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NATURAL THERAPEUTICS

ANCIENT AND MODERN SCIENCE OF HEALTHY DIET

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NATURAL THERAPEUTICS

Ancient and Modern Science of Healthy Diet

(A scientific explanation of age old traditional Naturopathy and other practices followed for vitality and health)

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PREFACE

India is not a wonderfully rich country economically, adorned with a lot of vegetation's, cultures and seasons .Most interesting and relishing part of all the festivities and celebrations are its feasts and food cultures.

Food products emerged out of these rituals has numerous health and medicinal properties. In spite of all this we are not much aware about our own research potential. Contrary to it various international organizations and research institutes are relentlessly revealing these benefits and patenting them.

After due approval of these research results from western organizations, we are easily accepting and imitating the research already done. Although we are the first hand possessor of this natural wealth, we are the last one to accept and incorporate it in our research curriculum.

Now, it is the time to stand up and grab the golden opportunity to scientifically approve our culture to harness maximum benefits of it. For this Indian Food researcher must get equated with their food culture and incorporate them in the curriculum first and then formulate the new 21st century food and nutrition strategy of this great India.

Present book is a meager step to collect the research work conducted all over the world and arranged it in lay man language so that each one of us can understand the importance of healthy diet and meal pattern adoption.

Dr Nutan

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Thanksgiving is a pleasant job but it becomes difficult where one sincerely tries to put it in words. These humble words and expressions that depict gratitude cannot really convey the deep feelings of one's heart. With highest team and profound regards, I take the privilege to acknowledge my indebtedness to my teachers **Dr GK Kochar and Dr Sheel Sharma** with whose efforts that text has taken the present shape.

I am extremely grateful to Dr Eklavya, Manager, Navneet Prabhakar Yog Chikitsa Dham, Bassi, Rajasthan.

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I am falling short of words in conveying my heart fat sentiments to my husband **Mr Ashok Ahlawat** for scarifying his claim of attention from me throughout this ordeal. I am thankful to my in laws for their engagement and

your affection and freedom that kept me focused in completion of this task.

I am sincerely thankful to my brothers for their abiding Corporation during this project. It would have not been possible without the loving and innocent support of my kids Doravee, Khushboo and Dhruv.

I am sincerely thankful to my parents for their untiring health support and encouragement. They always remained a perpetual source of inspiration to me. I especially thankful to my mother **Dr Omwati** who installed in me the confidence to carry on a lot of academic projects along with my family responsibilities

All may not have been mentioned but no one has been forgotten, remaining in my consciousness.
Lastly, yet most importantly; I thank all mighty **GOD** for his blessed benevolence.

Dr Nutan

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CHAPTER 1:
Natural Therapeutics

The characteristics of a healthy person as defined in a *Panch tantra* Shloka in Sanskrit as given:
"A healthy person will daily take healthy food ,cultivate healthy habits, enjoy all pleasurable emotions, give charity to others as equals forgives and forget, and help others in difficulties. Such a person will be free from want and disease".

One can only attain such perfect health through *Sadhna* (penance) i.e. constant and sincere effort. Moreover, there is a saying in *Vedas which* means that:

"A wise man in order to lead a healthy life throughout his living follows a principled life regarding diet and other living habits."

But, the man today considers this uncivilized and keep hunting for medicines and powerful tonics. In this way the whole human race is racing towards a pit fall of most degenerating nature, one should regulate his life in

respect of diet and living habits. The real pursuit lies in warding off the unnatural and wrong dietetics and habits which have taken roots in the society in the name of civilization and leading Unnatural life within the limits of the laws of nature. (Ghatge,2002).

There are the diverse ways in which rules of naturopathic diet have been put forward by various naturopathy practitioners and experts some of them are given below:

Bhamgara (2002) has given **general hints of naturopathy and diet for an average healthy person which concludes that:**

- A healthy person should avoid tea, coffee, cocoa, chemically treated foods, hydrogenated fats, fried foods and reheated foods.
- Consume least quantity of salt, spices and condiments.
- Take fresh food soon after cooking and at body temperature and raw salad soon after cutting.
- Use honey instead of sugar, hand pounded rice instead of polished one and whole wheat and pulse products.

- ❖ Chew food properly, follow vegetarianism and avoid over eating.
- ❖ Sun cooked foods like apples, peaches etc. should not be peeled before eating.
- ❖ Mind the food combinations.
- ❖ Avoid incongruous mixtures.
- ❖ Do not take starch with starch or protein with protein in the same meal .
- ❖ This is best achieved by having no more than two or three dishes in one meal.
- ❖ There is an apt saying ***"many dishes ,many diseases"***

Last but not the least: Do not be a hypochondriac.

As E.E.Puriton said ***"Eating for pleasure alone is eating for pain ultimately. But eating without pleasure is eating without life".***

Rao (1979) has classified all eatables under four groups: Nutrients, stimulants, irritants and poisons. Here we are concerned only with nutrients. Food should give nutrition to the body without any sense or feeling of stimulation, irritation or pain and displeasure. One

should not eat or drink anything except water in between two meals. It is necessary to masticate the food thoroughly before it is swallowed. Before and after meals clean mouth and teeth, eat when you are hungry and sit in a well-ventilated and clean room. Do not have mental and physical strain till half an hour after meals. Do not take enema until three hours after meals. Do not take any special treatment till your food is completely digested. Based on the *svasth vritham* of *ayurveda,* Dr B.Rao (1979) has formulated five principles for the preservation of health and leading a natural life: Take only two meals a day, take at least two seers of water in a day, do at least one hour exercise daily, pray to god twice daily and fast one day in a week compulsorily. Naturopathy provides solution to all confusions and nerve –racking problems concerning diet like: What to eat? How much to eat? When to eat? and How to eat ? (Rao,1979; Deewan,1996).

Number of meals consumed in a day

It is stated in the Vedas; ***one must eat only twice a day i.e. Morning and evening***. Another quotation from veda says-

It means one who eats one meal a day is a saint, one who eats two meals is a luxuriant and one who eats three meals a day is a chronic sufferer. Americans have also realized this truth and some scientist and diet reformers have started "*no breakfast campaign."* (Fry,1990).

Quantity of food intake

- Nature always instructs you to eat what you can digest.
- How much to eat depends on the age and type of vocation.
- People who do more physical labor should eat more and who do less labor should eat less (Venkat Rao, 1979; Gopalan et al., 2000).
- According to Rao (1979) it is stated in *ayurveda* that one must fill his stomach half with solid food, one fourth with water and keep the remaining empty for free movement of air.
- One should eat less than their appetite as Jussawala (1993) suggested the **intake of 85 per cent of the appetite**.
- As "One third of what we eat nourishes us and two third is going to nourish the doctors." A

French saying states ***"We dig our grave with our knives and forks."***

- ❖
- ❖ Rastogi (2002) said ***"Eat less to live long".***
- ❖ Frequent eating and nibbing in between meals gives an opportunity for surplus energy to get accumulated in the body in the form of fat tissues.
- ❖ Eating more than need taxes our body in two ways:
- Firstly this gives more strain to our digestive system to deal with what all has been ingested.
- Secondly the taxation goes to the storing system of our body.

Harms of Over Eating

Over eating can be better explained with the help of given step by step course of action:

Step 1- Eating more means more vigorous use of cellular activities

Step 2-More production of metabolism wastage

Step 3-Increased amount of free radical production

Step 4-More production of toxins and finally hastened aging.

So, eating less will bear the fruit in the form of delayed aging. As A Pletz (2002) described that "Eating less prevents formation of free radicals which are responsible for ageing and causing various disease like cancer etc".

Free Radical Damage and over eating

Hence, the scientific roots of eating less principle are lying in the concept of free radicals and improved antioxidant status (Sreemulu et al., 2003).

The mechanism of free radical damage is explained by Sharma (1995) as if free radicals are produced in the DNA, the DNA becomes transformed and it becomes mutated transformed DNA will produce cancer, leukemia and lymphoma. Diabetes, kidney problems, liver problems and almost every disease is related to the damage caused by free radicals. Furthermore he considered factors responsible for over production of free radicals are cholesterol, fat, meat, mental distress, alcohol, smoking, food preservatives and pesticides, environmental pollution, sunlight, chemotherapy and

radiation. All these factors are completely abandoned in naturopathy centers. Sharma (1995) recommended ghee, sesame oil, lacto vegetarian diet, curry herbs and rasayanas for protection against free radicals on the basis of his research findings.

Conclusion

It is concluded that diet restriction is known to reduce free radical generation and enhance life span.

CHAPTER 2
Water / Fluid Intake Principles

Water is life. Do you know? Water is the birth place of first living being –Algae. Yes, as we all know from astronomic theories that earth was a part of sun, it cooled down with time and ultimately water and atmosphere came in existence, in this water origin of first living cell algae took place. This alga ultimately evolved in to millions of species that are visible all around us today from mosquito to elephant. So, water is the synonym of life and there is no life without water. As a person is sure to die from dehydration just by losing 10 per cent of total body water.

Importance of water for human life

❖ Water is 45- 60% of the total body weight (Cyril et al., 2000).

❖ Rao (1979) considered water necessary for the body to aid digestion (Davidson, 1993), improve blood circulation and help in elimination (Bajaj, 2002).

❖ Further, according to Haider (1993) next to oxygen water is the most essential element for maintaining life.
❖ A healthy person can live for weeks without food, but can live only a few days without water.

Do's and Don'ts of Water Intake

❖ Our water intake should be sufficient to what is replaced by normal body functions.
❖ Rao (1979) suggested not taking water with meals.
❖ One should drink water one hour before meals, two hours after meals, during the day, before going to bed, after rising from bed.
❖ One should not Drink water immediately after having fried or oily foods

Harms of in appropriate Water Intake

❖ Rao as well as Haider (1993) stated that constipation, indigestion, lack of sleep, overheat etc. are the diseases resulting from not drinking sufficient quantity of water.
❖ Other disorders of low fluid intake as suggested by Haider (1993) are impaired kidney functions, apathy, fatigue and confusion.

Relation of Thirst and Water

❖ If one gets used to drinking water in the required quantity, he can get rid of all diseases and avoid future diseases (Rao, 1979).

❖ In *ayurveda* it is written that one who is thirsty should not be fed, and one who is hungry should not drink water.

❖ But unfortunately the present etiquette and social customs contravene these two laws of diet. Today's media advertisement campaign too rigorously advocate the consumption of a Plethora of Soft drinks and carbonated beverages, which is total violation of the laws of thirst and health.

❖ Bakhru (2000) said that **in God's creation except human beings all living things take and consume only water when they are thirsty.**

Appropriate Quantity of Water Intake

❖ Haider (1993) suggested elderly to drink six to eight glasses a day. Bajaj (2002), suggested the intake of 4-5 glasses of water before breakfast.

❖ An increase in exercise and hot weather could show a corresponding increase in water loss.

❖ Experts agree that it is essential to maintain water balance during any exercise program.

❖ A lack of sufficient water intake leads to dehydration, which causes a feeling of fatigue and impairs physical activity (Haider, 1993).

❖ A comparatively higher physical activities and sauna bath are carried out during stay in the naturopathy center with makes liberal fluid intake essential for the patients.

❖ As Rao (1979) said that during sauna bath excessive perspiration takes place which puts extra fluid intake demands on the body.

CHAPTER -3
Fasting and Health

Fasting is the best curative therapy for all the ailments as it provides rest to the body and gives a chance for relaxation and rejuvenation to the whole system. Ancient Indian culture always promotes the concept of fasting and believed in the philosophy given in a *hymen in Ishvasayaupnishad* (ईशावास्य उपनिषद सूत्र) which states:

"तेन त्यक्तेन भुंजीथा:!"

i.e. consumption with sacrifice and sharing. Try to live with minimum requirements.

Fasting is defined as the total abstinence from all foods both liquid and solid except water.

❖ Singh (2002) has rightly remarked fasting as nature's curative agent. It gives nature a chance to clean the system, gives more energy and power and also spiritual strength.

❖ So to get rid of all ailments in general in their initial form fasting can be helpful.

❖ Self-healing and repairing takes place with detoxification.

❖ All religions believe in fasting in one way or the other.

❖ A lot of experimentation conducted on fasting by various scientist has approved the fasting a boon for all spheres of vitality.

❖ Recently **Mr. Yoshinori Ohsumi of Japan won Nobel Prize in 2018** for discovering the concept of autophagy. The term **Autophagy** is derived from the Greek word meaning ***"Eating of self".*** In other words this is the process of reusing all damaged and old cell parts. Cells are the basic building block of our body. A cell has many parts to make it function properly, with time these parts get damaged and start behaving likes a junk or litter for a healthy cell. In this situation the processes of autophagy turn out a boon for health maintenance. It recycles the system by eating up these junk parts and rejuvenates the cells during 24 to 48 hours of fasting.

Fasting once a week

Venkat Rao (1979) advocated that by fasting once in a week, the body will have the rest for a day and get

sufficient opportunity to concentrate all its energy and eliminate all the accumulated wastes and toxins from the body which are there due to our mistakes in the diet for the previous several days.

