Review Article

www.ijrap.net

(ISSN Online:2229–3566, ISSN Print:2277–4343)

A REVIEW ON SCIENCE OF FOOD TRANSFORMATION IN AYURVEDA: UNDERSTANDING THE IMPACT OF FOOD PROCESSING ON DIETARY ATTRIBUTES (AHAR SANSKAR)

Sapana Ukey [1]*, Yeshwant Patil [2]

[1] PhD Scholar, Department of Swasthavritta and Yoga, Government Ayurved College, Vazirabad, Nanded, Maharashtra, India

[2] Professor & Head, Department of Swasthavritta and Yoga, Government Ayurved College, Vazirabad, Nanded, Maharashtra, India

Received on: 21/8/25 Accepted on: 24/9/25

***Corresponding author**
E-mail: dr.sapana.ukey@gmail.com

DOI: 10.7897/2277-4343.165197

ABSTRACT

Ayurveda considers Ahara (food) as a fundamental pillar of health, whose qualities (Guna) are significantly influenced by processing methods (Sanskara). This review aimed to examine classical Ayurvedic concepts of food transformation and correlate them with modern food science. Classical sources, including Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya were systematically reviewed, along with relevant modern literature. The study analysed various Sanskara types—Jalasannikarsha (aqueous treatment), Agni Sannikarsha (thermal processing), Manthana (churning), Desha (geographical influence), Kala (seasonal factor), Shaucha (hygiene), Vasana (flavouring), Bhavana (infusion), Kalaprakarshe (duration of processing), and Bhajana (metal contact)—and their effects on Rasa (taste), Veerya (potency), Vipaka (post-digestive effect), and overall suitability of food. Findings indicate that these processes can transform food from Guru (heavy) to Laghu (light), improve digestibility, modify therapeutic action, and align dietary attributes with individual constitution, seasonal needs, and environmental conditions. The concept of Sanskara in Ayurveda is not merely culinary but a deliberate therapeutic intervention, offering insights for functional food development and personalized nutrition. Integrating these principles into contemporary food science may contribute to health promotion, disease prevention, and the creation of tailored dietary strategies.

Keywords: Ahara, Ayurveda, Guna, Food Processing, Nutritional Science**,** Sanskara

INTRODUCTION

According to Ayurveda, health is achieved through the balance of the body's elements (dosha), tissues (dhatu), waste products (mala), and digestive fire (Agni). Among the three pillars that sustain life—food, sleep, and celibacy—Ahara(food) is considered the most important [1]. Health is viewed as a balance among the three internal states and their dynamic relationship with the external world. This interconnectedness between the microcosm (individual) and the macrocosm (universe) is a foundational principle of Ayurveda. The individual continuously engages with the external environment through the senses—both sensory perception (gyanendriyas) and motor functions (karmendriyas)—as well as cognitive faculties. Simultaneously, the external world exerts a constant influence on the individual. Both the external environment and the individual are conceptualized through the ontological framework of the panchamahabhuta, or the five-element theory. These five elements—earth, water, fire, air, and space—correspond to the five senses: smell, taste, vision, touch, and sound, respectively[2]. Food substances possess inherent Gunas that influence their effects on the body. However, these Gunas are not permanent and can be modified through Sanskara—a term encompassing a variety of physical, chemical, and energetic processes as outlined in classical Ayurveda. The processing of food is extensively detailed in Ayurvedic texts, with the Panchamahabhuta theory offering insights into the qualities of foods that are raw, dried, smoked, grilled, pickled, steamed, and those prepared with different additives. These processing methods can significantly transform a food's pharmacological characteristics. For instance, puffed rice becomes lighter and easier to digest, whereas flaked or cooked rice tends to be heavier and more challenging for the digestive system [3].

