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## ***Zinc.***

Zinc is a mineral that is vital to many biological functions such as immune resistance, wound healing, digestion, reproduction, physical growth, diabetes control, taste and smell.

The main bio-chemicals in which zinc has been found to be necessary include:

Enzymes and enzymatic function, carbohydrate metabolism & protein synthesis. More than 300 enzymes in the require zinc for proper functioning.

It is estimated that 3000 of the 100,000 or so proteins involved in life contain zinc. Many cells secrete zinc, including the pancreas, the salivary gland, and the prostate gland. Immune cells also secrete zinc.

Zinc is an important mineral which is essential for protein synthesis and which helps to regulate the production of cells in the body's immune system.

Zinc is stored primarily in muscle, zinc is also found in high concentrations in red and white blood cells, the retina of the eye, bones, skin, kidneys, liver, and pancreas.

In males, the prostate gland stores high amounts of zinc.

Zinc is a constituent of male reproductive fluid – important as supplement booster in stud dogs.

Biological functions and health benefits of zinc.

### **Zinc has a range of functions.**

Antioxidant function and is involved in many critical biochemical reactions.

Zinc used as an “astringent”, an antiseptic and a skin protectant.

Component factor of many enzymes and the catalysts of enzyme systems.

Zinc assists in maintaining the proper concentration of vitamin E in the blood. Regulating cell growth - essential for normal growth and development.

Zinc also supports normal growth and development during and after pregnancy.

In protection and for DNA function.

Essential for protein synthesis which helps to regulate the production of cells and boosting the body's cellular immune system.

As an essential component of many enzymes involved with metabolism and energy processes - in the metabolism of proteins, carbohydrates, lipids and resulting energy needs - also important in the metabolism of vitamin A and collagen.

Zinc is especially important in the development of reproductive organs - and for involved in most aspects of reproduction in both males and females – in the function of the male prostate and protection from early damage that could lead to cancer.

### **Regulation of gene transcription.**

Regulate hormone levels.

Zinc may also protect against fungal infections and various infectious disorders, such as conjunctivitis and pneumonia.

Plays an important role in the regulation of appetite and maintenance of taste acuity – and relating smell sense with dogs.

### **Zinc deficiency.**

Zinc deficiency most often occurs when zinc intake is inadequate or poorly absorbed (not all zinc supplements are easy absorbable) or unavailable - when there are increased losses of zinc from the body, or when the body's requirement for zinc increases.

Zinc is lost via the faeces, urine, hair, skin, semen and also menstruation.

Liver and pancreatic disorders, diabetes mellitus, and disorders that impair absorption can cause zinc deficiency.

Signs of zinc deficiency include hair loss, skin lesions, diarrhoea, wasting of body tissues, and, eventually, death.

Eyesight, taste, smell and memory are also connected with zinc and a deficiency in zinc can cause malfunctions of these organs and functions.

Lack of zinc may lead to poor metabolism, poor night vision and difficulty in wound-healing, a decrease in sense of taste and smell, a reduced ability to fight infections, a poor development of reproductive organs.

Zinc deficiency can lead to immune dysfunction and impairments in growth, cognitive function, and hormonal function.

Dogs that are zinc deficient tend to be more susceptible to a variety of infections.

Zinc levels tend to be low in dogs with diabetes, anorexia and bulimia.

### **Looking at dietary sources of zinc.**

Good sources include fresh dairy products, beans and lentils, yeast, nuts, seeds and wholegrain products.

Pumpkin seeds provide one of the most concentrated food sources of zinc.

Dietary fibre, particularly "phytates", can interfere with the body's ability to absorb zinc.

Zinc is best absorbed when taken with a meal that contains protein.

Commercial zinc supplements are available in most chemist's and pet stores.

A number of zinc supplements are available, including zinc acetate, zinc gluconate, zinc picolinate, and zinc sulphate.

Zinc sulphate is the most frequently used supplement.

This is the least expensive form, but it is the least easily absorbed and may cause stomach upset.

The more easily absorbed forms of zinc are zinc picolinate, zinc citrate, zinc acetate, zinc glycerate, and zinc monomethionine.

### ***uggested dosage – consult with your vet.***

General intake of zinc dosage is adequate to prevent deficiencies.

Adult young dogs: 3 to 6 mg

Pregnant and nursing females: 9 mg

Puppies up to 6 months 1 - 2 mg

### **Looking at side effects, precautions, toxicity, and drug interactions.**

Even though zinc is almost an essential requirement for a healthy body, too much zinc can be harmful and can lead to reduced iron function,

and impair the immune system can lead to nausea and vomiting within 30 minutes of ingestion.

The major consequence of long-term consumption of excessive zinc is copper deficiency.

Marginal zinc deficiency may be a contributing factor in some cases of anaemia.

Zinc may decrease the absorption of oral quinolones, including ciprofloxacin, norfloxacin, ofloxacin, and levofloxacin.

**Note!** >> - Zinc interacts with NSAIDs and could reduce the absorption and effectiveness of these medications.

Do not use zinc supplements and copper, iron, or phosphorus supplements at the same time.

It is best to space doses of these products 4 hours apart, to get the full benefit from each dietary supplement.