So, there is a habit in Indian culture that we use to have faith in any Deity or God or Goddess etc. and we keep a strict dietary check on a particular day as a symbol of surrender and belief in that supernatural power. This is called fasting.

In the Anushasan chapter of Mahabharata scripture it is stated that:

"Who so ever fasts is believed in every way! He draws the benefits of all the great medicines. Buchinger is an internationally famous authority on fasting; he cured himself of severe rheumatic fever by fasting for 19 days and liver disorder after fasting for 28 days. He not only regained his health but also his full capacity to work (Jindal,1996)."

Religion and Fasting

According to Murthy (2002) Fasting can be done for numerous purposes like all religions follow fasting -

viz. Hinduism, Islam, Christianity, Buddhism, Zoroastrian and Jainism. It has been used as a non-evident but powerful tool by Gandhiji also.

Fasting is a tool to combat extreme but gradual changes in the seasons, as Murthy (2004) has rightly remarked that the month of *kartik* in every religion is having auspicious fasting days. According to him religion and therapeutic fasting could be well integrated to harness its numerous benefits. We can convert our religious fast to a therapeutic one to create a healthier body and a purer mind. A periodic fast for religious purpose, if done seriously and preferably under a competent naturopathy professional could prevent majority of illness and give relief in even the advanced chronic ailments (Jindal, 1996).

Birds, Animals and Fasting

When birds or animals fall ill, their first and clear impression is that fasting itself is healing (Oswald, 1990). The sick or wounded animals find a secluded spot where he can keep warm and is protected from the weather, here he can have peace and quiet and be undisturbed, there he rests and fasts. He may, for

example have lost limb, lie in his privacy and generally recovers without drugs, without bandages or surgery.

Hibernation and Aestivation

Apart from this hibernation or aestivation (sleeping throughout the summer in tropical climates) is also a manifestation of adaptation for the changing season. Some animals fast during the mating season and in many cases, during the nursing period. Some domestic pet, a dog or a cat may not eat for several days when comes in to new environment, drought, snow, cold and live for long periods when no food is available (Jussawala, 1979). But human beings do not have even as much control over the palate and mind as the animals has (Oswald, 1990).

Fasting is not Starvation

Fasting should not be confused with starvation. It is an established fact that people do not die of fasting, whereas people who eat liberally may die earlier due to one disease or the other, caused by over eating and over indulgence in the so called delicious food which is junk (Jussawala, 1997).

Fasting and Detoxification

Rao (1979) has explained the benefit of fasting and reported that in the fasting state, the body will scour for dead cells, damaged tissues, fatty deposits, tumors, abscesses, as well as arterial cholesterol plaques, mucus, stored up worries and emotions all of which are burned for fuel or expelled as waste (James and Batch, 1999).

Self-Healing and Self Repairing with Fasting

Fasting allows a deep physiological rest of the digestive organs and the energy saved goes in to self-healing and self-repairing, which is the crux of naturopathic treatment.

Experiments with Fasting

Moreover, Dr. Herbert Shelton supervised the fasting of more than 40,000 people over a period of 50 years and said that the freer the body is of toxic materials flowing through the blood and lymphatic system, the clearer is the ability to think and solve intricate problems. It can contribute in recovering from diseases cropping up from mental and emotional stress like-hypertension, diabetes mellitus and mental disorders.

Serendip (2002) and Kim (2006) has also explained numerous benefits of fasting including strengthening of mind, improvement of digestion and assimilation, better teeth and gums, healthy cardiovascular system, balancing of nervous system, restoration of cell oxygenation etc. The most commonly observed fast in naturopathy centers are fluid based fasts like water fast, lemon-honey water fast and juice fast etc. Sniadach (2000) has rightly remarked that juice fasting is safe and can allow the body to clean itself of toxins while body's energy level remains high to carry on the normal activities because you are receiving sufficient nutrients from the juices.

Shirpoor (2003) studied the effect of Ramadan fasting on the albumin, creatinine and urea level of serum in Iranian subjects. He selected 24 young people (Male ;12 and female;12) of age 19-22 years. Blood samples were collected from all participants, in a day before 15th and 29th day of Ramadan. The study showed that the amount of albumin in both male and female groups showed a significant increase on the 15th and 29th day of Ramadan compared to a day before .While urea level

(which is produced by protein catabolism) showed a significant decrease.

Conclusion

Fasting is the best materialistic world related concept to make the new generation realize importance of exploiting minimum resources for their survival along with the attainment of physical, mental and spiritual wellness goals. It teaches a lesson of culture, religion, environmental sustainability and conservation of natural resources for the welfare of society and the world as a whole. It can cure all the ailments effectively that's why the naturopathy and Ayurveda strongly recommend for fasting at least once in a week to get all round wellness benefits.

Venkat Rao (1979) advocated that by fasting once in a week, the body will have the rest for a day and get sufficient opportunity to concentrate all its energy and eliminate all the accumulated wastes and toxins from the body which are there due to our mistakes in the diet for the previous several days.

Food and health / Food therapeutics

In Genesis 1:29, Bible God said : *" See, I have given thee every herb that yields seed which is on the face of the earth and every tree whose fruits yields seeds ,to you it shall be for food"!.*

Dewan (1998) predicted that food therapy is the in thing for tomorrow. No body, no system of medicine can stop this from happening. *Ayurveda* and Naturopathy provide broad guidelines regarding food which best suit your body chemistry and your palate. Dictionary defines food as "that which is eaten or drunk or absorbed for the growth and repair of organisms and the maintenance of life" and health as, "Health is general condition of body or mind, as to vigor and soundness". These meanings imply that it is *"food"* which has to be used "for the growth and repair of organisms" and for the *"maintenance of life",* if life has to be kept vigorous and sound. According to Pluto, "we are bound to our bodies like oyster to its shell. We feed ourselves to satisfy our palates. Socrates however says *"other man live to eat while I eat to live".* The golden truth seems to lie somewhere in the middle of these two

extremes. Hippocrates is not far wrong when he exhorts us and says *"Let food be your medicine"!*

CHAPTER 4:
Historical Perspective of Food Therapeutics

It is well known fact food therapeutics was exclusively practiced in ancient time which is replaced by medicinal therapies in modern civilization. However, there are a lot of anecdotes and mention in ancient scriptures which support the concept of food therapeutics i.e. treating the diseases with the help of food ingredients. There is a belief in Indian kitchen that kitchen is the most powerful laboratory even in this modern mechanized era. As home remedies are still the first approach to combat discomfort and diseases in our homes.

❖ Encyclopedia Britannica in its *"History of Medicine"* volume 11 of 15th edition says, Indian therapeutics were largely dietetic- dietetic treatment was important and preceded many medicinal treatment…..the Indian *Materia Medica* was extensive and consisted of vegetable dugs all of which were from indigenous plants …..But animal remedies such as the

milk of various animals and minerals ……were also employed."

❖ In case of China also "The material medica has always been extensive and consists of vegetable, animal and mineral remedies."

❖ In Greece Hippocrates (B.C.) "laid much stress on diet and the use of few drugs."

❖ The above evidence shows that the intimate relationship between good food and good health was known to our ancients in India, China, Babylon and the Nile valley .They also knew about the importance of minerals and trace elements in our diet.

❖ That knowledge lost its shine over the centuries and was sent in to oblivion by the food processing and preservation techniques turning out delicious but unhealthy dishes. Romans in their pharmacopia recommended garlic for more than 50 ailments.

❖ Munre (1988) said that all health imbalances are caused by imbalances in the food consumed!

CHAPTER 5
Modern Relevance of Food and Health

Dewan (1998) said that from the inception, the construction of the body structure in the womb starts with the food taken by the mother. On birth breast feeding and then other food take over the task of the growth of the child. Food provides the building blocks.

Modern Research studies to show the strong bond between food and Health

Srivastava (1992) has explained the evolution of word nutrition by studying nutrition science encyclopedia, from *'Nutricus'*, which means- suckle at the breast and he said that nature has given his first food to man as milk but nutrition is an ever changing process. Later on it is taken by the body from various outside sources and utilized according to the need of body as well as treatment of ailments.

Rao (1979) too stated that- As brick and mortar are the best materials for the repair of a wall made of brick and

mortar, the same is true of the human body. The body is built by food therefore best be repaired by food.

Live natural food, with its essential amino acids and enzymes is best suited to fight the stagnant cellular conditions associated with various ailments and is more effective tool for cell rejuvenation.

The relationship between dietary pattern, health and nutritional status was examined by **Changbumrung et al.(2003)** on 800 Thai and Chinese subjects aged above 15 years. Their detailed anthropometric and biochemical nutritional status was assessed and blood pressure was measured. Hematological data, micronutrients status and electrolytes levels were also determined. 24 hour recall method and food frequency questionnaire were administered for dietary pattern. Background information was collected by interview and questionnaire method. They concluded that food consumption undoubtedly affect health and nutritional status. Food habits and life style were found the important factors that affect the health in the long run especially the risk of some chronic diseases such as coronary heart disease and diabetes mellitus. Overall

Chinese people consumed more fat and have more cases of dislipidaemia.

Prakash (2003) from CFTRI, Mysore has stated that- The trend of functional foods, nutraceuticals, healthful foods, fortified foods have all become a very important area to address from a very firm scientific angle.

When we look at some of the bioactivities in foods and their potential be it be from fruits or vegetables, or be it be from grains, all are trying to rediscover the functionality by addressing a number of health concerns from a food based approach.

Juneja (2003) from Japan has stated that the lifestyle and age related diseases are directly related to eating habits, could be conquered with proper nutrition. According to **Abeywardena (2003)** many Asian diets are high in carbohydrate and low in fat. The popular carbohydrates consumed now a days by Asians tend to have high glycemic indices and result in rapid delivery of glucose to the blood stream. The high carbohydrate diets also modify lipogenesis and lead to abdominal obesity (without necessarily being overweight), with

unfavorable metabolic effects. In addition such compromised diets can result in adverse matrix interactions with increased intakes of saturated fat. Accordingly **CVD among Asians** is frequently associated with insulin resistance, diabetes and abdominal obesity.

US Surgeon General's Report

US Surgeon General's Report (1998) is a land mark in the global renaissance of health food relationship. The review by about 30 top level technical experts establishes *"the great importance of diet to health."* The Surgeon General in his massage stated *"it is important to emphasize that the focus of this Report is primarily on the relationship of diet to the occurrence of chronic diseases."* In his foreword secretary of the department stated: *"This report reviews the scientific evidence that relates dietary excesses and imbalances to chronic diseases .On the basis of the evidence, it recommends dietary changes that can improve the health prospect of many Americans. The evidence presented here indicates the convergence of similar dietary recommendations that apply to the prevention of various chronic diseases."* The report says that *"The*

quantity of current animal, laboratory, clinical and epidemiological evidence that associates the dietary excesses and imbalances with chronic diseases is substantial and evaluated according to established principles.

Main recommendations of the report are reproduced below:

Fats and Cholesterol: Reduce consumption of fat (especially saturated fat) and cholesterol. Choose foods relatively low in these substances, such as vegetables, fruits, whole grain foods, fish, poultry, lean meat and low fat dairy products. Use of food preparation methods that add little or no fat.

Energy and weight control: Achieve and maintain a desirable body weight. To do so choose a dietary pattern in which energy intake is consistent with energy expenditure. To reduce intake limit consumption of foods relatively high in calories, fats and sugars.

Complex Carbohydrate and fiber: Increase consumption of whole grain foods and cereal products, vegetables (including dried beans and peas) and fruits.

Sodium: Reduce intake of sodium by choosing foods relatively low in sodium and limiting the amount of salt added in food preparation and at the table.

Alcohol: Take alcohol only in moderation-- if at all!

CHAPTER 6:
Nutritional Genomics

Nutritional health is dependent on the interaction between the environmental aspects of diet in terms of supply, availability and consumption and the genetically controlled aspects of diet in terms of digestion, absorption, distribution, transformation, storage and excretion by proteins in the form of receptors, carriers, enzymes, hormones etc. Genetic variation influences the response to diet (Simopoulos ,2003). Advances in genetics and molecular biology indicate that susceptibility to chronic diseases such as coronary artery disease(CAD), hypertension, diabetes, obesity, osteoporosis, alcoholism, cancer etc. to a great extent is genetically determined (Simopoulos, 2003; Kashyap,2005). Studies have shown that 50 per cent of the variance in plasma cholesterol concentration is genetically determined (Simopoulos ,2003).

