

# Technical Bulletin

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## Bioavailability of Nutrients - What do the labels really tell us?

When it comes to evaluating nutritional products by their labels, the old adage, "You can't believe everything you read," seems to hold particularly true. It is hard to sort out fact from fiction when it comes to some of the inflated claims made on product labels. It is even more difficult to understand how to compare one product to another based on listed ingredient amounts. It seems as if every manufacturer of nutritional supplements has its own way of expressing the potency of the products.

Take enzymes for example. Some companies indicate enzyme potency in milligrams. While this may look impressive on the label, it is actually meaningless. Enzyme effectiveness depends on activity, not on weight. Other companies choose to express enzyme activity in an obscure system of units that originated in a foreign country. Some enzyme products keep you completely in the dark and don't list the potencies at all.

The system for determining enzyme potency used by the American food industry is derived from the Food Chemical Codex (FCC) and is accepted as the standard by the FDA. The activity of enzymes such as protease, lipase, amylase, etc. can be expressed in units which are well-defined by the FCC (in English). Anyone who cares to do so may look up the protocol for assay in the FCC reference book. If all enzyme activity were expressed in FCC units, comparisons could easily be made.

Infinity<sup>2</sup> has chosen to use the FCC system to measure and report the enzyme activity in all of its products, giving you the best, most easily understood information. The enzyme activity of all Infinity<sup>2</sup> products is measured and reported using FCC units.

### FCC units used by Infinity<sup>2</sup>

Protease . . . HUT . . . (Hemoglobin Unit — Tyrosine basis)  
Amylase . . . DU . . . (Alpha-amylase Dextrinizing Units)  
Lipase . . . LU . . . (Lipase Unit)  
Cellulase . . . CU . . . (Cellulase Unit)  
Sucrase . . . IAU . . . (Invertase Activity Unit)  
Lactase . . . LacU . . . (Lactase Unit)  
Maltase . . . Dp° . . . (degree Diastatic Power)

As you use these standards to compare enzyme supplements, you will see that the potencies of Infinity<sup>2</sup>s Digest-a-Meal™ and Infinity<sup>2</sup> Essentials for Life™ are high compared to others on the market, and have additional advantages that may not be immediately apparent from simply comparing label potencies. The ingredients tell a powerful story. Infinity<sup>2</sup> supplements contain no animal enzymes, only plant enzymes, which are more effective in the pH and temperature ranges of the body. In addition to lipase, protease, and amylase, Digest-a-Meal™

and Infinity<sup>2</sup> Essentials for Life™ include the entire spectrum of enzymes needed to complete the process of breaking down fats, carbohydrates and protein into usable forms.

Trying to compare the labels on vitamin and mineral supplements can also create confusion. Vitamin companies may use their labels to inflate their allegations or hide their product's flaws. Some supplements appear to be powerful combinations of vitamins, but in reality have little nutritional value and may even create drug-like reactions in the body. Weighing the effectiveness of vitamins, then, comes down to understanding some fundamental differences. Again, the benefits of vitamin supplements cannot be measured by dosage alone. In fact, natural food complex supplements are typically of a low dose, which may lead some people to believe they are not as potent or valuable. Actually, the opposite is true. "Natural" or "whole food" refers to vitamins as found in natural foods, unaltered in any way that might change their molecular, biological or biochemical combinations, or their action. You should see listed on the label the exact food source from which that vitamin is obtained.

Crystalline vitamins are vitamins which have a natural food as their original source, but these foods have been treated with high powered chemicals, solvents or heat to reduce them down to one specific, pure crystalline vitamin or amino acid. In this form they no longer contain the synergistic components (the enzymes, co-enzymes, minerals, mineral activators and co-vitamin helpers) which are essential for assimilation and utilization in the body.

Synthetic vitamins are those developed in a laboratory, where a scientist has reconstructed the exact structure of the crystalline molecule by "putting together" or chemically combining the same molecules from other sources (mostly coal tar). Both crystalline and synthetic vitamins have been robbed of important food values, even though the labels may show high "vitamin" potencies. In actuality, they are void of valuable nutrients, so they do not perform nature's curative, life-generating process.

In an attempt to standardize supplement labels and reduce confusion, new government regulations have been put in place. A key part of the new supplement labels is the Supplement Facts section where specific nutrients are listed by amounts and as a percentage of the Daily Value (%DV). But what is the Daily Value and how is it calculated?

