

Marie C. Aguayo Beligat

The Strong Health

Nutrition for a healthy weight
and for preventing, reverting and curing diseases

TRIAL VERSION



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MARIE C. AGUAYO BELIGAT

THE STRONG HEALTH

NUTRITION FOR A HEALTHY WEIGHT
AND FOR PREVENTING, REVERSING AND CURING DISEASES





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NUTRI-SCIENCE FOR EVERYBODY

THE KEY TO WISDOM AND PERFECTION

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ISBN 978-84-09-47923-8

THE STRONG HEALTH.

Nutrition for a healthy weight and
for preventing, reversing and curing diseases

Marie C. Aguayo Beligat
Biologist

Dedicated to studying the impact of foods and plants
on human health and diseases and
to promote healthy patterns for a better health and lifestyle

Edition 2023.
Eidos-Project Books



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Don't miss this book

We are part of the Universe.

We can't escape from the laws of the Universe.

All answers and solutions are in the Universe,
only we must search and find them.

Preface

The paradigm is changing. Nutritional science is emerging as the medicine of the future. Functional foods with nutraceutical properties have begun to gain prominence in the field of nutrition. In the area of health, combating diseases resulting from malnutrition has become a global priority.

A considerable part of the scientific community is already focusing its efforts on the study of the properties and effects of foods on health and quality of life. Phytochemistry is acquiring great relevance in the field of nutritional science, health and human wellbeing. In recent years there have been great advances in the role of plant properties in the benefit of health and the quality of life.

Thanks to advances in the scientific community's research on the role of molecular biology in nutrition, on the effects of functional foods with nutraceutical properties and in the area of phytochemistry, it is now possible to formulate new nutritional strategies that can greatly enhance and improve the health and lifestyle of all people.

It is currently proven that both deficiencies and excesses of food intake are the cause of many diseases, but it is also known that in order to have an optimal state of health, it is no longer enough just to satisfy the daily nutritional requirements, but it is also necessary to incorporate functional foods with nutraceutical properties into the diet, in addition to having a good hydration and a daily physical exercise program. It is also proven that by properly manipulating nutrition, many diseases can be prevented, reversed and cured.

In the contents of this book you will find very good reasons to change your daily diet by incorporating healthier foods and increasing the consumption of spices for an optimal health and to avoid diseases of different nature.

This book is based on the most recent advances in nutritional science. The **advances and knowledge of nutritional science are made accessible to everybody** in a simple, clear and understandable language.

INTRODUCTION

Food plays a vital role in the maintenance of good health and both in prevention and cure of diseases; according to Sir Robert McCarrison '*The right kind of food is the most important single factor in the promotion of health; and the wrong kind of food is the most important single factor in the promotion of disease*'^[2].

In this book, **based on scientific evidences**, you will find and you will understand the good reasons for having a healthy and a well balanced and an optimal diet plenty of natural foods. A lot of natural foods are functional foods with nutraceutical properties that benefit enormously the health.

In recent years, a large number of scientists have been devoting their efforts to studying the phytochemicals produced by plants and how they influence health. The paradigm is changing. Nutrition is about to become the medicine of the future. It is scientifically proven that both deficiencies and excesses in food intake are the cause of many diseases. It is also proven that by properly manipulating nutrition, many diseases can be prevented, reversed and cured.

For example, the subject of preventing and fighting cancer is of course a vitally important one; treatment of cancer should be under the direction of your doctor and preferably also a Nutrition Consultant liaising with the doctor; a proper nutritional strategy is required and therefore an individual consultation on the matter is recommended^[1].

Another example is the use of phytochemical compounds properties of some spices as an alternative efficient treatments in conventional medicine when the conventional treatments are not working: in **modern medicine**, the capsaicin has been considered to be an effective yet safe topical analgesic as antiarthritic, antioxidant, and anticancer agent; the antiviral efficacy of capsaicin has been reported in the treatment of herpes zoster infection; the Osteoarthritis Research International (ORI)

recommended the topical use of capsaicin as an effective adjunctive or alternative medicament to oral analgesic/anti-inflammatory agent for the treatment of moderate to severe pain and inflammation in case where conventional oral analgesic/anti-inflammatory agents generally do not respond^[3]. Another similar example that is based on a scientific study indicates that **clove oil and eugenol have considerable antifungal activity against clinically relevant fungi, including fluconazole-resistant strains**, deserving further investigation for clinical application in the treatment of fungal infections; studies have shown that clove essential oil is both fast and effective in killing fungal infections^[4].

Actually, it is well known that in nutrition is very important to satisfy the daily nutritional requirements, macronutrients – carbohydrates, proteins and fatty acids – and micronutrients – vitamins and minerals – but that is not enough; for having a good health it is also very important to include in the regular diet, functional foods with nutraceutical properties.

“The evidence for nutritional therapy is becoming so strong that if the doctors of today don’t become nutritionists, the nutritionists will become the doctors of tomorrow”^[1].

The content of this book is at the hands of everybody. This book aims to people who want to have a good health and a good lifestyle. Overweighted and obese people who want to recover a healthy weight will find natural solutions, also diabetic people will find valuable information for making healthy plates. Also teachers, social workers and health professionals will find useful guidelines for helping people to get a better health and a better lifestyle.

Nutritional recommendations in this book are based on scientific foundations trying to make available to people in a easy way to make better nutritional choices in their benefits.