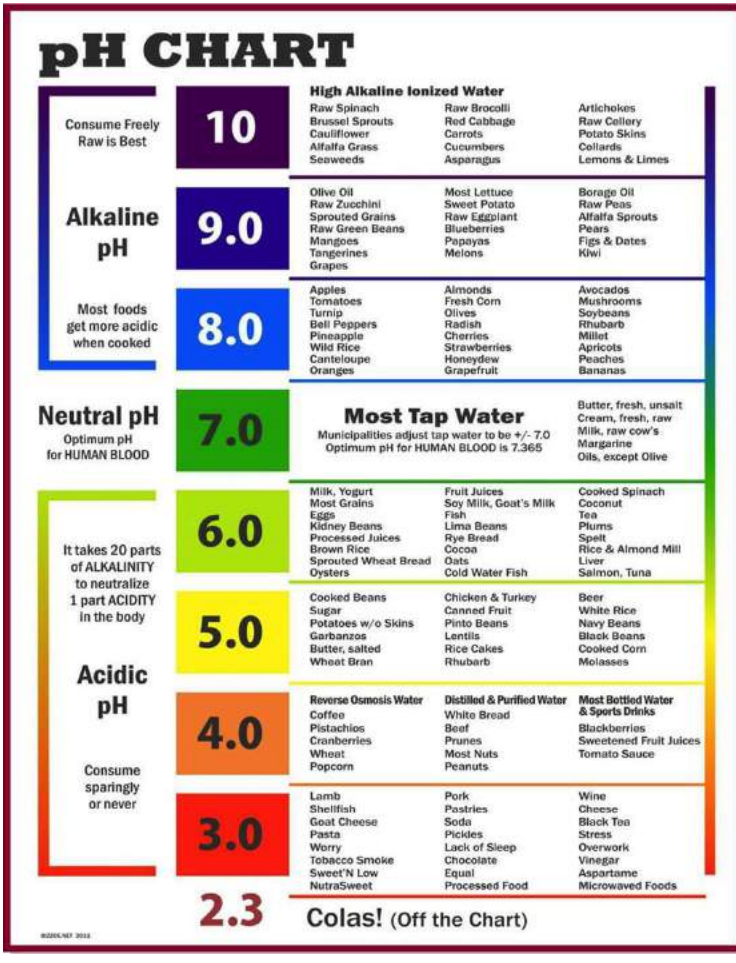
Thus, the focus of the research in nutritional genomics is to unravel the mysteries of continuous interplay of nutrients and genes and find reasons for variation in

individual's responses to various dietary components (Kashyap,2005).

❖ According to Kashayap (2005) *curcumin*, a yellow pigment in turmeric has been found to reduce the action of number of genes that promote inflammation, which is linked to heart disease, colon cancer and Alzheimer's. Similarly a constituent of soya, called *lunasin*, enhances the activity of 123 different genes; many of them are tumor growth suppressors (Kashyap, 2005). Kashyap found food gene interactions similar but more complicated than the drug gene interactions.
Nutritional genomics has tremendous potential to change the future of dietary recommendations as in coming times doctors and nutritionists will prescribe personalized dietary plans based on individual's genetic profile. Hence, the response of different subjects to the same type of dietary regimen follow up may vary to any extent depending upon their genetic makeup, this may account for the variability in the efficacy of any diet and home remedy in changing the nutritional status and pathological status of different persons in a different way because of the variable genetic constitution.

CHAPTER 7:
Acid and Alkaline Balance of Diet

Food is made up of acid and alkaline elements, for good health correct balance between them should be 7.4 i.e. slightly alkaline. Dr. MT Fere in his book 'Does diet cure cancer' supports that extreme acidity causes diabetes and extreme alkalinity brought cancer. This acidic and alkaline balance entirely depends upon the food one eats (Jussawala, 1995). Williams (2004) in her research on *"Children stomach environment changes due to naturopathy, diet and meditation"* found certain foods directly related to alkaline and acidic environment of stomach. It concludes that all these diseases can be cured by food that are eaten because food alone can restore the acidity-alkalinity balance and disease is caused when this important balance is disturbed (Jussawala, 1995). Keeping in mind the nature of diet being consumed these days the consumption of alkaline food is quite beneficial for each human being. Given below chart help us choose the alkaline food in our diet as well as the degree of alkalinity present in them:


pH CHART
Consume Freely Raw is Best
Alkaline pH
Most foods get more acidic when cooked
Neutral pH
Optimum pH for HUMAN BLOOD
It takes 20 parts of ALKALINITY to neutralize 1 part ACIDITY in the body
Acidic pH
Consume sparingly or never
10
High Alkaline Ionized Water
Raw Spinach
Brussel Sprouts
Cauliflower
Alfalfa Grass
Seaweeds
Raw Brocolli
Red Cabbage
Carrots
Cucumbers
Asparagus
Artichokes
Raw Cellery
Potato Skins
Collards
Lemons & Limes
9.0
Olive Oil
Raw Zucchini
Sprouted Grains
Raw Green Beans
Mangoes
Tangerines
Grapes
Most Lettuce
Sweet Potato
Raw Eggplant
Blueberries
Papayas
Melons
Borage Oil
Raw Peas
Alfalfa Sprouts
Pears
Figs & Dates
Kiwi
8.0
Apples
Tomatoes
Turnip
Bell Peppers
Pineapple
Wild Rice
Canteloupe
Oranges
Almonds
Fresh Corn
Olives
Radish
Cherries
Strawberries
Honeydew
Grapefruit
Avocados
Mushrooms
Soybeans
Rhubarb
Millet
Apricots
Peaches
Bananas
7.0
Most Tap Water
Municipalities adjust tap water to be +/- 7.0
Optimum pH for HUMAN BLOOD is 7.365
Butter, fresh, unsalt
Cream, fresh, raw
Milk, raw cow's
Margarine
Oils, except Olive
6.0
Milk, Yogurt
Most Grains
Eggs
Kidney Beans
Processed Juices
Brown Rice
Sprouted Wheat Bread
Oysters
Fruit Juices
Soy Milk, Goat's Milk
Fish
Lima Beans
Rye Bread
Cocoa
Oats
Cold Water Fish
Cooked Spinach
Coconut
Tea
Plums
Spelt
Rice & Almond Mill
Liver
Salmon, Tuna
5.0
Cooked Beans
Sugar
Potatoes w/o Skins
Garbanzos
Butter, salted
Wheat Bran
Chicken & Turkey
Canned Fruit
Pinto Beans
Lentils
Rice Cakes
Rhubarb
Beer
White Rice
Navy Beans
Black Beans
Cooked Corn
Molasses
4.0
Reverse Osmosis Water
Coffee
Pistachios
Cranberries
Wheat
Popcorn
Distilled & Purified Water
White Bread
Beef
Prunes
Most Nuts
Peanuts
Most Bottled Water & Sports Drinks
Blackberries
Sweetened Fruit Juices
Tomato Sauce
3.0
Lamb
Shellfish
Goat Cheese
Pasta
Worry
Tobacco Smoke
Sweet'N Low
NutraSweet
Pork
Pastries
Soda
Pickles
Lack of Sleep
Chocolate
Equal
Processed Food
Wine
Cheese
Black Tea
Stress
Overwork
Vinegar
Aspartame
Microwaved Foods
2.3
Colas! (Off the Chart)

CHAPTER 8: Vegetarianism

The word vegetarian was coined by the Vegetarian Society of United Kingdom in 1847. It is a derivation of the Latin word ***'Vegetari'*** which means to enliven.

There are various types of vegetarians:

- *Vegans* are the strictest vegetarians who eat only plant foods and exclude all animal by-products such as eggs, milk, cheese, curd, butter, ghee and even honey.
- *Lacto vegetarians* eat plant foods as well as dairy products.
- *Lacto ovo vegetarians* eat eggs, plant foods and dairy products.

Benefits of Vegetarian Diet

A vegetarian diet is known to confer wide range of health benefits. Research has shown vegetarian to suffer less heart disease, hypertension, obesity, diabetes, various cancers, diverticular-disease, bowl disorders, gall stones, kidney stones and osteoporosis

(Dwyer,1988). Vegetarian diets have also been used in the treatment of all these illnesses.(Craig,2008)

Research studies showing the benefit of Vegetarian Diets

The results of study associating diet with chronic disease in a group of nearly 35,000 Seventh day Adventists living in California. The members of the group who followed a vegetarian diet (defined as eating no red meat, poultry or fish) had lower incidence of many diseases, including obesity, hypertension, diabetes, arthritis, colon cancer, prostate cancer and ischemic heart disease than the non-vegetarians.(Fraser,1999)

Grover and Jyoti (2006) selected sixty clinically healthy Pujabi male subjects (30 vegetarian and 30 non vegetarian) from Amritsar city, in the age group of 40-50 years, for the comparative study on their nutritional profile. The preliminary survey revealed that the prevalence of chronic diseases as diabetes (21 vs 27 per cent), hypertension (5 vs 12 per cent) and heart diseases (1vs2 per cent) were lower in vegetarians as compare to vegetarians. Both tended to have higher body weight but the prevalence of obesity was higher in non-

vegetarians (67 vs 70 per cent). The diet of vegetarians contained significantly higher amount of carbohydrates, fiber thiamine and ascorbic acid. Vegetarians have significantly lower levels of blood glucose (90.88 vs 96.99 mg per cent), TC (182.49 vs 194.20 mg per cent), TG (137.56 vs 149.29 mg per cent), LDL-C (111.77 vs 126.02 mg per cent), VLDL-C (27.48 vs 29.29 mg per cent) but significantly higher levels of HDL-C (43.17 vs 38.87 mg per cent)

Relationship of Vegetarian diet with Lifestyle disorders

Vegetarians and obesity

Vegetarians are leaner than non-vegetarians and their weights are generally closer to desirable levels compared with non-vegetarians as western vegetarians have lower average Body Mass Index (BMI) (by about $1kg/m^2$).

A major study known as the Seventh Day Adventist Church on the general health and mortality of vegetarians in the US was done, data was collected from 1976-1988 from 34,192 participants; in which 29 per cent were vegetarian, while 7-10 per cent of the

vegetarians were vegan. Compared to non-vegetarians the above vegetarians had about ½ the blood pressure and diabetes.

Vegetarians and diabetes

Snowdon (1985) found type II diabetes to be only half as common as a cause of death amongst the largely vegetarian Seventh Day Adventist Church population as in the general population.

An average vegetarian diet closely matches the British Diabetic Association's recommendations for diabetic patients. Vegetarian diets tend to be high in complex carbohydrates and dietary fiber, which has beneficial effect on carbohydrate metabolism, lowering blood sugar levels. The leanness of vegetarian also contributes to reduced incidence of diabetes. Diabetes is often associated with raised blood cholesterol levels and a vegetarian diet confers protection against this.

Vegetarians and Hypertension

Hypertension or high blood pressure can contribute to heart disease, strokes and kidney failure. A number of studies have shown vegetarians to have lower blood

pressure than non-vegetarians. A vegetarian diet has also been shown to reduce blood pressure in hypertensive patients (Margetts,1986). The reason for the low blood pressure associated with vegetarian diet is unclear.

Vegetarian diet is not beneficial therapeutically but also nutritionally as Jindal (1996) has proved by biochemically correlating the structure of hemoglobin with chlorophyll and says that a similar web of elements girdle around an atom of iron in case of hemoglobin and this central atom is magnesium in case of chlorophyll. This analogy provides one of the secrets about the value of chlorophyll to the human system.

Due to the above explained reasons more and more people are adopting vegetarian food habits as a healthy way of life, which is backened by the summary of the 1988 National Food Survey, which says that, "*The British population is eating fewer eggs than in 1980 and only half as much butter. Consumption of red meat (beef, lamb and pork) has fallen by quarter but the consumption of fruit juice has more than doubled."*(Fry,1990)

CHAPTER 9
Fruit and Vegetable Rich Diet

A vegetarian diet is chiefly comprised of raw fruits and vegetables, nuts, milk and curd. Detoxification diet chiefly used in naturopathy center is chiefly comprised of fiber rich foods in abundance which is fruits and vegetables.

Fruits and Vegetables are the food items blessed with a lot of healthful qualities which are approved by modern day scientific research:

Radhika et al. (2006) suggested that there is an increasing evidence to suggest that nutrient dense plant foods (fruits and vegetables) decrease the many risk factors for CVD. Mohan et al. (2003) from Madras Diabetes Research Foundation, Chennai on the basis of the study of diabetes mellitus in south Indians have suggested that to meet the required amount of dietary fiber intake, antioxidants and micronutrients and phytochemicals the intake of fruits and vegetables should be increased. Sethi and Deka (2003) investigated and formulated potential technologies for preparing

nutritious products from fruits and vegetables and found that the importance of dietary changes to improve health is gaining recognition by consumers on health enhancing role of specific components such as antioxidants phenolics, flavonoids, phytochemicals etc. fruits, vegetables and spices are the treasure chests of these specific compounds and their health benefits are well recognized now.

