

when NO3 start to fall on 100 Net Water Volume you would add 1.3mL daily at this time for the continuing weeks until the NO3 becomes undetectable.

7. When your NO3 and PO4 levels drop near undetectable with your test kits cut your current dose in half. This will be your starting maintenance dose (if the levels drop during week 2 then the dose after reaching undetectable levels would be 0.65ml daily [1.3ml divide by 2]).
8. Continue to test for NO3 and PO4. If levels become detectable in the future increase your daily dose by 0.1ml increments per week until the levels start to decrease. If you maintain that dose the levels will eventually drop back to undetectable. This would become your new maintenance dose.

Throughout your dosing, observe your livestock daily to look for any signs of stress. If stress of any sort is noticed stop dosing, or at a minimum cut back by reducing your dose in half. If for some reason you cannot remember if you ve added for that day skip it. It is better to accidentally miss a dose than add twice as much (a journal will keep this from occurring). ***Never double the dose for missing a prior day!***

40 Proof 20% EtOH	25 Gallon	80 Proof 40% EtOH	25 Gallon	100 Proof 50% EtOH	25 Gallon	160 Proof 80% EtOH	25 Gallon
Week 1 Day (1-3)	0	Week 1 Day (1-3)	0	Week 1 Day (1-3)	0	Week 1 Day (1-3)	- *
Week 1 Day (4-7)	0	Week 1 Day (4-7)	0	Week 1 Day (4-7)	0	Week 1 Day (4-7)	-
Week 2	1	Week 2	0	Week 2	0	Week 2	-
Week 3	2	Week 3	1	Week 3	1	Week 3	-

Table 1. 40 Proof Vodka      Table 2. 80 Proof Vodka      Table 3. 100 Proof Vodka      Table 4. 160 Proof Vodka

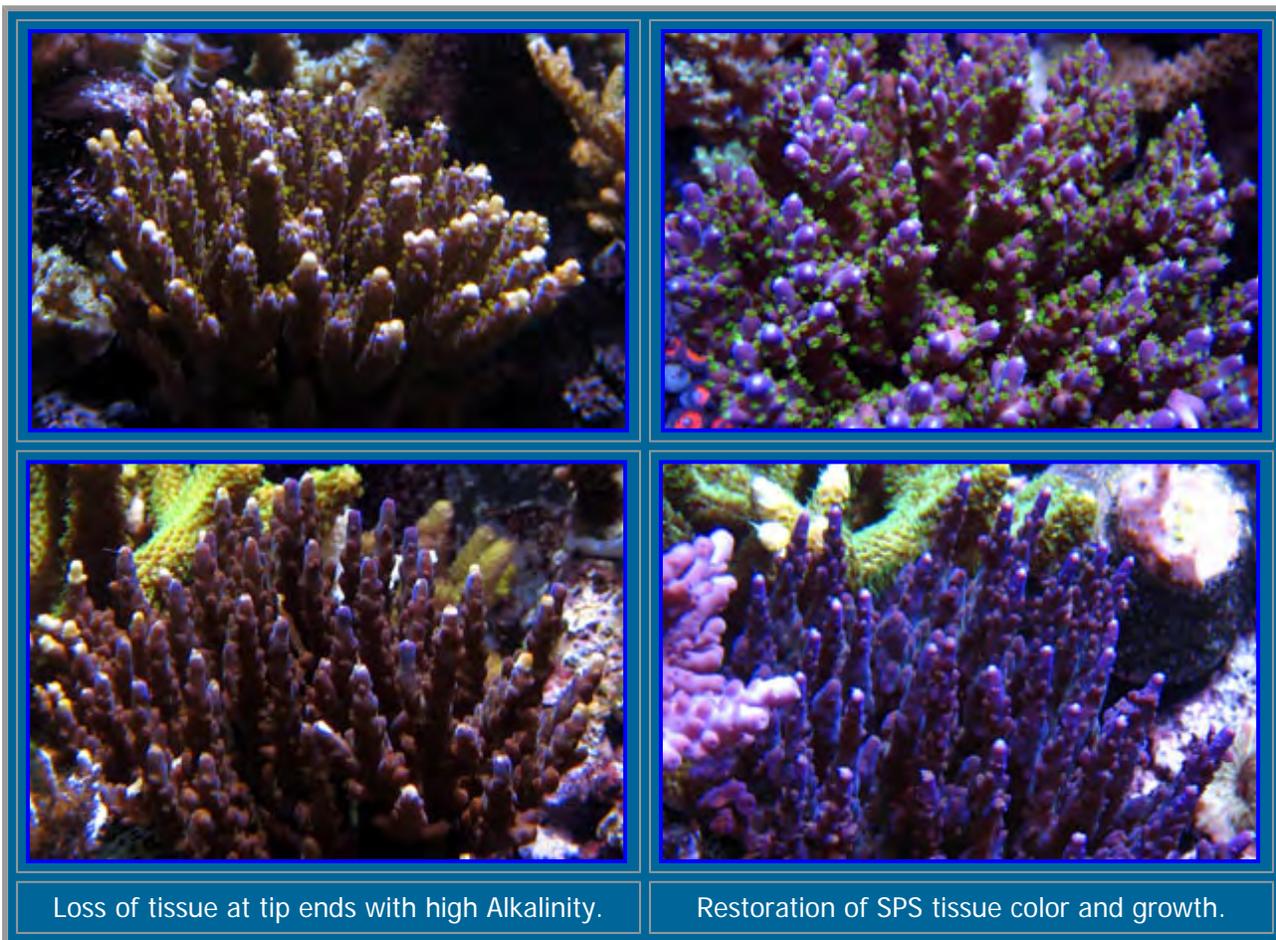
For ease of use these tables have been generated to reflect a dosing schedule regimen for different common proofs of vodka. They follow the directions stated above and are rounded off to the nearest tenth decimal for simplicity. With use of these tables if you notice NO3 / PO4 dropping do not increase as stated within the table for the following weeks but follow the directions above starting at #6.

