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Food Discipline According to *Ayurveda*- A Holistic Approach in Eating Healthy Food with *Ayurveda Siddhant* Mentioned in *Ayurveda* and Food Technology

Nikita Sharma[1], Chandan Singh[2], Rajendra Prasad Purvia[3], Manoj Adhlakha[4]

1-PG Scholar Department Of Dravyaguna Vigyan Dr. Sarvapalli Radhakrishnan Ayurved University Jodhpur
2-Professor & Hod Of Department Of Dravyaguna Vigyan Dr.Sarvapalli Radhakrishnan Ayurved University, Jodhpur
3,4-Associate Professor Of Department Of Dravyaguna Vigyan Dr.Sarvapalli Radhakrishnan Ayurved University, Jodhpur

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Corresponding author-
Nikita Sharma, PG Scholar Department Of Dravyaguna Vigyan Dr. Sarvapalli Radhakrishnan Ayurved University Jodhpur (Rajasthan), 342037, India

Email - ns.nikita7790@gmail.com

ABSTRACT:

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 disease.Ayurveda elaborate 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. *Rasayanas* are the foods, therapies or practices that are conducive and beneficial to body tissues and its functions. Diet plays an important role in keeping our mind healthy and explicit psycho-pharmacological effects of food led to classification of food in to following 3 categories. 1. *Satvik* diet: ideal diet containing vegetarian, non-oily, non-spicy articles which are congenial to the body and mind. 2. *Rajasik* diet: too spicy, hot, sour, salty; excite the mental faculties.3. *Tamsik* diet: too oily and heavy food. But in the age of systems biology, personalised medicine, and the wider context of a more holistic transition in sciences generally, modern knowledge is reinventing and advancing a number of these ideas. Trans-disciplinary study could be important for advancing the fields of food and health sciences as well as for offering real-world remedies for current health issues. This article highlights the need for a deeper engagement with traditional knowledge systems, such as Ayurveda, by quickly reviewing the similarities between Ayurveda and Technology..

Keywords: Ayurveda, food, nutrition, *pathya*, dietary suppliments

INTRODUCTION

Food and Nutrition are the way that we get fuel, providing energy to our bodies. Nutrition is increasingly being recognised as an important indicator of development at national and international level. Food and nutrition is a vital component of individual's and community health as nutritional wellbeing of the population is considered as an economic asset and pre-requisite for national development. Most Health problems develop due to the incorrect eating

practices and cookery procedures. *Ayurveda* lays stress on positive health, a blend of physical, mental, social, moral and spiritual welfare and this holistic medical science considers three important factors, while dealing with the health and disease, *Aushdha*(drug and therapies), *Ahara* (Diet) and *Vihara*(practices).[1] *Ayurveda* deals with the *Pathya-vyavastha* (planning of diet) in a very scientific and holistic way *pathya*(or a proper diet advocacy) is defined as the diet plan which is congenital to the channels of the body and keeps individual healthy, maintains normal body functions, leads to proper functioning of the organs, nourishes the mind and intellect prevents diseases and at the same time corrects the irregularities that may occur in the body.[2] Ayurvedic medications are traditionally used as extracts, as individual raw and crude ingredients, or a mixture of ingredients, for therapeutic purposes. *Ayurveda* has a parallel or separate medicinal system in India, set apart from modern pharmaceuticals and nutraceuticals, but as consumer acceptance for natural and herbal Ayurvedic ingredient grows, the production of *Ayurvedic* based modern nutraceuticals is increasing. It is not just about medicine, but also part of Indian cooking which demonstrates the Healthy advantages of incorporating certain ingredients into daily Diets.