Bajaj (2002) suggested that a fruit or vegetable with higher water content e.g. melons, pumpkins, cucumber, guards, coconut water, pine apple, sweet lime, oranges etc. helps to clean the urinary tract. From the scientific scenario naturopathy center diet is endowed with the following life blessing qualities:

Fruits and health

Fruits should be an indispensable part of our daily diet (Diabetovalens.com, 2007). Fruit juices hydrate the body system. Clinical observations have shown that potassium, magnesium and sodium content of the fruit act as a diuretic and diuresis is considerably increased when fruit juices are taken. The organic acids in the

salts produce alkaline carbonates when transformed with in the organism, which alkalize the fluids.
Fruits furnish minerals to the body. Dried fruits such as *apricots, raisins and dates* are rich in calcium and iron. These minerals are essential for strong bones. The fibrous matter in fruits, cellulose, aids in the smooth passage of food in the digestive tract and easy bowel action. The sugar and organic acids contained in fruits also increase their laxative effect.

Fruits are indispensable sources of vitamins that exert a tonic effect. *Guava, Custard apples and citrus fruits like lemons and oranges* are particularly valuable sources of vitamin C. These fruits are usually eaten fresh and raw, thus making the vitamins fully available to us. In case of sickness it will be advisable to take fruits in the form of juice (Diabetovalens.com, 2007). It has been found that fruits are highly beneficial in maintaining the acid alkaline balance in the body. They neutralize the toxic condition of body resulting from excessive intake or acid forming foods and restore its alkalinity. Vitamins, minerals, enzymes and trace elements contained in fresh fruit juices are extremely beneficial in normalizing all the body processes. They

supply needed elements for the body's own healing activity and cell regeneration and thereby speed up the recovery (Diabetovalens.com, 2007).

Curative properties of fruits

It has been found that fruit sugars calcium, iron, vitamins A, B and C control the gradation of heart energy. Hence eating fruits like apple, lemon, orange and pomegranate can aid the proper functioning of the heart and keep it healthy even in old age. The lemon can be a good food remedy in case of liver ailments, indigestion and rheumatism (Diabetovalens.com, 2007). Water melons the most abundantly consumed fruit in the naturopathy centers, make the best kidney cleansers (Diabetovalens.com, 2007), beneficial for dyslipidemia (Habib et al.,2003). It avoids attaining peak in blood glucose level on intake. So, Habib et al. (2003) confirmed it beneficial for type 2 diabetes patients on the basis of their cross over study. Fresh and fully ripe fruits like grapes, apples, bananas and figs are best suited for all brain efficiencies. Fruits prevent all diseases and keep a person smart energetic and active throughout his life up to the ripe old age (Diabetovalens.com, 2007).

Diabetes and fruits

Naturopathy and Ayurveda states that people with diabetes can eat any kind of fruit because fruits contain Fructose not Glucose i.e. responsible for increasing the blood sugar level. Everyone is encouraged to eat at least five portions of fruits and vegetables daily. Spreading the fruit you eat throughout the day will avoid a sudden rise in blood glucose levels. All fruit and vegetables are extremely good for diabetics. They are high in fiber, low in fat and packed with vitamins and minerals. Research has shown that eating more can reduce the risk of coronary heart disease, some cancers and some gut problems. Eating more fruits and vegetables also helps to improve the overall balance of the diet. Fruits can also be consumed as perfect snacks (Diabetovalens.com, 2007). The role of fruits in diabetes can be explained better on the basis of fructose-fruit sugar. Which is nearly 1.5 times sweeter than table sugar and it has a slower conversion to blood sugar. It is also found in honey as well as fruit and vegetables. The sugar absorption rate of many fruits are very low like apple, apricots, cherry, pear, plums and prunes, raspberry etc. so these fruits are suitable for diabetics (Diabetovalens.com, 2007).

Hypertension and fruits

Fruits contain very low level of sodium; they make a very valuable contribution to a salt free diet. So, is a boon to hypertensive patients (Diabetovalens.com, 2007). Wang et al. (2003) in a study of hypertension and associated risk factors in 6186 Chinese subjects of above 40 years of age statistically concluded that fresh fruits (OR=0.71) have a protective effect on hypertension.

Obesity and fruits

The rich fiber content imparts satiety and reduces the quantity of food intake, so contribute in weight reduction.

CHAPTER 10: Flavonoids

According to, **Nijveldt et.al. (2001)** flavonoids are the natural substances present in natural foods and are known for their beneficial effects on health. Wikipedia (2007) has defined flavonoids as the large family of compounds synthesized by plants having an amazing array of over 6000 different substances found in virtually all plants are responsible for many of the plant colors that dazzle with brilliant colors of yellow, orange and red.

Functions of flavonoids

Vitamin C support: The relationship between flavonoids and vitamin C is that each substance enhances the antioxidant function of each other (Wikipedia, 2007).

Inflammation control: it is the body's natural response to damage, it must be always regulated to prevent the over activities of immune system and unwanted

immune responses. Many in vitro studies found flavonoids effective against inflammatory effects (Robak et.al., 1996)

Antibiotic activity: they can act directly as antibiotics by disrupting the function of microorganism like viruses or bacteria (Wikipedia, 2007).

Anti-oxidant activities: according to Acker (2007) recent studies have found that flavonoids found in fruits and vegetables may also act as antioxidant (Acker, 2007).

Flavonoids and therapeutics

Flavonoids play a role in treatment of diabetes; reduce blood levels of cholesterol and triglycerides (Wikipedia, 2007). Lavvy (1994) had in his study on 20 healthy men had found that flavonoids increase HDL level. Many in vitro studies found flavonoids effective against coronary heart disease (Hartog et.al., 1995) and for scavenging of free radicals (Hanasaki et . al.,1994). Jung and Choi (2003) experimented for the beneficial

biochemical effects of flavonoids in the type 2 diabetic mouse. In which male C57BL/KsJ-db mouse(5 weeks old) type 2 diabetes animal model were provided a diet supplemented with (experimental group) or without (control group) naringin, hesperidin, quercetin supplements for 5 weeks. Naringin, hesperidin, quercetin supplements significantly lowered levels of fasting blood glucose and hemoglobin A1c level after 3 weeks of experimental diet ,whereas that of the control group continuously increased by the end of experimental period. The plasma triglyceride and total cholesterol concentrations were significantly lowered in experimental group. These results suggest that these three flavonoids (Naringin, hesperidin, quercetin) play important role in regulation of blood glucose and plasma lipids in type 2 diabetes mouse.

Goyle and Singhal (2003) studied the serum lipid profile modification efficacy of flavonoids from apple after one month of feeding trial on CHD patients and concluded that flavonoids reduced oxidative stress and were efficacious in lowering total cholesterol by 8 per

cent and LDL cholesterol by 11 per cent and raising HDL cholesterol.

Common dietary flavonoids

According to the USDA database (2003) for the flavanoid content of selected foods there were described following subclasses of flavanoids.

Table 10.1 Common dietary flavanoids

Flavanoid subclass	**Dietary flavanoids**	**Some common food sources**
Anthocyanidines	Cyaniding, Delphlnidin, Malvidin, Peonidin, Petunidin	Red ,Blue And Puple Berries,Red And Purple Grapes.
Flavanols	Monomers(Catechins): Catechin, Epicatechin, Epigallocatechin, Epicatechin, Gallate, Epigallocatechingallate, Proanthocyanidins	Grapes, Berries Apples.
Flavanones	Hesperetin, Narigenin, Eriodictyol	Citrus fruits and juices e.g.

		Oranges, Grape Fruits,Lemons.
Flavonols	Quercetin, Kaempferol, Myricetin, Isohamnetin	Onions, Broccoli,Apples, Berries.
Flavones	Apigenin, Lutealin	Parsley, Thyme, Celery, Hot Peppers.
Isoflavones	Daizein, Genistein,Glycitein	Soy Bean, Soy Foods, Legumes.

CHAPTER 11: Antioxidants

According to Rao (2002) *"Anti-oxidants are the chemical compounds generated during various normal cellular metabolic activities in our body".*

In this process various biochemical reactions take place, which continuously produce various free radicals. If these free radicals are not quenched by antioxidants, they cause damage to the cells, proteins, DNA and RNA resulting in various degenerative diseases such as cancer, arteriosclerosis and diabetes.

Anti-oxidants are the chemical elements that will help us to prevent oxidation of other chemicals and in biological systems normal oxidation results in the production of highly reactive free radicals that damage other molecules as well as the body's own cells. Now-a-days there is a new rage for the foods that are rich in antioxidants. The best sources for anti-oxidant rich foods are fruits and vegetables. Therefore eating liberal fruits and vegetables is the best way to increase antioxidant content of the diet. These antioxidant rich

foods enter in our body and destroy the free radicals, which damage cells. This is why we should eat foods that are rich in anti-oxidants so that there are always enough antioxidants available to the body when needed most. Fruits and vegetables carry natural antioxidant, which have recognized bring many benefits to our health, including improved cardiovascular health and cancer fighting properties (http://www.jurugan.com,20/2/2007).

Recent researches related to potential Health Benefits of Antioxidants

It is scientifically approved by Sona et al. (2003) on the basis of her studies on the effect of food based antioxidants on a group of 60 coronary heart disease patients divided into three groups 20 received dietary antioxidants comprising of Amaranthus gangeticus-100g;amla powder-10g;wheat germ 10g and sweet lime one in number. Second group received antioxidant capsules whereas third group was control group receiving no supplementation .The anti-oxidant status was found significantly reduced in both the experimental groups whereas control group showed no improvement after two and a half month of

supplementation. Moreover it was inferred that the dietary supplements were equally effective as tablet supplements in improving the blood hemoglobin levels, vitamin A, vitamin E, vitamin C and copper levels. These findings thus indicate that antioxidant supplementation in the food form, a natural practicable aspect of dietary management of cardiovascular disease when followed on a day to day basis, is no doubt the answer to oxidative stress.

Eating foods that contain large amounts of natural antioxidant properties is important to get most health benefits while staying with in necessary caloric ranges. Vegetables dark color is typically higher in natural antioxidants than lighter color vegetables (http://www.jurugan.com ,20/2/2007). Epidemiological studies suggested that antioxidant vitamins reduced CVD but randomized trials have not supported this theory (Jha et al.1995). The antioxidant properties of vitamin E have been discussed elaborately by many scientists like Jialal and Grundy (1994) in their in vitro studies found that, vitamin E inhibited LDL oxidation and it is superior to combined supplementation with vitamin C ,E and β carotene. The American Heart

Association recommended that Vitamin E should be included in diet which is low in saturated fats (Krause et al.,2000). Jiyan Ma and Cornwell (2007) has took on the task of determinig how well the often touted Vitamin E works as an antioxidant. They discovered that vitamin E is the most powerful antioxidant that can work both ways.

Kaur and Sangha (2006) studied the impact of dietary antioxidant intake on 60 upper middle class male at risk heart patients aged 30- 50 years and was observed that dietary antioxidants resulted in significant lowering of their blood lipid profile. Whereas, Radhika et al. (2006) carried out a study with the aim to examine the association between legumes, fruits and vegetable intake and CVD risk factors in 1143 adult urban South Indians aged > 20 years. Subjects consuming highest legumes fruits and vegetables intake have significantly low prevalence of hypertension.

Findings of Preethi and Kowsalya (2006) implied that supplementation with antioxidant flour mix (*Whole Wheat Flour, Wheat Germ, Roasted Bengal Gram Flour, Soya Flour, Amla Powder And Amaranth*

Powder) for three months brought about a significant reduction in blood glucose level and improvement in the antioxidant status of selected diabetics in terms of plasma vitamin A, vitamin C, vitamin E, selenium, copper and zinc levels. For the purpose of study 30 most cooperative type 2 diabetic subjects were selected. The supplementary group (15 subjects) received 30gms of the antioxidant mix and control group comprised of 15 non-supplemented diabetics. Kaur and Jasvinder (2006) also reported the significant hypolipidemic effect of dietary antioxidants among 60 male patients in the age group of 30-50 years belonging to upper middle class, who were at risk of developing coronary heart disease.

Wang et al. (2003) in a study of hypertension and associated risk factors in 6186 Chinese subjects of above 40 years of age statistically concluded that antioxidant vitamins like vitamin E (OR=0.61) and retinol (OR= 0.86) were protective factors for hypertension.

Rao (2002) has explained that free radicals can react with fat, protein, carbohydrates, RNA and DNA

molecules and alter the function of the cells. It is estimated that the DNA in every human cell receives about 10,000 hits per day indicating the importance of balance between free radicals and antioxidants in maintaining the human health.

The presence of free radicals with in the body is an unfortunate reality. The presence of free radicals has been linked to the aging process and as well as the onset of major illnesses with in the body. The disease can include cancer and heart disease. To combat the presence of free radicals the proper food and possible use of supplements are indicated. Some of the best foods to ingest are vegetables, fruits, beans, cocoa, teas etc. The anti-oxidant properties of these foods help to combat free radicals by absorbing the free radicals that are found in the blood stream (http://www.jurugan.com ,30/1/2007).

Rao (2002) concluded that antioxidants play an important role in countering the deleterious effects of free radicals produced during metabolic activities. The studies carried out at NIN highlight the effects of foods such as garlic, turmeric, clove etc. in providing

antioxidant protection to combat degenerative diseases which occur due to free radicals. He suggested to ensure regular intake of antioxidant rich foods and remarked them as perfect protective shields against many diseases.

