of environment, congenial social and cultural atmosphere. Diet (ahara) is an essential factor for the maintenance of life. Though the science of nutrition at the present times evolved as an elaborate and organized subject of study, contemporary perspective mull over gross components of diet like carbohydrates, fats, proteins, minerals, water etc.

Keywords: Ayurveda elaborates, dietary pattern, Ayurvedic Culinary Practices, Chrononutrition, Microbiome Health.

1. Introduction

Ayurveda is one of the oldest healthcare systems that evolved in the Indian Subcontinent. From the large number of literatures spanning over three millennia on diverse aspects of managing health and wellbeing, both in Sanskrit and regional languages of the subcontinent, it can be deduced that it has had a dynamic and unbroken knowledge tradition. Contemporary Ayurveda has been formalized and institutionalized on aspects such as education, clinical approaches, pharmacopeia, and product manufacturing starting from late nineteenth century. In the post-independence period in India, it has been recognized and legitimized as one of the formal healthcare systems of the country [1]. The term Ayurveda comprises two words – ayu (life) and veda (knowledge), thus, deals with various aspects related to health and wellbeing in their diverse aspects, such as happy life, sustainable happiness, and longevity. According to Ayurveda, there are three fundamental states of a being such as the physical (including physiological), mental, and the spiritual. Health is a balance of all these three states and their relationship with the outside world. This relationship between the microcosm and the macrocosm is yet another fundamental tenet of Ayurveda. The “being” constantly interacts with the outside world through its senses (senses of knowledge and senses of action) and the cognitive functions. At the same time, the outside world is constantly influencing the being. Both the outside world and the being are understood on the ontological basis of the pancamahabhuta or the five-element theory. According to Ayurveda, this forms the basis of understanding of materials (Dravya guna sastra), such as food or medicine, therapeutic approaches, and dietary or lifestyle changes, to stay healthy. Food classifications based on their organoleptic properties and their impact on psychological constitution of an individual is yet another interesting precept of Ayurveda [2].

2. Literature Review

Dhanya Soman Pillai (2021) Food plays a crucial role in both health and disease. A healthy life starts with healthy food. One should consume food only depending on one's digestive fire. In Ayurveda, six ritus (seasons) have been detailed, and specific dietary and lifestyle regimens are also well explained. There is a great interconnection between ahara, the gut microbiome and seasons. In Ayurveda, food supports and brings out the three qualities of mind, namely satvika (quality of purity and harmony), rajasika (quality of passion and manipulation) and thamasika (darkness, destruction). The satvik diet appears to be similar to a modern but prudent dietary pattern [2].

Takashi Tatsuse (2021) We aimed to clarify the predisposing factors for adolescent constipation in a longitudinal study, because while factors associated with childhood constipation have been reported, prospective studies on the incidence of constipation are lacking. We enrolled 5540 adolescents aged 12 to 13 years from the Toyama Birth Cohort Study—a communitybased prospective study examining children's health. The incidence of constipation, defined as bowel movement frequency of less than once every 2 days, was surveyed during the three-year period from baseline (grade 4) to follow-up (grade 7). Multivariate logistic regression analyses were performed to explore the association between the incidence of adolescent constipation and their lifestyle variables. Our prospective study demonstrated that female sex, insufficient fruit intake, and deteriorating lifestyles such as skipping breakfast and becoming inactive during the 3-year period were associated with the incidence of adolescent constipation. Beyond anecdotal, maintaining a healthy lifestyle is recommended to reduce the incidence of adolescent constipation [5].

Amita Sehgal (2021) Circadian clocks are biological timing mechanisms that generate 24-h rhythms of physiology and behavior, exemplified by cycles of sleep/wake, hormone release, and metabolism. The adaptive value of clocks is evident when internal body clocks and daily environmental cycles are mismatched, such as in the case of shift work and jet lag or even mistimed eating, all of which are associated with physiological disruption and disease. Studies with animal and human models have also unraveled an important role of functional circadian clocks in modulating cellular and organismal responses to physiological cues (ex., food intake, exercise), pathological insults (e.g. virus and parasite infections), and medical interventions (e.g. medication). With growing knowledge of the molecular and cellular mechanisms underlying circadian physiology and pathophysiology, it is becoming possible to target circadian rhythms for disease prevention and treatment [4].

