

Nutritionals Nutraceuticals Functional Foods Dietary Supplements

# NuFFooDS

perspectives on science & business  
**Spectrum**

Volume 3 | Issue 8 | April 2016 | ₹100  
[www.nuffoodsspectrum.in](http://www.nuffoodsspectrum.in)

68 pages including cover

## The label says it all



*'Consumers of more coffee live longer'*



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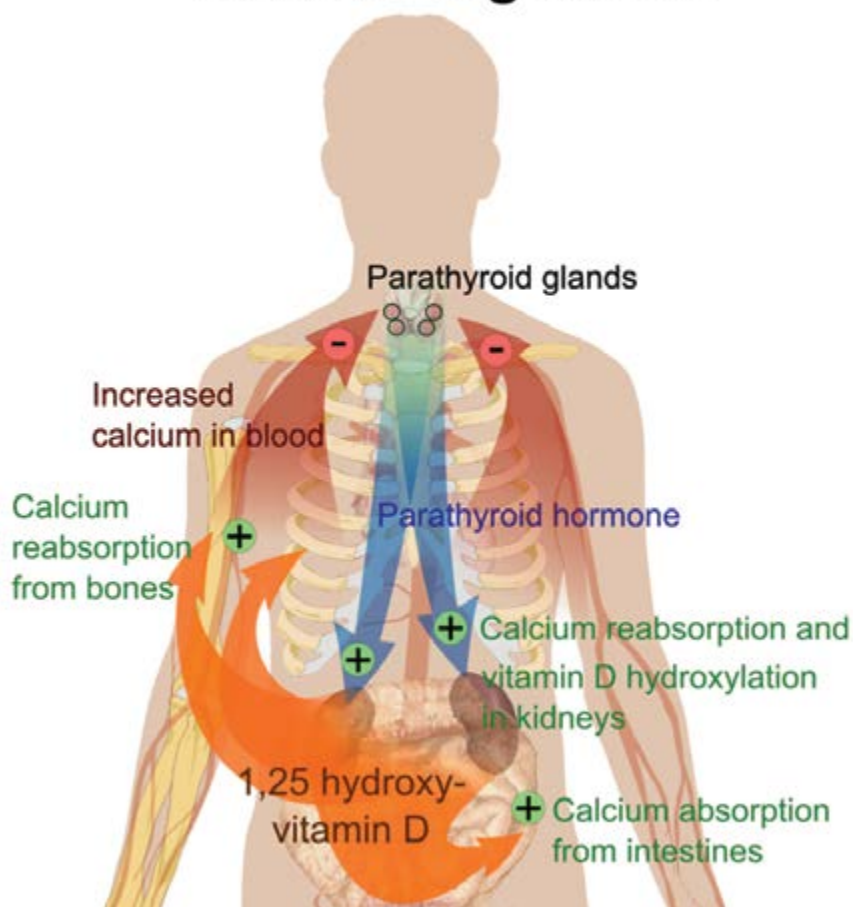
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**T**he human body is made of complex cellular organisation. This complex structure constantly strives to maintain a constant balance of the internal environment in the body what we call as 'Homeostasis'. Homeostasis is essential for successful performance of basic life functions, longevity and good health. A very essential body system which plays an integral part to maintain this homeostasis is the endocrine system. Endocrine glands, which are special groups of cells, make hormones. The major endocrine glands are the pituitary, pineal, thymus, thyroid, adrenal glands and pancreas. In addition, men produce hormones in their testes and women produce them in their ovaries.

Hormones are chemicals (sometimes described as chemical messengers) that are produced from the endocrine system. In simple terms, hormones act as 'messengers' by moving around the body then conveying instructions to the cells they interact with. Hormones can affect many aspects of the body and its state of health, such as growth and development (including puberty), Metabolism including metabolic rate, Basal Metabolic Rate (BMR) and the risk of obesity, physical appearance (including body shape), reproduction, sexual function, emotions and emotional responses.

# Nutraceuticals and hormonal regulation

## Calcium regulation



The diversity of hormonal activity requires, in order to ensure normal body homeostasis, the precise correspondence of hormone output in response to the body's needs. This precise and delicate correspondence is ensured by the mutual influence of nervous, humoral, and hormonal factors. Since the hormones are present and act at such low concentrations, it is critical that their levels be precisely regulated. Consequently, hormone synthesis and degradation is regulated by the activity of specific biosyn-

thetic and catabolic enzymes.