People should keep in mind that **there is not a miraculous diet for losing weight**. People never must put at risk their health for losing weight. People must thing that **we don’t escape to the law of the Universe**. We are a part of the Universe. We are mainly governed by two laws of thermodynamics: *“The first law is a conservation law: it says that the form of energy may change, but the total is always conserved; the second law is a dissipation law: it defines a quantity, the entropy, S , which we traditionally identify with disorder or high probability; the second law says that in any (real) irreversible process, the entropy must increase ($\Delta S > 0$); balance is not expected; entropy is, in fact, identifiable with irreversibility”^[5].*

As part of the Universe, humans were conceived as omnivores. The human being as omnivore obtains the energy to live from both the plant and animal kingdom. This is an important factor to take in account when formulating a healthy diet.

Diets and nutritional recommendations published in this book are based on the control of the amounts of calories necessary taking in account the personal needs. It is possible making diet with calories restrictions but never can have restrictions in the daily required amounts of micronutrients – vitamins and minerals –. The absence or the excess of one or more micronutrients can result in disease and eventually in death. Also it is very important that the diet includes plenty of functional food with nutraceutical properties for preventing, curing and reverting diseases.

Depending of the kind of foods that people are eating, they can become malnourished getting a lot of health problems or they can be healthy with a good lifestyle. For example, if people are daily eating fast foods, soda drinks, foods rich in sugar they will become obese and they will get diseases associated with obesity such as heart diseases, high blood pressure and cancer among other health problems; but, if people are daily eating a lot of healthy foods like as seeds, nuts, grains, vegetables and fruits they will be healthy and plenty of energy. In other words, foods can poisoning and kill people or they can promote a good health preventing diseases. Depending of what kind of food people are including in their diet, foods can promote a good health or can promote diseases.

Throughout this book you will learn about how to build a good diets, how to prepare different kind of foods for enjoying their nutrients and their functional and nutraceutical properties, you will get examples of recipes and useful ideas. Also you will learn about special diets for treating nutritional diseases such as obesity and metabolic syndrome among others health problems.

At the end, the content of this book will help people to change of mind about their eating behavior. Remember: foods can kill people or can benefit enormously the health and the lifestyle.

Knowledge is gold. Knowledge allow us to make the right decision.

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1

THE ROLE OF HUMAN NUTRITION AND FOOD SECURITY

According to FAO 2016, food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.

Unfortunately, not always, particularly in developed countries where people have physical, social and economic access to food they are well nourished. More than 2 billion people worldwide are affected by deficiencies in vitamins and minerals; these deficiencies are called '*hidden hunger*', as people who suffer from them may look healthy and not consciously feel hunger; the consequences, however, are tragic; for example, anaemia affects over 613 million women of reproductive age worldwide and contributes significantly to maternal deaths; while the causes of anaemia vary, it is estimated that half the cases are due to dietary deficiencies of iron, Vitamin B₁₂ and/or folic acid^[8]. In industrialized countries, major causes of morbidity and mortality for cardiovascular disease, metabolic disorders in particular, type-2 diabetes and certain cancers, in particular, colon rectum are associated with overweight and obesity which, in turn, are associated with over nutrition^[9].

While food security and food safety have historically been the main concern of public food policies, over the past few decades trends in consumption have associate with an **increase in food-related chronic diseases**, such as obesity, cancer, and coronary heart disease; diets high in fat, especially saturated fats, sugar, and sodium, and low in fiber, are considered to be risk factors for hypertension, cardiovascular diseases, diabetes, breast, colon, rectum, and prostate cancer, and obesity (WHO 2003); in developed countries, lower socioeconomic groups tend to have diets that are rich in animal products, fat, and sugar, and poorer in fruit and vegetables^[19].



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2

THE DANGER OF EATING POISONING AND HIGHLY ADDICTIVE FOODS

Nutritionally quality poor diets are characterized by higher intakes of processed foods, sugar-sweetened beverages, trans and saturated fats, and added salt and sugar, and lower intakes of fresh fruits, vegetables, nuts and whole grains^[1]. Fast foods and junk foods are examples of nutritionally poor diets that are mainly composed by poisoning and highly addictive foods. These kind of foods are called “*empty calories foods*” because they are rich in calories with little or not nutritional value contributing with human malnutrition.

Poor eating habits can lead to lack of sleep, digestive problems, depression and difficulty in staying awake and alert whilst on duty; these can also lead to obesity, diabetes 2 and heart problems in the longer term^[2]. Ailments like obesity, food poisoning, dehydration, cardiac problems, diabetes mellitus, and arthritis have seen a profound rise in developing countries and such unhealthy junk food, processed food, high fat calorie consumption are the notable factors to its contribution^[4].

