

Silicon dioxide – a novel approach for application in animal nutrition

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For several decades now, nutritionists have been looking for technologically advanced solutions for improving feed digestibility, growth performance and global health status of the animal while reducing feed costs. The industry of feed additives has constantly offered innovative ways to respond to these demands.

The main strategy has been the diversification of protein intake with food sources sometimes less digestible, compensated by the addition of enzymes or highly digestible protein concentrate amongst others. The addition of certain feed additives like prebiotics, probiotics and yeasts have also allowed nutrient availability to be increased.

Silicon dioxide is a well known feed additive and its beneficial use as an anticaking agent and mycotoxin binder is well recognised by scientists worldwide. However, new technologies are available today that have developed a novel approach for the use of this mineral and have brought to light other capacities that SiO₂ possesses.

Silica is a very large family of minerals and includes a wide range of elements such as clay, diatom, zeolite and quartz. Based on their structure, the function of the mineral is different. The kind of silicon dioxide commonly used as a feed supplement has an amorphous molecular structure and is able to absorb

humidity. Zeolite for example has a crystalline molecular structure and a very high cationic exchange capacity (CEC). In contrast, quartz also has a crystalline structure but without any absorption power and a CEC close to 0.

As a matter of fact, silicon mineral has another very interesting function that has been explored and used in the world of information technologies. Due to its crystalline structure and its piezoelectric effect, quartz is a component that has the property of oscillating at a stable frequency when stimulated electrically which permits it to obtain very precise oscillator frequencies.

Crystalline silicon is also the main actor in transforming solar rays (electromagnetic waves) to electricity and is the main component of solar batteries. This mineral has the ability to be stimulated by different electric or electromagnetic signals and keeps the oscillation inside its crystalline structure for long periods of time.

Activated form

Ceresco Nutrition, under a proprietary technology has developed an electromagnetically activated form of silicon dioxide, under the brand name Silica+, defined as a Biological Resonance Catalyst. This form of silicon dioxide is submitted to a particular energetic field, a low frequency electromagnetic signal, carrying biological information.

The specific signal emitted by the

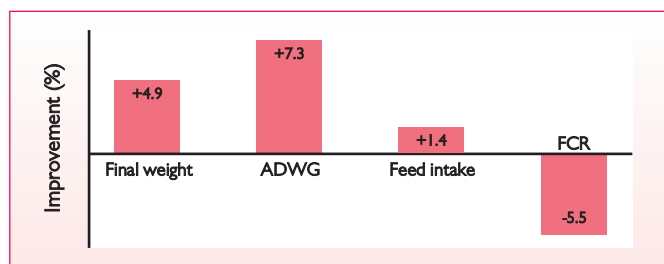


Fig. 2. Effect of Silica+ on turkey growth performance (improvement of test group over control).

mineral is capable of exciting the water molecules in the intestine and provide free electrons necessary in enhancing the rate of all kinds of biochemical reactions. We call this a resonance effect. We know that digestion, absorption and assimilation of the nutrients occur in an aqueous medium. Water molecules also play an important role in all enzymatic reactions taking place during the digestive process. Today we can affect the rate of all biochemical reactions involved in the process of digestion by modifying the properties of water using different electromagnetic signals.

Several studies have shown that electromagnetic fields have an effect on water structure and influence biological function. For instance, professor Luc Montagnier, a Nobel prize recipient, recently discovered that the DNA of bacteria emitted electromagnetic signals when exposed to ambient electromagnetic backgrounds. This signal can be registered and transferred to water

where in contact with nucleotides and enzymes, are able to reconstruct the same DNA.

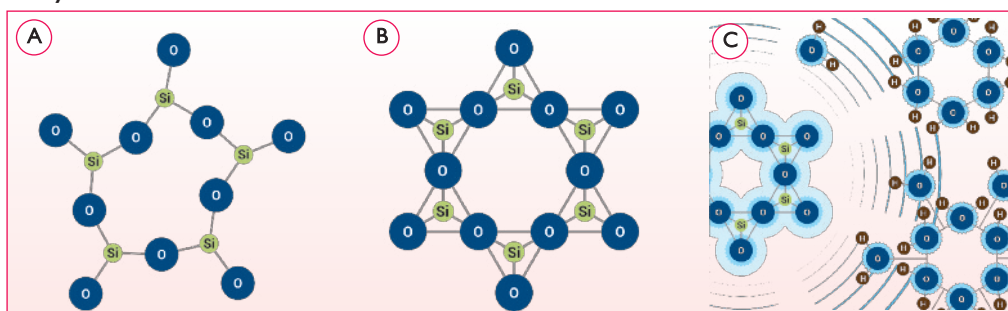
Scientific studies

A recent study revealed that adding 200ppm of activated silica supplement significantly improved weight gain and FCR in turkey production, offering potential economic benefits to turkey producers. The team of researchers from the University of Guelph, who conducted this study, concluded that the positive effect of activated silica on daily body weight gain and FCR was significant during the grower and finisher phase of the study. During the same period, concentration of ammonium in treated litter was significantly higher while pH significantly lower. A strong correlation was observed between ammonium concentration and the efficiency of feed conversion.

The same Silica+ product has also been tested in broilers, layers and swine feed showing positive effects on growth performance, egg quality and ammonia emission. Other research revealed that the activated silica significantly improves the enzymes activity as well as protein and mineral digestibility.

Through its intense research work, Ceresco Nutrition scientifically demonstrated the efficiency of the new activated silicon dioxide powder on animal growth performance and farm environment. ■

Fig. 1. A: Amorphous structure, B: Crystalline structure, C: Transfer of electromagnetic information to aqueous system.



References are available on request from the author