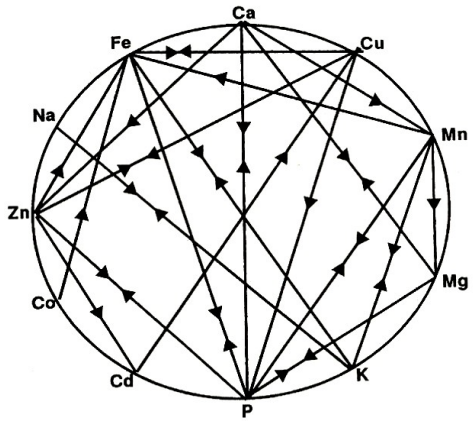
*What are minerals?

As simple as it may seem, this question is the first step in examining the role of minerals in nutrition. Webster describes minerals as a solid, crystalline substance (diamond copper, quartz, etc.) not of animal or vegetable origin. Important in this definition is the indication that their origin is not from animal or vegetable source. Minerals for nutritional purpose cannot be synthesized by the body. They must be utilized as natural elements from nature.

*Why are minerals important?

The following table shows various systems in the body which utilize minerals. **Research is showing that imbalances or deficiencies in mineral nutrition can affect these systems.**

Immune System	Cu, Zn, Fe, Se
Energy Production	Mg, P, Mn
Hormone System	Fe, Mn, Zn, Cu, Mg, K
Vitamin Production	Co
Blood Production	Cu, Fe
Enzyme System	Zn, Cu, Mn, Mg, Fe, Ca, Mo
Skeletal System	Ca, Mg, Zn, Mn, B, P
Reproduction	P, Cu, K, Mn, Zn, Mg



*What is BIOAVAILABILITY and why is it important?

One good definition of **Bioavailability** is the amount of a nutrient ingested that is absorbed and thus available to the body for metabolic use.

Bioavailabilty is important because all nutritional intake must be available to various body systems for growth, maintenance of body tissues, reproduction and other performance factors. No matter how high the nutrient levels or how well formulated the product, if it is not available then money and effort has been wasted.

*What are CHELATED MINERALS?

When minerals such as zinc, manganese, magnesium, copper, iron, calcium, and others become surrounded by and bonded to amino acids, in a stable form, this is referred to as **CHELATION**. **Chelation is a natural means for the body to transport minerals across the intestinal wall as part of digestion.**

*Why is it important for the mineral to have a stable bond to the amino acids?

Simply mixing inorganic minerals with amino acids in a liquid or dry mixture does not fall into the category of a true amino acid chelate. This simple ionic and hydrogen bonding of minerals to amino acids does not produce a stable product. Special processing must be preformed to create a stable (covalent) bond which is important for greater bioavailability.

*What makes MAC so affective?

a. Size: Picture in your mind the fuel filter on the car engine. The filter allows fuel to pass through but holds back Large particles from entering the engine. This idea applies to the absorption of minerals from the intestine to the blood stream.

Large particles cannot easily pass through the intestinal wall. Many mineral products on the market have molecular weights too large to be absorbed intact.

Through technology, chelated minerals with molecular weights small enough to pass easily through the intestinal wall. The results is a compound similar to that which the body itself produces by natural chelation.

b. Stability: Stability is maintained throughout the entire ph range encounter during the digestion process. This assures maximum presence of intact mineral chelate for absorption via the special dipeptide-like absorption process.

The body cannot utilize traditional mineral compounds in their natural state. Zinc sulfate, iron sulfate, or any sulfate, oxide or carbonate must be broken apart and restructured to allow it to be transported through the intestinal wall.

A similar situation exists with some reported chelates or complex ed mineral products. Not properly stabilized, they break apart, exposing the raw, ionized mineral.

It is after digestion when other mineral forms have their mineral payload cleaved from their carriers. In this situation, these minerals become charged ions, and their absorbability comes into jeopardy. These charged free minerals are known to block the absorption of one another, or to combine with other dietary factors to form compound that are un absorbable.

c. Neutrality: The process of chelation results in the final mineral compound becoming neutral, i.e., containing no electrical charge. Why is this important ? **Mineral compounds that have electrical charges can interact with other dietary compounds, such as phytates and other oppositely charged molecules, and form substances that are not absorbable. In addition, mineral compounds that have an electrical charge are reactive, and as such they can deactivate other important nutrient factors, such as: vitamin E, ascorbic acid, various B-vitamins, as well as important medications.**

*Why are minerals bound to amino acids to form a chelate?

The body is very efficient at absorbing amino acids. In a priority list of nutritional substance crossing the intestinal wall, after digestion, **Dipeptides** (two amino acids linked together through a special bond) and single amino acids rank highly. **In fact dipeptides now appear to absorbed at a higher rate than a single amino acid. This an apparent by- product of their special active transport mechanism of absorption. It has been seen that dipeptides are removed from the interior of the intestine at a much faster rate than single amino acids. Chelating minerals to amino acids, in a dipeptides-like fashion, allows this mineral form to be smuggled via this special active transport system across the intestinal lining and into the system.**