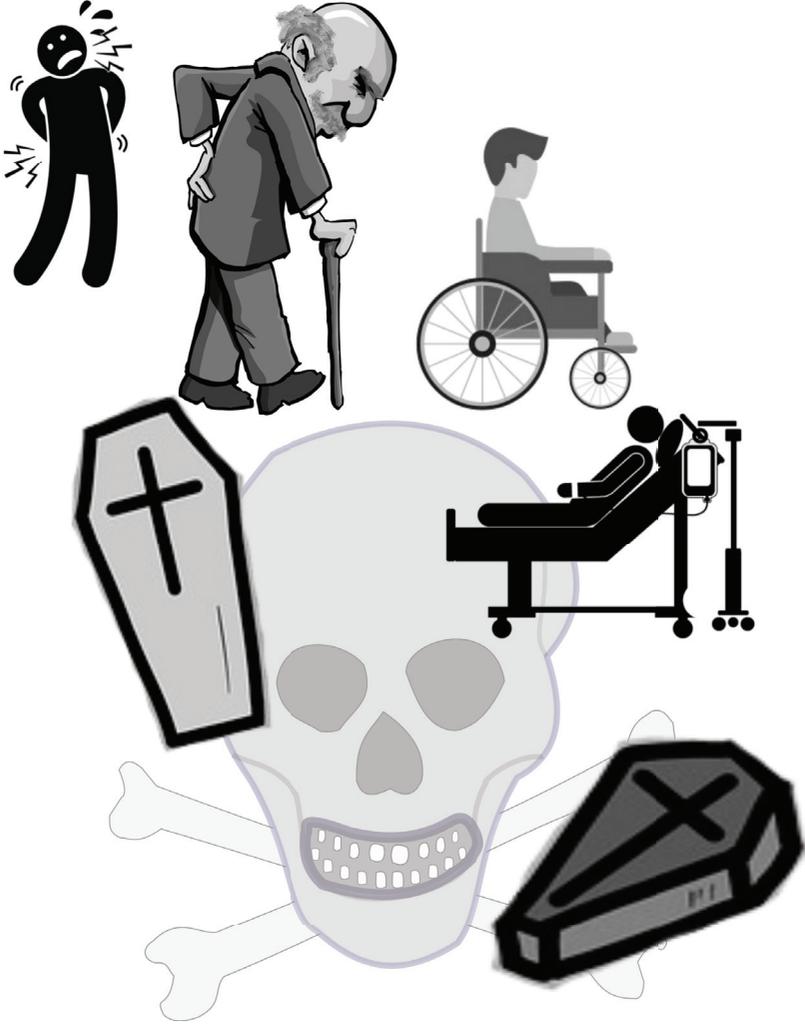
FAST FOOD OR JUNK FOOD AS EXAMPLES OF POOR DIETS

The term ‘**Fast food**’ was introduced by Merriam-Webster in 1951; according to Merriam-Webster, fast food is the term given to food that can be prepared and served very quickly^[3]. Hamburgers, pizzas, fried chicken or sandwiches are some examples of fast foods. They are rich in simple carbohydrates and sugar, high in salt, rich in saturated fats, they are high in energy or calories and they contain little or no proteins, vitamins and/or minerals; so they are foods with minimal nutritional value. Consuming junk foods or fast foods on a regular basis leads to many cesses of hanger to the brain by dampening suppress to

Poisoning Foods



That this does not happen



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3

Nutritional requirements for living

As we are part of the Universe, we are governed by the laws of the Universe as well also we are part of the cyclic events that happen in the Universe, specially of those cyclic events that are happening close to us such as circadian and seasonal processes. Although we are thinking beings with a measurable intelligence with an intellectual coefficient, we are a chemical entity, we are composed by chemical molecules and chemical compounds that are part of different biological functions and processes that are governing our health and our life. For example, our body is composed by about 60% of water, a chemical molecule with two atoms of hydrogen and one of oxygen; water intervenes in the modulation of our temperature, through transpiration and urine chemical toxic wastes are eliminated; if the water that we lose in these biological processes is not replaced, we dehydrate. Without drinking water we can't live for more than two to five days. Another example, is how trace elements such as iron, selenium, molybdenum or copper are absolutely necessities in the right amount because they have important roles and functions in our body, for example some minerals are essential for enzymes reactions throughout biological processes, and deficiency or excess of these trace elements in our diet could harm our health.

Knowledge of how molecules and chemical compounds are participating and are interacting between them in our life and in the biological processes that occur in each stage of our existence can allow us to model our lives for having a plenty healthy lifestyle. With this knowledge, we will be able to prevent, reverse and cure different kinds of diseases, including cancer, and although we cannot fully stop the natural biological cycles of which we are part, we will be able to feel '*young*' throughout our lives and we will be able to achieve a healthy longevity without the need of intake medicinal drugs.

in the human body; cobalt binds to iron-transport proteins and is thus involved in the synthesis of haemoglobin also it seems that some

3. Nutritional requirements for living

TABLE 1 - DIETARY REFERENCE INTAKES (DRIs): ESTIMATED AVERAGE REQUIREMENTS
FOOD AND NUTRITION BOARD, INSTITUTE OF MEDICINE, NATIONAL ACADEMIES

LIFE STAGE GROUP	CALCIUM	CHO	PROTEIN	VIT. A	VIT. C	VIT. D	VIT. E	THIAMIN	RIBOFLAVIN	NIACIN	VIT. B6
	mg/d	g/d	g/kg/d	μg/g	mg/d	μg/d	mg/d	mg/d	mg/d	mg/d	mg/d
INFANTS											
0-6 MO											
6-12 MO			1								
CHILDREN											
1-3 Y	500	100	0.87	210	13	10	5	0.4	0.4	5	0.4
4-8 Y	800	100	0.76	275	22	10	6	0.5	0.5	6	0.5
MALES											
9-13 Y	1100	100	0.76	445	39	10	9	0.9	0.8	9	0.8
14-18 Y	1100	100	0.73	630	63	10	12	1.0	1.1	12	1.1
19-30 Y	800	100	0.66	625	75	10	12	1.0	1.1	12	1.1
31-50 Y	800	100	0.66	625	75	10	12	1.0	1.1	12	1.1
51-70 Y	800	100	0.66	625	75	10	12	1.0	1.1	12	1.3
>70 Y	1000	100	0.66	625	75	10	12	1.0	1.1	12	1.3
FEMALES											
9-13 Y	1100	100	0.76	420	39	10	9	0.7	0.8	9	0.8
14-18 Y	1100	100	0.71	485	56	10	12	0.9	0.9	11	1.0
19-30 Y	800	100	0.66	500	60	10	12	0.9	0.9	11	1.1
31-50 Y	800	100	0.66	500	60	10	12	0.9	0.9	11	1.1
51-70 Y	1000	100	0.66	500	60	10	12	0.9	0.9	11	1.3
>70 Y	1000	100	0.66	500	60	10	12	0.9	0.9	11	1.3
PREGNANCY											
14-18 Y	1000	135	0.88	530	66	10	12	1.2	1.2	14	1.6
19-30 Y	800	135	0.88	550	70	10	12	1.2	1.2	14	1.6
31-50 Y	800	135	0.88	550	70	10	12	1.2	1.2	14	1.6
LACTATION											
14-18 Y	1000	160	1.05	885	96	10	16	1.2	1.3	13	1.7
19-30 Y	800	160	1.05	900	100	10	16	1.2	1.3	13	1.7
31-50 Y	800	160	1.05	900	100	10	16	1.2	1.3	13	1.7