Ashta Ahara Vidhi Visheshayatana, the method of dieting systematically and scientifically expounded by Acharya Charaka, comprises eight essential factors. Among these, the compatibility (Satmya) of food items is emphasized as a key element in preserving health. This classical framework outlines various critical aspects that influence Ahara (food), including:

Prakriti (Nature of the food substance) – The inherent qualities and constitution of the food.
Karana (Processing) – The methods of preparation and transformation, which can alter the food's properties.
Samyoga (Combination) – The compatibility and interaction between different food items.
Rashi (Quantity) – The appropriate amount to be consumed, both individually and collectively.
Desha (Habitat/Region) – The geographic origin of both the food and the consumer, influencing suitability.
Kala (Time) – Seasonal timing and time of day, which affect digestion and metabolism.
Upayoga Samstha (Dietary rules) – The manner and discipline of food intake.
Upayokta (Consumer) – The individual who consumes the food, including their constitution, health status, and habits.

These eight principles together serve as a comprehensive guideline for healthy eating and personalized nutrition in

Ayurveda[4]. Biological characteristics, environmental conditions, freshness, origin, and season are all important considerations in Ayurvedic dietary principles. Additionally, Ayurveda provides a rational framework for balancing food in alignment with an individual's Dosha (bodily constitution) and physical needs. This approach ensures that dietary choices are tailored not only to the nature of the food but also to the unique physiological and environmental context of the individual, promoting optimal health and well-being [5].

Vidhi Ahara Vishesayatana refers to the factors that determine the beneficial or harmful effects of food (Ahara) and outlines the specific techniques and rules for food intake (Aharasevana). According to Ayurveda, before consuming food, one should carefully consider the eight factors[6]. Sanskara, also known as Karana, refers to the processing methods applied to substances that alter their intrinsic qualities. These processes can include dilution, application of heat such as vaporization, distillation, or sublimation, clarification, emulsification, aging, flavouring, impregnation, preservation, and even the influence of the material of the container used. Each of these techniques contributes to modifying the original properties of a substance. For example, Vrihi (rice), which is naturally heavy and difficult to digest, becomes significantly lighter and more digestible when transformed into Laja (puffed rice) through frying. In contrast, roasted grain flour, which is initially light, becomes heavier when made into a cooked bolus. These examples illustrate how Sanskara can either enhance or reduce the heaviness, digestibility, and other attributes of food, playing a critical role in dietary planning and therapeutic applications in Ayurveda[7].

In the Charaka Samhita, after quoting the definition of Sanskara from the earliest Ayurvedic texts, a list of various techniques useful for bringing about Gunantaradhana (the transformation of inherent qualities) is provided[8]. The primary objective of Sanskara is to modify food to become either Guru (heavy) or Laghu (light) for digestion and metabolism, thereby facilitating the intended physiological effect by preventing the formation of Ama (toxins) or aiding in its elimination at all levels. It also aims to bring about the necessary qualitative transformation in raw food materials before consumption. Ahara attains compatibility when processed through various methods to acquire specific Rasas (tastes) and Gunas (qualities). The application of Sanskara provides a synergistic effect, especially when multiple techniques are employed to enhance the material's properties. Sanskara plays a vital role in both pharmaceutical and dietary preparations. Its major benefit is the ability to induce controlled and systematic transformation to achieve the desired therapeutic outcome[9]. This research explores the classical Ayurvedic principles of food processing, emphasizing how these methods alter the Gunas (qualities) of food and influence its appropriateness for various physiological conditions. The study seeks to connect traditional Ayurvedic wisdom with contemporary scientific understanding of food transformation.

Classical Perspectives on Food Transformation
Ayurvedic view of Ahara as a pillar of health
Panchamahabhuta theory and its relation to food qualities
Ashta Ahara Vidhi Visheshayatana and dietary principles
Role of Sanskara (processing) in modifying Guna (qualities) and Rasa (tastes).

Textual Review: Systematic analysis of Ayurvedic classical texts such as Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, and Bhaishajya Ratnavali. - **Modern Correlation:** Cross-referencing Ayurvedic concepts with modern food processing science and biochemical changes. - **Comparative Study:** Exploring classical examples (e.g., curd vs. buttermilk, raw vs. cooked garlic) with their documented physiological effects.

