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Nutrition

Modern Food: Is It Really Future-Oriented?

by

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Introduction

Genetically engineered food, "nutraceuticals," and convenience foods are only a few of the names applied to various foods now available in the market. The media is filled with reports about these foods. These products are cause for concern because nutritionists can not yet categorize these foods and they may have negative effects on people's health. Further, announcements about these new products are not always in the best interest of the consumer.

We have seen more changes in lifestyle at the end of the twentieth century than in practically any other time in history. Globalization and the resulting social and economic problems are pressing in upon humanity. Food and nutrition have been affected by these changes. In earlier times the amount of time needed for food plants to become "native" to a certain area was decades or even centuries. Today we are faced with an acceleration process that does not allow enough time for us to become accustomed to everything new. Skepticism, or even fear, of too much that is new has been one result.

The Origin and Development of Food

Food comes from nature, that is, from plants and animals. We use certain living microorganisms such as yeast in limited quantities. Salt and various additives from the mineral kingdom do not nourish us, but are added for taste or used as part of a processing technique, such as brine salt in sausages.

Minerals are more often integrated into plant or animal organisms and are thus absorbed by human beings. This allows for a completely different utilization than is possible with isolated ingredients.

Food has a natural origin, but it is not always a pure, natural product. That term applies only to wild plants and animals that grow without any interference from human beings. Nutritional plants from the field are grown under the care of farmers. Even wild game is controlled and the forests are appropriately tended. So really "natural food" should be called "cultured food" because people, with their ideas and their labor, have created their food. They have grown and bred the needed plants and animals and created an environment containing the required supplements for growth.

Food is also a mirror of the cultural development of humanity. *Fast food*, which has come about in our time, is very connected to the way we handle time, and the value placed on haste and leisure. *Functional food* is supposed to serve a specific purpose such as cancer prevention, osteoporosis prevention, or strengthening intestinal flora. In addition nutrients have been refined for specific uses as *food supplements*.

There is an old Chinese saying that expresses the significance of food that has been further developed by humans:

> *Human beings differentiate themselves from animals by their spirit and by cooking their food.*

Processing food means that people create their food according to their needs with the help of their spirits. This differentiates humans from animals. Food processing corresponds to a soul-spiritual need and is a cultural process.

For the time being the above statement is neutral. First of all, a processed food can be judged only in reference to the intent and the original food. If one wants pleasure only, then one gets pleasure foods that often are not, however, especially "healthy." If one wants easy preparation, desire often conflicts with nourishment from original, naturally-grown quality.

History of Food Processing

Food processing has developed dramatically during the last century through technology. Many commonly-used products today have come about because of technological advances. For example, it is interesting to note that the technique of sterilization was first discovered and put into practice and only later did Pasteur discover why and how the process worked for food preservation.

New Methods (Sample Choice)

19th Century

Sterilization, pasteurization (1813 first canned food factory opened in England)

20th Century

1940s Frozen foods
1960s Freeze-dried, pressure-cooked foods
1980s Microwave Cooking
1990s Induction Cooking

Before pasteurization there were no preserved fruit juices, for example, only fresh-pressed at harvest time. In order to preserve fruit juice one made

wine out of it; alcohol fermentation was a useful method. In old books one still finds writings about the beneficial effects of wine for ill people as we read in the fairytale of *Little Red Riding Hood*, where cake and wine are brought to the sick grandmother, not for celebration but to help make her well. Today, because of its alcohol content, wine is less often given to the ill for their recovery and more fruit juice.

During the twentieth century many new processes were invented such as deep-freezing or microwave cooking that quickly became standard practices in the kitchen but, at the same time, brought forth criticism.

Likewise, new foods have been developed that could not have come about without the new technological applications.

New Foods (Sample Choice)

19th Century

- White flour
- White beet sugar

20th Century

- Fruit juice (Pasteurization)
- Margarine
- Cola drinks
- Artificial sugar substitutes and sweeteners (Sorbitol, Xylitol, Saccharine)
- Liquid formula for infants

Frozen Foods

This preservation method has been regularly used since the middle of the twentieth century. Initiated in cold climates as a way of naturally preserving meat and fish, the freezing process was expanded to include just about all foods in industrialized nations. The one requirement is a "cooling chain": uninterrupted cooling at the processing plant, transportation to the market, and storage by the consumer.

Foods are "deep frozen" quickly at temperatures of at least minus twenty-five degrees Fahrenheit (commercially minus fifty-eight degrees Fahrenheit) at which a kind of cold-rigor sets in. Normal processes of deterioration that occur when the temperature is slowly lowered have no time to develop. Storage temperatures must be kept at zero degrees Fahrenheit or below in order to maintain the cold-rigor. All bacterial deterioration processes are stopped. Chemical and enzymatic decomposition is significantly slowed. This allows for a long storage life of frozen products.

Following the exact recommendations for freezing (which often does not happen in households) allows for the preservation of vitamins. The inner,

life-quality and vitality are not destroyed, as has been demonstrated by the use of frozen semen of men and animals in artificial insemination techniques.

Despite these facts, there are still some doubts about this modern method of food preservation. From an ecological viewpoint, the energy used for the cooling chain is a detracting factor. As far as quality goes, one must differentiate between the polarities of vitality and ripeness. The ripening process requires warmth (from the sun) and time in order to create color, aroma, and taste. Cold is the polarity to this. Freezing preserves vitality, but it interrupts the ripening process, or does not allow it to fully occur. In truth, thawed foods quickly lose their aroma and their structures disintegrate as soon as the cold no longer holds them together. The vitamin content remains sufficient, but that represents only one aspect of food quality. Experiments using imaging methods indicate a simultaneous loss of form and formative forces.

These methods should not be rejected out of hand, but it is important to look at the effects beyond the substantive content. In our culture are we not surrounded by more cold processes than warmth processes? How does this apply to the ripening of fruit, for instance? When do we have or take the time to let food "ripen" in peace? Today, is not so much accelerated so that it may be preserved for a long time?

Microwave Technology

Microwave technology was applied as an energy source for cooking food in the second half of the twentieth century. Previously, Microwave was known as a medical therapy; it was used to bring warmth into certain skin tissue.