Vitamin D and Vitamin K have synergistic effect. Vitamin E is heavily dependent of Vitamin C, Vitamin B₃, selenium and glutathione but its effect is decreased by Vitamin K. So, it is recommended to intake Vitamin D at the same time with Vitamin K while Vitamin E should

3. Nutritional requirements for living

TABLE 1 - DIETARY REFERENCE INTAKES (DRIs): ESTIMATED AVERAGE REQUIREMENTS FOOD AND NUTRITION BOARD, INSTITUTE OF MEDICINE, NATIONAL ACADEMIES										
LIFE STAGE GROUP	FOLATE	VIT. B12	COPPER	IODINE	IRON	MAGNESIUM	MOLYBDENUM	PHOSPHORUS	SELENIUM	ZINC
	µg/d	µg/d	µg/d	µg/d	mg/d	mg/d	µg/d	mg/d	µg/d	mg/d
INFANTS										
0-6 MO										
6-12 MO					6.9					2.5
CHILDREN										
1-3 Y	120	0.7	260	65	3.0	65	13	380	17	2.5
4-8 Y	160	1.0	340	65	4.1	110	17	405	23	4.0
MALES										
9-13 Y	250	1.5	540	73	5.9	200	26	1055	35	7.0
14-18 Y	330	2.0	685	95	7.7	340	33	1055	45	8.5
19-30 Y	320	2.0	700	95	6.0	330	34	580	45	9.4
31-50 Y	320	2.0	700	95	6.0	350	34	580	45	9.4
51-70 Y	320	2.0	700	95	6.0	350	34	580	45	9.4
>70 Y	320	2.0	700	95	6.0	350	34	580	45	9.4
FEMALES										
9-13 Y	250	1.5	540	73	5.7	200	26	1055	35	7.0
14-18 Y	330	2.0	685	95	7.9	300	33	1055	45	7.3
19-30 Y	320	2.0	700	95	8.1	255	34	580	45	6.8
31-50 Y	320	2.0	700	95	8.1	265	34	580	45	6.8
51-70 Y	320	2.0	700	95	5.0	265	34	580	45	6.8
>70 Y	320	2.0	700	95	5.0	265	34	580	45	6.8
PREGNANCY										
14-18 Y	520	2.2	785	160	23	355	40	1055	49	10.5
19-30 Y	520	2.2	800	160	22	290	40	580	49	9.5
31-50 Y	520	2.2	800	160	22	300	40	580	49	9.5
LACTATION										
14-18 Y	450	2.4	985	209	7.0	300	35	1055	59	10.9
19-30 Y	450	2.4	1000	209	6.5	255	36	580	59	10.4
31-50 Y	450	2.4	1000	209	6.5	265	36	580	59	10.4

be intake with Vitamin C + Vitamin B₃ + Selenium and Gluthatione far away the intake time of Vitamin D + Vitamin K for avoiding negative interference in the bioavailability of these micronutrients.

3. Nutritional requirements for living

TABLE 2 - REFERENCE HEIGHTS AND WEIGHTS FOR CHILDREN AND ADULTS^[10]

GENDER	AGE	MEDIAN BODY MASS INDEX (KG/M ²)	MEDIAN REFERENCE HEIGHT CM (IN)	REFERENCE WEIGHT KG (LB)
MALES/FEMALES	2-6 mo	--	62 (24)	6 (13)
	7-12 mo	--	71 (28)	9 (20)
	1-3 y	--	86 (34)	12 (27)
	4-8 y	15.3	115 (45)	20 (44)
MALES	9-13 y	17.2	144 (57)	36 (79)
	14-18 y	20.5	174 (68)	61 (134)
	19-30 y	22.5	177 (70)	70 (154)
FEMALES	9-13 y	17.4	144 (57)	37 (81)
	14-18 y	20.4	163 (64)	54 (119)
	19-30 y	21.5	163 (64)	57 (126)

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4

THE IMPORTANCE OF FUNCTIONAL FOODS AND THE BIOLOGICAL CLOCK

4.1

THE IMPORTANCE OF FUNCTIONAL FOODS WITH NUTRACEUTICAL PROPERTIES

Satisfying all the daily nutritional requirements it is not enough. For getting a strong health it is absolutely necessary to include in our diet functional foods with nutraceutical properties.

Nutrients that are satisfying all the daily nutritional requirement allow to prevent, reverting and curing many diseases but functional foods provide health benefits beyond these basic nutrients, they are contributing to a better health and a better lifestyle. Functional foods with nutraceutical properties confer a potentially beneficial effect on health when they are included and consumed as part of a varied diet on a regular basis at effective quantities and in appropriate combination, specially when they have synergic effects. Functional foods with nutraceutical properties are foods or part of foods that contain bioactive or biochemical components that provide medicinal benefits useful and effective for preventing, reversing and curing a lot of diseases, including cancer; also they are foods that contain bioactive or biochemical components that improve health, delay aging, prevent chronic diseases and increase life expectancy in add to confer protection and help to avoid to get chronic diseases.