Types of Sanskara and their effects

Jalasannikarsha (Soaking/Aqueous Exposure): Hydrating or soaking food changes its Laghu (light) or Guru (heavy) quality. For example, soaking black gram decreases its heaviness and makes it easier to digest. Ayurveda acknowledges this practice as a means to decrease Tamoguna (the quality of darkness or inertia) and increase Satvik (harmonious) qualities[10]. In all the processes mentioned above, a common factor is the use of Jala Mahabhuta (water-dominant substances). This help remove Prithvi (earth)-dominant impurities and water-soluble contaminants. According to the Panchamahabhuta Siddhanta, altering Parthiva Dravya (earthy substances) requires Jala Mahabhuta to soften their hardness. Additionally, Jala Mahabhuta penetrates Parthiva Dravya, loosening molecular bonds and creating space between molecules. Since the evolutionary sequence is from Akasha (ether) to Prithvi (earth), the process of dissolution follows the reverse order: Prithvi, Jala, Agni, Vayu, Akasha. Therefore, as Prithvi dissolves into Jala Mahabhuta, water-dominant substances are employed in these processes[11].

Agni Sannikarsha (Thermal Processing): Boiling, roasting, steaming, and frying are all examples of Agni Sanskara (heat-based processing). Heating alters the Rasa (taste), Veerya (potency), and Vipaka (post-digestive effect) of substances. Kwathana (boiling) is one of the water purification techniques described in the Sushruta Samhita. The heated water (Ushna Jala) acquires properties such as Vata-Kaphaghna (pacifying Vata and Kapha), Deepana-Paachana (enhancing digestion and metabolism), and Sroto-vishodhana (clearing channels), which are opposite to the qualities of normal or cold water (Sheetala Jala), known to increase the consolidation of Doshas (Dosha Sanghaata Vardhaka). Therefore, processing through Agni Sannikarsha (contact with fire) imparts a medicinal quality to heated water (Ushnodaka). For instance, heating increases the Ushna Guna (hot quality) and decreases Snigdha (unctuousness)[12].

Manthana (Churning): Churning alters both the physical structure and energetic qualities of food. For example, when curd is churned into buttermilk, it becomes Laghu (light) and Deepana (digestive stimulant). This demonstrates a transformation from Guru (heavy) to Laghu Guna and an enhancement of Agni Deepana (digestive fire-promoting) properties[13]. Yogurt is heavy to digest, has a heating quality, is Abhisandhi (it closes pores and obstructs sweating and other bodily channels), and increases Kapha. When water is added and the butter is removed through stirring, it transforms into buttermilk, which is lighter to digest, non-obstructive, and helps reduce Kapha.

Desha (Geographical Influence): Desha usually refers to both Deha Desha (Human Body) as well as Bhoomi Desha (Geographic region). Here Dehadesha has been dealt in Upayokta(consumer). Here Bhoomi Desha, which are classified into three, produces Dravyas of different Gunas[14]. “Punhasthana Dravyanamutpattipracharau Deshasatyam” — It means place of origin of food[15]. Desha also denotes the body which consumes food[16]. Classics say that before consuming particular food stuff, it is essential to know from which land or country it has been derived[17].

Modern science also emphasizes the close relationship between health and environment, stating that disease cannot be understood without studying both the person and their surroundings.

Ayurveda explains this through Vyadhita Desha Pariksha (examination of the patient's environment), which is essential before initiating treatment[18]. Similarly, Ahara (food) should be selected according to the Bhoomi Desha (geographical origin) and Atura Desha (patient's condition) to ensure proper compatibility and digestion[19].

