

It is known that copper, zinc, and some others in oxide and chloride forms are poorly absorbed by animals - and toxic to animals and people, when absorption figures are as low as 3% for some elements, while sulphate forms have no problems. Chelating was developed to try and overcome poor absorption, but I have not seen evidence that it does, when compared with sulphate-based minerals on an equal cost basis. If not on cost, it is unfair and deceitful. Also there could be times when the sulphate in minerals helps animal health. North American DCAD trials showed this. See Animal Health > Milk Fever.

All the Solminix minerals are sulphates, none of which are toxic and all are better absorbed. The very small amount that is not absorbed by the animals benefits the soils, pastures and earthworms. I've seen earthworms gathering around overflowing water troughs containing Solminix.

Chelated minerals are usually bound to amino acids and organic molecules and claimed to reduce antagonism and increase absorption, but not that they are cheaper in sulphate forms. Their very high extra selling price is profits to the vendors. I've asked chelated mineral manufacturers for figures based on costs and returns to show that chelating is rewarding, but have not received any. Proteinates systems have also been promoted as the latest and greatest and some say that 'colloidal' is the best form, but until one sees cost benefit comparisons against feeding the sulphate forms in drinking water, which for animals is the nine sulphate minerals in Solminix, should be continued. Sulphur in the sulphate helps reduce high molybdenum bad effects, milk fever and nitrate toxicity. See Solminix.

Two clients changed from sulphate elements to chelated ones at a higher cost and their cows then showed mineral deficiency symptoms.

Chelated minerals have been up to 14 times more expensive than sulphate forms. Avoid chelated products because they are not only artificial and expensive, but some have additives, including mercury which is used to chelate (glue, lock, tie), which is very unhealthy, like it is in amalgam teeth fillings. Is chelation another amalgam disaster, which is mercury chelated (glued) with silver for teeth fillings, that cost people thousands of dollars in bad health and then the high costs of removing amalgam - which improved my health after the boils Hg caused ceased.

The word 'chelation' comes from the Greek word 'chele' which means claw and implies grasping and holding. In the case of chelation, the grasping is done by an agent which is often mercury, a highly toxic mineral which is claimed to make a more stable product.

I and many others, are allergic to all human supplements that have the word 'chelated' on the label.

Claims that chelated items are better or more available are unproven, in fact the opposite is usually the case.

From Florida USA University -

"In ruminants, chelated minerals have been of less benefit due to the rumen microbes and their involvement in digestion. Under certain conditions ruminants have responded to chelated minerals, but it is not clear from the studies reported whether this response is due to the form of the mineral or simply to increased mineral consumption. Information presently available does not consistently show advantages for chelated minerals in the diet."

End

Some find it more economical to add more of a sulphate mineral, rather than use the much more expensive and sometimes toxic chelated minerals, for no proven benefit. A client who fed Solminix minerals for decades was talked into changing to chelated minerals, and his animals started to show deficiency symptoms, which they hadn't done for the previous 20 years. Another farmer changed from chelated minerals to Solminix sulphate minerals, which with other improvements, reduced milk fever from about 10% to almost none, with a dramatic improvement in overall animal health. See the Solminix details.

Supplying minerals with grain or concentrates is satisfactory for pigs with their

powerful digestive juices and system developed to digest grains, roots, etc., but not for ruminants for which grain is foreign, unnatural, unhealthy and unprofitable, even in USA feeding their 50% subsidised maize (corn) at twice our milk price.

I and many with whom I've spoken achieved better results using sulphate forms of minerals in both human and animal trials compared with equal cost chelated minerals. Any copper sulphate consumed, but not absorbed by animals ends up in the soil, so is not wasted. Chelation is promoted by some as being better for mineral absorption. Some use flowery meaningless statements, but give no costs or comparative financial benefits.

When testing plants and plant based supplements in various forms for heavy metals, they are not normally found, but some have man made changes using chelation and other systems, sometimes suffering heavy metal pollution.

None of nuts, herbs, fruits, etc., had any heavy metals, and none of the sulphate minerals had any, but the chelated ones did, even from a big reputable American company.