Venkatasubramanian P (2016) Ayurveda, a traditional system of medicine that originated over three millennia ago in the South Asian region, offers extensive insights about food and health based on certain unique conceptual as well as theoretical positions. Health is defined as a state of equilibrium with one's self (svasthya) but which is inextricably linked to the environment. Ayurvedic principles, such as the tridosha (three humors) theory, provide the relationship between the microcosm and the macrocosm that can be applied in day-to-day practice. Classical Ayurveda texts cover an array of themes on food ranging from diversity of natural sources, their properties in relation to seasons and places and to their specific function both in physiological and pathological states. The epistemic perspective on health and nutrition in Ayurveda is very different from that of biomedicine and modern nutrition. However, contemporary knowledge is reinventing and advancing several of these concepts in an era of systems biology, personalized medicine, and the broader context of a more holistic transition in sciences in general [1].

Narayanam Srikanth (2015) The high end of medical science is the preservation of health and it can be attained in two ways, first of all by eradicating the diseases, which may invade the body; secondly by due observation of such rules as would keep away the diseases. These rules are no less important than the treatment of diseases and method of cure. The prerequisites to attain this include wholesome diet, conservation of environment, congenial social and cultural atmosphere. Diet (ahara) is an essential factor for the maintenance of life. While Ayurveda—the ancient science of life emphasizes on diversified aspects of dietetics and

nutrition viz. quality, quantity, processing methods, rationale of combination of food articles, emotional aspects, nature of the consumer, geographical & environmental conditions etc. which are pivotal in preservation and promotion of health and prevention of disease [3].

Rasa (Taste) and Food

Healthy diet is vital for a healthy body and a healthy mind. In Ayurveda, an ideal diet incorporates the six rasas (tastes) prescribed in the classics. The word rasa refers to taste and that which is perceived through the tongue. According to acharya Vagbhata, rasas are six in number: madhura rasa (sweet), amla rasa (sour), lavana rasa (salty), katu rasa (pungent), tikta rasa (bitter), and kashaya rasa (astringent) [2].

Madhura Rasa

Madhura rasa is related to the strength and stability of the body. By birth, the human body is familiar with this taste. It is beneficial to the skin, hairs, sense organs and general growth of the body. Herbs having a sweet taste increase the breast milk, soothe a dried throat, and also help in erectile dysfunction in men. When taken in excess, they cause obesity, obesity-related diseases, and diabetes. Madhura rasa increases kapha dosha. Food and herbs of sweet taste are usually rich in carbohydrates or simple sugars and provide a lot of calories when consumed. Additionally, these calories provide plentiful energy. The desired level of calorie requirement will be exceeded when these types of foods are consumed in excess, and this excess number of calories are stored as fat. This excess accumulation of fat leads to obesity. Therefore, Ayurveda acharyas suggest madhura rasa or sweet foods to those people who require a good supply of calories. These foods can be consumed in excess by those persons who have heavy physical work, kids who are active in outdoor games, lactating mothers, pregnant women, improving patients and patients who need a quick supply of energy [3]. Foods are categorized based on their qualities. Sattvic foods (pure and light) promote clarity and health, while Rajasic (stimulating) and Tamasic (heavy) foods can disrupt balance. Ayurveda recognizes six tastes—sweet, sour, salty, bitter, pungent, and astringent. Incorporating all tastes in meals can enhance digestion and satisfaction.

Microbiome Health:

The gut microbiome plays a crucial role in digestion, immune function, and overall health. A diverse and balanced microbiome is essential for well-being. Fermented foods (like yogurt, kimchi, and pickles) are particularly beneficial for gut health, as they introduce beneficial probiotics.