The nutraceutical properties of bioactive or biochemical components of functional foods can confer a lot of health benefits. Among the health benefits that they can produce they can alleviating the risk of cancer and heart disease and also to prevent or treat hypertension, high cholesterol, excessive weight, osteoporosis, diabetes, arthritis, macular degeneration (leading to irreversible blindness), cataracts, menopausal symptoms, insomnia, diminished memory and concentration, digestive upsets and constipation, not to mention headaches; other products are touted as cures for thinning hair, lack of confidence, poor complexion, varicose veins, alcoholism, depression, and lethargy^[114].

4.2

THE IMPORTANCE OF THE BIOLOGICAL CLOCK

Cyclic events are a property of the Universe and all forms of life on Earth, from prokaryotes to mammals including the plant kingdom, do not escape from these cyclic events. Living beings are part of the Universe, therefore they are influenced and governed by cyclical events that are characteristic of each living being. The human species, like all biological organisms, is influenced by daily, environmental –whether internal or external–, geographic, seasonal and cosmic events.

The daily changes in environmental factors such as temperature, light, humidity, etc., occur due to the earth's rotation around its axis and probably influence the adaptation of almost all living organisms in the course of evolution; under the influence of such environmental changes, most of the biological processes such as behavior, physiology, and gene expression, have evolved with pattern of rhythmic oscillations present across diverse spectrum of the living world; such biological oscillations in activity, physiology, metabolism, behavior, etc., are termed as circadian rhythms (circadian: Latin: circa – about, dies – a day), which are ubiquitous in occurrence across the living organization and are regulated by an endogenous time keeping system called circadian clocks; there are certain biological oscillations, which are repeatedly encountered with tidal (~12 h), semilunar (~14 days), lunar (~29 days), or annual (~a year) periods in organisms that are in accordance with the seasonal changes or geophysical cycles; the divisions of activity of organism in a specific phase of a day are controlled by the circadian clocks; for instance, diurnal organisms restrict most of their activities to the light phase of a day (daytime), whereas in nocturnal animals such as mice, rat, etc., it occurs during the dark phase of a day (night); biological clocks efficiently harmonize various metabolic processes with environmental cycles, alongside creating substantial anticipation towards the rhythmic environmental changes; in coordination with environmental changes, the biological clock synchronizes the daily activities of the organisms to the environment^[100].

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5

FOOD HYGIENE

We can't speak about nutrition and diet for a strong health if previously we don't face food hygiene.

What's food hygiene? Food hygiene is an important and topical issue and is about making sure that food is safe to eat^[1]. Hygiene is the science of preserving or promoting health; food hygiene seeks to preserve or promote health by ensuring the safety and wholesomeness of food^[3]. Food proper storage, food cleaning and disinfection, food preparation, food cooking and food serving are the main hygienic procedures to be taken in consideration for getting the best food properties for eating that benefit our health.

Depending on the nature of the food operations we need to undertake, we should consider all the necessary processing methods to apply for getting the maximum nutritional values of the foods we are preparing for eating. Among the food preparation methods, we need to think in the best procedures that will apply to our foods such as heating, cooling, cooking, refrigerating and freezing food, and monitoring food temperatures and humidity to ensure the safety and suitability of food at home.

GETTING FOODS

Getting foods is the first step procedure we are making. All kinds of foods are sold at the local supermarkets, also there are a lot of places where we can buy fresh fruits and vegetables such as at the grocery store, at the local farmer, farmers market, family's farm or we can pick them from a garden.

Buying good quality foods is more expensive? No, it isn't. Sometimes bad foods and good foods have the same price, sometimes good safe, edible and palatable^[13].

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6

NUTRITION FOR A STRONG HEALTH

Until the present, we have learned in the previous chapters, how some kind of foods can harm seriously the body and the health, and some others, can enormously benefit and allowing people to have a great lifestyle with a plenty health.

For getting a strong health it is absolutely necessary having a plenty and healthy foods intake pattern that go beyond of the daily nutritional requirements. It is absolutely necessary to include in the daily diet a lot and a varied of functional foods with nutraceutical properties at effective level. Also, at the same time, it is very important to follow all appropriate hygiene procedure methods for preparing healthier foods. Following all the nutritional recommendations and food preparation procedures is the only way that foods can guaranty a strong health and help us to prevent, to cure and to reverse effectively a lot of kind of diseases as well to improve our health, impede aging, and increase our life expectancy.

Nutraceuticals is a term derived from ‘*nutrition*’ and ‘*pharmaceuticals*’; it was coined in 1989 by the founder of Foundation for Innovation in Medicine, Dr. Stephen De Felice, and is defined as ‘*any substance that is a food or a part of a food and provides medical or health benefits, including the prevention and treatment of disease*’; just like functional foods, nutraceuticals is defined differently in many countries; **nutraceuticals** refers to foods having a medicinal effect on health of human beings; ‘*nutrient*’ means a feed constituent in a form and at a level that will aid, sustain a life of human being or animal while ‘*nutraceutical*’ means any non-toxic food constituent that has scientifically proven health benefits together with prevention and treatment of diseases^[1].

Many nutraceutical substances are found in both plants and animals, and sometimes in microbes^[2]. These nutraceuticals are known as secondary metabolites. **Nutraceuticals** produced by plants are Beyond

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7

GETTING A HEALTHY WEIGHT WITH HEALTHY FOODS

The health risks of being overweight and obese have been clearly demonstrated: obesity is a risk factor for diabetes, cardiovascular disease, and most cancers, and it is associated with shortened life expectancy^[3].

Obesity is a chronic disease that results from complex interactions between genetic, metabolic, hormonal, behavioral and environmental factors; key lifestyle interventions to promote weight loss include behavior change strategies, reducing calorie intake, improving the nutritional value of the diet and increasing energy expenditure^[8].