Chelating of minerals is claimed by some to bond and improve bodies absorption, however, I have seen no independently proven evidence that chelated minerals are better in any way than sulphate forms, which are the safest and cleanest forms. Chelated minerals cost up to 10 times more per milligram of elemental mineral compared to normal, natural sources, for no proven benefits. All comparative trials should be done on an equal cost basis, otherwise they are useless. I've been suggesting this to the establishment (Ruakura and other NZ research people) for 50 years, but still very few do it, making some of the millions of tax payer's dollars a waste. Some of it is farmer's money. An example is the AgResearch \$5,000,000 spent researching reducing methane production by ruminants. It was a complete waste because the methane figures were from USA grain-fed cows that have far higher levels than NZ pasture-fed cows and the suggested solutions were to grow Sulla, a low yielding legume that doesn't survive grazing. New Zealand's white clover based pastures make much less methane than 100% grass pastures, but that has not been promoted, while the opposite has by those recommending and selling urea, but not recommending LimePlus (a fine lime with the farm's deficient minerals.)

Anyway, New Zealand's animal methane production is so low that if all New Zealander's ruminants were eliminated, there would be almost no reduction in the world's total methane production. Rice paddy fields are massive producers of methane, but are not penalised. Swamps and native bush and forests also produce it.

I have enough evidence to show that most chelating is an unnecessary system of patenting and making money, and in some cases, producing a highly toxic chemical loaded substance. Foods, vitamins, supplements as well as the container labels should have to show heavy metal levels, or state, "This product and the container contain no mercury, cadmium, manganese, lead, copper, arsenic, toxic or foreign substances."

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He wrote and I agree -

"Mineral absorption can depend on what is in your stomach when you eat the mineral. For example, fat increases and fibre decreases mineral absorption. Vitamin C will significantly increase the absorption of iron from plant foods. One mineral can affect the absorption by or of, another. Taking too much zinc markedly reduces copper absorption. Taking calcium with iron together, reduces absorption of both. Chelation or lack of chelation is insignificant compared with the variable conditions in your digestive system."

Drug stores (chemists), supermarkets and internet sites sell chelated calcium and iron pills that are advertised to be more absorbable than cheaper non-chelated ones, but their ignorance is shown because those who know, recommend not taking those two together. I know a person who insisted on taking calcium had to go to hospital to get her blood changed, and then took Ca again and died. Farmers feeding Ca to cows has affected them very badly.

See Cobalt in 'Minerals in Soils, Pastures and Animals', for more on chelates. I and

many with whom I've spoken have not achieved better results from comparative animal trials comparing chelates with sulphates on an equal cost basis.

Googling for Chelating gets some supporting it who are mostly vendors of chelated products made so that they can then be patented and sold at a higher price. Others write that there is no difference except a higher cost.

I take deficient minerals and vitamins and checked my heavy metals in urine and found I had a problem, so got them drained out and my urine became clean. The health specialist said to stop all supplements and two weeks later I was still clean. I then went back on them and the heavy metals returned. He then checked them for heavy metals and found that a third had excess mercury from chelation (mercury) used as a glue, excess manganese and/or lead.

If you wonder why I worry about manganese, it is because many studies have shown that Parkinson's disease is associated with rural living and farmers' well and bore waters containing high Mn. Get yours (house and farm waters) tested and filtered if necessary. Mn toxicity is so bad that most people who work in Mn mines get Parkinson's Disease. This has been reported from many countries.

Fortunately muscle testing is extremely accurate. I test all batches of all fruits, vegetables, foods and supplements because I'm Celiac and am also very sensitive to wd system. Every supplement with just one chelated item, upsets my digestion severely. Luckily all seem to almost proudly add the word 'chelated', as if it means 'better than' or 'patented'. One batch of vegetables, fruit or supplement can be OK and the next not. If I eat even slightly green (immature) fruit, I get severe diarrhoea. My late sister was highly allergic to all preservatives so avoided them and lived to 90.

From Florida University -

"In ruminants, chelated minerals have been of less benefit than sulphate forms. Under certain conditions ruminants have responded to mineral chelates, but it is not clear from the studies reported, whether this response was due to the form of the mineral or simply to increased mineral added.

"Information currently available does not show any advantages of chelating minerals in diets." End.

A successful person in mineral mixes, wrote to me, "Some like to use terms like 'chelated', which I am very sceptical about, having never seen any objective scientific proof of its benefits."