The advantage of microwave cooking is its speed which satisfies people's need for quick preparation time. Microwave ovens allow us to thaw frozen foods and cook small portions very quickly. It does not really save much time in meal preparation for larger families (more than three portions). This technology fits well in a society that mostly consists of small households that have less and less time for food preparation.

Microwaves are electromagnetic waves of relatively high frequency that penetrate the food in bundles. The energy waves cause heat from friction with the water already present in the food. This kind of heat generation is very different from conventional cooking whereby the heat meets the food and diffuses (convection).

Microwaves accelerate the vibration of the water, affecting the inner energy structures in the food. Materially speaking, there is no more loss than with conventional cooking. However, if one understands that food is an organism formed by forces, vibrations, and energies, then one can look

skeptically at such changes. Unfortunately there has not yet been enough research conducted about this kind of influence.

While the microwaves have no other effect on the food itself, the user must be protected from exposure. Therefore, microwave ovens are intensively insulated and shielded. Even so, one should not remain for long periods of time in front of a running microwave oven. In households that is not often a problem; however, in restaurants or places where meals are mass-produced, this consideration should be taken seriously.

There is also a social aspect that should be considered. Those in favor of microwave ovens have said that they like being able to cook or reheat single portions of food with little effort any time of the day or night. As practical as this is for single persons, in communities, such as families, it can lead to family members eating alone and at any time they feel like it. It takes extra effort to maintain the family meal and teach waiting for others.

Novelty Foods and Genetic Engineering

A big milestone in food production occurred a few years ago through the use of genetic engineering on food crops. Researchers had been trying for decades to produce edible fats or other foods from lifeless materials such as coal or petroleum; all of their attempts failed. Even the breeding of single-cell microorganisms into biomass to produce protein-rich foods was not successful. Again and again it was demonstrated that people are dependent upon the plant and animal kingdoms for their nutrition.

Large corporations began to try more intensely and more specifically to change these agricultural raw materials. Genetic engineering, a method for gene manipulation, is applied for adding specific, single characteristics to certain plants or animals. Often the organisms of these living things as a whole are in no way taken into consideration.

Compared to conventional breeding methods, genetic engineering is faster, intervenes more radically in the molecular structure, is mostly irreversible, and is mostly uncontrollable. The objective to be met through genetically engineered changes is, first and foremost, short-term economic success, and improvement in food quality or quantity are hardly ever inquired about. At this time (1999) there is still not many genetically engineered foods: enzymes, corn, and soy. However, research is being conducted with almost every nutritional plant and many animals.

Organizations for organic agriculture have banned the use of genetically engineered plants or animals in their food lives. Acclaimed chefs also reject such food.

In 1997, after long negotiations, legal parameters for these food products were outlined which define the rules of registration and declaration. Included

in these so-called *Novelty Food Regulations* are not only genetically manipulated foods, but also exotic foods, synthetic foods, and foods that are produced by new techniques.

Novelty Foods Regulations

- Foods which contain genetically manipulated organisms (GMO)
- Foods that are produced from genetically manipulated organisms but no longer contain them (i.e. oils, lecithin)
- Foods with a new molecular structure (i.e. synthetic fats)
- Foods from microorganisms, algae, or mushrooms
- Foods that have not been previously consumed by our population (i.e. beetles, grasshoppers, exotic fruits)
- Foods that are produced by previously uncommon methods (i.e. high-pressure sterilization)

These legal parameters show what is possible. No foods are banned, but there are established guidelines for their production and identification. Genetically manipulated foods that still contain genetic material or proteins must be labeled as such. Sugar from genetically manipulated sugar beets or refined oil from genetically manipulated rapeseed need not be labelled. Food additives, such as soy lecithin from genetically manipulated soy, are also not included in the requirement for labelling. This is not an altogether satisfactory solution for the consumer.

All this demonstrates that human research has now entered into an area that is directly connected with life. The acceleration of the development has led to such discoveries being immediately put into commercial use including food production. Consumers have not been allowed enough time to either emotionally, or educationally, evaluate these developments, resulting in widespread rejection (80% of consumers) of genetically manipulated foods.

Since the end of 1998 the food label *GMO-Free* has been sanctioned. Producers can declare their products *GMO-free* if they can prove that all ingredients and additives were made without the benefit of any genetic engineering. Traces of genetically manipulated contents may find their way into foods from an uncontrolled source, such as cross pollination that can occur between crops in neighboring fields, or from small quantities in transport containers, or machines, and so forth. These traces are, at the present time, allowed.

It is ironic that producers must absorb the cost and time in proving they do not make use of an undesirable technology while the producers that do make use of genetically engineered foods are, in part, freed from any form of declaration (for example, additives, enzymes, refined oils, and so forth).

The advantage for consumers remains that there is finally a way to be informed and becoming oriented.

Food Supplements

Besides novelty "food" products, there is a category that, at first glance, does not seem to be food but is legally defined as such. These are the various vitamins and minerals, single substances like amino acids, and secondary plant-content materials offered as nutritional supplements in the form of pills or capsules created and marketed because, supposedly, normal nutrition is no longer adequate.

Some Examples of Nutritional Supplements:

- Vitamins and minerals
- L-Carnitine (affects the metabolism)
- Carotene (provitamin)
- Selenium (trace element)
- Omega-3 fatty acids (found in fish oil)
- Gamma-Lanoleic acid (found in Evening Primrose Oil, for example)
- Co-enzyme Q10 (important for cell metabolism)
- Secondary plant content material (coming soon)

All of these nutritional supplements occur naturally in foods. In fact, that is where their effectiveness, i.e. health-promoting qualities, was first observed.

Example: Omega-3 fatty acids instead of mackerel:

Omega-3 fatty acids are found in fish oils. A polyunsaturated fatty acid, it is regarded as being very active biologically. Its positive nutritional effects were discovered when it was observed that Eskimos, whose diets consist mainly of animal products, suffered less from arteriosclerosis than the North and Central Europeans whose diets also contain many animal products. Studies showed that the difference was in the form of the food consumed. While the Eskimos ate a lot of fish, the Europeans ate more beef and pork, and fish fat is very different from that of beef or pork. Because they move in water, fish can not use heavy, saturated fatty acids. They must have a "light," unsaturated fatty acids, similar to vegetable oil for their organism. These biologically "active" fatty acids were named after their chemical structure, omega-3. They help prevent the formation of the plaque found in arteriosclerosis, a common result of our lifestyles and of refined foods: animal fat (land animals), animal protein in excess, cholesterol (animal products), lack of exercise, smoking, alcohol, and so forth.