Kala (Time/Seasonal Factor): The timing of processing and consumption affects a substance's efficacy. For example, honey is most beneficial when taken in spring, whereas ghee is better suited for winter. This seasonal adaptation, known as Ritu (Seasonas) Sanskara, modifies the Guna (qualities) accordingly[20].
Shaucha (Hygiene & Purity): Purity of food, utensils, and the preparation area affects the Sattva Guna and overall Rasa (taste). Contamination or poor hygiene introduces Ama (toxins) and promotes Tamasic (the quality of darkness) qualities. The practice of Shoucha (cleanliness) removes physical impurities from raw materials, whether food substances, medicinal herbs or minerals. Shoucha can be regarded as a form of Shodhana (purification) similar to processes like Swedana (sudation) and Mardana (triturating)

Meals prepared at home are often more nutritious and hygienic than those from restaurants or fast-food outlets. Restaurant meals typically contain high levels of salt, calories, and cholesterol, which can be harmful if consumed regularly. In contrast, cooking at home gives you control over ingredients. You can choose organic items, sugar-free sweeteners, low-sodium options, and add more vegetables and whole grains—supporting better heart health and overall nutrition. Portion control is another benefit. Restaurants often serve oversized meals, leading to overeating. At home, you can manage portions—like having 2–3 ounces of meat with vegetables instead of a 12-ounce steak—reducing saturated fat intake. You can also skip sugary desserts in Favor of fresh fruit to meet your sugar needs naturally. Homemade food holds a special place in maintaining a healthy lifestyle. It is fresher, healthier, and more nutritious compared to meals served in restaurants. One of the greatest advantages of cooking at home is the ability to control the quality of ingredients. We can personally select fresh produce, ensure proper cleaning, and choose healthier alternatives—such as cholesterol-free oil—ensuring that every meal supports our well-being.

Hygiene is another important factor at home, meals are prepared in a clean environment, with hands washed and utensils sanitized. Vegetables and grains are thoroughly cleaned before cooking, which minimizes the risk of contamination. In contrast, many restaurants focus primarily on business and profit, often compromising on hygiene and the nutritional quality of the food they serve. Homemade food also carries emotional and social value. freshly prepared meals at home promotes not only physical health but also emotional well-being. By preparing meals at home, we can enjoy high-quality, hygienic, and flavourful dishes at a fraction of the cost of dining out. This offers peace of mind, knowing exactly what goes into our food. homemade food is the perfect blend of health, hygiene, emotional connection[21].

Vasana (Flavoring): The use of aroma through spices and herbs influences both Manas Guna (psychological qualities) and physical Gunas. For instance, adding *cardamom* to milk enhances its Laghu (lightness) and Vishada (clarity or freshness) properties.

Bhavana (Infusing): Repeated grinding with a liquid medium transfers the properties of that medium to the substance. For example, Chicken marinated in yogurt, lemon juice, and spices**.** Bhavana carries the qualities and actions (Guna-Karma) of the liquid medium into the powdered drug being Infusing. In simple terms, Bhavana refers to the impregnation of the liquid medium's properties into the Bhavita material (the drug that has undergone the Bhavana process). This method regulates the quality and potency (Guna) by altering potency (Gunantara), adding new properties (Gunadhana), enhancing existing ones (Gunotkarsha), or reducing/removing certain properties. For example, in the preparation of Amalakarasayana, Charaka recommends Bhavana of Amalaka (Indian Gooseberry) with Amalakaswaras (Indian Gooseberry juice). This method is also applied in the Shodhana (purification) of various substances and in making different Gutika (herbal formulations)[22].

Kalaprakarshe (Duration of Processing): The duration of processing affects the intensity of transformation. For example, prolonged cooking can increase Tikshna (sharpness) and decrease Snigdha (unctuousness). This is especially important in where excessive reduction can alter the Veerya (potency) of the substance**.**

Bhajana: When medication comes into contact with particular metals, it gains enhanced properties—a process known as Bhajan Samskara. This process involves using specific vessels, where treatment with certain containers imparts unique characteristic properties to the Ahar substance. This technique is important yet less explored in drug preparation. The choice of utensil directly influences the physicochemical properties of Ahar; for instance, storing Ghrita (Clarified Butter) in a copper vessel for 10 days can render it toxic. Similarly, vessels used for cooking fish should not be used for other foods. Through this unique method, Acharyas incorporate the desired qualities of metal containers—such as iron, copper, or silver—into the drug, thereby increasing its potency[23].