The lifestyle of western society is causing a sudden and drastic increase in the percentage of people who are overweight or obese; in fact, in the developed world, around half of the population is overweight or obese; epidemiological studies show that this problem is becoming more serious with the passing of time; the reason for this increase in the weight of the population is to be found in the imbalance between the consumption of calories and energy expenditure; in this cultural context, hypocaloric diets, designed to help lose weight rapidly by means of a drastic reduction in the consumption of calories and prohibiting certain types of food, have become tremendously popular^[1].

For getting a healthy weight, the basic golden rule is: caloric restricted diets YES, diets with daily nutrient restricted requirements NEVER. Getting a healthy weight always should be done with a healthy eating. A good diet for weight loss must be a **well balanced diet** that must be **composed with low caloric foods that provide all the daily nutritional requirements and mainly need to be rich in functional foods with nutraceutical properties**, specially must to include a lot of spices. **Health never can't put at risk performing dangerous dieting-**physiologically adapted to his new weight without drastic suffering.

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NUTRITIONAL DISEASES

8.1

FITTING AGAINST DISEASES WITH NUTRACEUTICALS

Nutritional diseases are the nutrient-related conditions and diseases that cause illness in human; they may include deficiencies or excesses of at least one nutrient in the diet, obesity and eating disorder, and chronic diseases such as hypertension, cardiovascular disease, cancer, and diabetes mellitus; also, nutritional diseases include hereditary metabolic disorders which respond to dietary treatment, developmental abnormalities that are preventable by diet, food allergies and intolerances, potential hazards in the food supply, and the interaction of foods and nutrients with drugs; undernutritions caused by insufficient food to meet the energy needs; it is characterized by weight loss, wasting of body fat, muscle wasting, and failure to thrive instead malnutrition is the impairment of body functions that result from chronic deficiencies or excesses of total energy or specific nutrients such as carbohydrates, protein, vitamins, essential fatty acids, or minerals; malnutrition can also result from inadequate food availability, overzealous use of dietary supplements, or unwise food choices^[5].

The term “*nutraceutical*” is used to define these nutritionally or medicinally functional foods; nutraceuticals, which have also been called medical foods; the difference between functional foods and nutraceuticals is that a functional food is essentially a food, but a nutraceutical is an isolated or concentrated form used as medicine to improve health, impede aging, prevent chronic diseases, and increase life expectancy; functional foods differ from another related term nutraceuticals in that functional foods are essentially foods while nutraceuticals are derived from foods but are used as medicines; nutraceuticals can be considered non-specific biological therapies used to promote general well-being, prevent malignant processes and control symptoms; generally, nutraceutical is said to be a “*food, or parts of a food, that provide health benefits, including the prevention and treatment of disease*”; p

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8.2

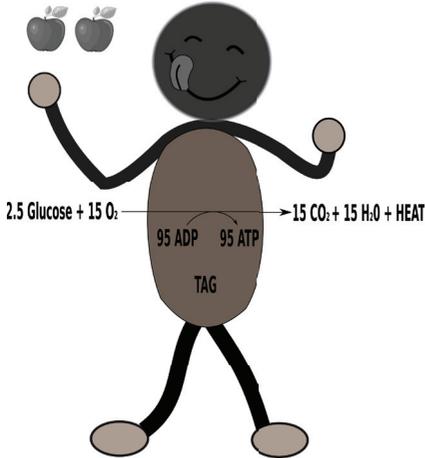
OBESITY, METABOLIC SYNDROME, MALNUTRITION, HUNGER AND UNDERNUTRITION

Obesity, metabolic syndrome, malnutrition, hunger and under-nutrition are, in different ways, a consequence of nutritional problems.

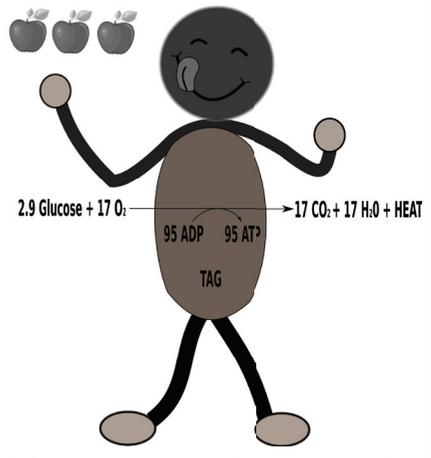
More than 2 billion people worldwide are affected by deficiencies in vitamins and minerals; these deficiencies are called '*hidden hunger*', as people who suffer from them may look healthy and not consciously feel hunger; the consequences, however, are tragic; for example, anaemia affects over 613 million women of reproductive age worldwide and contributes significantly to maternal deaths; while the causes of anaemia vary, it is estimated that half the cases are due to dietary deficiencies of iron, Vitamin B₁₂ and/or folic acid; also globally, nearly 2 billion adults are **overweight**, of whom 672 million are **obese**; overweight and obesity are risk factors for many non communicable diseases such as heart diseases, stroke, type 2 diabetes, and some cancers; instead **malnutrition** in all its forms has many causes; an important one is low-quality diets; unhealthy diets are an important cause of malnutrition; they are now responsible for more adult deaths and disability than alcohol and tobacco use; in add to all these nutritional problems, industrial food production has also led to widespread use of agro-chemicals and antibiotics, which can have adverse health effects^[2].