The fact that industrialized nations have a higher risk for sclerotic diseases is not due to a lack of unsaturated fatty acids, as found in fish oils, but rather to bad habits in choosing food and lifestyles.

Nutritional counselors now recommend vegetable oils which contain similar unsaturated fatty acids. The fatty acids found in fish oils, especially mackerel, are supposed to be even more effective; eating more ocean fish or using fish oils is recommended. On one hand, there is a problem of availability and on the other hand, there is a problem of taste. Fish oils have an intense, fishy taste that is not always acceptable. Additionally, these special fatty acids have been isolated and are now offered in the form of nutritional supplements. However, no attention was given to the question of whether the consumption of such fatty acids separate from the whole fish is sensible.

Food Supplements: Yes or No?

Food supplements are not suitable or effective on a permanent basis. They cannot balance unhealthy habits in nutrition and lifestyle over long periods of time. In the case of illnesses related to metabolic disorders, a doctor-prescribed substitution for a specific length of time can be helpful. In these instances, concentrated preparations made from plants, and so forth, are more effective than isolated, synthetic preparations.

In order to balance deficiencies permanently, the causes must be remedied. How can food that gives people adequate nourishment be raised and grown? Plants and animals that can develop in optimal conditions for their species (organic agriculture) are the best foundation for our nutrition.

Functional Foods

In earlier times almost everyone knew that food promoted good health, even prevented illness. Today this knowledge has almost disappeared. For instance, one knew that garlic prevents arteriosclerosis, that onion juice is good for coughs and cherry juice for blood formation. A more analytical scientific view has reduced food to its nutritional qualities. With the knowledge of vitamins, minerals, and trace elements, this clinical viewpoint has expanded to include the "effective mechanisms" necessary for metabolism. Vitamins are touted as disease preventatives, not only as cures for specific illnesses resulting from vitamin deficiencies such as scurvy (vitamin C), or beri-beri (vitamin B1). Historically, diseases resulting from vitamin deficiencies occurred only when the diet was very one-sided. The diseases were not cured or prevented by taking isolated vitamins, but rather by eating whole foods such as sauerkraut or fresh, spring herbs and citrus fruits for scurvy, and brown rice for beri-beri.

In the last few years, especially in the USA and Japan, the particular health-enhancing effects of particular foods have been newly revisited. Such

foods are described as functional foods. They are supposed to have supplementary positive effect on physical or mental health in addition to their value as nutrition. Foods are now assigned effects over and above their supplying of nutrients (nutritional physiological value).

In other words, in addition to their nutritional value, functional foods have positive influences on health, physical energy, and mood of individuals.

Our modern way of thinking still defines health value in purely materialistic terms. Single substances are researched such as lycopene found in tomatoes or omega-3 fatty acids found in mackerel. With the intention of rounding out the nutritional "programs" of individuals, such substances have been isolated and offered as supplements. However, various studies have shown that these substances do not work as well in their isolated form as when consumed in natural foods. Some studies have even shown harmful effects. Clearly nutritional supplements do not replace whole foods.

A functional food, therefore, must be a real food, not a powder or a tablet. It should be a staple food that is eaten daily so that regular consumption is assured.

Functional Foods

- are foods (no capsules, tablets, or powders)
- are eaten daily
- fulfill special functions besides their nutritional value

Admittedly, this approach to nutrition has already been taken up by the commercial arena. In Japan functional foods must be approved and their health-promoting properties proven through research studies. So companies are now doing this for their specific products and not for natural foods like fruits or vegetables. Chewing gum with teeth-protecting sugar substitutes and hypoallergenic rice from which the protein allergen has been removed are now officially recognized as functional foods.

The second nation to label functional foods was the United States, first functional foods arising in the fitness and wellness movement: drinks that are supposed to enhance the physical capability of athletes by supplying energy (usually from sugar) and certain vitamins, minerals, and other additives. This development led into customized foods based on the very latest standard of knowledge (food design). Often a supplement or an additive

is still under scientific scrutiny and discussion when it is offered to the public as an additive in some foods.

In Germany the term "functional food" is not yet legally recognized. Still, there are foods already available with such additions. Belonging in this category are pro-biotic and pre-biotic milk products containing special bacteria cultures originally isolated from human intestines and then cultured, supposedly to improve the intestinal flora, stimulate the immune system, and increase the cleansing function of the intestines. Naturally, these processes are especially aided by the use of product X from manufacturer Y with the patented bacteria culture Z. Research trials confirm these statements. These same results apply to regular yogurt.

That food has a much greater role than mere nourishment has been generally accepted, but at the same time, it is being commercially abused. Supplements are not viewed as natural components of food, but rather as substances that must be put into it by the food industry. In the near future it may very well be that certain substances will be injected into natural foods through genetic engineering, thus turning them into functional foods.

A further problem exists because of the narrowness of our vision. For example, while tomatoes are seen to be cancer preventatives because they contain one substance, they also contain many substances that can be shown to cause cancer.

Convenience Products

A paper on new food products would be incomplete without convenience products. Convenience products are supposed to make food preparation easier. The term "convenience food" is practically synonymous with "pre-cooked" or "fully-cooked" food, often with a negative twist of being degenerated, low-quality products. Of course, this does not apply to all convenience products. In principle, bread is a convenience food; it relieves us from eating porridge that must always be prepared fresh and it frees us from set meal times and the need to be in the kitchen: One can always take along a slice of bread and eat it at any time.

This principle of convenience now applies to a great variety of foods. The most obvious convenience foods include prepared soups, sauces, and puddings; entrees that need only be warmed; baking mixes; granola and other cereals; instant powders, and pre-cooked foods that require less cooking time (for example, grains and legumes). These products have been available in conventional grocery stores for a long time and are now being sold in health-food stores.