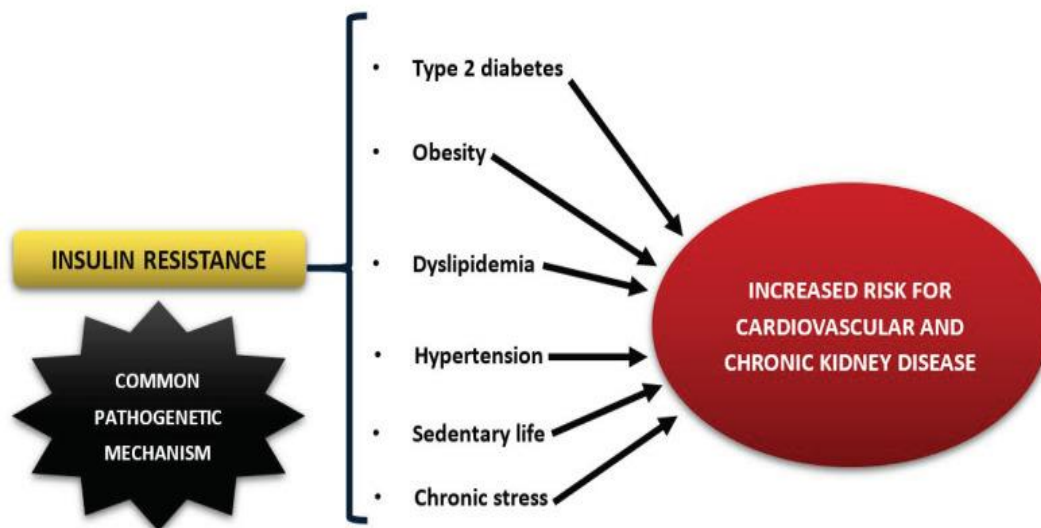


Figure 1: Lifestyle Interventions

Chrono nutrition:

This concept refers to the timing of food intake and its impact on metabolism and health. Aligning eating patterns with the body's circadian rhythms can enhance digestion and nutrient absorption.

Aligning Ayurvedic Practices with Chrono nutrition

Meal Timing: Ayurveda suggests eating larger meals during the day when digestive capacity is strongest (around noon). This aligns with chrononutrition principles, which advocate for consuming more calories earlier in the day.

Fasting: Intermittent fasting, a common Ayurvedic practice (like the idea of not eating after sunset), supports digestive health and can enhance the microbiome.

Food Preparation:

Cooking techniques such as steaming, boiling, and lightly frying with spices not only enhance the nutritional value of foods but also improve digestibility. Using spices like cumin, ginger, and turmeric supports gut health and reduces inflammation.

Sattvic diet

Sattvic means pure essence. This is the purest diet for a consciously spiritual and healthy life. It nourishes the body and maintains it in a peaceful state [6]. According to Ayurveda, this is the best diet for physical strength, a good mind, good health, and longevity. And it calms and purifies the mind, enabling it to function at its maximum potential. A sattvic diet thus leads to true health: a peaceful mind in control of a fit body, with a balanced flow of energy between them. A sattvic diet is excellent for those individuals who desire to live a quiet, peaceful and meditative life.



Khichadi

Sattvic foods include sprouted whole grains, fresh fruit, land and sea vegetables, pure fruit juices, nut and seed milk and cheese, legumes, nuts, seeds, sprouted seeds, honey and herbal teas.

Emphasizing seasonal, locally sourced foods can improve microbiome diversity. Seasonal foods are often fresher and more nutrient-denser, aligning with the natural cycles of the body.

Mindful Eating

Ayurveda emphasizes mindful eating practices, such as eating in a calm environment and chewing food thoroughly. This enhances digestion and promotes a healthy microbiome by reducing stress, which can negatively impact gut health.

Incorporating Fermented Foods

Traditional Ayurvedic diets include fermented foods like yogurt (dahi), which support the microbiome. Regular consumption of these foods can enhance the gut flora and overall digestive health.

Start with Warm Water: Drinking warm water or herbal teas in the morning can aid digestion and prepare the gut for food.

Balanced Plates: Aim for a mix of carbohydrates, proteins, and fats, ensuring all six tastes are represented in your meals.

Embrace Fermentation: Incorporate homemade probiotic-rich foods like lassi, idli, and dosa to support gut health.

Adapt to Seasons: Focus on seasonal fruits and vegetables, adjusting your diet according to the weather and climate.

Food and Mind

According to Karmayoga adhyaya of Bhagavat gita, creatures are born from ahara. The origin of ahara is from rainfall; rainfall originates from sacrifice, and sacrifice has action as its origin. According to the Bhagavat Gita, Sraddha-traya-vibhaga-yoga adhyaya, food is of three kinds—sativka ahara, rajasika ahara and thamasika ahara.

Sativka Ahara

Satva guna is the spiritual quality. Food that augments life, firmness of mind, strength, health, happiness and pleasure, and which is succulent, buttery, substantial and agreeable are dear to those in whom sattva predominates. Ayurveda suggests a satvik diet for maintaining good health, mind and longevity. Satvik foods include fresh fruit, pure fruit juices, milk, honey, sprouted whole grains, land and sea vegetables, cheese, nuts, seeds, legumes, sprouted seeds and herbal teas. Foods that do not disturb the stomach are considered satvik food.