In human studies it is becoming apparent that an increased intake of long-chain ω -3 PUFA by 0.3–3.0 g/day can reduce body weight and body fat in overweight and obese individuals; the mechanism by which increasing the intake of ω -3 PUFA by such an amount may improve body composition is most likely altered gene expression favoring increased fat oxidation in adipose and skeletal muscle tissue and reduced fat deposition in adipose tissue; data from other studies also support that long-chain ω -3 PUFA might promote increases in lean tissue mass,

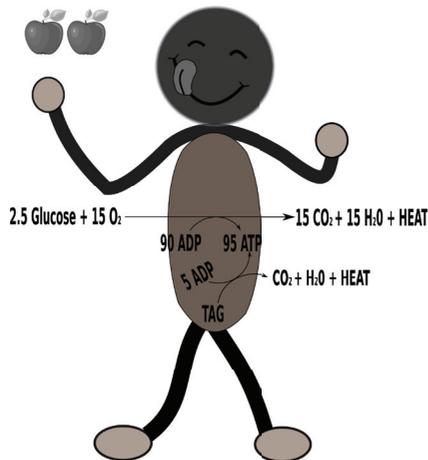
DIFFERENT METABOLISMS EFFICIENCY



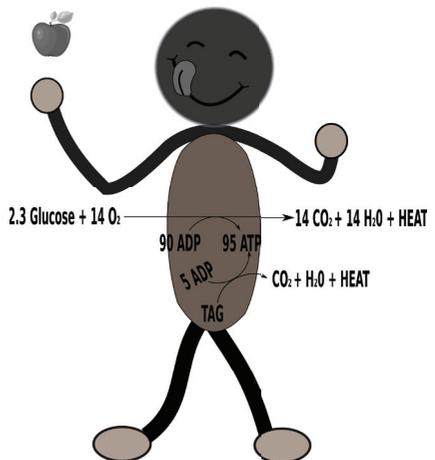
1. **Normal living system model.** There is stoichiometric balance and no net weight change.



2. **Reduced efficiency:** If efficiency is reduced then our subject would have to eat more. The additional CO₂ and H₂O produced will be excreted maintaining constant weight.



3. **Reduced efficiency:** Eat the same amount and lose weight. The remaining 5 moles ATP needed for homeostasis must be made up from oxidation of body stores of lipid or lean mass. This results in weight loss, exactly as it does for the example of reduced caloric intake.



4. **Eat less and lose weight:** A common way of thinking of weight loss is from reduction of caloric intake. If our subject ingests 2.3 moles of glucose (or equivalent lipid and/or protein) and produces only 90 moles of ATP, then homeostasis will enlist body stores of fat (and/or lean body mass) to yield the additionally required 5 moles ATP. The additional resultant CO₂ and H₂O (and heat) will be excreted (and radiated) leading to weight loss.

Fig. 1: To illustrate the proper interpretation of the first law of thermodynamics in living organisms we must consider that conservation of matter and energy includes excretion of products into the external environment. None of the products of oxidation (CO₂ and H₂O) remain within the organism. (CO₂ and H₂O) remain within the organism. There is stoichiometric balance and no net weight change. Only the ATP is representing the useful energy, is retained. The wasted heat constitutes 60% of the energy of oxidation, while the efficiency is reflected in the retained ATP, available for reactions in the organism. Body fat stores are signified as TAG (triacylglycerol)^[13].

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8.3

PREVENTING, REVERSING AND CURING CANCERS WITH NUTRACEUTICALS

Cancer is among the primary causes of death worldwide and, despite the high level of global awareness and the development of multi targeted therapeutic options, death rates from cancer are still significantly high; cancer cells are characterized by disruption of several signaling pathways including those responsible for angiogenesis, proliferation, metabolism, migration, immune modulation and survival^[12].

Cancer is a disease, which involves abnormal growth of cells with the potential to invade and metastasize to other parts of the body; among several factors that are involved in cancer initiation include changes in the genes that regulate normal functions of the body; given the steady increase in cancer incidence worldwide, together with escalating problems with drug resistance, there is increasing interest in various strategies for cancer prevention; generally, primary and secondary chemoprevention has been categorized under primary chemoprevention; examples primary chemopreventive agents are dietary phytochemical and non-steroidal anti-inflammatory drugs (NSAID)^[9].

In cancer, during metastatic cascade, the crosstalk between inflammation and angiogenesis not only sustains the survival of spreading cells, but also favors their dissemination; the angiogenesis/inflammatory axis acts on most non communicable diseases; examples include excess of neo-vascularization in cancer, permitting tumor growth, inflammatory angiogenesis in rheumatoid arthritis leading to pain, aberrant angiogenesis in tissues of diabetics and lack of angiogenesis in ischemic tissues^[10].

For preventing, reversing and curing cancer, the diet is very important. It is well known that vegetables, fruits, and whole grains contain a wide variety of phytochemicals that have the potential to cancer cells^[21].

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8.4

NUTRACEUTICALS FOR IMPROVING DIABETES

Diabetes, often referred to by doctors as diabetes mellitus, describes a group of metabolic diseases in which the person has high blood glucose (blood sugar), either because insulin production is inadequate, or because the body's cells do not respond properly to insulin, or both; the most common diabetes symptoms include frequent urination, intense thirst and hunger, weight gain, unusual weight loss, fatigue, cuts and bruises that do not heal, male sexual dysfunction, numbness and tingling in hands and feet; insulin is a hormone that is produced by the pancreas; after eating, the pancreas automatically releases an adequate quantity of insulin to move the glucose present in our blood into the cells, as soon as glucose enters the cells blood-glucose levels drop; a person with diabetes has a condition in which the quantity of glucose in the blood is too elevated (hyperglycemia); this is because the body does not produce enough insulin, produces no insulin, or has cells that do not respond properly to the insulin the pancreas produces^[1].

There are two types of diabetes: Type 1 and Type 2.