One major disadvantage of convenience products is the preservation process, be it through the use of chemical preservatives, heat processes (sterilization, pasteurization), cold processes (freezing, for example), or air

exchange processes (CA-controlled atmosphere, or removing oxygen and replacing it with nitrogen or carbon dioxide).

Convenience foods can lead to poor eating habits in particular to a decline in the consumption of fresh foods. However, this is mainly dependent upon the consumer and his or her buying and eating habits.

The convenience is saving time; the amount of work needed for food preparation is greatly reduced. Advertising expounds upon the many possibilities for variety, but this should be critically examined. Prepared foods exhibit a certain monotony, a sameness in taste and appearance that is often glossed over in advertising.

Convenience: Joyful living without frustration?

An apartment without a kitchen? Something that seems unthinkable in Europe is already well-known in the USA. In many households only a refrigerator and a microwave oven indicate that warm meals are ever available there.

This development became possible through modern convenience products. Open the package, heat for five minutes in the microwave, and there you have a finished meal on the table.

> *But convenience means more that mere timesaving and comfort. Convenience brings variety and change in the menu plan. Mexican tacos, Asian rice, or Italian pasta; the culinary world is now open to those who are less talented in the kitchen.*
>
> – Taken from: *Food Ingredients Aktuell*, July 1997

Convenience products have brought the principle of division of labor now more strongly into the home. As always with new developments, other skills, parts of daily culture, are lost. On the one hand it is regrettable, but on the other hand, it is a fact that today fewer and fewer people wish to cook daily in their households.

Convenience products can not be separated from societal development, obviously because these foods are purchased more and more often, obviously because they fulfill a need of consumers. Let us take a quick look at the societal changes in the last few decades.

Changing Food Habits

Societal and demographic changes have given nutrition a different significance. The time available for purchase, preparation, and eating is decreasing. Further the lack of knowledge and the will to occupy ourselves with nutrition are on the increase.

In earlier times, one purchased food daily. Today food shopping occurs only once or twice per week. Food with a longer shelf life is required (pasteurized milk today lasts five days, earlier two days, UHT milk up to six months). When in Germany UHT milk makes up fifty-two percent of all milk purchased, this says much about our changed eating habits.

At the same time, however, freshness is an important and sought-after criterion for quality. On vacation and during free time, people shop pleasurably in markets, bazaars, and the gourmet sections of grocery stores. In the health food industry, the trend is for larger stores with expanded services: more parking, packaged products, subscription produce, and home delivery. Service is desired so that shopping takes less time. Households have become smaller; large cities have up to fifty percent single-occupant households.

Preparation

Daily people eat in restaurants, cafeterias, bistros, and cantinas. Even in families, fast food is desirable and promoted through technology (freezers, microwaves) and convenience products. On the whole, less cooking is done because skills and time are on the wane.

At the same time, people have higher expectations for their meals because of vacations, advertising, and experiences in restaurants. More and more consumers are eating Chinese or Italian food without knowing how to prepare it themselves from scratch. For this reason, more prepared or partially-prepared foods are purchased, everything from frozen pizza to canned minestrone soup. For example, in the natural foods industry, prepared Italian tomato sauce and frozen oven-baked Frenchfries are very popular.

Eating

Our eating culture is changing. In families there are fewer mealtimes together because, among other things, it is technically possible with microwave ovens to eat separately without much trouble. Even children can prepare a meal for themselves when they get home from school or play. Non-rhythmic lifestyles are on the increase, along with the desire for lighter foods. Often, meals dissolve into several small snacks in which finger foods are chosen.

The goods sold in grocery stores are changing because all of us have changed. This may cause some to complain but it simply is the result of changes in our lifestyles.

Is Our Nutrition Insufficient?

During his agricultural course in 1924, Rudolf Steiner warned: "Even the materialistic farmer, if he is not simply living a dulled existence, but

contemplates things that are going on daily, or at least yearly, can calculate approximately how many decades it will take until the products are so degenerated that sometime during this century they can no longer serve as adequate nutrition for people." Is our nutrition really no longer adequate? And, if that is the case, how can it be improved?

The concept of nutritional supplementation identifies the deficiency as a lack of certain substances. Can this can be remedied through substitution, i.e. adding these substances taken from material that is possibly already deficient?

However, implementing this supplementation concept can not alter the fact that many people do not fully nourish themselves with enough fruit, vegetables, whole-grain bread, and other grain-based dishes due to stress, extraordinary pressures, or simply not paying attention to eating a whole-foods diet with enough variety. This is the responsibility of the individual and can be most easily improved by changes in eating habits to include highly nutritious foods. However, the situation is not helped by quick and comfortable "solutions" like swallowing pills, for instance.

The idea that it is possible to substitute a whole-foods diet with supplements is driven by materialistic thinking. Conventional science defines food based exclusively on its identifiable nutrients that are seen as the only valuable components. For this reason a vitamin that has been added is given the same value as one that is originally contained in the food. This kind of evaluation can be changed only if a different understanding of quality underlies our concept of nutrition. This is also key to the above statements by Steiner.

Health Food

Already in the nineteenth century, and especially at the beginning of the twentieth century, new approaches and ideas about new nutritional forms were born. The increasing influence of technology on food, and the separation and isolation of single components were all compared to a more holistic view of quality. Dr. Bircher-Benner (1867–1939) was a pioneer in this field. He recognized the life-forces, the compressed sunlight, found in plants. He prescribed specific juices and raw foods to heal sick people; very much in opposition to the accepted medical knowledge of his time. In the 1940s Werner Kollath (1892–1972) created a foundation of a whole-foods diet that was later further developed by the Giessener Group associated with Dr. C. Leitzmann. This group also spoke of the important influences of Dr. Kollath and Dr. Bruker and, later, about bioactive substances. Substances were described that had been recognized as being necessary during animal testing, but these substances could not be analytically proven at that point in time.