A client fed Solminix to his cows which has all sulphate soluble minerals, from 1989 with excellent results. In 2005, he was talked into chelated minerals by a salesman, after which his heifers grew more slowly and showed mineral deficiency symptoms. They had smaller bodies and showed cobalt deficiency (hair growing on top of the neck), zinc deficiency (hair on the crown), raw skin in the join of hooves and thinner bones.

Chelated minerals cost 10 to 15 times more per milligram of elemental mineral compared to normal, fully soluble, natural safer, pollution-free, sulphate minerals.

All comparative trials should be done on an equal cost basis, otherwise they are useless. I've been suggesting to Ruakura and NZ research people for 50 years that they do all trials on an equal cost basis, but very few do, making some of the millions of research dollars spent annually, a waste. Some of it is farmer's money. An example is the AgResearch \$5,000,000 spent on research trying to reduce methane production by ruminants. It was based on USA grain fed animal figures which are much higher than clover based pasture fed to New Zealand ruminants, so a complete waste also because the suggested solutions were to grow Sulla, a low producing legume that doesn't survive.

Clover based pastures make less methane than nitrogen-fed ryegrass pastures, but that has not been promoted, the opposite has, by those recommending the use of urea, which is a drug, because once started, has to be repeated. They should recommend the proven cheaper and better LimePlus mix, in most areas of New Zealand and in many countries. Read Calcium in Soils Plants Animals.

A GrazingInfo member who fed Solminix for decades changed to chelated minerals, and his animals started to show deficiency symptoms, which they hadn't done for the previous 20 years. Another changed from chelated minerals to Solminix, which with other improvements, reduced milk fever from about 10% to almost none, with a dramatic improvement in overall animal health and no worm drenching of calves, if LimeMagPlus is applied to increase earthworm numbers which eat the dung, reducing parasites breeding base.

Animals need sulphur. Feeding the sulphate forms of minerals provide it. The oxide (fertiliser) forms are not soluble in water and because many people are allergic to oxides, they are best not used unless necessary, such as when dusting pastures with magnesium in rain, because magnesium oxide takes more rain to wash off the plant, than magnesium sulphate. Magnesium oxide is bitter, so some animals avoided it, so don't get their magnesium unless made palatable by mixing salt based minerals like Solminix with it.

It is known that copper, zinc and some others, are poorly absorbed by animals. Absorption figures are as low as 3% for some elements, however, the remainder benefits soils, so is not wasted. Low absorption is not just from supplements, but also from pastures and other feeds.

Chelating was developed to charge more and make more money, wrongly claiming to overcome poor absorption, but I have not seen a trial that it does, when compared with sulphate minerals on an equal cost basis, and there are times when the sulphate in minerals helps animal health. North American trials have shown that sulphur helps prevent milk fever.

I've asked chelated mineral manufacturers and promoters for figures based on equal costs and returns to show that chelating is rewarding, but have not received any because they don't.

Statements such as 'bio-availability of minerals is improved' mean nothing.

I believe that some chelating is done solely to be able to patent an item to be able to charge more.

If anyone has evidence of the financial and/or health benefits of chelated minerals please send them to us or tell me where I can access them. Thanks.

Selenium needs vitamin E to be absorbed by animals and humans, so should be taken together, without having to chelate them. Animals eating green pasture or pasture silage absorb the selenium without needing more. See Selenium.

Robert S. Waters, M.D. received his bachelor's degree in biology from the University of Illinois, and wrote -

How Does Chelation Work?

Numerous theories have been promoted to claim benefits of Chelation Therapy. The following is a list of possible mechanisms, all of which have only been incompletely promoted by research studies.

Heavy metals such as Lead, Mercury, Cadmium, Copper, Arsenic, Nickel, and Antimony have been shown to accumulate in human tissue over time. Aluminum has been implicated as a possible factor in the cause of Alzheimer's disease. These poisonous metals disrupt the normal biochemical processes of bodies.

End

If talked into chelation therapy to remove heavy metals be aware that livers can become damaged and there are side effects, so Google for them before deciding.

Avoid all chelated minerals and supplements. They can cost 14 times more than sulfate ones and be useless. Cows need sulfur (in sulphate minerals) which is sometimes fed in USA to reduce milk fever.