METHODS AND MATERIALS

There are following elements-

A. The Basics of ayurvedic diet-

Ayurveda emphasized primary importance of wholesome Diet(prophylactic and promotive nutrition) while advocacy of specific diet in disease condition(Clinical nutrition) is always done, which is the characteristics of holistic Ayurvedic approach. *Vaidyajeevanam* , an Ayurvedic text dedicated to dietetics quotes, 'If wholesome diet is given in a planned way there is no need for separate medicinal treatment(prophylactic nutrition) while if unwholesome diet is being permitted, the advantage of treatment becomes questionable(dietetics or clinical nutrition) The original Sanskrit verse runs as follows:

"Pathye sati gadartasya kimaushdhanishevanah
Pathye-asati gadartasya kimaushdhanishevanah
(vaidyajivanam)[3]

Furthermore Ayurveda attributes certain fundamental qualities to wholesome and balanced diet that include 1.Congenital to the body tissues and micro-channels 2.relished by the person 3.keep body healthy4. Sustains homeostasis of physiology 5. Conductive for mind and intellect 6. prevents diseases. Any kind of food article can become wholesome or unwholesome based on the permutations and combinations to above factors. The same diet can be wholesome and unwholesome on the basis of variations of these factors. So the natural qualities of dietary articles and regimen as well as condition like quantity etc. are required to be well ascertained before the administration of the diet and requisite therapy in order to achieve the desired effect. Ayurveda classifies food into 12 basic categories based on source, method of preparation and utility; such as

1.*Shukdhanya*(corns with bristles)
2. *Shamidhanya* (pulses)
3. *Mansa*(meat)
4. *Shaka*(vegetables)
5. *Phala*(fruits)
6. *Arita*(salads)
7.*Madya(*fermented drinks)
8. *Ambu*(water)
9. *Gorasa*(Milk and milk preparation)
10.*Ikshuvarga*(products of sugarcane)
11.*Krtanna*(food preparations)
12. *Aharyogi*(accessory food articles).

Similarly, these are some dietary articles, which naturally wholesome in almost all circumstances and they are readily acceptable such as red shali rice (oryzae sativa Linn.), *mudga* (Phaseolus mungo Linn.) among pulses, *saindhava*(rock salt), meat of Lava birds(common quail) *rohita* fish, cow milk, cow ghee, ginger, grapes, sugar etc.[4]

b. Principles on Dietic-

While considering the *Aharamatra* (quantitative dietetics) *Maharshi Charaka* says, that one should eat in proper quantity. The quality of Food to be taken, again depends upon the power of digestion(including metabolism). The quantity of food intake is directly proportional to the power of digestion and Metabolism, which according to season as well as the age of the individual. The amount of food which without disturbing the equilibrium (of Dhatus and Doshas of the body) gets digested as well as metabolized in proper time is to be regarded as the proper quantity. In order to state the quantity of food like *'Shali* Rice', '*Shastika* Rice' *Mudga* pulse, the meat of common quill, gray partridge, antelope, rabbit, wapiti, Indian Sambar, etc. even though light in digestion by nature are to be taken according to the measure prescribed. Similarly the preparations of Flour, Sugarcane and Milk, *Tila*(sesamum)., *Masha*(black gram) and Meat of marshy animals and aquatic animals even though heavy in digestion by nature are also required to

take in proper quantity. According to *Maharshi Charaka*, the eight factors which determine the utility of the various type of foods are-

1. *Prakriti*(nature of the foods)
2.*Karana*(processing the substances)
3.*Samyoga*(combination)
4.*Rashi*(quantity)
5. *Desha*(Habitat)
6.*Kala*(time)
7. *Upayogasamstha*(rules governing the intake of food)
8. *Upyoktaran*(Wholesomeness to the individual who takes it).[5]

3. Food discipline and indicated foods for daily dietics-

In Indian system of Medicine, there has been a thorough consideration for seasons, besides the dietetic regimens for day and nights. Life as a whole starting for intrauterine period till death, is all the time dynamic. One is bound to face minor and major changes in every moment of life and thereby. Doshas are also variable accordingly. Based upon the strength of sun and moon outside and the variabilities of body Doshas and their control through certain *Ahara* and *Viharas* (Dietetic and daily routines). According to Acharya Charak the Ayurveda has divided the year as a whole into its two phases