For a long time one believed in still-unknown vitamins or trace elements. With the methods of analysis available the last few decades it has become possible to examine these substances more closely which were known to be components of food but whose effects remained unclear. Often these substances were found to be so-called non-nutritive substances that were, in part, qualified as being harmful to health. For example, this was the case with phytine, a phosphorus-storing substance found in seeds of grains or legumes. Today phytine is known as a bio-active substance that has cleansing and cancer-preventing qualities when consumed in normal amounts. Similar re-evaluations have occurred with the natural plant pigments (carotenoid, anthocyane), and with flavorings such as sulfur oils found in onions and garlic, for example.

Always one is looking to a substance that underlies metabolic properties. In whole-foods diets there is a clear distinction made between naturally-grown foods and highly refined food products in which these fine substances are partly missing. The background for a holistic view, does not, however, include consideration of the actual liveliness in foods as an independent force.

Therefore, their recommendations are often based on, as Dr. W. Kollath said, "Let the natural remain as natural as possible." In actuality, this attitude negates the human spirit; it implies that human beings do more harm than good in their interaction with their nutrition. The fact that food preparation can cause an improvement in the nutritional quality of the food is hardly recognized. A possible loss of vitamin content often means a gain in the flavor and tolerance of food. This is one aspect of the anthroposophical approach that goes beyond the material. It associates human beings and their cultures with the creation and preparation of their nutrition. Through their ideas and will, human beings are in a position to affect positive changes in their nutrition and, with that, to encourage development.

The Anthroposophical Approach

In 1924 Rudolf Steiner (1862–1925) gave a professional course for farmers in order to bring a new impulse into agriculture. Steiner wished to help farmers to produce real, nutritional food. Speaking of the basic tenet for creating quality nutrition he said: "Forces must be taken from the spiritual realm." In other words, only through a newly developed understanding of who human beings are, can really nutritious, and not just stomach-filling, food be grown. The degrees of inner flexibility, vitality, and maturing forces are measurements of quality. What modern food should give people is stimulating energy that offers them the possibility of working on their inner selves and being active in the soul-spirit.

The trend of supplementing foods with isolated substances is really in opposition to human needs. The exceptions are people with illness-related,

and not nutritionally-related, deficiencies. The question arises of just how far the increased supplementation of isolated substances can go in embedding themselves into the structure of a living organism, causing inner strain, sluggishness, or deposits. This would be the opposite to the image of inner stimulation, fullness of ideas, and desire for activity.

Anthroposophically-oriented teaching about nutrition is based upon another image of human beings than is normally presented by natural science. If human beings are imagined to be only physical bodies that have to be given consumed material and energy so that they are capable of activity, then nutrition is understood to be the optimal consumption of nutritional substances and calories. However, if human beings are seen to be soul-spiritual beings that have enlivened physical bodies, then, at the very least, it is acknowledged that nutrition has a far-reaching influence. It is then comprehensible that the emotional impression, for instance, that food makes upon people is significant. A meal eaten with pleasure is much better received than one that is swallowed with difficulty. Foods that are hard to digest are also difficult for the soul-spiritual life. This can just as easily happen with constant, small snacks as with a single, very heavy meal. With time it can affect one's ability to concentrate. Other foods facilitate soul-spiritual alertness, such as grains, for example, that, as complex carbohydrates, support spiritual and physical activities.

However, nutrition does not stand alone as the single determining factor. One can not eat one's way into Heaven, thereby improving the quality of one's thinking. This must still be accomplished through working on one's inner self. But one can either make one's life, health, and ability to concentrate easier or more difficult, depending upon one's choices in food and drink.

What Nourishes Human Beings?

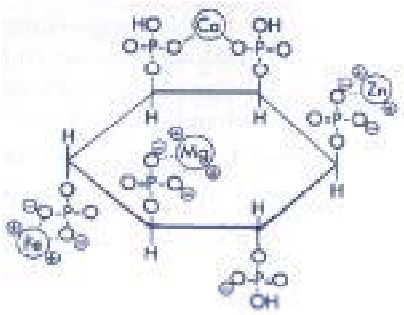
Against this backdrop it becomes clear that, with food, what it comes down to is the spiritual background, that is to say the idea of the food, the plant, or the animal. At first is the thought and then comes the material manifestation. First the idea of "apple" must be there before the appropriate genes can form which allow the tree to grow. This is comparable to a human being who wishes to build a house. First comes the idea, then a plan is made, and that plan is put into action with material such as stones, wood, and so forth. As something that is not alive, a house is held together by static forces. Food is held together by forces of life. If those forces are no longer effective, the food decays. This life force can be seen in the forms, the configurations, such as an apple tree and the apples, or the pork cutlets.

Life forces (formative forces) are what food is comprised of. When we eat an apple, we destroy its structure in our mouth, and during the course of its digestion everything that could identify it as the original apple is broken

down: apple protein, apple fat, and apple carbohydrate. Food allows human beings to become active, to build energy and enzymes in the gallbladder and pancreas in order to purposely and specifically digest food.

The necessary self-activity of digestion strengthens us. It is similar to physical training. During this activity energy is gained that is used for the formation of human substance. Food makes us internally flexible and alert.

Mineral absorption almost always takes place through the consumption of animal and plant foods. One exception is salt; it is a pure mineral. Such direct minerals which we take in without the "help" of plants or animals present us with similar challenges to isolated vitamins and pills containing nutritional substances. We must first integrate them into our organism. They offer us no stimulating forces because they come from a non-living sphere. One significant characteristic of these substances is their prominent crystalline structure. For example, vitamin B-2, (seeillustration). Alternatively, the natural vitamins contained in a plant or animal organism have a living connection to the cells and other substances. We get these vitamins in foods such as cheese, vegetables, and so forth. We benefit from the integrative work already accomplished by the plant or animal and do not need to perform this work ourselves. Therefore we should be cautious when it comes to the intense absorption of pure minerals; metabolizing could easily become too intense for us.



Phytine

In 1924 Steiner spoke about the degeneration of food that would occur at the end of the twentieth century. He surely meant this loss of quality at the living level. Diminishing, reduced, or one-sided formative forces lead, for example, to an inability in plants to properly absorb minerals from the soil into their organisms. This would require human beings to put more into their metabolic activity in order to integrate minerals into their organisms. It would require metabolic forces which, today, human beings no longer have at their disposal.