Rajasika Ahara

Rajasika guna is the quality of passion and manipulation. Foods that are excessively sour, bitter, salty, pungent, hot, dry and burning and that which produce sorrow, pain, and disease are rajasika ahara. The mind-body equilibrium is ruined by rajasika ahara, and they make the mind agitated and uncontrollable. These foods make the mind anxious and hyperactive, cause a lack of concentration, affect sleeping patterns, encourage the development of insomnia, and increase urges of anger.

3. Research Methodology

Ayurveda, the ancient Indian system of medicine, emphasizes a holistic approach to health, including diet. It recognizes the importance of balancing the body's energies (doshas) and promoting overall well-being. Recent research suggests that these traditional dietary practices may also positively influence the gut microbiome, which plays a crucial role in health. Identify the individual's dosha through assessment tools (e.g., questionnaires). Consider current health status, lifestyle, and dietary habits. Focus on fresh, whole foods—fruits, vegetables, whole grains, legumes, nuts, and seeds—to provide prebiotics and support microbiome diversity. Incorporate traditional fermented items like yogurt, kefir, and pickles to introduce beneficial probiotics. Utilize spices like turmeric, ginger, and cumin, which can enhance digestion and have anti-inflammatory properties. Emphasize methods like steaming and slow-cooking, which enhance nutrient availability and digestibility. Incorporate the six tastes (sweet, sour, salty, bitter, pungent, and astringent) to ensure a balanced diet that meets doshic needs. Encourage mindfulness during meals to enhance digestion and promote a healthy relationship with food. Eating in a calm

environment aids in the digestion process. Emphasize eating seasonal and local foods to support both the environment and the body's natural rhythms, which can positively impact gut health.

4. Data Analysis

Distribution for Age

Table 1: Distribution for Age

SL. NO	Age Group	Group 1	Group 2
1	20-29	13	11
2	30-39	06	08
3	40-49	07	08
4	50-59	03	02
5	60-69	01	01
Total	30	30	30

In the present study it was max incidence of cholelithiasis is noted in the age group of 20 to 29 years. In Group 1, among 30 subjects 13 and in Group 2, among 30 subjects 011 were in the age Group 30-39. Among 30 subjects (06) of subjects in Group 1, and (08) of subjects distributed in the age group of 40-49.

Distribution on Gender

Table 2: Distribution of Gender

S. No	Male	%	Female	%
Group 1	7	23.33%	23	76.66%
Group 2	10	33.33%	20	66.66%
Total	30		30	

Distribution of gender in Cholelithiasis in various clinical researches goes hand in hand with this pattern of distribution. In the present study it was observed that in Group 1, 76.66% (23) of the patients were female and 23.33% (07) of the patients were male. In Group 2, 66.66% (20) of the patients were female and 33.33 % (10) of the patients were male.

Distribution for Food Habit

Table 3: Distribution of Food Habit

S. No	Group 1	%	Group 2	%
VEG	17	56.66	19	63.33
MIXED	13	43.33	11	36.66
TOTAL	30		30	

It was found that food habit in this present study noted as 17 (56.66%) subjects were vegetarian and 13 (43.33%) subjects were non-vegetarian in Group 1. In Group-2 19 (63.33%) subjects were taking vegetarian and 11 (36.66%) were non-vegetarian.

5. Conclusions

Integrating Ayurvedic culinary practices with contemporary understanding of microbiome health offers a holistic approach to wellness. By focusing on personalized diets, mindful eating, and seasonal foods, individuals can enhance both their digestive health and overall well-being. Ayurveda gives the highest importance to the maintenance of health and to promoting positive health rather than curing disease. Rapid

changes in diet and lifestyle led to a major emerging shift towards non-communicable diseases (NCDs) such as lifestyle related disorders (diabetes, obesity, arthritis, mental illness, cardiac diseases, cancer etc.) and Ayurvedic principles certainly play an important role in their prevention and management. The goal of Ayurveda is more on prevention rather than curing diseases; thus, Ayurveda emphasizes the ideal food to be consumed to attain and sustain good health. Food is essential for a good life, and the same food, if taken improperly, becomes the root cause of many diseases. By synthesizing Ayurvedic eating practices with the principles of chrono nutrition, this study aims to create a holistic nutritional framework that respects traditional wisdom while leveraging modern scientific insights, ultimately promoting better health and quality of life. Health-promoting regime (pathya vyavastha) is the hall mark of Ayurvedic therapeutics; specific diet and lifestyle guidelines are always prescribed along with the drugs and therapies to facilitate restoration of homeostatic bio-mechanisms (dhatu-samyata) and wellbeing.