1. *Adana kala*(Uttarayan a period of debility or exhaustion) 2 *Visarga Kala* or *Dakshinya* (a period of strength or enrichment) where each has been further divided into two sets of three seasons- A. *Shishira*(Late winter) 2. *Vasanta*(spring) 3. *Greeshma*(summer) 4. *Varsha*(Rainy seasons) 5. *Sharada*(Autumn) 6.*Hemanta*(Early winters).respective.[6]

A. Indicated foods for daily dietetics-

According to *Maharshi Charaka*, one should regularly take '*shastika* rice' (a kind of rice harvested in sixty days), *'Shalee'*(a kind of rice probably harvested in winter season and it takes more days in harvesting) '*Mudga*'(green gram) ,Rock salt, *Amalaki*(emblica officinalis), rain water which collected before falling on the ground , ghee, meat of animal dwelling in arid climate *(jangala*) and honey. The above routine dietetic prescribed by *Maharshi Charaka* is no doubt wholesome and possess all types of food values, such as carbohydrates, protein, fat, minerals and vitamins. Seasonal consideration of dietetics are as follows-[7]

1. During *Shishira*(winter) season, due to contact of cold air, the restricted digestive power of healthy people get enforced and is capable of digesting any food stuff, hence people are advised to take unctuous, sour, saltish food, juice of meat of cock, goats, deer and drink of *madira*, *sidhu* types of wine and honey is recommended in drinking.
2. During the *Vasanta* season, the accumulated *kapha* is liquified by the heat of the sun and disturb the power of digestion, the food to be taken are barley, wheat, meat of rabbit, deer drink should be unpolluted *sidhu*.
3. During *greeshma*, the heatness of the season evaporates the moisture of the earth by its rays and individual feels weakness during this season. The intake of sweet, cold, liquid and unctuous diet and drinks are prescribed.
4. During *varsha* season, where the power of digestion as well as the body was though already weak. In order to maintain normal power of digestion one should take old barley, wheat, *shali* rice, along with meat of arid animals.
5. The *sharada ritu*, the pitta accumulated during the rains, gets generally vitiated. In this season, sweet, light cold and bitter foods and drinks which have potentialities to alleviate '*pitta*' are advisable to be taken when there is good appetite.
6. The seasonal dietetics of *Hemanta* and *Shishira* are similar.

B. Food Habits and cultural patterns-

Major basics of Ayurveda detail about the system of eating food covering physiological, qualitative, quantitative, social spiritual, emotional and psychological, environmental aspects. Few of these rules comprise, 1. One should take food with full eating awareness i.e. "*Tanmanabhunjita*" (charaka Vimana *Sthana1/24*), 2. Every country enjoys various traditions of food as per the region. Hence, one should consider the type of food and quantity according to the habitat for maintaining good health(*desha satmaya*) 3. One must take wholesome food in right quantity and right time to maintain the homeostasis of all the three biological humors.(*doshas*). 4. Ayurveda strongly regards that eating before or after the usual timings of meals is unhealthy or '*swasthyavighataka*' which causes physical and mental illness.5. *Sushruta* advices intake of food which is easily digestable, energetic, soft, warm, and to be taken in proper quantity only when one is hungry[8]

There are different rules laid by *Maharshi Charaka*, *sushruta* and *vagbhatta* regarding the taking diet. According to *Maharshi Charaka*, the healthy individuals as well as some of the patients should observe the following , even while using such of food articles as are the most wholesome by nature,[9] One should eat only that food in proper quantity which is hot, unctuous, and not contradictory in potency and that too, after the digestion of

the previous meal. Food should be taken in proper place equipped with all the accessories, without talking and laughing with concentration of mind and paying due regard to oneself. Further explaining those he say one should take warm food. When taken warm, it is delicious, after intake, it provokes the enzymes in the abdomen and responsible for digestion. It gets digested quickly and helps in the downwards passage of *Vata*, and detachment of *Kapha*. Therefore one should take warm food.[10]