But, still the most powerful antioxidant is yet to be researched. Looking for the most powerful antioxidant is linked to finding a cure for many diseases, there are a lot of thoughts out there, but none has been conclusively identified. The importance of antioxidants is not in dispute, but determining which one is the powerful antioxidant remains open to debate. (http://www.jurugan.com ,20/1/2007).

CHAPTER 12
Phytochemicals and Phytonutrients

Phytochemicals is a member of a wide range of biologically active chemicals that are found in fruits and vegetables and may have beneficial effects on human health. These are the secondary metabolic compounds found in plants. They include antioxidants, phyto estrogens and compounds that modify potential toxins and carcinogens.

Some phytochemicals are known to have medically important effects. (Raghunathna Rao, 2002). Phytochemicals is the modern name of the term neutraceutical and emphasizes the plant source of most of protective and disease preventing compounds. The branch of science that deals with the study of phytochemicals is known as photochemistry. It is widely practiced in Chinese herbal medicines for quality control of the developed products.

Consumption of ancient nutrient rich diet for a long disease free life

These phytochemicals strongly links the importance of diet to health - as we move away from the diet of our ancestors we succumb to modern diseases. Evidence of this can be seen in societies in the centenarian tribes that live in remote villages in the Andes Mountains and who still embrace traditional dietary practices. These people reported to live extraordinarily long lives that are free of such illnesses as cancer, heart disease and arthritis (Zimmerman, 2008). Researchers have examined epidemiological evidences from modern societies from the people who live today as naturally as do the tribes in remote Andean villages to find clues to the diet diseases connection. On the basis of such studies biochemical researchers have identified certain phytochemicals that aid the body in maintaining health and combating disease. As an overall guidelines health authorities recommend that we consume diets rich in whole grains, fresh fruits and vegetables as well as reduce fat and animal protein consumption (Zimmerman, 2008).

Phytonutrients

Phytonutrients refer to phytochemicals or compounds that come from edible plants.

- In the past phytonutrients found in fruits and vegetables were classifieds as *Vitamins : Flavonoids as Vitamin P*
- Cabbage factors (*Glucosinolates and Indoles*) as vitamin U
- *Ubiquinone* as vitamin Q.

Recent research however has enable scientists to group phytonutrients in to classes on the basis of similar protective functions as well as individual physical and chemical characteristics of the molecules.

Use of Phytochemicals as drugs

Phytochemicals have been used as drugs for millennia. For example, Hippocrates in 400 BC used to prescribe willow tree leaves to abate fever .Human clinical trials have demonstrated that lycopene, from tomatoes helps to improve the blood flow through the heart and provide protection against cardiovascular diseases. *Allicin*, a component of garlic may offer some protection against heart disease. In 1989, the National Cancer Institute started a multimillion dollar project that includes the study of phytochemicals. It is likely that many new phytochemicals will be discovered

which have an important effect on human health and disease (Zimmerman, 2008). Clinical investigations are ongoing worldwide on thousands of phytochemicals with medicinal properties

Availability of Phytonutrients from contemporary diet sources

Phytochemicals in freshly harvested plant foods may be destroyed or removed by modern processing techniques, possibly including cooking. For this reason industrially processed foods likely contain fewer phytochemicals and may thus be less beneficial than unprocessed foods (Zimmerman, 2008). So, one should indulge in fresh, raw and minimally processed food consumption. One should completely refrain from packaged foods.

.

Source of phytonutrients: The top phytonutrient rich foods or super foods are shown in Table 12.1:

Table 12.1 Phytonutrient rich foods

Foods	**Phytonutrients present**
Soy	Protease Inhibitors, Beta Sitosterol, Saponins, Phytic Acid, Isoflavones
Tomato	Lycopene, Beta Carotene ,Vitamin C
Broccoli	Vitamin C,3,3'- Diindolymethane, Sulphoraphane, Lignans, Selenium
Garlic	Thiosulphonates, Limonene, Quercetin
Flax seeds	Lignans
Citrus fruits	Monoterpenes, Courmarin, Cryptoxanthin, Vitamin C,Ferulic Acid And Oxalic Acid
Blue berries	Tannic Acid, Lignans, Anthocyanins
Sweet potatoes	Beta Carotene
Chilli peppers	Capsiacin

Source: wikipedia

CHAPTER 13: Phytosterols

These are also called *Stanol or Sterol esters*. The cholesterol lowering properties of plant sterol have been known since the 1950's (Ling and Jones,1995). The major sterols found in nature are Beta-Sitosterol, Campesterol and Stigmasterol (West Strate and Meijer, 1998). The natural dietary sources included Vegetable Oils, Grains, Nuts, Fruit And Vegetables (De vries et al.1997).

Health Benefits of Phytosterols

Increasing plant sterol consumption reduced intestinal and biliary cholesterol absorption and thus lowered circulating serum cholesterol concentrations by a complex set of consecutive and /or interacting events in the gut or at the cell membrane among them compete with cholesterol for miceller solublization and impact on influx and efflux transporters (Trauwein et al. 2003). It has been demonstrated that functional foods enriched with plant sterols and stanols are effective in various population groups and in combination with cholesterol lowering diets or drugs. Before being incorporated in to

food products, they are esterified, forming the sterol esters, to increase solubility and in some cases saturated to form stanol esters. The efficacy of the two forms of plant sterols has been reported to be comparable.

Several studies have shown that 2-3 g plant sterols or stanols in their esterified form given daily for up to 12 months. Margarine or spread significantly reduced total and LDL cholesterol concentrations by 5-15 percent in normo and hypercholesterolemic subjects with no limitations of dietary cholesterol (Gylling and Mietinnen ,1994; Mietinnen et al,1995; Gylling et al,1997 ; West strate and Meijer,1998;Hendricks et al.,1999; Hendricks et al.,2003;Temme et al.,2002; Cleghorn et al. 2003).Plant sterol are also effective hypocholesterolemic agents when provided in association with reduced dietary fat regimens(Hallikinen et al.,1999; Maki et al.,2001;Nestle et al.,2001; Ntanios et al.,2002). Little effect of plant sterols on HDL cholesterol or triglycerides levels has been reported. Intake of plant sterols >3 g/d conferred no additional benefits with respect to lowering of total or LDL cholesterol. However, plasma levels of plant sterols are not or only minimally elevated after daily

ingestion (Gylling and Mietinnen,1994,1999; Hallikinen et al.,1999).

Plasma Sterols and Fat Soluble Vitamins

The most important concern has been raised regarding the tendency of plant sterol containing foods to reduce the plasma concentration of some fat soluble vitamins. Plant sterols and stanols lowered blood concentrations of β carotene by about 25 per cent ,concentrations of α –carotene by 10 per cent and concentrations of vitamin E by 8 per cent (Westrate et al.,1998; Hendricks et al., 1999; Gylling eta l.,1999 ; Hallikinen et al.,1999 ; Clifton et al.,2004 ;Clogan et al.,2004). The physiological significance of these changes is unclear at this time.

CHAPTER 14:
High Fiber Content in Diet

'The big mistake in nutrition has been removing that part of food (fiber) that does not provide nutrients, but is enormously valuable as a protection against disease."

-Denis Burkit.

Nahar et al. (2003) surveyed about the dietary fiber intake and prevalence of dyslipidemia in Bangladeshi diabetic population (type 2 diabetes subjects) and revealed that dietary fiber are now widely accepted as invaluable components of a healthy diet. This is particularly true for patients with certain disorders like diabetes mellitus, dyslipidemia and hypertension. As Scheer (1990) reported that high fiber diet helps decrease cholesterol.

According to Van Horn (1997) soluble fibers which included guar gum, pectin, mucilage, algal polysaccharides and some hemicelluloses (in legumes, fruits and oat products) and *Phsyllium* lowered serum

cholesterol and LDL cholesterol. The average decline in total cholesterol was found to be 14 per cent for hypercholesterolemics and 10 per cent for normocholesterolemics when the soluble fiber was added to a low fat diet (Galore et al.,1994).

Insoluble fibers such as cellulose and lignin had no effect on serum cholesterol levels. Although there are studies showing that specific fiber supplements are associated with lowered LDL or glucose but there are no long term trials showing relationship between these supplements and cardiovascular disease. Therefore, at this time, fiber supplements are not recommended for heart disease risk reduction.

Yadav and Chakravarthy (2003) studied the effect of plasma lipid levels in patients with coronary heart disease through a randomized controlled trial study of coronary heart disease patients (15 experimental and 15 control) between the ages of 30-60 years was conducted. The mean change in total cholesterol after the study period of 6 weeks was -44 mg/dl in experimental group against + 7.81 mg/dl in control group. The change was found highly significant

($p<0.01$). Similar significant and desirable changes were found in LDL cholesterol, triglyceride. Mean HDL cholesterol increased significantly (7.8 per cent) in experimental group. No significant change was found in the lipid profile of control group.

High fiber diet and obesity: High fiber diet aid in weight loss as high fiber diet require a more chewing time, which gives body time to register when you are no longer hungry so you are less likely to over eat. High fiber diet make one feel full for a longer time period and tends to be less *'energy dense'* means they have fewer calories for same volume of food. (http://www.myoclinic.com/health/fiber/NU 00033,2008)

High fiber diet and diabetes: Researchers of mayoclinic.com are trying to pin point any relevant dietary factors to lower risk for type 2 diabetes, one of which seems to be a high fiber diet. The studies of the male health professionals and female nurses both found that a diet high in cereal fiber was linked to a lower risk of type 2 diabetes (http://www.myoclinic.com/health/fiber/NU 00033,

2008). According to Prabhakar Rao (2005) fibers help in delaying digestion of carbohydrates, and also delaying absorption of glucose into blood stream. So the glucose level does not shoot up alarmingly after consuming diet rich in fiber. Fibers are helpful in other way by absorbing extra glucose, fats and proteins present in the digested food into them and then expelling them out of the body through the faeces. Fibers are one of two types viz ;1)water soluble fibers and 2)water soluble fibers .

Water soluble fibers gaur, pectin and agar are water soluble fibers found in legumes, fruits and sea foods respectively. These fibers have the property to cover the carbohydrate and fat molecules present in the G.I. tract, thereby making them less available to the digestive enzymes. By virtue of this covering property it slows down the conversion of complex carbohydrates and fat molecules into glucose and fatty acids respectively and thus helps in keeping the blood sugar and cholesterol levels and control .Water insoluble fibers are found in whole –grains products, brown rice, leafy and non-starchy seasonal vegetables, salad and fruits. As these are indigestible fibers they do not have a scope to

increase blood sugar in spite of intake of large quantity of diet rich in fiber.

High fiber diet and hypertension: As in internet (http://www.myoclinic.com/health/fiber/NU 00033,2008) the researchers evaluated the results of 25 studies on the blood pressure of adding fiber to the diet. Fiber intake (in the form of fruit, cereal, fiber pills and vegetables) in the studies ranged from 3.8 g/day to 125 g/day. Overall results showed that adding fiber to the diet was associated with a significant reduction in both systolic and diastolic blood pressure in people with high blood pressure. In studies lasting at least 8 weeks, the average reduction in blood pressure was 3.12 mmHg systolic and 2.57 mmHg diastolic. A small drop in both systolic and diastolic blood pressure reading was also seen in people without high blood pressure

CHAPTER 15:
Live Force or Vital Energy in Foods

According to Dewan (1998) *"Life Force"* in natural foods is due to their enzymes. Enzymes are a magnetic cosmic energy, which activates substances like electricity. This enzymatic energy is *"intimately involved in the action and activity of every atom in the human body, in vegetation and in every form of life"*. It is a form of *prana*, the life energy referred to in the Indian philosophy and Indian science of yester years. Enzymes are in a way are controllers of almost all body processes .The enzymes of the food taken have, for the sake of good health, to be kept alive and active.(Deewan,1996). The various means of conserving vital energy practiced in naturopathy centers are: fresh and seasonal foods, natural and organic nutrition, enzyme therapy, raw foods, consumption of sprouts and probiotics etc.

Fresh and seasonal foods

Deewan (1996) stated that body produces enzymes but the main resource of fresh enzymes is of course, fresh food and sprouting makes it richer. Furthermore, Bajaj

(2002) stated that nature itself gives us hints to select a good diet. The balance of nature suggests that the vegetation growing in the nearest surroundings under the same climatic conditions where we live is best for health and also economical.

Natural and organic nutrition

Food produced on fertile land without the use of chemicals, fertilizers, pesticides are known as natural foods (Dewan,1996). A comprehensive and careful review of over 400 scientific papers by Heaton (2002) has revealed important difference between organic and non-organic foods and declared organic foods better for the health.UK Food Standards Agency (2000) come up with the scientific evidence supporting the superiority of organic foods to health.

Devoid of harmful chemicals: Usually the effects of chemicals such as pesticides are insidious and the danger lies in long term exposure. Bottled water, soft drinks, flour, ghee, butter and almost all items of food (including mother's milk) contain pesticide residues in varying amounts. The Indian Council of Medical research has reported that about 51 per cent of our food

is contaminated with pesticides of which 20 per cent exceeds the maximum tolerance limits (Khora, 2004).