Steiner said that the application of mineral fertilizers prevent the plants from finding enough liveliness in the soil. After a few decades the plants are weakened in their ability to form protein; deficient protein quality is the result of too little liveliness in the soil. In turn, if people eat these plants, then they are missing the inner liveliness, the stimulation for their own protein formation, the energy increase that a whole-foods diet can give.

A diet that is deficient in inner liveliness but supplemented with isolated mineral substances will have a weakening effect in the long run. Therefore,

a worthy goal is to produce, procure, and eat strong, vital, and fully-ripened foods without mineral supplements.

The Task of Agriculture, Processing, and Preparation

Then it is clear what the task for agriculture is in growing food. Instead of adding non-living minerals (first and foremost, nitrogen fertilizers), it must be realized that plants need living soil. Ecologically sound cultivation methods are helping us along in this direction by advocating the use of animal and plant fertilizers (manure and compost). The biodynamic method uses preparations as well that come from all the realms of nature and, through their particular preparation, help plants absorb living forces. Part of the biodynamic method purposely is to stimulate the liveliness within plants in order to cultivate a living quality.

"Liveliness" does not mean that all foods should be eaten raw or that the plant is the liveliest. That would be a purely quantitative interpretation. "Liveliness" in plants shows itself in the entire structure, in growth, ripening, metabolism, and substance formation. It comes down to a qualitative, inner quality.

The task of processing is to form the "raw materials" from plants and animals so that an improvement in their inner quality can occur. Processing and preparation are formative and creative tasks. There are different guidelines or rules for different foods. For instance, a salad is already complete and just needs a dressing to "refine" it, but not through a cooking process. On the other hand, the forces stored within grain kernels need to be unlocked; with water and heat we can make a porridge that is especially nourishing for people with weak digestion. Or, we can make a nourishing, will-promoting, hefty loaf of whole-grain bread. In each case different forces in the human organism are required and activated in order to deal with food made from whole grains. Looked at in this way, processing and preparation can have a variety of effects:

- Improvement in food-tolerance and digestibility
- Lengthening of storage life
- Improvement of flavor
- Development of new products

Food for the Future

Reviewing the tendencies of our time, one can begin to see trends:

1. One way is the addition of isolated substances, selective alteration, and functional foods with one singular quality. In this case, human beings are viewed as creators of new products.

2. The other way portrays nature as the creator and best source of food. In this case only foods in their natural state are recommended. This way excludes any positive effects of human creativity on food processing and preparation.

3. The middle way strives for integration, with nurturing the creative abilities of people, and with becoming creatively active with respect for the life of food crops and animals. Unlike the other two directions, this way can not be clearly defined, it is preconnected with our changing culture and the possibilities of plants and animals. It requires creativity, intuition, and inner flexibility. For example, a whole-grain can be prepared in such a way that it gains digestibility without losing any of its inner value, or fruit can be cooked and seasoned so that it tastes like a different food. The conditions in which animals are housed and fed play a role in agriculture. How can one get a good-quality meat when the animal is never allowed outside the barn, or a chicken lay its eggs onto a conveyor belt from a narrow cage? Ethical views in food production belong to this middle way. One could speak of "cultural food," as food that is made for people and meets the needs of the consumers and not just those of the producers.

Just exactly how the food of the future will be depends on us, the consumers. We will buy and eat the foods that meet our needs. We can make our purchases in a conscious way, using the head and the heart and not only out of an unconscious want. What follows are some recommendations for creating a healthy, consciously-conceived diet.

Suggestions for Food Choices

- Biodynamically grown foods (Demeter) or organically grown foods because of the superior quality of the growing methods.

- A predominantly plant-based diet with milk and milk products. Meat, fish, and eggs can be included in small amounts. One should pay attention that the animals are raised in a species-appropriate manner.

- Processing serves to open-up the food and should improve tolerance, digestibility, and sensory quality for the people eating it. Techniques involving genetic manipulation and irradiation are undesirable. Intensively processed foods such as isolated substances (isolated protein, for instance) or additives (artificial sweeteners, synthetic fats) should be avoided. This also applies to

foods with such additives as preservatives, artificial colorings, and artificial flavorings.

- In food preparation, use fresh products quickly (no long storage); a gentle cooking method for vegetables (steaming instead of boiling); allow enough time for liquid absorption when preparing grains, bread, and legumes. Frozen foods and microwave cooking should be avoided. Good seasoning with herbs and spices not only improves the taste, but also strengthens health-giving qualities of food.

- Nutritional supplements such as isolated vitamins or minerals are superfluous in the daily diet.

- In general, fruit and vegetables that are in season and grown in your region should be given preference, with occasional choices of tropical or "exotic" fruits.

- Cold-pressed vegetable oils and butter as well as oily seeds, nuts, and almonds. Protein requirements should be met for the most part by plants, milk and milk products. Vitamins, minerals, and trace minerals are abundantly present in vegetables, fruits, and grains.

It is hoped that this article has provided information and background about the development of modern food and will be a help in consciously creating your own individual nutrition plans.

Timeline
Edibles & Quaffables
[Added by the editor]

The Nineteenth Century

1872, Blackjack chewing gum
1876, Premium soda crackers (later Saltines)
1881, Pillsbury flour
1886, Coca-Cola
1887, Ball-Mason jars
1888, Log Cabin syrup
1889, Aunt Jemima pancake mix
1889, Calumet Baking Powder
1889, McCormick Spices
1889, Pabst Brewing Company
1890, Knox gelatine
1890, Libby introduces keys to canned meat
1890, Lipton tea
1891, Del Monte
1891, Fig Newton
1891, Quaker Oats Company
1893, Cream of Wheat
1893, Good & Plenty
1893, Juicy Fruit gum
1894, chili powder
1895, shredded coconut
1895, Triscuits
1896, Cracker Jack
1896, Michelob beer
1896, S&W canned foods
1896, Tootsie Roll
1897, Campbell's condensed soup
1897, Campbell's tomato soup
1897, Grape Nuts
1897, Jell-O
1898, Nabisco graham crackers
1898, shredded wheat cereal
1899, Wesson oil