C. Contraindicated Diets in Daily Routine-

Maharshi Charaka says that one should not take regularly take heavy articles such as "*Vallura"*(dried meat), dry vegetables, lotus rhizomes , lotus stalk. One should never take the meat of diseased animals. Moreover one should not regularly take *"Kurchika*" (boiled buttermilk) *"Kilata*(inspissated milk) , pork, Beef, meat of buffalo, fish , curd, *Masha*(Black gram) and *Yavaka*(a variety of Hordeum Vulgare). One should not take the heavy food such as cakes, unboiled rice, and pressed peddy (Cheuda) after food. One should take them in an hungry . Curd is forbidden in night also.

The food with incompatible or contradictory qualities has poisonous effect on the body, that aggravates *Tridoshas* intern leading to various disorders viz. *Gulma*(Lump), fever, Allergic Dermatitis, Eczema, Abcess and other Skin diseases. It also destroys strength, vigour, memory, immunity etc.[11]

4. Food as Medicine-

There is a fundamental principle in *Ayurveda*, often referred as the principle of *Samanya*(similarity) and *Vishesha*(difference). These principals came into being in the present form about 3000 years ago, and draws on the *Vaisheshika* school of Thought. It has contributed immensely to the cause of rational therapy and diet in *Ayurveda*. In a simple verse, the principle of *Samanya* and *Vishesha* propounds that similarity of all substances is always the cause of increase and dissimilarity is the cause of decrease. Both have an impact by their application. Similarity brings unity, dissimilarity brings diversity. Similarity is understood as equal and dissimilarity is the opposite.[12]

A. *Samanya Vishesha Siddhant* for balancing the dosha in the treatment-

Drugs possessing *katu, tikta, ruksha , Laghu* and *Sheetdravyas* offer relief in *Vatakshaya* under the concept of *Guna samanya*. Similarly, *Amla, katu, kshara, Lavana, ushna* and *Tikshnadravyas* helps to cure *pitta kshaya* while *snigdha, Madhura*, *Guru* and *Sandra dravyas* used in *Shleshmakshaya. Karma samanya* also works for managing Dosha balance, since similar activities increases similar *Gunas* in body. *Kayika karma* (running and floating) increases *Vata* due to their *chalatva Guna. Shukra kshaya* can be treated using *Dravya* possessing responsible for *vriddhi* such as, *Kshira* and *ghruta* possessing *Madhura, shita* and *snigdha gana*. *Mutra kshaya* can be relieved using *ikshu, Varuni* and *manda*, these *Dravyas* offers *Madhura, Amla and Lavana rasa*. concept of *Vishesha* also helps to manage the *Dosha* predominance since opposite property of substances to that of particular *Dosha* helps to pacify aggravated *Doshas. Shadavidhiupkrama* are some activities such as, *Langhana, rukshana, snehana,, brimhana, and stambhana.*[13]

Ayurvedic medications are traditionally used as extracts, as individual raw and crude ingredients, or a mixture of ingredients, for therapeutic purposes. In order to develop Ayurvedic medicine into a form that will be accepted and recognized as a modern dietary supplement, modifications are required. Standardization and quality control for the raw materials and ingredients are one of the critical criteria for their acceptance in the Modern world- ensuring the consumer gets pure, safe and efficacious supplements.