According to Murthy (2002) all inorganic food stuffs are manufactured in factory by chemicals which are harmful and carcinogenic. It is very difficult to mimic the nature's composition and its effect on the live organism. But the mind and body can recognize these inorganic synthetic products and rejects it and in doing so there is a lot of burden on the internal vital organs like liver and kidneys. These unwanted, unabsorbed, unassimilated and no eliminated components harm the human body in many ways. Frost (1999) reported organically produced food items superior in quality aspects as compare to that produced by synthetic chemicals. They are good in taste, flavor, essential nutrients etc. and at the same time they are free from harmful and toxic chemicals. They are devoid of pesticide and weedicide residues which are commonly present in almost all fruits and vegetables available in present time. A study conducted by the University of Strathclyde and the Galloway Royal Infirmary (United Kingdom) found that eating organic could actually help reduce the risk of heart attack, strokes, Parkinson's

disease and cancer. The study discovered that organic vegetable soups contain six times as much Salicylic acid as non-organic vegetable soups possess. Salicylic acid helps combat the hardening of arteries as well as bowel cancer. This is the acid found in aspirin that causes its anti-inflammatory action. This acid forms in plants as a defense against disease and stress. The study determined that the level of salicylic are higher in organic vegetables because they were not treated with pesticides that keep them from needing to create as much salicylic acid (Singh and Kumar,2007).

High nutrient content: Many people fail to get the recommended daily allowance from their diet (National Dietary Survey US, 1993; MAFF National Food Survey, 1995; MAFF National Food Survey, 1997) and the deficiencies are common not enough to cause severe deficiency but chronic impact of these deficiencies decrease our immunity. The United States Department of Agriculture has estimated that considerable improvement in public health, including decline in cancers, heart disease, diabetes, arthritis, osteoporosis, allergies and infant deaths, would result from small improvement in our intake of vitamins and minerals

(Welt,1992) and Worthington has shown how the sometimes small differences between organic and non-organic produce can mean the difference between getting the recommended daily allowances for a nutrient or failing to. Realizing the possible benefits of organic foods Cheah et al. (2003) from Malaysia conducted a study to compare the contents of antioxidant vitamins (A and C) and total poly phenol (TP) and total antioxidant activity (AOA) in organically and conventionally grown green vegetables of five types namely *Chinese Mustard (Sawi), Chinese Kale (Kai-Lan), Lettuce (Duan Salad), Spinach (Bayam putih) And Swamp Cabbage (Kangkung).* It was found that only swamp cabbage grown organically was higher in vitamins A and C contents among all the samples. Out of 27 studies comparing the mineral and vitamin C contents of organic and inorganic crops, 14 showed higher levels in organic produce. While just one favored the non-organic (Heaton ,2001).

High phytonutrient content: Plants contain some 5-10,000 naturally occurring phytonutrient compounds26 that often involved in the immune system, protecting it from pests and disease. Because organic crops are not

artificially from pesticides they tend to produce more of these protective compounds. So far, more significantly more lycopene has been found in the organic tomatoes (Pither and Hall,1990) more polyphenols in organic potatoes (Hamouz et al., 1999) more flavanols in organic apples (Weibel et al., 2000) and more reveratol in organic red wine(Levite et al., 2000). A recent review of this issue estimated that "on the basis of currently available evidence, organically grown vegetables tend to contain 10-50% more phytonutrients than those conventionally grown (Brandt and Molgaard, 2001).

Devoid of food additives: More than 500 additives are permitted for use in conventionally produced foods (Hanssen and Marsden, 1987) compared with just 30 or so permitted in organic processing ,and only when necessary for the production of the food in question .Additives are present in extraordinary abundance in food today and we each eat up to five kilograms if them a year (Clayton, 2008) . Organic standards strictly prohibit many specific additives and ingredients that have been linked with these problems, including hydrogenated fat (heart disease (Willet W et al., 1993),

phosphoric acid (osteoporosis (Wyshak, 2000), MSG (Asthma headache (Carper,1994; Scoppal,2008), aspartame (nuerological disturbance (Koehler,1988; Roberts,1990)), and artificial flavouring and colouring (allergic reactions, hyperactivity in children (Hanssen and Marsden,1987; Ward et al.,1990; Fuglsang G et al., 1993)).

Less Nitrate: Nitrate is a natural constituent in plants present at low level in all vegetables and while not toxic itself, in certain circumstances nitrate can be converted into potentially harmful nitrite and nitrosamine, which are known to cause cancer in the animals (Avery, 1998; Magee and Barnees, 1967). Artificial fertilization are known to result in higher level in vegetable crops (Woese et al., 1997).14 out 16 comparatives studies found higher levels in non-organic than organic crops and none found higher in organic (Heaton, 2001).

Reduced risk of food poisoning: There is no evidence linking organically produced foods with an increased risk of food poisoning (FSA, 2000). A recent Public Health laboratory service survey of over 3,000 samples gave organic foods a clean bill of health (PHLS report,

UK, 2001) and confirmed expectations that organic methods such as the careful composition of manure minimize pathogenic risks. Professor Hugh Pennington, a leading UK expert on *E.coli* agrees that organic standards are *"risk reduction measures that represent the way forward".* Animals fed from organically produced feed have better health in terms of growth, reproductive health and recovery from illness than those fed on non-organic feed, including over those successive generations (Staiger, 1988; Worthington, 1998). Murthy (2002) stated that natural live foods-fruits, vegetables, herbal products, not only enliven you, by bringing, filling, nourishing, analgesics, hormonal and enzymatic actions on the body and the mind, there by bringing contentment and satisfying the biological urges and needs and keeping us healthy.

CHAPTER 16
Enzyme Therapy

Enzyme therapy advocates keeping food at room temperature and avoid extremely low and high temperature like cooking of food, using refrigerator for storage of food and thawing. Dr. Wolf and Ransberger in their book *"enzyme therapy" (*Regent House, Los Angeles 1977) states that "*the large enzyme molecules are emulsified and then transported to the tissues of the body directly". Thus you may eat food with vitamins and minerals but those nutrients will not be absorbed by the body if enzymes are missing".* Enzymes are catalyst and promote change without changing themselves. Dr. N. Gillies in his paper published at page 1390 of the BMJ of 28.11.1987 says that the anti-oxidant enzymes protect the body against disease and dysfunction.

Eating raw foods/ Raw foodism

Raw foodism is a life style promoting the consumption of uncooked, unprocessed and organic foods as large percentage of the diet. Depending upon the type of life

style and results desired raw food diets may include a selection of raw fruits, vegetables, nuts, seeds (including sprouted whole grains). A raw foodist is a person who consumes primarily raw food, or all raw food, depending on how strict the diet is and 70% of his diet should be from raw ingredients (Quinon, 2008). Raw foodist typically believe that the greater the percentage of raw food in the diet, the greater the health benefits. Members of the raw food community claim that raw foods encourages weight loss, prevents and heals many form of sickness and many chronic diseases (Wikipedia, 2008).

Raw foodism is also known as living foodism. Raw foods enzymes are thought to be in activated state as compare to seeds which are dormant and need soaking to activate them. This practice can be further subdivided in to Sproutariaans (who eat sprouts and green leafy plants), Fruitarians (Who eats fruits exclusively), and Juicarians (who stick to fresh fruit and vegetable juice). Natural Hygienist (naturopathy practitioners) uses fasting in combination with one or other of these diets to cleanse the body (Quinon, 2008).

Raw foods gained prominence throughout the 1900's, as proponents such as Wingmore and Shelton claimed that a diet of raw fruits and vegetables is the ideal diet for humans (Wikipedia, 2008).

Virtanen (1895-1973), showed that enzymes in cooked foods are released in the mouth when vegetables are chewed. It is believed that these enzymes interact with other substances, notably the enzymes produced by the body itself to aid the digestion process (Wikipedia, 2008).

Kenton (1984) claimed that raw foodism is the reason behind long lived Himalayan Hunza people. He advocated a diet of 75 per cent raw foods to prevent degenerative diseases, slow the effects of aging, provide enhanced energy and boost emotional balance (Wikipedia, 2008). Moreover, many researchers (Forbes, 1933; Price, 1936; Lucas,2005) stated that raw foodism is responsible for better dental health than cooked foods. The principles of natural hygiene promote a raw vegan diet (Wikipedia, 2008).For activating enzymes besides sprouting, Edger Caycee of Virginia Beach USA recommended that raw vegetables

be taken with gelatin in salad- not for vitamins or other values of gelatin but for its the enzyme activating action in aiding assimilation of vegetable and their vitamins.849-75

Rothschild (1988) treated 60 patients suffering from a variety of conditions related to the dysfunction of immune system. They gave 30 patients 6 tablets daily of enzymes derived from sprouted wheat for two months. He gave the other 30 patients the same enzymes but in this case they deliberately used heat to destroy the active properties there of 29 out of 30 patients receiving the active enzymes reported remarkable relief from their symptoms after 20 days of the therapy, while only six out of other 30 reported moderate relief. Howell and Illinois (1941; 1981) claimed that the enzymes were forced to work harder on a diet of cooked foods (Wikipedia, 2008).

Hence, it has been found that raw food diet is helpful in management of diabetes, obesity and various cardiovascular disorders.(http:// altmedicine.about.com/od/ popular health diets /a/Raw Food.htm ,2/11/2008).

Food and Cooking

Dewan (1998) stated that food which has not been cooked on fire has great importance for your health. Its vitamins are not destroyed and its enzymes also remain intact .The supporters of uncooked food ask as to which animal other than man eats its food after cooking it on fire. None! Then why should man do so? They repeat the English proverb *"God sends food and Devil sends cooks."*

According to Posati (1979) nutritional changes can occur through effect of heat, leaching of nutrient in to the cooking liquid or absorption of cooking media. Raghuvanshi et al. (2001) designed a study to assess the nutritional quality and nutrient retention of commonly consumed legumes. They prepared fourteen recipes by employing simple methods of pressure cooking, open pan cooking, shallow or deep frying, tempering and sprouting. Nutrient composition of 100 gm of cooked product was analyzed and nutrient content of raw ingredients was calculated by using table value. Results revealed that fat and moisture content decreased in all cases except for recipes prepared by sprouting method, which resulted in increase of moisture content. Whereas

Mehta et al. (2007) reported that heat treatment decreased the protein and water soluble vitamin contents of germinated pulses. According to Raghuvanshi et al. (2001) frying resulted in loss of protein, crude fiber, calcium. Iron showed an increase on processing. Further, they explained that decrease in protein content of recipes prepared by frying, sprouting and tempering was due to the reason that severe heat processing lowers protein and essential amino acid due to their possible reactions with the reducing constituents or phenolic compounds.

Kowsalya and Chandrasekar (2001) studied the cooking losses of beta carotene and lutein from selected six green leafy vegetables and concluded that in cooked form beta carotene and lutein could be retained only up to 50 and 70 per cent respectively. During studying impact of cooking on food Khora (2004) said that zinc poisoning is possible when stewed apples or other acid fruits are prepared in galvanized iron pans. Grewal and Hira (2003) reported that processing and cooking of wheat in to various products significantly lowered its mineral content (mg/100g) ; Calcium (51.9 To 84.7), Iron (3.74 To 8.73), Zinc (0.65 To 2.65), Copper (.20

To 0.674), Manganese (0.32 To 3.20), Magnesium (97 To 266), Sodium (14 To 32)And Potassium(100 To 350).

Doshi, Aggarwal and Antony (2003) studied the effect of processing on the polyphenolic (largest category of phytochemicals) content of 10 cereals and 8 pulses. Out of them nine cereals showed a significant decrease ($p<.05$) in total phenol content (14-48 per cent) and similarly, whole pulses too showed a significant decrease ($p<.05$) in total phenol content (32-70 per cent). In dals total phenol decreased by 12-50 per cent, while the tannin content showed an increase.

Sprouts

Bajaj (2002) stated that **t**he germination of seeds make them *"alive"*. Scientifically the content of vitamins increases manifolds. Also the phytates, which bind iron, zinc, calcium and magnesium, this binding break down on germination and thus these minerals, become available to our body.

As Sanderson (2008) said that sprout is a wonder food produced when a seed starts growing in to a vegetable.

They represent the miracle of birth (Meyerowitz, 2006) and are truly nature's elixir. It is the food that rivals meat and dairy products in their nutritive value and have none of the ill effects. Scientists have studied sprouts for centuries to better understand their high level of disease preventing biochemical and how they contribute to better health, from prevention to treatment of life threatening diseases. Over 5,000 years ago, sprouts were prescribed by ancient Chinese physicians as a cure for many disorders. In 1700's Captain James Cook and in 1940 US army sponsored a full investigation on sprouted seeds, studying their usability as a food during war. During World War 1 the British army sprouted beans to ward off scurvy in the trenches (www.indoindians.com,2005).