The Twentieth Century

1900, Chiclets gum
1900, cotton candy
1900, Hershey's chocolate bar
1901, instant coffee
1902, Barnum's Animal Crackers
1902, Karo corn syrup
1902, Pepsi
1903, Best Foods
1903, canned tuna
1903, Sanka
1903, Sunshine Biscuit Company
1904, banana split
1904, Campbell's Kids introduced
1904, Campbell's Pork and Beans
1904, Canada Dry ginger ale
1904, Dr. Pepper
1904, peanut butter
1904, popcorn
1905, Epsicle (later Popsicle)
1905, Holly Sugar
1905, Royal Crown cola
1906, A-1 Sauce
1906, bouillon cube
1906, Kellogg's Corn Flakes
1907, Hershey's kiss
1908, Dixie cup
1908, electric toaster
1908, monosodium glutamate isolated
1909, Lipton tea
1909, Melitta drip coffeemaker
1909, puffed wheat and rice (Quaker)
1909, Tillamook cheese

The 1910s

1910, tea bag
1911, Crisco
1911, Mazola corn oil

1912, Cracker Jack puts in a prize
1912, hamburger buns
1912, Hellmann's mayonnaise
1912, Life Savers
1912, Lorna Doone cookies
1912, Morton table salt
1912, Ocean Spray cranberry sauce
1912, Vitamins
1912, Whitman's Sampler
1913, Campbell's cream of celery
1913, Oreo cookie
1913, Peppermint Life Savers
1914, Doublemint gum
1914, fruit cocktail
1914, Morton Salt girl
1915, processed cheese
1915, Pyrex bakeware
1916, fortune cookie
1916, Kellogg's All-Bran cereal
1916, Mr. Peanut
1916, Orange Crush
1917, Clark Bar
1917, Moon Pie
1918, Campbell's vegetable beef
1918, Contadina tomato sauce
1918, French dip sandwich
1918, Welch's first jam, Grapelade
1919, Fridgidaire
1919, Konabar, Peter Paul
1919, Malt-O-Meal
1919, Sunkist oranges

The 1920s

1920, Baby Ruth
1920, boysenberry
1920, Good Humor bar
1920, La Choy Food Products
1920, Wonder Bread
1921, Betty Crocker
1921, Eskimo Pie
1921, Hershey kisses get blue & white streamer
1921, hybrid corn
1921, iodized salt
1921, Land O' Lakes butter
1921, Mounds bar
1921, Oh Henry!
1921, Sioux Bee Honey
1921, White Castle hamburger
1921, Wonderbread
1921, Wrigley's gum
1922, A&W Root Beer
1922, Charleston Chew candy
1922, Almond Rocha
1923, Milky Way bar
1923, Reese's Peanut Butter Cup
1923, Welch's grape jelly
1924, Bit-O-Honey candy
1924, Caesar salad
1924, Dum Dum sucker
1924, fruit-flavored Life Savers
1924, packaged sliced bacon (Oscar Mayer)
1924, Wheaties
1925, Green Giant canned peas
1925, Mr. Goodbar
1925, Wesson oil
1926, Cobb Salad
1926, Hormel canned ham
1926, Milk Duds
1926, Orange Julius
1927, Gerber baby food
1927, homogenized milk
1927, Kool-Aid
1927, Lenders bagels
1927, Mike & Ike
1927, Wonder Bread
1927, Welch-ade
1928, broccoli introduced to U.S.
1928, Butterfinger
1928, Peter Pan peanut butter
1928, Nabisco shredded wheat
1928, Progresso Foods
1928, Reese's Peanut Butter Cups
1928, Rice Krispies
1928, Velveeta cheese
1929, Colombo yogurt
1929, Karmelkorn
1929, Klondike bar
1929, Libby canned pumpkin

1929, Lithiated Lemon (later 7-Up)
1929, Niblets corn
1929, Oscar Mayer weiner
1929, Po' Boy sandwich
1929, Popeye the Sailor
1929, Ruby grapefruit

The 1930s
1930, Birds Eye Frosted Foods
1930, Bisquick
1930, Jiffy Biscuit Mix
1930, Lime Jell-O
1930, Mott's Apple Sauce
1930, Snickers
1930, Toll House cookies
1930, Twinkies
1930, sliced Wonder Bread
1931, Alka-Seltzer
1931, Beech-Nut baby food
1931, Cryst-O-Mint Life Savers
1931, dehydrated onion
1931, The Joy of Cooking, Irma S. Rombauer
1931, Reed's Butterscotch candy
1931, Tootsie Pop
1932, 3 Musketeers bar
1932, bagel
1932, corn chips
1932, Heath bar
1932, Jell-O chocolate pudding
1932, Skippy peanut butter
1933, Budweiser Clydesdales
1933, canned pineapple juice
1933, Lithiated Lemon renamed 7-Up
1933, Prohibition ends
1933, Sunsweet prune juice
1933, V8 Juice
1933, Waldorf salad
1934, Campbell's chicken noodle
1934, Campbell's cream of mushroom
1934, Ritz crackers
1934, Sugar Daddy
1935, 5 flavors Life Savers
1935, Adolph's Meat Tenderizer
1935, Friendly Ice Cream restaurant
1935, Realemon lemon juice
1935, Royal Crown cola
1935, Sugar Babies
1936, Dom Pérignon champagne
1936, Elsie the Cow (Borden)
1936, 5th Avenue bar
1936, Girl Scout cookies
1936, Mars Bar
1936, Waring blender
1937, A & P Supermarket
1937, Good 'n Plenty
1937, Kit Kat bar
1937, Kix cereal
1937, Kraft Macaroni & Cheese Dinner
1937, Pepperidge Farm Bread
1937, Ragu Spaghetti Sauce
1937, Rolo candy
1937, shopping cart
1937, Smarties
1937, Spam
1938, Bumble Bee tuna
1938, Hershey Krackel bar
1938, Lawry's Seasoned Salt
1938, Mott's apple juice
1938, Nescafé, first instant coffee
1938, Nestlé Crunch bar
1938, Teflon
1939, food stamps
1939, Lay's potato chips
1939, Nestlé chocolate chip
1939, pressure cooker
1939, Sara Lee cheese cake