## Common Questions

**Bacterial Blooms** - High additions of carbon sources at once are noted as production of slimy white strings upon rocks or in sumps that become noticeable a few hours to a day after addition. There is no clear evidence that this is detrimental to your tank. If this is observed dropping your dose by 50% will result in the disappearance of these strands. Additionally, these strands may have given rise to the notion of "bad bacteria". By this forum users mean pathogenic bacteria. But there has not been any documented evidence of such yet. If you happen to overdose your tank with an organic carbon dose, you will stimulate a bacteria bloom, this appears like a snowstorm in your tank. After a day, the tank will clear up. During this time people have reported mixed results on survival from this snowstorm. Stony\_Coral has purposefully caused this on one tank and while ORP readings dropped, no loss of livestock was observed. However, people have mentioned loss of more delicate fish such as anthias during the visualized bloom. In general, a visible bloom will not occur if vodka is dosed as per the instructions above.

**Bacterial Populations** - Currently, it is unknown which bacterial populations grow with the addition of organic carbon. Some have suggested a single organic carbon source, such as vodka, results in monoculture or single specie growth. Due to this ideology, it has been increasingly common to dose multiple carbon sources as this may create additional bacterial diversity. Most likely, in any one organic carbon source addition there are several species that become dominant. However, it has not been decided whether diversifying impacts corals either beneficially or negatively.

**Burnt tips** - Some users of organic carbon dosing have reported the tissue loss at the ends of their SPS. These "burnt tips" have **recovered** once the user reduced the alkalinity levels within their tank to alkalinity levels closer to natural seawater (7-8 dKH), pictured below. Unfortunately, the root cause for this is not known.



Photos provided by Peter Martis (SDguy).

**Carbon Sources** - Reduction in nitrates and phosphates can be accomplished with ethanol and vinegar with great efficiency. Other molecules that may aid in nutrient reduction are sugar, acetone, methanol, and isopropanol. We have not experimented with sugar though there are many threads on RC about this topic. The latter three have been called into question about the possible effects on health of the owner as well as the wellbeing of the aquarium inhabitants. For these reasons, we chose to describe ethanol addition as a means to decrease both nitrates and phosphate levels.

