

Proper Calcium Supplementation in Reef Aquariums

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Calcium is one of the most important elements for thriving reef aquariums. A steady supply of biologically available calcium is required to ensure healthy coral growth. Closed systems like home reef aquariums will eventually exhaust their supply of calcium without regular supplementation. [Calcium additives](#) are, therefore, necessary to ensure proper calcium levels. However, calcium supplementation is more than simply dispensing an additive. Avoid common mistakes and learn how to optimize calcium supplementation.

→ Calcium availability in nature

Natural seawater is a solution containing calcium and other [essential minerals and trace nutrients](#). The average calcium level found near coral reefs is between 380 and 420 ppm. This availability of calcium supports the healthy growth of reef inhabitants.

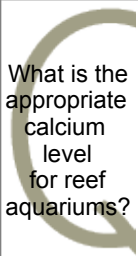
But more importantly, the chemical composition of seawater tends to be stable and is not commonly subject to dramatic fluctuations. In other words, the supply of natural calcium is consistent and always present for corals.

In contrast, artificial environments such as home reef aquariums are subject to change. In heavily stocked reef aquariums, calcium is actively utilized and calcium levels rapidly decline. Also, as corals grow, they remove carbonate ions and combine them with calcium ions to form their hard skeletons. Without supplementation, not only will corals experience a reduction in growth but the aquarium system may also experience a reduction in buffering capacity and pH.

→ Supplementing calcium in reef aquariums

Constant availability of calcium is important for reef aquariums. So why not just add more calcium into the aquarium and forget about it? The goal is to maintain high calcium levels, right? While this initial thought may seem sound, an "add and forget" approach can be potentially harmful and is not recommended for calcium or any other reef supplement.

There are factors that limit or restrict this approach towards calcium supplementation. The fundamental factor is that aquarium water is only capable of keeping a finite amount of dissolved calcium in solution. If this concentration exceeds the water's capacity to keep it in solution, then dissolved calcium falls out of solution in the form of calcium carbonate. In certain cases, the calcium carbonate precipitate can make an aquarium appear as if it is snowing. While the "add more at once" approach is clearly not the appropriate way, following a static formula of "X" amount of calcium additive per month may not be the best approach either. The calcium demand of a reef aquarium changes as it matures and supplementation needs to be adjusted accordingly.

 <p>What is the appropriate calcium level for reef aquariums?</p>	<p>A: The recommended calcium level in reef aquariums is between 350 and 450 parts per million (ppm) depending on stocking levels. It is important to test calcium and alkalinity levels on a regular basis, especially if the aquarium is stocked heavily with hard corals.</p>
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→ Calcium & alkalinity

Calcium utilization by corals is a dynamic process influenced by many factors. As the biological demand for calcium increases, so does the need to maintain alkalinity. When supplementing calcium levels, hobbyists need to monitor aquarium alkalinity as well. Calcium and alkalinity have a unique relationship, where the concentration of one affects the other. For example, if aquarium alkalinity is too high, then calcium levels tend to fall as calcium precipitates out of solution. Conversely, if the calcium level is too high (over 500 ppm), then there is a tendency for alkalinity to drop.

→ Determine calcium need

Proper calcium supplementation begins with [measuring alkalinity and calcium levels](#). Without prior testing, there is no accurate way to determine the specific needs of your aquarium. Also, consider the stocking level of your particular reef system. Lightly stocked reef aquariums will have longer intervals between calcium supplementation compared to systems housing numerous hard corals. Regular testing and monitoring provide insight regarding the rate at which corals utilize calcium and, subsequently, its effects on alkalinity. To achieve ideal calcium levels between 400 ppm and 450 ppm, make sure the aquarium alkalinity is kept between 8 and 12 dKH (carbonate hardness as measured in degrees) to maintain proper balance.

→ Simplify calcium supplementation

Independent supplementation of calcium and alkaline buffers may sometimes result in a "see-saw" effect. The proper upkeep of calcium levels may require regular addition of buffers (and vice versa) to counteract the effects of the other. This repeated process not only complicates proper calcium supplementation but can also contribute to the buildup of sodium and bromide, since most buffers contain high concentrations of these elements.

Keep calcium supplementation simple by using balanced formulas for maintaining both calcium and alkalinity. These two part formulations, like [Two Little Fishies C-Balance](#), are capable of maintaining both high calcium levels and alkalinity without causing a buildup of unwanted compounds. This method of maintaining calcium and alkalinity in reef aquariums has become very popular due to their ease of use.

In addition, be sure to [test magnesium levels](#). Magnesium plays an important role in maintaining the correct balance between calcium and alkalinity in seawater. It helps stabilize alkalinity and calcium levels by preventing excess precipitation of calcium and bicarbonate. Fortunately, maintaining proper magnesium levels between 1,250 and 1,350 ppm is as easy as performing regular water changes with a quality [saltwater mix](#).