The products which other than nutrition are also used as medicine. The food products used as nutraceuticals can be categorized as dietary fibers prebiotics, probiotics, polyunsaturated fatty acids, anti-oxidants and other different types of herbal food and natural foods. According to *Ayurveda,* Nutraceuticals can correlate with *Samanya* and *Vishesh siddhanta* as per *Maharshi Charaka* says,'-

"*Sarvada sarvabhavanaam Samanyam vridhikarnam.*
Hraashetu visheshcha pravritirubhayasya tu||[14]

The most rapidly growing segments of the industry were dietary supplements and natural herbal products(11.6 per year). Global nutraceutical market is estimated as USD 117 billion FDA regulated dietary supplements as foods to ensure that they were safe. Herbal nutraceutical is used as a powerful instrument in maintaining health and to act against nutritionally induced acute and chronic diseases, thereby promoting optimal health, longevity, and quality of life.[15]

5. Food Technology-

The character of America's food supply has radically changed over the years. These changes which have swept

the food marketing system, are rooted in widespread social changes and scientific advances. The agricultural and food processing industries have developed various chemicals to increase and preserve food supply. Although Food engineering is a scientific, academic, and professional field that interprets and applies principles of engineering , science and mathematics food manufacturing and operations, including the processing, production, handling, storage, conservation, control packaging and distribution of food products.

A. Applications and practices-

The following are some of the applications and practices used in food engineering to produce safe, healthy, tasty and sustainable food.

1.Refrigeration and freezing- The main objective of food refrigeration is to preserve the quality and safety of food materials.

2. Evaporation-Evaporation is used to pre-concentrate, increase the solid content, change the color, and reduce the water content of food and liquid products.

3.Packaging- Food packaging technologies are used to extend the shelf life of products, to stabilize foods and to maintain the food clean and protective and appealing to the consumer.

4. Energy for food processing- To increase sustainability of food processing there is a need for energy efficiency and waste heat recovery.

5. Heat transfer in food processing- Heat transfer is important in the processing of almost every commercialized food product and is important to preserve the hygienic, nutritional and sensory qualities

Food safety management- A food safety management system is a systemic approach to controlling food safety hazards within business in order to ensure that the food product is safe to consume.

B. Emerging Technologies-

The following technologies, which continue to evolve, have contributed to the innovation and advancement of food engineering practices.

- Three dimensional printing of food- it is also known as additive manufacturing , is the process of using digital files to create three dimensional objects. The process of (3D) printing is slow, but is improving over time with the goal of reducing costs and processing times. some of the successful food items that have been printed through 3D technology are- cakes, chocolate, cheese etc.
- Biosensors- Biosensor technology is one way in which farmers and food processors have adopted to the worldwide increase in demand for food, while maintaining their food production and quality high.
- Milk pasteurization by microwave- when storage condition of milk are controlled , milk tends to have a very good flavor. To prevent the growth of pathogenic bacteria and extend the shelf life of milk, pasteurization processes were developed.
- Drones
- Eco-friendly packaging and waste reduction
- Smart sensors
- Blockchain methods
- AI based solutions Etc.

C. Importance of food engineering for innovating food quality-

Food engineering plays a significant role in food production to achieve a high quality. Increasingly discriminating consumer taste has resulted in pressure to improve the flavor quality of food products at ever higher stages, from simple combinations of basic taste components, to the flavor stage, at which basic taste sensations and flavors are combined, to the stage of "combined taste", which incorporates food texture, to the still higher stage of integrated taste, in which cultural and psychological factors play a role. Technology helps food manufacturers to produce more efficiently for a **growing World population**.[16]

DISCUSSION AND CONCLUSION

These trends have created demand for food products that offer superior characterstic at the highest stages of food quality. Advances in machinery have expanded the scale, speed, and productivity of farm equipment leading to more efficient cultivation of more land. Seed irrigation, and fertilizers also have vastly improved, helping farmers increase yields. Also Agriculture in India is largely dependent on nature, but climate and global warming issues make farming unpredictable. The need of the hour is to educate farmers in the use of modern technology and innovative approaches to increase productivity and raise profitability. By using tech to improve processing and packaging, it can improve the shelf life and safety of food. The use of machines in the food industry also ensures quality and affordability. By using machines, it drives down the costs of keeping the food fresh and increases productivity.

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ORCID

Nikita Sharma , https://orcid.org/0009-0007-5918-7614

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