**Coral Coloration / Paleness** - With reduction of nitrates/phosphates SPS corals have been reported to increase in color pigmentation and have even been reported to pale over time. This is outside the scope of the article presented here. However, if looking for recommendations for additives that will reduce paleness and enhance SPS health check out amino acid addition as this has been reported to enhance coloration in a ULN (ultra-low nutrient) environment. If for any reason you experience coral bleaching, please stop vodka dosing!

**Deep Sand Beds** - People with Deep Sand Beds (DSBs) have reported issues with vodka dosing. These issues seem to be from increasing vodka additions over time without seeing a decrease in nitrate/phosphate levels. Users with DSBs that are failing to reduce nutrients efficiently may be experiencing a lack of nutrient decrease from the build up of organics within the DSB. If this were the case it would take more time to cycle out the nitrates within the system as there is now a hidden bed of organic waste that needs to be removed. Do not get discouraged or increase your dose irrationally as the vodka addition is working but not detectable as the DSB needs to cycle through completely before a reduction is observed. Keep adding vodka slowly until decreasing levels are detected. This may take months to achieve. Once there maintain that dose until nitrates start to decrease. At this point, it may be best to cut the dose in half and cut it in half again once undetectable is reached. Many people with DSBs who have reported issues increase vodka additions quickly and irrationally, leading to a detrimental overdose.

**Feeding** - A derivative of vodka dosing is the ability to increase feeding for fish or invertebrates without reducing water quality. Since the vodka is essentially removing the waste products (nitrates/phosphates) from the reef aquarium, addition of extra food is welcomed if not encouraged.

**Old Tank Syndrome** - Reef systems that have been running for longer than a year have reported vodka-dosing building up a thick sludge within some area of their reef. The thought is the buildup of organics and NO<sub>3</sub>/PO<sub>4</sub> over time results in a high growth of bacteria from the addition of vodka. In tanks that are older, where detritus has built up, careful observation of the tanks state is needed. If thick sludge develops within the tank immediately reduce the dose by 50% and continue at that point until the sludge has disappeared and then slowly increase as per instructions laid out above.

**Phosphate Removal / Granulated Ferric Oxide (GFO)** - One of the most common questions is whether to use a phosphate removal material, such as GFO, with carbon dosing. GFO is useful in removal of phosphates from the water column. Essentially, by carbon source additions, the same net result is being achieved. It may even be counterproductive to run GFO while dosing an organic carbon source as both nitrate and phosphates need to be present for this to work properly. Therefore, it is not needed and not commonly recommended but some people continue to run phosphate reactors concurrently.

**Water Clarity** - Even without the use of either ozone or activated carbon, water clarity is said to

improve dramatically with the vodka method. This has been stated by nearly everyone using this method and may be an indirect result of nitrate/phosphate removal from the water column. Dr. Jean Jaubert made similar claims of his plenum system, where nitrates and phosphates are also depleted and water clarity may be a result of this depletion.

**Vodka Brand** - One of the most common questions is which brand is the best. Honestly, it will make little difference on which brand is used. The most common response is to find the cheapest vodka brand and go with that. Do not use vodka that contains flavor additives such as raspberry or mango vodka. Additionally, industrial ethanol should not be used as a substitute as it contains denaturing agents that are toxic.

## Summary

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**V**odka dosing has become a simple method for reduction of nitrates and phosphates that have plagued many reef aquarists. Here we have described a method for reduction of these nutrients by stimulation and promotion of bacterial growth through the addition of vodka. Though the underlying mechanism and actual bacteria populations are unknown the results are impressive for their ability to both rid the system of excess nitrates and phosphates.

Thanks go out to the many who have contributed to advancing this hobby. The detailed descriptions and results from fellow RC members is the reason behind writing this article. Without participation from the cohort of people on RC that bring their own talents to the hobby this article would not have been written. We want to recognize Peter Martis (SDguy) and Mike Woodard (miwoodar) for providing the photos within this article.

## References

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**"Dosing vodka to bring down N and P."**

**"Let s talk about Vodka/sugar dosing"**

**"Let's see 'em - Before and After pics of Vodka Dosing!"**

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If you have any questions about this article, please visit the **Notes from the Trenches forum** on Reef Central.

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