Type 1 Diabetes (Insulin-Dependent Diabetes): People with diabetes type 1 are insulin dependent. The body does not produce insulin; approximately 10% of all diabetes cases are type 1; patients with type 1 diabetes will need to take insulin injections for the rest of their life^[1]. In type 1 diabetes, the body no longer makes insulin or enough insulin because the body's immune system, which normally protects you from infection by getting rid of bacteria, viruses, and other harmful substances, has attacked and destroyed the cells that make insulin^[2].

Type 2 diabetes (Non Insulin-Dependent Diabetes): The body does not produce enough insulin for proper function, or the cells in the body do not react to insulin (insulin resistance); approximately 90% of all cases of diabetes worldwide are type 2; some people may be able

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8.5

BONE HEALTH AND OSTEOPOROSIS

The adult human skeleton contains 213 bones, excluding the sesamoids; bone is a metabolically active connective tissue that provides structural support as well as facilitation of movement by providing levers for muscles, protection of vital structures, reservoirs for minerals and growth factors, regulation of mineral and acid-base homeostasis, and a site for hematopoiesis^[6].

Bone is a composite material whose extracellular matrix consists of mineral (65%), water (10%), lipids (1%), and organic material (25%), the latter being composed predominantly of type I collagen (90%), non-collagenous proteins (10%); these components have both mechanical and metabolic functions, and the composition and architectural features vary with age, gender, species, and the site which is studied, and it can be affected by disease and treatment^[7].

Human adults lose approximately 0.3% of their bone mass each year; this means that their calcium balance is negative and they lose about 10 mg of calcium each day; this loss of bone mass may be ten times greater in post-menopausal women^[47]. Between 1 and 4 % of the human adult skeleton is thought to be renewed each year; trabecular bone has a faster turnover than cortical bone^[48].

Bone consists of the mineralized and non-mineralized matrix (osteoid) and one of the three principal cellular components are the **bone-forming osteoblasts**; some of which become entrapped into the mineralizing bone matrix they lay down to become **osteocytes**, and the **bone-resorbing osteoclasts**; the origin of these cell types as well as the communication between them and their involvement in vital processes such as skeletal growth, bone adaptation (modeling), and bone maintenance (remodeling); bone is a multifunctional tissue which serves as mechanical support and protection, is an essential part of hematopoiesis and mineral metabolism, and has a role as an endocrine organ; s e

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HERBS FOR INSOMNIA

Insomnia is technically defined as difficulty falling asleep, staying asleep, or non restorative sleep causing daytime impairment or distress despite adequate opportunity and circumstance to sleep occurring at least three times per week for at least 1 month^[1].

Studies show that the prevalence of sleep disturbances increases with age so that 50% of elderly people who live in private homes and 70% of nursing home residents suffer from sleep disturbances^[1]. The majority of studies indicate that insomnia affects between 10% and 30% of the population; patients with insomnia report difficulty in initiating sleep, difficulty in maintaining sleep, (ie waking intermittently during the night), or early morning waking (ie waking in the early morning and being unable to fall asleep again); the causes of insomnia include psychiatric disorders, physical problems such as cardiopulmonary failure and chronic pain, drugs and foods such as caffeine, nicotine, alcohol, and amphetamines, and an irregular sleep-wake cycle; a significant proportion of patients with insomnia (approximately 20% to 25%), however, do not have a definite underlying cause for their insomnia^[2]. Insomnia is a major health problem because it can deteriorate one's health and well-being by inducing reduced quality of life, impaired daytime functioning, and higher healthcare costs; also, insomnia has been reported to increase risk of many diseases, including diabetes, cardiovascular disease, as well as many psychiatric disorders^[3].

Some classes of sleep medications, particularly the still widely prescribed benzodiazepines, actually degrade the quality of sleep; people do fall asleep faster when taking these drugs, but they do not go into deep, restorative sleep and end up groggy and impaired in the daytime; for this reason, it is well documented that benzodiazepines actually impair people's ability to drive and operate heavy machinery safely, and ultimately do not improve sleep for most people; also, newer non benzodiazepine sedative drugs such as zolpidem have less tendency

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NUTRACEUTICAL TEAS AND INFUSIONS AS VALUABLE FUNCTIONAL FOODS

Herbal infusions have long been used in traditional medicine and are a popular global beverage choice; now, in the era of globalisation, regional and ethnic barriers have been removed and specialist infusions have become universally available; the consumption of herbal beverages is gaining popularity driven by the fact that many are rich sources of natural bioactive compounds, such as alkaloids, carotenoids, coumarins, flavonoids, polyacetylenes and terpenoids; subsequently, more people consume these infusions as daily beverages for health purposes; bioactives present in herbals infusions could have a diverse range of biological effects, including potential anti-bacterial, anti-oxidant, anti-inflammatory, anti-allergic, anti-thrombotic and vasodilatory actions, as well as anti-mutagenic, anti-carcinogenic and anti-ageing effects^[1].

The World Health Organization seeks to capitalize on the use of traditional medicines including herbal medicines in its 2014–2023 strategy, with the aim of keeping populations healthy through providing access to effective and affordable alternatives to medicine, and to provide healthcare choices coherent with people's cultural practices; herbs are rich in phytochemicals that are important constituent secondary metabolites required for plant growth, natural defence and communication, and are similar in structure to many human biochemical compounds; plants contain an abundance of phytochemical compounds and these vary with the growing conditions of the plant, and the farming and processing methods that form the '*value chain*' through to the manufacture of products; the mechanisms by which herbs and their constituents may exert anti-diabetic effects may relate to the antioxidant effects of the phenolic components as shown for herbs such as green tea and peppermint, and the synergistic effects of differing combinations suggest the potential importance of the whole herb over extracts of singular phytochemical components^[2].

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