Modern Correlations with Food Science
Parallels between Ayurvedic Sanskara and modern food processing
Effects on digestibility, nutrient bioavailability, and therapeutic potential
Examples (curd vs. buttermilk, puffed vs. cooked rice, roasted vs. boiled foods)

Comparative Analysis: Ayurvedic and Modern Insights
Integrating classical wisdom with biochemical and nutritional science
Transformation of food qualities (Guru → Laghu, heavy → light)
Therapeutic relevance in functional food and personalized nutrition

Implications for Health and Nutrition
Dietary planning according to constitution (Prakriti), season (Ritu), and environment (Desha)
Role of food processing in disease prevention and health promotion
Significance of hygiene, choice of utensils, and preparation techniques

CONCLUSION

The concept of Sanskara provides a distinct perspective on how food processing alters the inherent nature of substances. In Ayurveda, food transformation goes beyond mere cooking—it is a deliberate therapeutic process. Understanding how each method of processing modifies the Guna (qualities), Rasa (taste), Veerya (potency), and Vipaka (post-digestive effect) allows for personalized dietary and therapeutic guidance. Applying these principles within modern food science could lead to innovative approaches in functional foods and personalized nutrition.

Acharya Charaka emphasized the significance of cooking methods by explaining that the Guru (heavy) quality of food can transform into Laghu (light), and vice versa, depending on the preparation technique. For instance, in Charaka Samhita, the example of rice illustrates this concept, properly washed and drained rice, cooked after removing its extract so that heat is absorbed thoroughly, becomes Laghu (light and easy to digest) and is beneficial in cases of poisoning and Kapha (Phlegm) disorders. In contrast, rice that is not washed, cooked with the extract intact, and cooled to room temperature remains Guru (heavy) and harder to digest.

Similarly, Acharya Sushruta highlighted the importance of cooking by discussing roasting or barbecuing: food roasted over coal or barbequed becomes light for digestion but tends to increase Vata (air) Dosha. Additionally, very thin food that is properly roasted also becomes light in nature. These classical insights underline how cooking techniques play a crucial role in modifying food qualities and their effects on the body.