Presently major organizations including the National Institutes of Health, American Cancer Society and John Hopkins University have reinforced the benefits of sprouts with ongoing studies that explore various sprout varieties for their nutritional properties and to validate health claims (www.indoindians.com,2005). Deep inside a seed, there is hidden a blue print, a genetic package sleeping waiting to awaken as water is

introduced, enzyme inhibitors are disabled and the seed explodes to life. Germination unfolds and enzymes trigger elaborate biochemical changes; protein break into amino acids, water soluble vitamins such as B complex and Vitamin C are created, fats and carbohydrates are converted in to simple sugars, then the seed expends all its energy to break through the soil. Weight increases as the seed absorbs water and minerals. Through the miracle of germination, thiamin increases fivefold and niacin content doubles. Vitamin C, E and carotene increase and the vitamin C content becomes as rich as tomatoes (www.indoindians.com,2005). Mehta et al. (2007) too reported that germination increased the protein, riboflavin, and niacin and vitamin C contents in pulses. Sprouting is accompanied by an intense enzymatic hydrolysis of protein. Stored proteins are broken down in to component amino acids. Because the protein is predigested, sprouts are more easily assimilated and less gas forming than dried beans.(www.isga-sprouts.org,2003)

Germination also modified the carbohydrate component of the food grains (Subramanian et al. 1976; Lebaneiah

and Luh 1981). It was well known that consumption of pulses leads to flatulence. Inclusion of legumes in the diet at levels that provide 20-25 per cent of total calories resulted in a manifold rise in the amount of gas produced in the intestines (Steggreda and Dimmick,1966). One of the factors associated with flatulence is the high concentration of certain oligosaccharides of the raffinose family in pulses. Because of the absence of suitable digestive enzymes these sugars are not utilized by man (Gitzelmann and Auricchio ,1965). The sugars which are unabsorbed are acted upon by the microflora of the large intestine resulting in to gas production.(Calloway et al.,1966; Richards et al.,1968).Studies on common pulses like the chick pea ,green gram, black gram and red gram (Udaysekhar Rao and Belavady,1978) have indicated a fall in the oligosugar content on germination. In grains germinated for 24 hours the oligosugar levels were at 50 per cent of their initial value, and by 48- 72 hours at less than 25 to 15 per cent .These observations suggested that sprouted pulses are less likely to be flatulence producing. A gradual decrease was noted in total protein, soluble protein and protein fractions such as albumin, globulin, prolamine and glutelin in the

endosperm of Dolichos lablab L germinated for 8 days but germination increased the in vitro protein digestibility of the *Dolichos lablab* (Shastry and John,2006). However, following a decrease in the amino acid composition of the seeds after 48 hour of germination, significant increase in the concentration of cysteine, aspartic acid and histidine was found after 72 hour incubation in winged beans. The non-protein nitrogen was found to increase gradually and protein nitrogen content to be decreased. As light decrease in the lipid content was also observed. However, lipoxygenase activity was found to be decreased, approximate 77 per cent of the original activity was lost after 120 hours (King and Puwastein, 1987). Thilakavathy and Ajiba (2006) worked out a study aimed to study the effect of selected south Indian recipes on 72 NIDDM subjects and were incorporated with sprouted pulse powders. A significant decline in the GI (Glycemic Index) of selected recipes was observed in contrast to the standard recipes. During germination several enzyme systems become active and carried profound changes in the nutritive value of pulses (Subramanian et al., 1976; Mohd. et al., 1980).Vitamin C which was practically absent in dry

legume seeds, increased in significant amounts after germination (De and Barai 1949; Prabhavathi and Narsinga Rao 1979; Doblado et al., 2007).An increase on the antioxidant capacity (TEAC) in cowpea sprouts was also observed (58-67 percent). High pressure treatment, slightly modified vitamin C content and TEAC after pressurization at 500 MPa (Dobaldo et al.,2007).

Germinated legumes had a higher content of thiamin and ascorbic acid, higher protein and starch digestibility even after cooking (Khatoon and Prakash, 2006). It brought about an increase in the content of α-tocopherol, a decrease in the content of γ-tocopherol and did not affect the content of δ-tocopherol, which resulted in an increment in the Vitamin E activity (Frias et al.,2005).Similarly, Babu (1976) has found two to three fold higher values for folic acid in the grains than in the raw grains of the *Chick pea and Ragi.*

Along with folic acid, content of riboflavin, niacin, choline and biotin also increases on germination (Srilakshmi,2003). On the other hand it has been reported that anti nutritional factors such as phytate,

trypsin inhibitor and haemagglutenis were broken down on germination (Reedy et al.1978; Subbulakshmi et al. 1976). Phytate, which constitutes over 60 percent of the total phosphorus in the raw grains of the Bengal gram, dropped to a level of 44 per cent in the 48 hour germinated grains with no change in total phosphorus (Prabhavathi and Narsinga Rao, 1979).On contrary, Nnam (2000) recorded increase in the phosphorus levels, following germination, which is expected as a result of increased activity of the enzyme phytase, during germination .This enzyme hydrolyses the bond between protein- enzyme-mineral and set phosphorus to free form. The beneficial effect of these changes in food grains on germination and malting are reflected in the improved bioavailability of nutrients. Germinated legumes had a higher content of bio available iron even after cooking (Khatoon and Prakash, 2006). During sprouting calcium, zinc and iron released from bound form (Srilakshmi,2003).

Meyerowitz (2006) reported that saponins present in sprouts were responsible for lowering the bad cholesterol and fat but not the good HDL fats. He further stated that animal studies prove their benefits in

atheroscerosis and cardiovascular disease. Saponins also stimulate the immune system by increasing the activity of natural killer cells such as T –lymphocytes and interferon. Sprouts also contain an abundance of antioxidants that protect DNA destruction and protect us from the ongoing effects of aging.

Kelkar and Joshi (2003) has undertaken the study to assess the effect of germination on the fatty acid profile of legumes; alfalfa, moth beans, green gram, horse gram, cowpea red and white and lentil were obtained locally and germinated for 12 and 24 hours. The study revealed that legumes on germination can only be the potential source of lenoleic and alfa lenolenic acid but also long chain polyunsaturated fatty acids (LCPUFA's) like eicosapentanoic acid (EPA) and docosahexanoic acid (DHA) which are available only in fish oils. The extremely high ratio of n-3 to n-6 on germination can help to attain the recommended ratio of fatty acids and thus keep the degenerative diseases at a bay.

CHAPTER 17:
Indian Spices and Health

The term *"spice"* has been originally derived from the word *"species,"* which was applied to groups of exotic foodstuffs in the middle ages. Aromatically scented herbal products have been used since ancient times to flavor foods and for preparing incenses and perfumes. Rare spices were utilized in cooking as a sign of wealth in Rome, and later in Medieval and Renaissance times, and the privileged developed an exaggerated taste for spicy foods. The need to supply spices to the European markets spurred explorations, culminating in the extraordinary voyages that resulted in the discovery of the New World.

A spice can be broadly defined as a tropical herbal plant or a specific part of it that is valued for providing color and aromatic flavoring along with stimulating odor for use in cooking and in condiments, as well as in candies, cosmetics, fragrances, and medications. Spices add taste, flavor, aroma and colour to our food. Spices are also used as preservatives, appetizers, digestives, and aphrodisiacs by many societies. These spices are

derived from specific parts of a plant such as flowers, fruits, leaves, seeds, rhizomes, roots, buds, secretory products, and even the bark of a tree.

Spice Production in India

India produces a large proportion of all the spices produced in the world, largely owing to its varying climate and diverse soil conditions. According to the Indian Spice board, India produces 3.2 million tons of spices valued at approximately 4 billion US dollars every year. India has about half the share of the world trade in spices because of its excellent reputation.
Kerala is known as the home of spices.

Use of Spices in Indian Diet

As part of our diet, spices and herbs, in addition to fruits and vegetables, could provide us with additional sources of natural antioxidants. Antioxidants from spices are a large group of bioactive compounds which consist of flavonoids, phenolic compounds, sulfur-containing compounds, tannins, alkaloids, phenolic diterpenes, and vitamins. These compounds demonstrate different antioxidant activities. Because spices have very low calorie content and are relatively

inexpensive, they are reliable sources of antioxidants and other potential bioactive compounds in diet. This review outlines the role of some spices and herbs used in the Indian kitchen for its flavour and taste which are potential to maintain a healthy life.

Therapeutic role of certain Indian spices used in the naturopathy centers

India has a rich history of using various herbs, spices and herbal components for treating various diseases. It has been believed for some time that dietary factors play a key role in the development of some human diseases, including cardiovascular disease. In the current set-up, the anti-proliferative, anti-hyper-cholesterolemic, anti-diabetic, anti-inflammatory effects of spices have overriding importance, as the key health concern of mankind nowadays is diabetes, cardio-vascular diseases, arthritis and cancer. In 9th Asian congress of Nutrition Krishnaswamy (2003) has stated that *"From the time immemorial India has been recognised all over the world as the abode of spices and spicy food. Basically Indians are vegetarians, consuming plant foods of diverse variety with several spices. Spices and plant foods are rich sources of*

innumerable phytochemicals with several biological plausibilities of decreasing the risk of chronic diseases in general and cancer and cardiovascular problems in particular."

Sethi and Deka (2003) confirmed that spices are the rich source of health enhancing components such as antioxidants phenolics, flavonoids and phytochemicals etc. Ramakrishnan and Mithunapreethi (2003) formulated and processed a spice mix of fenugreek, ajwain, cumin and black cumin. It was supplemented (15g/day) to a group of 10 hyperlipidemic subjects for 30 days. Entire lipid profile (total cholesterol, HDL-C,LDL-C, VLDL-C and triglyceride) of the subjects was estimated before and after supplementation and results confirmed the hypocholesterolemic role of these spices. The various type of spices used in the naturopathy centers are: cumin seeds, fenugreek seeds and turmeric etc.

Fenugreek seeds

Krishnaswamy (2003) has claimed that fenugreek seeds, spice commonly used in Indian cuisine,

significantly impacts on glucose and lipids and it can be used as a food adjuvant in diabetics.

Mathur and Choudhary (2003) declared fenugreek (Trigonella foenumgraceum) as the miraculous health food. They found that the seeds contain 50% of soluble and insoluble fibers which are essential for good health. It also contains about 30% protein of high NPU value. The seeds are rich in minerals vitamin A (1040 IU), choline (1161ug), folic acid (84ug), but low in sugars. The oleoresin fraction contains ω-3, ω-6 and ω-9 fatty acids along with many saponins, alkaloids and sterols that serve as a source of pro-oestrogens and inhibit intestinal cholesterol absorption. They strongly confirmed the hypoglycemic and hypocholesterolemic effect of fenugreek seeds.

Turmeric: Krishnaswamy (2003) on the basis of his studies have found that turmeric feeding in experimental animals also reduced cholesterol and triglycerides.

Cumin seeds: Anusya and Anuradha (2003) gave 4gm of cumin seed and cinnamon powder supplementation to 30 newly diagnosed male type 2 patients in the age

group of 40-60 years of age for 90 days. A significant reduction (aone percent level) in BMI , blood pressure and blood glucose levels (fasting, postparandial and random), total cholesterol, triglyceride and low density lipoprotein and increase in high-density lipoprotein was noted.

CHAPTER 18:
Wheat Grass Juice: A Potential Health Tonic

Wheat grass juice is generally provided to the patients as a health tonic. It has been found useful in improving health and morbidity status in various ailments.

Rajaeswari and Amrithaveni (2006) called wheat grass as panacea on earth stands at the peak in the field of medicinal research. Wheat grass juice is considered to be the *"Cornuapia"* of all essential nutrients in bioavailable form. An investigation was carried out by them to study the efficacy of wheat grass juice on blood glucose level and antioxidant profile of the selected 60 NIDDM subjects. The subjects were divided into two groups, group A and group B consists of 30 subjects each. Group A was supplemented with 150 ml of wheat grass juice early morning in empty stomach and group B received no supplementation for a period 6 months. Efficacy of supplementation was assessed in terms of alteration in fasting and post prandial blood glucose level. The subjects in groups A registered a significant decrease of 38.35mg/dl on fasting blood glucose level. And also decrease in glycosylated hemoglobin level

and increase in plasma vitamin A, E and C levels were recordable.

Sharma and Srivastav (2001) assed the effect of 30 days of wheat grass juice supplementation on 80 young anemic girls and observed a significant increase in Hb levels of anemic young women. The mean rise in Hb level was 0.85mg/dl, maximum rise in Hb level (1.25 mg/dl) was seen in subjects having mean initial Hb levels below 10gm/dl. Chemical analysis of wheat grass juice as given by Sharma and Srivastav (2001) was as given in Table.

Table 17.1: Chemical composition of wheat grass juice.