A hormone imbalance is when there is too little or too much of a particular hormone in one's body. The constant stress, unhealthy diet pattern, lack of adequate exercise in today's world have led to increasing problems of hormonal imbalance and ill-health. Some of the most common symptoms include fatigue, skin problems or acne, mood swings, weight problems, diminished sex drive, and poor memory. It should also be noted that



some chemicals in the environment and natural compounds found in the diet can affect the activity of hormone receptors, particularly the estrogen (female sex hormone) receptor. Such interaction can potentially lead to disturbances in hormone homeostasis and inappropriate regulation of target genes. These xenobiotic 'endocrine disrupting chemicals' have the potential to impact many body systems by inappropriately activating or interfering with the activity of hormone receptors. As a result, endocrine disruption is a growing concern that is being studied intensively in many laboratories around the world.

In today's fast pacing world with lack of time to pay attention to healthy food habits, nutraceuticals come to the rescue of general population to prevent this hormonal imbalance and help maintain the required homeostasis. There are various examples substantiating this fact. Vitamins and minerals are essential components which play an important role in hormonal regulation. One such example is magnesium. Magnesium is used in the body in hundreds of reactions and in everything from proper hormone function, to cell regeneration and healthy bone formation. Magnesium supports hundreds of reactions in the body and often contributes to better sleep (which is great for hormones!). Insomnia (inability to sleep) is a matter of growing concern due to highly stressful lifestyle. Melatonin, L-tryptophan and 5-hydroxytryptophan have been the most effective nutrients for treating insomnia. Calcium and Vitamin D help to maintain bone health and can be an important part of an

osteoporosis prevention strategy. Increased bone fragility and increased number of falls caused by impaired muscle function are known risk factors for hip fractures especially in the elderly and post menopausal women. This is due to increase parathyroid hormone caused by deficiency of calcium and Vitamin D in these groups. Studies have shown that supplementation with calcium and Vitamin D can restore the parathyroid hormone balance and reduce risk of fractures.

Omega 3 fatty acids, due to their antioxidant and anti-inflammatory properties, play an important role in producing and balancing hormones. Serotonin is a very important hormone of the human body with inevitable role in various bodily functions like mood, temperature regulation, sexual drive, normal blood function etc. It has been found that Vitamins B6, folic acid, B12 can increase serotonin levels and help with mild depression. Another mineral, Selenium, is necessary for the conversion of thyroid hormones from the inactive form to the active form which is essential for everyday body functions.

A very widely prevalent condition in today's world is diabetes mellitus which is due to the deficiency or resistance of hormone insulin. There is a growing body of evidence that nutraceuticals containing polyphenols have been useful in stimulating insulin secretion and thereby restore the glucose balance of the body. They also prevent the long term complications due to their anti-oxidant properties. Studies have shown that zinc and magnesium play an essential

role in androgen metabolism (testosterone-male sex hormone) and interaction with steroid receptors.

Women are more commonly affected after 30s and 40s by hormonal imbalance. They suffer from postmenopausal symptoms like mood changes, hot flushes etc. due to reducing level of estrogen (female sex hormone). As a result, lot of studies are being conducted to study the effect of various nutritional supplements to restore the balance. Nutraceuticals like Vitamin E, bioflavonoids and Vitamin C have shown to have some effectiveness in treating hot flushes. Elevated lipids like cholesterol and triglycerides lead to problems like polycystic ovaries in females which can adversely affect fertility. Niacin (Vitamin B3) is well studied to treat elevated cholesterol and triglycerides and thus help in improving fertility.

One of the most universal nutrient deficiencies is Iodine. A deficiency of Iodine affects not only the thyroid gland but also the adrenals, ovaries and testes. It is therefore a major factor in fertility and other hormonal problems. One of the most common reasons for fertility problems, such as failure to get pregnant and miscarriage, is simply a chronic Iodine deficiency which can be treated with iodine supplementation.

Thus, in view of largely inadequate dietary habits and growing evidence implicating role of nutritional supplements in hormonal regulation, nutraceuticals form an integral part of today's lifestyle for replenishing the deficits and ultimately able to keep up the body homeostasis. **NS**