The 1940s
1940, cellophane-wrapped meat
1940, Dairy Queen
1940, McDonald's
1940, Rain-Blo gum ball
1940, York Peppermint Patty
1941, Cheerioats (renamed Cheerios in 1946)

1941, garbage disposal
1941, M&M's Plain chocolate candies
1942, Dannon yogurt
1942, Kellogg's Raisin Bran
1942, Sunbeam bread
1944, Chiquita banana jingle
1945, Constant Comment tea
1945, Fleischmann's Active Dry Yeast
1945, Junior Mints
1945, Tupperware
1946, French's Instant Potatoes
1946, Minute Maid frozen o.j.
1946, Mrs. Paul's frozen food
1946, Ragu pasta sauce
1946, Tupperware
1947, Almond Joy
1947, aluminum foil
1947, cake mix
1947, Kraft singles
1947, Minute Maid o.j. concentrate
1947, Reddi-Wip
1948, Baskin-Robbins
1948, Nestle's Quik
1948, V-8 juice
1949, electric dishwasher
1949, Jolly Rancher candy
1949, Junior Mints
1949, Minute Rice
1949, Pillsbury Bake-Off
1949, Whoppers malted milk balls
1949, violet M&Ms replaced with tan

The 1950s

1950, Ball-O-Fire gumball
1950, cyclamates
1950, Dunkin' Donuts
1950, Green Giant Co.
1950, Sugar Pops cereal
1951, Ore-Ida Foods
1951, Swanson beef, chicken, turkey pot pies
1951, Tropicana juice
1952, fish sticks
1952, Kellogg's Frosted Flakes
1952, Lipton onion soup mix
1952, No-cal Ginger Ale, 1st sugar-free soft drink
1952, Pez comes to the U.S.
1952, Saran Wrap
1953, Cheez Whiz
1953, Danny's Donuts opens (became Denny's in 1959)
1953, Howdy Doody tumbler from Welch's
1953, Irish coffee invented in S.F.'s Buena Vista Cafe
1953, Lawry's spaghetti sauce
1953, Sugar Smacks cereal
1953, Swanson TV dinner
1954, Burger King
1954, Butterball turkey
1954, colored appliance (G.E.)
1954, M&M's Peanut Candies
1954, Reddi-wip
1954, Shakey's pizza opens
1954, Trix
1955, Del Monte stewed tomatoes
1955, Kentucky Fried Chicken
1955, McDonald's
1955, Special K cereal
1956, Imperial margarine
1957, Sweet'n Low
1958, aluminum beverage can (Coors)
1958, Cocoa Krispies, Kellogg
1958, Cocoa Puffs, General Mills
1958, Green Giant canned beans
1958, Internation House of Pancakes
1958, Jif Peanut Butter
1958, Lipton Instant Tea
1958, Pizza Hut (Wichita, KS)
1958, Rice-a-Roni
1958, Williams-Sonoma opens
1959, Haagen-Dazs ice cream
1959, Frosty O's, General Mills

The 1960s

1960, Coffee Rich non-dairy

creamer
1960, Dominoes pizza (Detroit)
1960, Granny Smith apple imported to U.S.
1960, red, green, & yellow M&M's
1960, Sprite
1961, Coffee-Mate non-dairy creamer
1961, Green Giant frozen vegetables
1961, Mrs. Butterworth's Syrup
1961, Total cereal, General Mills
1961, Charlie the Tuna (Starkist)
1961, kiwifruit
1961, Sprite
1962, Bridgford frozen bread dough
1962, Diet-Rite cola
1962, Pet-Ritz Frozen Pie Crust
1962, Taco Bell
1963, Chips Ahoy! cookies
1963, Chiquita banana blue sticker
1963, Cremora non-dairy creamer
1963, Fruit Loops
1963, self-cleaning oven
1963, Tab cola
1963, "The French Chef" debuts
1963, Weight Watchers founded
1964, Kellogg's Pop-Tarts
1964, nachos
1965, Cool Whip
1965, Gatorade
1965, Poppin' Fresh, Pillsbury Doughboy
1965, SpaghettiOs
1965, Tang
1966, Fresca
1967, Bugles
1968, McDonald's Big Mac
1969, Bac-Os
1969, Diet 7-Up
1969, sugarless gum

The 1970s
1970, Eggo waffles
1970, Hamburger Helper
1971, canned A&W Root Beer
1971, Jell-O pudding treat
1971, Rolos candy
1971, smoked Spam
1971, Starbucks
1972, Egg McMuffin
1972, Top Ramen
1972, Tuna Helper
1973, Cuisinart food processor
1973, Honey Maid cinnamon grahams
1976, Jelly Belly
1976, orange M&M's
1977, McDonald's Happy Meal
1977, Yoplait yogurt
1978, Reese's Pieces

The 1980s
1981, aspartame
1981, Prego spaghetti sauce
1981, Stouffer's Lean Cuisine
1982, Diet Coke
1982, Equal
1983, Nutrasweet
1984, Ben & Jerry's ice cream
1985, Cherry Coke
1985, New Coke
1985, Pop Secret microwave popcorn
1986, Classic Coke
1987, Cherry 7-Up
1987, Nestlé Alpine White chocolate bar
1987, soy milk
1989, Symphony candy bar

The 1990s
1990, Campbell's cream of broccoli soup
1990, dolphin-safe tuna
1990, Hershey's kisses with almonds
1990, Jamba Juice
1992, Crystal Pepsi
1992, Spam Lite
1993, The Food Network
1993, Hershey's Hugs
1995, blue M&Ms
1996, Olestra
1998, Jell-O Museum, Rochester, NY
1998, Pepsi One

1998, Wow potato chips
1999, Benecol
1999, Hershey's Bites
1999, Incredibles, push-up food

The 21st Century

2000, Betasweet carrot,
bred to be a powerful
antioxidant
2000, Heinz green ketchup
2000, pre-cut carrots and celery sticks
2001, Boston Market Homestyle Meals
2001, Chicken of the Sea Tuna Salad Kits
2001, Heinz purple ketchup
2001, It's Pasta Anytime
2002, Multi-colored M&Ms