Nutrient	**Amount (mg/100 ml exract : Juice + water) (Mean $\pm$ SE)**
Iron	$\pm$ 1.54
Calcium	2.50 $\pm$ 1.11
Phosphorus	8.25 $\pm$ 5.49
ascorbic acid	13.14$\pm$ 1.12
Tannates	5.41 $\pm$ 0.86

CHAPTER 19:
Prebiotics and Probiotics

A *probiotic* is any organism that contributes to the health and ecological balance of the intestinal tract. It is also called the friendly, beneficial or good bacterial species. Probiotic bacteria favorably alter the intestinal microbial flora balance, inhibit the growth of harmful bacteria, promote good digestion, boost immune function and increase resistance to infection (Mishra, 2003; Bhattacharya , 2004).

According to Fuller (1992) probiotic is a live microbial feed supplement which beneficially affects the host animal by improving its intestinal microbial balance. According to Sheth et al (2007) the two main groups of microorganism which have been shown to be therapeutically beneficial as probiotic are the *lactobacilli and bifidobacteria.*

Sheth et al (2007) studied the role of consumption pattern of prebiotic and probiotic foods on the gut health of 100 young adult females (18-25 yrs) and concluded that the consumption of more than 10

prebiotic and probiotic foods at least weekly helps to establish significantly higher number of beneficial microorganisms and decrease colonization of pathogenic microorganisms.

Lactic Acid Bacteria (LAB) are a group of related bacteria that produce lactic acid as a result of carbohydrate fermentation. These have been exploited for centuries in food fermentation, food preservation and to promote good health (Mishra,2003; Bhattacharya ,2004).

LAB-fermented foods may be sour with sharp acidic taste but are rich in flavor and taste because LAB's also influence bio enrichment during fermentation. Bio enrichment involves enrichment of food value by supplementation with proteins, essential amino acids, minerals and vitamins. Thiamine, Riboflavin And Methionine content of certain foods increase with LAB fermentation (Bhattacharya ,2004).

Probiotic supplements have been embraced and accepted as agents that can significantly improve human health. Some of the benefits of these

supplements as explained by Bhattacharya (2004) are as follows:

Probiotics can replace the friendly bacteria destroyed by broad –spectrum antibiotics. Probiotics enhance immune system function and help in the production of some B vitamins especially vitamin B 12 and vitamin K. Neutraceutical effects include reduction of serum cholesterol management of diabetes and prevention of osteoporosis.

Further, several health benefits of prebiotic and probiotics have been explained in the literature such as improved lactose tolerance, supply of SCFA as energy substrates for the host, anti tumour properties, neutralization of certain toxins, stimulation of intestinal immune system and reduction of blood lipid levels (Sanders,1994).

Prebiotic

A prebiotic is a no digestible food ingredient that beneficially affects the host by selectively stimulating the growth and activity of one or a limited number of

bacteria in the colon, which can improve the host health (Sheth et al., 2007).

The primary dietary sources of such food stuffs are milk, yogurt, and cheese and fermented dairy products like curd and butter milk etc. Thus, the only dairy product provide to the patients in the naturopathy centers is buttermilk so as to harness the benefits of probiotics (Bhattacharya ,2004).

The use of probiotics in regular diets is not a new concept. In traditional cultures, probiotics were a normal part of the diet. Europeans used fermented milk products (yogurt, kefir, soft cheeses) and vegetables (Sauerkraut); Asians had their fermented soy products (miso, tamari), vegetables (*kim-chi*) not to forget regular *dahi*. African cultures used fermented grains or milk. Over the year dietary practice seemed to have turned a full cycle with scientists encouraging the return of friendly flora via food to the gut (Bhattacharya ,2004).

CHAPTER 20
Recommendations for Good Health

Based on the information gained from the results of the study, the following points are recommended for the maintenance of proper body weight and good health by avoiding and controlling the degenerative, non-communicable diseases like NIDDM (Non-Insulin Dependent Diabetes Mellitus) and essential hypertension.

Recommendations for general good health:

1. The secret of good health lies in being in tandem with nature and to follow its rules.
2. Follow a daily schedule of going for a walk, taking exercise and concentrating on yoga.
3. Enjoy the early morning sun every day.
4. Remember the creator every morning and evening.
5. Maintain Ideal Body Weight (IBW) or better, remain slightly on the lower side of it.
6. Adhere to the right quality as well as quantity of the foods to be consumed. Ingest a well-balanced diet with high nutrient density.
7. Profess and practice vegetarianism.

8. Attach importance to the nutritive value rather than taste and prestige value of the food.
9. Don't live to eat but eat to survive and live happily.
10. Avoid eating haphazardly at social functions and eating places.
11. Eat only when you are hungry, eat small at a given time and chew it well.
12. Control spices, sugar, salt and fat in your food.
13. Avoid intoxicants like tea, coffee, alcohol, betel leaf and tobacco.
14. Fiber rich foods such as whole grain pulses and raw vegetables can be preferred to refined flours, cooked vegetables and peeled fruits and other similar commercial preparations.
15. Prefer raw, fresh, seasonal and locally grown food stuffs as far as possible.
16. The patient should have a good nutritional knowledge to make an intelligent choice of food.
17. Use low fat requiring cooking methods like steaming, boiling, roasting and baking, instead of frying.

CHAPTER 21:
Rejuvenation of Traditional Indian Food Practices through Research: Need of the Hour

Introduction

Traditional food systems of indigenous peoples are defined as being composed of items from the local, natural environment that are culturally acceptable. Rapid dietary change of indigenous peoples worldwide is posing threats to use of this food and the traditional knowledge required for traditional food system maintenance. (Hariett,1996).

Indian Civilization is the oldest in the world and equally old is the food culture of India. This time tested food culture and tradition of India is shaped by its long history, unique geography and greatly influenced by its rulers, neighbors and travelers (Rao,2012) but the unique health and medicinal benefits of Indian food have emerged from the spiritual lifestyle of ancient and *vedic* era. All these factors lead to a fool proof and the most health friendly food habits of India with a lot of choices. This is the ultimate factor of incredible India, due to this Indian food has been declared the

fourth most popular cuisine trade in the world after Italian, Japanese and Chinese food. Although, this survey was based on the sensory attributes of the food. Along with this Indian food is much competent in its health and medicinal pursuits too as there are a number of food remedies which are completely successful in treating diseases from tonsillitis to cancer. Western world has accepted it long ago. But our educated Indians are suffering from mental slavery of accepting each and every part of our culture only after getting the stamp of foreigners. This article is an effort to assemble all that we have before it vanishes from our hands through patents.

History of Indian Traditional food culture

First of all *Maharshi Charak* in his book *Charak samhita* discussed the medicinal benefits of Indian foods and herbs in detail. This made the base of *ayurveda*, the Indian Medical System. Same *ayurveda* is the naval trend to get multidimensional health benefits for the underprivileged masses. Indian cuisine reflects an 8,000-year history of various groups and cultures interacting with the Indian subcontinent, leading to diversity of flavors and regional cuisines

found in modern-day India. Later on, trade with British and Portuguese influence added to prediversified Indian cuisine. A few evidences suggest that Indus valley Civilization lay the foundation of *ayurvedic* cooking practices in 2000 BC, then modified by Aryans in 1000 BC Buddhism and Jainism in 600 BC and later on by Europeans in 1400AD onwards and it is still continue.

Benefits of Indian Traditional food

Traditional Indian food, however, is not only healthy, but incredibly acceptable with a lot of health benefits. Indian food supports immunity, reduces inflammation, brain function and several other functions in the human body (Coutino,2018). Indian diet comprises of freshly prepared food from whole grains, fruits and vegetables with a perfect combination of oils and spices with numerous antioxidant properties, digestive juice enhancers and health improvers like Amla, Cinnamon, Cumin Seeds, Asafetida etc.

In order to elaborate on Indian diet and its health benefits one can mention a study carried out to compare food beliefs associated with a naturally nutritious

agricultural product (namely pulses) in Western and Eastern cultures (namely the US and India).results of the study showed equally good taste of Indian and American foods but processing of American foods showed decreased healthfulness of their food. As Western foods have capitalized on industrial ingredients and processing methods to add value to agricultural product, they typically raised the content of fat and sugar, components associated with "superior" taste perception. The industrial processing also add value to agricultural commodities by improving the qualities that well adapted to modern lifestyle, including but not limited to convenience and financial accessibility. Major investment has also been typically deployed in advertising, in-store promotion, branding, and other marketing practices to reinforce consumer appeal particularly on the hedonic experience. Laurette et al,2016.

So, traditional Indian cuisines excel in its nutritive content along with this Ayurveda has discussed the role of seasons, time, dose and dietary combinations. This system correlates all these factors with the help of individual differences in detail, much before the arrival

of the concept of nutrigenomics in modern nutrition intervention practices. This makes it a perfect health system far above the hunger satisfier.

Need for Research in traditional Indian Foods

Inspite of food taste, vitality, economy, variety, acceptance and medicinal positivity's there is a dearth of scientific evidences to excel in making the best health friendly food in the world. So there is a need to be aware, feel proud and provide scientific evidences to make it the perfect food of the 21st century.

Our *Vice President,* Mr Vankaiah Naidu has stated on Aug 3, 2019 that there is a Need to usher nutrition revolution in the country he called for a national movement to eliminate scourge of malnutrition; Urged media and cinema to create awareness on the importance of nutrition.

There are a number of steps have been taken by the government in this direction:

TKDL and Food Patents

Traditional Knowledge Digital Library (TKDL is) a pioneer initiative of the Indian Government, and came to the fore due to the India's efforts on revocation of patent on wound healing properties of turmeric at the USPTO and the patent granted by the European Patent Office(EPO) on the antifungal properties of *Neem*. India's traditional medicinal knowledge exists in local languages such as Sanskrit, Hindi, Arabic, Urdu, Tamil etc. is neither accessible nor comprehensible for patent examiners at the international patent offices. It was identified by the TKDL expert group in 2005 that annually around 2000 patents were granted around the world erroneously concerning Indian system of medicine by patent offices around the world. TKDL provides contents of the ancient texts on Indian Systems of Medicines i.e. *Ayurveda, Siddha, Unani and Yoga*, into five international languages, namely, English, Japanese, French, German and Spanish, with the help of information technology tools and an innovative classification system - Traditional Knowledge Resource Classification (TKRC) Bio-piracy and Misappropriation of TK. The use of intellectual property systems to legitimize the exclusive ownership and control over biological resources and biological products and

processes that have been used over centuries in non-industrialized culture can be defined as "bio-piracy". In other words bio-piracy means misappropriation of traditional knowledge with an intention to gain patent protection over that knowledge. Devolution, encroachment, the bio prospecting rush, lack of appropriate legal systems and a clash of systems all make traditional knowledge highly vulnerable to bio-piracy. Traditional knowledge is associated with biological resources which in turn is a component of biodiversity. The clues/ leads provided by TK can be utilized to develop best practices/processes/ system for mankind without the investment of huge amount of money for research and results validation through clinical trials in labs, above all such knowledge saves time. In the recent past, several cases of bio-piracy of TK from India have been reported like *Neem Turmeric and Basmati Rice Patents*. (Balasubramanian, 2017).

In order to harness the benefits of these organization Indian food scientists need to come forward with the research pertaining to traditional Indian food system.

Introduction of folk medicine

Folk medicine and traditional healing practices has been enhanced and rejuvenated by the efforts of ***AYUSH*** (Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy). Various Ayurveda institutes are engaged in these activities.

Outlook Poshan Awards

Recently, outlook *Poshan Awards 2019* has been given to many people working for better community nutrition of the masses, eradication of malnutrition and promotion of healthy indigenous food products.

All these efforts include a lot of fields including medical, health, food processing, food security and agriculture .They are not primarily concerned with Food practices of India. A number of awards, grants and fellowships are given to eradicate malnutrition through various methods without focusing solely on our traditional foods .These awards encompasses the nutrition as a whole from ancient to current dietary practices. In order to overcome this negligence of enhancing and brightening age old food culture of India

there is an urgent need to take a number of steps; some of them are given below:

- Encourage the mass malnutrition eradication practices through non-conventional and wildly grown food stuffs.
- Special attention must be given to the improvement and modification of traditional health supplements used at domestic level to improve the health of pregnant and lactating mothers and growing children. Documenting and keeping a record of all these supplements so that our coming generations can also avail the benefits of these non-recorded health foods.
- Grants may be sanctioned in the country budget and UGC budget to the researchers who are involved in developing *ayurvedic* health supplements from traditional and seasonal, locally grown foods.
- There is a need to develop a simple and fast patent procedure for the traditional Indian origin foods.
- A separate government organization must be designed for the documentation and record keeping of the research outcomes pertaining to Indian food heritage.

▪ *Ayurvedic* nutrition must be a part of dietetics and nutrition courses so that the upcoming Indian Food researcher must get equated with their food culture.

Conclusion

India is on the verge of becoming the *Vishwaguru*. Vegetarianism, raw foodism and spiritual food practices are gaining popularity among the developed countries. This wave of Indian culture can prove a boon to the food research in India. It can be feasible only through the increased number of researches related to discovering, documenting, scientifically approving and patenting traditional food practices of India. Hence, this is the time to formulate new 21st century food and nutrition strategy and curriculum of my great incredible India.

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