The Daily Values are standard values developed by the Food and Drug Administration (FDA) for use on food and supplement labels. The Daily Values were created

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based on two sets of reference values, the DRI and the DRV. The DRI (Dietary Reference Intakes) are the food label values for protein, vitamins, and minerals based on population-adjusted means of the RDA (Recommended Dietary Allowances). The DRV (Daily Reference Values) are food label values for nutrients and food components (such as fat and fiber) that do not have an RDA value but do have important relationships with health. Together, the DRI and DRV make up the Daily Values used on food and supplement labels.

The RDAs used to calculate the DRIs and the DRVs were originally designed in the 1940's for the purpose of providing war rations that would ensure adequate nutrition to keep the military from becoming deficient in any single nutrient. These values were determined using military and laboratory experiments to ascertain what amount of a synthetically created nutrient would be required to prevent or correct a nutrient deficiency. These values were then adjusted according to how well the nutrient used in the experiment was absorbed. For example, the iron (Fe) requirement for adult males is calculated as follows:

Males lose ~1.0 mg of iron each day that must be replaced or iron deficiency anemia can occur. The type of iron used in the experiments was ferrous sulfate, which has a 10% absorption rate. Therefore the RDA was set at 10 mg per day for men. For adolescent males the RDA is 12 mg/day; for premenopausal women 15 mg; and for pregnant women 30 mg. The Daily Value is then calculated based on the average of the requirements for the various subgroups of the population, which for iron is 12 mg/day.

Iron found in a supplement or food will be listed on the label as a percentage of the Daily Value of 12 mg/day. If a supplement contains 6 mg of iron, it will be listed as 50% DV regardless of whether that form of iron has a 10% absorption rate or a 100% absorption rate.

As you can see the labels do not tell you much about the biological daily value of the nutrient you are ingesting. The labels do not take into consideration that the absorption of the nutrient in that particular supplement may be higher (or lower) than the form of the nutrient used to calculate the daily value. The labels also do not consider the biological activity or possible side effects of the nutrient listed. For example, ferrous sulfate is the most commonly used form of iron in supplements, but is very poorly absorbed; and what little iron that is absorbed from ferrous sulfate is not well utilized by the body. In contrast, the amino acid chelated form of iron (Ferrochel™) has an absorption rate as high as 75%, which is much higher than ferrous sulfate. This means that a supplement containing 5 mg of iron as Ferrochel™ can actually supply 3.5 to 3.75 mg of

iron to the body. This is three times the amount required to replace the iron losses and prevent anemia in males even though it is listed as only 50% DV. Ferrochel™ is in a form that is more readily used by the body and is many times more effective than ferrous sulfate. In addition, Ferrochel™ is the only iron that has been granted GRAS status by the FDA (Generally Regarded As Safe).

It is nearly impossible to compare the effectiveness of various vitamins by weight alone. Look for whole food vitamins, such as Infinity<sup>2</sup>'s Insure Plus™ and Infinity<sup>2</sup> Essentials for Life™, which list the actual food source. When reading mineral supplement labels, remember to look for amino acid chelated minerals. These are minerals which are bound to an amino acid through a patented process, making them available for use in the body just like natural, organically bound minerals. Other minerals are merely "rocks" and are not absorbed into the body. Not only should the label indicate that the minerals are chelated, but look also for the Albion patent number to be sure they are chelated by the patented process which makes them readily available for use in the body.

All of Infinity<sup>2</sup>'s products contain Albion chelated minerals and whole food sources of vitamins, which are more biologically active than commonly used mineral salts and synthetic vitamins. As you will notice on the Infinity<sup>2</sup> labels, our products have the additional benefit of CA<sup>e</sup>DS®. CA<sup>e</sup>DS® (Chelate Activated Enzyme Delivery System) is unique to Infinity<sup>2</sup>'s supplements and refers to a combination of ingredients, which ensure that each of our products are bioavailable, absorbed and transported to the cells without taking anything from the body. CA<sup>e</sup>DS® dramatically boosts the potency of each of our supplements. In other words, because of CA<sup>e</sup>DS®, the amounts listed on our labels are much more bioavailable than the same amounts in other products that do not contain this powerful delivery system.

As you can see, a supplement label often turns into advertising propaganda. Much of what is printed on labels is merely hype used to sell the product, and is not a true representation of nutritional value. Because of this, it is difficult to compare "apples to apples" when you are selecting supplements. We are taking a step forward, hoping to see a more standardized approach in using easy to understand measurements and accurate ingredient listings. We challenge our competitors to follow suit in order to make it more convenient for consumers to select products which are beneficial in their quest for health. For more information on choosing supplements and reading supplement labels refer to "How to Choose Your Supplements" and "How to Read Supplement Labels".