



# Mineral Ratios

## Compliments of Dr. Donna F. Smith

### H-RANGES & L-RANGES

The *Tissue Mineral Ratios - Comparison Chart*, used to record your test values for six specific mineral ratios, makes it easier to compare your progress from Tissue Mineral Hair Analysis to the next. Our goal is to provide the clinical nutrition therapy that provides the nutrients your biochemistry requires to bring abnormal (high or low) tissue mineral health test values into Homeostasis (biochemical balance; true health), and then help you maintain optimal test values for the rest of your life so you can stay healthy. The **Reference Ranges** on this form are defined as:

**H-Range:** Reference ranges labeled as “H” indicated your test value is in “Homeostasis,” i.e., indicating your mineral level (test value) is sufficient and healthy. If your test value is outside the H-Range, such as lower, this indicates you have a clinical deficiency of that mineral (Ex: Ca/Mg ratio below 5.67); if higher, you have a clinically-excessive amount of that mineral (Ex: Ca/Mg ratio above 7.67).

**L-Range:** Reference ranges labeled as “L” indicate there is no disease or life-threatening test value when your test value falls within the L reference range. However, when your test value is outside the L-Range (lower or higher), then you may be referred to your medical physician for further testing to rule this out.

### HAIR ANALYSIS RATIOS

Below are some keynotes about these six specific mineral ratios. (They are located on Side 2 of your Hair Lab Report and their rows have been highlighted in blue or gray.) Your therapy will be initially focused on balancing these six ratios because, by doing so, we will have a positive-domino effect on improving all other individual mineral values, as well as other mineral ratios. Note: **Inversion or Inverted means** – one mineral is too high and the other is too low in relationship to each other. For example, Na/K is inverted if Sodium is clinically high and Potassium is clinically low or vice versa.

1. **Calcium (Ca) / Magnesium (Mg)** – This is the Blood Sugar (Pancreas) ratio. When this deviates over 10 or under 3 it is strongly indicative of high blood sugar. When this ratio deviates it indicates sugar problems at a cellular level that can eventually manifest as deviant blood sugar levels, if not already.
  - a. **Zinc (Low)** – In addition, if Zinc (Zn) is low, the symptoms will be more pronounced. Zinc is needed to make insulin, release insulin and sustain the activity of insulin.
  - b. **Chromium (Low)** – Chromium (Cr) will usually be low, also. Chromium is needed for insulin to enter the cell. (Keep in mind that Type II Diabetics have high levels of insulin not functioning properly.)
2. **Calcium (Ca) / Potassium (K)** – This is the Thyroid ratio. When this ratio is high it indicates “Hypothyroid” (low thyroid) activity at a cellular level. When it is low, it indicates “Hyperthyroid” (high



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thyroid) activity at the cellular level. Mineral imbalances can often result in thyroid-related symptoms, even though the thyroid glands are healthy and functional. This is true for mineral imbalances affecting the adrenals, ovaries, uterus, pancreas, cardiovascular system, including the autonomic nervous system, thus interfering with your body's ability to heal (repair), return to homeostasis, and grow new healthy cells to replace those that were too damaged or decays to heal.

3. **Calcium (Ca) / Phosphorous (P)** – This is the Protein Usage ratio. When this ratio deviates, proteins are either not being digested properly, ingested insufficiently, and/or not getting into the cells to be used.
  - a. **Phosphorous (P)** - When Phosphorous is also low, it indicates insufficient consumption of proteins, i.e., you have a protein deficiency, or you are not absorbing your protein and thereby, at a cell level, your protein is deficient.
  - b. **Zinc (Zn)** - When Zinc (Zn) is also low, this indicates you are not metabolizing your proteins.
  - c. **If the “Nutrient Minerals” Chart for P and Zn** are in the H range, but your Ca/P ratio is not, the cells are unable to utilize protein, even when you are getting 1) sufficient protein and 2) absorbing it (both due to sufficient P) and 3) metabolizing your protein (due to sufficient Zn).
4. **Sodium (Na) / Magnesium (Mg)** – This is the Adrenal ratio. High ratios indicate adrenal stress and Sympathetic Dominance. Low ratios indicate adrenal fatigue and Parasympathetic Dominance. Perpetuating low or high Na/Mg for too long can adversely affect the heart and circulatory function.
  - a. The Parasympathetic Nervous System (PNS) controls homeostasis and the body at rest. It is responsible for the body's "rest and digest" function.
  - b. The Sympathetic Nervous System (SNS) controls the body's responses to a perceived or real threat and is responsible for the "fight or flight" response.

When under stress, without sufficient rest and peace of mind, your nervous system gets stuck in an ongoing “fight or flight” response. This uses up current levels of minerals and vitamins even faster, such as Calcium that has to be used to calm, or cool down, a heated nervous system. This, then, creates sufficient minerals to become deficient and deficient minerals to become more deficient. This sets up a myriad of worse or new biochemical imbalances and organ/gland dysfunctions, thus speeds up the disease processes.

5. **Sodium (Na) / Potassium (K)** – This is the Vitality Ratio. This means a balanced Na/P ratio is required to maintain healthy energy levels, adrenal and immune function and assist cells in “Anabolic” processes, i.e., repairing damaged cells and regeneration (i.e., the growth of new healthy cells and tissue).



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High ratios (especially over 8:1) indicate acute stress and/or inflammation. Low ratios indicate adrenal fatigue, chronic stress with symptoms including fatigue, digestive problems allergies, and hormonal weaknesses.

Inverted ratios indicate more advanced adrenal fatigue with tissue Catabolism. Catabolic processes are the opposite of anabolic processes, i.e., the cells and tissue are decaying, dying, breaking down, not regenerating timely or properly, and leading to premature death of the human body.

- a. **Sodium (Na)** levels are a reflection of mineral corticoid activity (aldosterone). These control mineral balance, especially Sodium, and are inflammatory in function.
  - b. **Potassium (K)** levels are a reflection of glucocorticoid activity (cortisol). These raise blood sugar levels and are anti-inflammatory in function.
  - c. **The Na/K ratio** is also a reflection of the strength of the Immune System. Low or inverted ratios indicate fatigued immune function.
6. **Zinc (Zn) / Copper (Cu)** – This is the Male and Female Hormones Ratio and the Heart and Circulatory System Ratio. Zinc is a reflection of progesterone activity in females or testosterone activity in the male. Copper is a reflection of estrogen activity in both females and mails. Zinc and Copper are minerals that are very involved in brain chemistry, also.