REFERENCES

1. Charaka. Charaka Samhita. Sutra Sthana, Dirghanjivitiya Adhyaya, 1/42. Edited and translated by Sharma PV. Varanasi: Chaukhamba Sanskrit Series; 2014.
2. Payyappallimana U, Venkatasubramanian P. Exploring Ayurvedic knowledge on food and health. Front Public Health. 2016;4:57. doi:10.3389/fpubh.2016.00057.)
3. Anonymous. Charaka Samhita. In: Shastri KP, editor. 5th ed. Varanasi: Chaukhamba Sanskrit Sansthan; 1997
4. Vd M H Pachaghare, Ph D dissertation on Critical study of Charakokta sanyogviruddha & vishamasana in an etiology of Vicharchika i.e., eczema, TMV Pune 2012, shodhganga. inflibnet.ac.iin-14-chapter pdf, assessment date 20 march, 2017)
5. Tripathi B, Pandey GS. Charaka Samhita with Charak Chandrika Hindi Commentary. Varanasi: Chaukhamba Surbharati Prakashan; 1995. Sutrasthana, Atreyabhadr akapīya Adhyāya, 26/102–103. p. 498-9.
6. Vd Deepali Pisal, Kushthavyadhiaharajhetu adhyayana, International Journal of applied Ayurved research Jan-Feb, 2016; 568 & 569.
7. Agnivesha. Charaka Samhita with Vidyotini Hindi Commentary by Sastri K, Chaturvedi GN. Varanasi: Chaukhamba Bharati Academy; 2005. Vimanasthana, Rasa Vimana Adhyaya, 1/24-8.
8. Gaud B, editor. Charaka Samhita (composed by Agnivesha, revised by Charaka and Dridhabala). Vol. 2. New Delhi: Rashtriya Ayurveda Vidyapeetha; 2021. Vimanasthana, Rasa Vimana Adhyaya, 1/21(2). p. 259.
9. Gedam ST, Dayama MG, Bansod PD. Importance of Samskara in Ayurveda practices W.S.R. to role in Bhaishajya Kalpana. World Journal of Pharmaceutical and Medical Research. 2025 Jan;11(1).
10. Vagbhata. Ashtanga Hridaya. In: Murthy KRS, editor and translator. Varanasi: Krishnadas Academy; 2009. Sutrasthana, Dravyadi Vijnaniya Adhyaya, verse 12.
11. Chavda K, Sharma AK, Meena RR, Nigam A. Samskara (Karana) as a process, its types & effect on Dravya: Review. J Ayurveda Integr Med Sci. 2023;8(6):11. doi:10.21760 /jaims.8.6.11
12. Charaka. Charaka Samhita, Sutrasthana, anannapanvidhi adhyay 27/249. In: Sharma PV, editor and translator. Varanasi: Chaukhamba Orientalia; 2005.
13. Charaka. Charaka Samhita, Sutrasthana, anannapanvidhi adhyay 27/247. In: Sharma PV, editor and translator. Varanasi: Chaukhamba Orientalia; 2005.
14. Charaka Samhita, Vimanasthana, rogbhishajitiya 8/84–85. (Deha and Bhoomi Desha classification).
15. Charaka Samhita, Sutrasthana, Chapter 25 Yajjah Purushiya Adhyaya. (Origin and propagation of Dravyas depends on Desha).
16. Ashtanga Hridaya, Sutrasthana, Ayushkamiya Adhyaya 1/20. (Definition of Deha Desha and Bhoomi Desha).
17. Charaka Samhita, Sutrasthana, anannapanvidhiadhyay 27/242–243. (Food selection should consider Desha and Kala).
18. Charaka Samhita, Vimanasthana, rogbhishajitiyaviman 8/94–95. (Examination of patient and environment before treatment).
19. Ashtanga Hridaya, Sutrasthana, matrashitiya adhyay8/46. (Wholesomeness of Ahara depends on Desha and Kala).
20. Vagbhata. Ashtanga Hridaya, Sutrasthana Rutucharya Adhyay 3/7. In: Murthy KRS, editor and translator. Varanasi: Krishnadas Academy; 2009.
21. Homemade Food Is Better Than Restaurant Food: Essay [Internet]. Edu birdie. 2022 Dec 15 [cited 2025 Aug 12]. Available from: https://hub.edubirdie.com/examples/ homemade-food-is-better-than-restaurant-food-essay/)
22. Sharma R, Bedarkar P, Tim Alsina D, Chaudhary A, Prajapati PK. Bhavana, an Ayurvedic pharmaceutical method and a versatile drug delivery platform to prepare potentiated micro-nano-sized drugs: core concept and its current relevance. Bioinorg Chem Appl. 2022 Apr 29; 2022:1685393. doi: 10.1155/2022/1685393. PMID: 35529314; PMCID: PMC9076343.)
23. Vashist P, Vyas M. Bhajana Samskara: A unique method of drug fortification with essential metals. Int J Ayurveda Pharm Res. [Review Article] [Date not provided]; [Volume and Issue not provided]. Dept. of Samhita and Siddhant, All India Institute of Ayurveda, Delhi, India.

Cite this article as:

Sapana Ukey and Yeshwant Patil. A Review on science of food transformation in Ayurveda: Understanding the impact of food processing on dietary attributes (ahar sanskar). Int. J. Res. Ayurveda Pharm. 2025;16(5):187-190
DOI: http://dx.doi.org/10.7897/2277-4343.165197

Source of support: Nil, Conflict of interest: None Declared