

Chapter 6

Enzymes and Live Foods

Among the health claims commonly made for natural foods and supplements, including the cereal grasses, is the promise of the benefits of active enzymes. Dehydrated wheat grass and barley grass do contain a wide variety of enzymes, but current evidence suggests that the health benefits provided by dietary enzymes is limited, at best. We believe it is important that some balanced information on this subject be provided.

Almost everyone has heard the word enzyme. People who are less familiar with the biological sciences tend to think of enzymes as sort of magical, living chemicals. In a sense, they are right.

All proteins associated with the human body, or with any living system, do something. Some of them form structures, like fingernails; others, like hormones, participate in chemical reactions. Enzymes are proteins which stimulate chemical reactions between other proteins. They are present in every living thing, and may continue to function long after the organism is no longer technically alive.

The reactions which enzymes stimulate are essential to the life process. It is estimated that a single human liver cell contains at least 1,000 different enzyme systems.⁵⁰ The total number of enzymes in our bodies can only be speculated on; the number of individual enzyme molecules is virtually inestimable. The same is true for any complex living system, such as a green plant.

Enzymes do their work by reducing the energy required for individual reactions to take place. In other words, enzymes make it easier for two proteins to react together. Enzymes themselves are not altered by the reactions they stimulate; they are not “used up” by performing their functions. They are catalysts. Figure 6.1 illustrates this principle.

Hundreds of thousands of reactions are taking place in the cells of your body as you read this page. Your central nervous system is busy processing this information while your digestive system is processing your last meal. Your

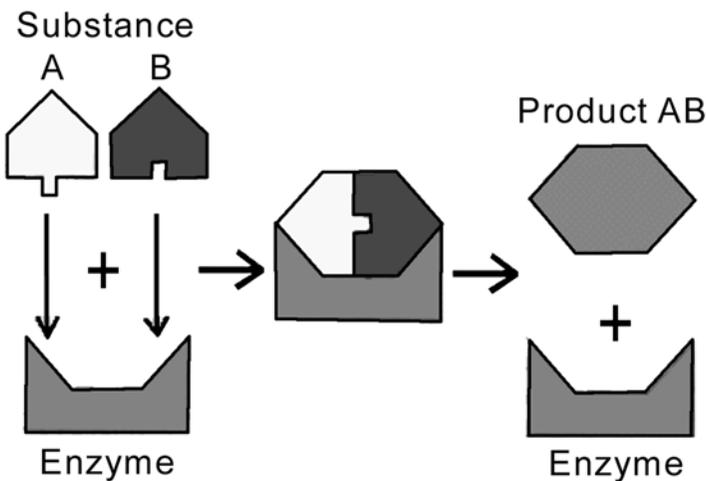
immune system is handling the many germs and particles which have entered your body, your heart is beating, and many cells are being made and replaced as other internal systems carry out a multitude of other intricate processes. All of these functions involve numerous enzymes.

Because enzymes are so important to everything our bodies do, some might think it a good idea to take enzyme pills and eat “enzyme-rich” foods. Unfortunately, with one very important exception, the enzymes in foods and pills have little to do with the enzymes needed in our bodies.

The countless enzymes in our bodies are where they are—in a specific place within a specific cell type, in a tissue, or in the blood—for very good and particular reasons. The environmental conditions of that specific area of the body (pH, temperature, chemical components, etc.) provide for the synthesis of the enzyme, then activate the enzyme when it is needed. Taking enzymes into the body by way of the alimentary canal provides no benefit whatsoever to the cells in other areas of the body, which need many specific types of enzymes at specific moments, in specific sequences.

More obviously, our stomachs and intestines cannot absorb enzymes, usher them intact into the blood and then transport them to the specific cells which might use them. Enzymes, like most proteins, are rendered inactive by the acid secretions of the stomach, and then broken down by our own digestive enzymes. Even if we could identify the exact enzymes we need at

Figure 6.1 Diagrammatic Representation of Enzyme Action



the precise moments we need them, we still couldn't get them to our cells by putting them into our mouths.

The best way to insure adequate enzyme activity is to provide our bodies with the building blocks needed to make those enzymes. These building blocks are components of the foods we eat: amino acids (from proteins), carbohydrates, vitamins, and minerals.

This brings us to the one enzyme exception we mentioned previously. The one type of enzyme which people can ingest to their benefit are the digestive enzymes. Three basic kinds of digestive enzymes break down the proteins, starches, and fats in the foods we eat. Normally our bodies do make these enzymes, but some individuals, due to disease, age, or stress, cannot manufacture adequate levels. As a result, these people cannot break down their foods sufficiently to provide nutrients in a form which can be absorbed.

Digestive enzymes are available in capsules. When ingested with foods, they may contribute to the digestion of those foods. It is possible for some of the digestive enzymes to survive the acid environment of the stomach. They need not be absorbed into the body to carry out their job in the small intestines. Few of the enzymes available in whole foods function as digestive enzymes.^{7,57}

The foods we eat, like any life form, contain thousands of enzymes. Cereal grass is a virtual enzyme factory.²⁹ It contains proteases, amylases, and lipases—bustling with growth activity as it prepares itself for jointing. (See Chapter 1.) In the growing plant, countless specific enzymes are activated and deactivated at every moment, as chemical reactions spawn other chemical reactions according to growth stage, pH, temperature, etc. If they are not destroyed by processing, these enzymes can continue to function in the proper conditions even after the plant is harvested.

The level of potential enzyme activity retained in a plant after it is harvested depends on the way it is handled, stored, and packaged. Generally, protein (and therefore enzyme) structures are best retained when they are exposed to a minimum amount of light, air, and heat. When foods are stored for long periods in unfavorable conditions, or cooked in any way, their nutrient value is significantly reduced.

“Live Foods” is a term used in natural-food circles to refer to foods which are newly harvested and uncooked. Most people would agree that fresher is better, and they are right for many reasons. Fresher foods generally taste better, look better, smell better, and have higher levels of some nutrients than those long “separated from the vine.”

Aside from all these visible and measurable advantages of “live foods”, many health-conscious people feel that live foods provide an intangible, but important, benefit. This benefit is “vitality”, or the quality of “aliveness” which live foods pass on to those who eat them. Some individuals say they can see and feel this quality in living systems, others have devices which they say help them to measure it. Most of us can’t see or measure this vital energy, but would be hard pressed to deny its existence. Live foods may very well contain a kind of living energy which benefits us.

Many raw-food advocates incorrectly equate the benefits of this vitality with enzyme activity. Certainly, live foods contain active enzymes. But, as we have seen, enzymes are proteins which are digested and utilized by our body like any other proteins. Ingested enzymes do not generally provide our bodies with enhanced enzyme activity. If the quality of “aliveness” of foods is beneficial, it is for reasons other than the presence of enzymes which are still active in those foods before we eat them.

Enzymes and Live Foods: A Summary

Enzymes are proteins which stimulate vital chemical reactions in virtually every life process. All foods, when harvested, contain active enzymes. Foods which have been exposed to minimal levels of air, heat, and light may retain a high level of activatable enzymes.

Supplemental and food enzymes can potentially function in the digestive tract but have no direct effect on cells throughout the body.

Foods which are processed as little as possible are most desirable for nutrition, flavor, and aesthetic reasons. Fresh foods are also thought by many to provide an intangible benefit of vitality. If such a benefit exists, it cannot be attributed to any chemical enzyme activity which those foods convey to the cells of those who eat them.