References

- [1] Venkatasubramanian P, "Exploring Ayurvedic Knowledge on Food and Health for Providing Innovative Solutions to Contemporary Healthcare", *Front.Public Health*, ISSN: 2296-2565, Vol.4, 2016, doi:10.3389/fpubh.2016.00057
- [2] Dhanya Soman Pillai, "An Ayurvedic View on Food (Ahara)—A Review", *Biol. Life Sci. Forum*, ISSN:2673-9976, Vol. 6, 19, 2021. <https://doi.org/10.3390/Foods2021-11006>
- [3] Narayanam Srikanth, "Nutritional Discipline in Ayurveda: Prospective For Translational Research", *World Journal of Pharmacy and Pharmaceutical Sciences*, ISSN:2278-4357, Vol. 4(7), 2015, pp. 586-605.
- [4] Amita Sehgal, "Circadian Rhythms, Disease and Chronotherapy", *Journal of Biological Rhythms*, ISSN no: 1552-4531, Vol. 36(6), 2021, DOI:10.1177/074873042111044301
- [5] Takashi Tatsuse, "Lifestyle, psychological stress, and incidence of adolescent constipation: results from the Toyama birth cohort study", Yamada et al. *BMC Public Health*, ISSN no: 1471-2458, vol. 21, 2021, <https://doi.org/10.1186/s12889-020-10044-5>
- [6] Parveen Bansal, "Effect of traditionally designed nutraceutical on stress induced immunoglobulin changes at Antarctica", *African Journal of Biochemistry Research*, ISSN no: 1996-0778, Vol. 3(4), Pp. 084-088.
- [7] N. Srikanth and Ramesh Babu. "Why go for Ayurveda? Food and Diet in Ayurveda", *Life stream*, vol. 1(1), 2012, pp. 29-32.
- [8] Pedersen, O. "Beyond the fourth wave of genome-wide obesity association studies", *Nutr. Diabetes*, Issn: 2044-4052, 2012, Vol. 2,
- [9] Kalsbeek, A.; et al. "Diurnal rhythms in the white adipose tissue transcriptome are disturbed in obese individuals with type 2 diabetes compared with lean control individuals", *Diabetologia*, issn: 1432-0428, 2019, vol.62, pp.704–716.
- [10] K. Griffiths, "Perspectives of Human Development: Time, Space, and Chrono-nutrition", 66 *The Open Nutraceuticals Journal*, vol. 5, 2012, pp. 66-78.
- [11] Bloomgarden Z.T. "Insulin resistance, dyslipidemia, and cardiovascular disease", *Diabetes Care*, 2007, vol.30, pp.2164–2170. doi:10.2337/dc07-zb08.
- [12] Zabetakis I. "Dairy Fats and Cardiovascular Disease: Do We Really Need to be Concerned? Foods", vol. 7, 2018, doi:10.3390/foods7030029.
- [13] Deepa Arora, "Concept of Chrono-pharmacology in Ayurveda", *Ancient Science of Life* vol. 19(3-4), 2000, pp. 155-63
- [14] Nishath M Ingalagi, "Biological Rhythms- An Ayurvedic Perspective", *Ayushdhara*, issn: 2393-9591, vol. 9, no. 1, 2022, DOI:10.47070/ayushdhara.v9i1.905
- [15] Nagarjuna Reddy Aturi, "The role of psychedelics in treating mental health disorders - intersection of ayurvedic and traditional dietary practices", *International Journal of Science and Research (IJSR)*, Volume 7 Issue 11, November 2018, pp. 2009-2012, DOI:10.21275/SR24914151317
- [16] Nagarjuna Reddy Aturi, "Integrating siddha and ayurvedic practices in paediatric care: a holistic approach to childhood illnesses", *International Journal of Science and Research (IJSR)*, Volume 9 Issue 3, March 2020, pp. 1708-1712, DOI: 10.21275/SR24910085114
- [17] Nagarjuna Reddy Aturi, "Cultural stigmas surrounding mental illness impacting of migration and displacement", *International Journal of Science and Research (IJSR)*, Volume 7 Issue 5, May 2018, pp. 1878-1882, DOI:10.21275/SR24914153550