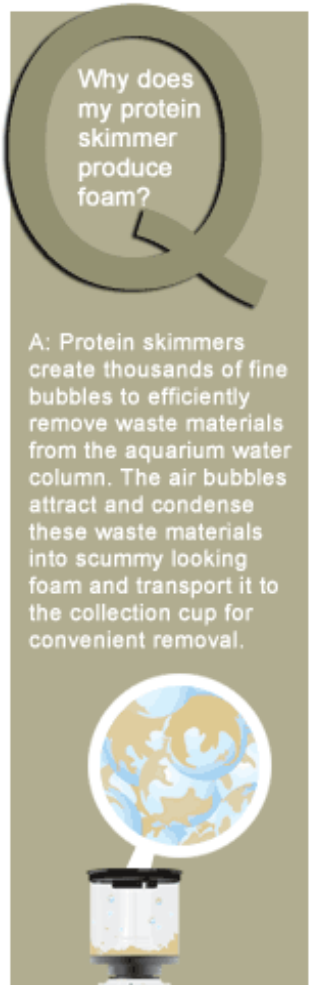
Saltwater Filtration: How Protein Skimmers Enhance Aquarium Filtration

Drs. Foster & Smith Educational Staff



PROTEIN SKIMMERS ARE SUPPLEMENTAL FILTRATION DEVICES ESSENTIAL FOR SUCCESSFUL MARINE AQUARIUMS.

By effectively removing protein and other organic waste materials, protein skimmers maintain a healthy aquarium environment. Protein skimmers allow the primary filtration system to perform more efficiently and also provide numerous other benefits for superior water quality and clarity.

ACTIVE WASTE REMOVAL

Protein skimmers rely on the chemical process adsorption to remove organic waste materials from the water column. Waste materials adhere to the surface of the air bubbles and are literally pulled out of the water. A vigorous mixture of air and aquarium water within the protein skimmer reaction chamber generates thousands of these protein-skimming micro-bubbles. As these micro-bubbles travel through the skimmer, waste clinging to the bubbles is condensed and transported into the protein skimmer collection cup. This active waste-removal process employed by protein skimmers allows mechanical, chemical, and biological filtration to work more efficiently.

MECHANICAL FILTRATION

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Thousands of micro-bubbles transporting protein waste travel from the reaction chamber to the collection cup. There the waste is condensed and trapped, completely separating it from the water supply.

Mechanical filters improve water clarity by physically trapping and removing visible particles from aquarium water. While you may not see the trapped waste material, it is still part of the aquarium water column. If mechanical filter media are not cleaned or replaced in a timely manner, the trapped waste breaks down and various pollutants including ammonia, nitrite, nitrate, and phosphate are released into the aquarium.

PROTEIN SKIMMER ADVANTAGE:

In contrast, protein skimmers extract organic waste material out the water column. The foamy waste material, or skimmate, contained within the collection cup, is completely removed from the water column and cannot release pollutants back into the aquarium.

SUMP AND PROTEIN SKIMMER MAKE A GREAT TEAM

Installing a sump and protein skimmer is a great way to create the ultimate filtration system. The sump increases overall aquarium water volume for stable water parameters less prone to fluctuations. Also, greater water volume dilutes the concentration of harmful chemicals to lessen their effects. More importantly, the sump is the ideal location to house advanced, auxiliary filtration devices like a protein skimmer. The extra space allows the convenient installation of powerful, in-sump protein skimmers to ensure superior water quality. Shop sumps ▸

CHEMICAL FILTRATION

Similar to protein skimmers, most chemical filter media rely on the principle of adsorption. However, as the waste-binding surfaces fill up on conventional chemical filter media, the effectiveness of the media diminishes. In certain cases, the harmful chemicals leach back into the aquarium if the chemical media is not replaced.

PROTEIN SKIMMER ADVANTAGE:

Since adsorption occurs on the surface of each bubble, a properly maintained protein skimmer provides a near endless supply of waste-binding surfaces. This continuous supply of waste-removing bubbles perpetuates efficient waste removal without need for replacement media or fear of pollutants leaching into the aquarium.

BIOLOGICAL FILTRATION

Biological filtration breaks down harmful nitrogen compounds by means of aerobic beneficial bacteria. Ammonia and nitrite are converted into the less toxic compound, nitrate. While nitrate is less toxic, sensitive reef invertebrates, including corals, do not

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tolerate nitrate even in low concentrations. Many saltwater aquariums do not have the appropriate conditions to facilitate efficient de-nitrification to render nitrate into harmless nitrogen gas. As a result, nitrate levels can build up to harmful levels.

PROTEIN SKIMMER ADVANTAGE:
Protein skimmers help maintain low nitrate levels by retarding nitrate buildup. They remove organic waste before it has a chance to break down and release nitrogen compounds. The use of a protein skimmer is essential in reef aquariums where a very low nitrate level is crucial for coral health.

SECONDARY BENEFITS

The many secondary benefits of protein skimmers improve the overall health and quality of water in your marine aquarium. In addition to efficient waste removal, protein skimmers also:

- Reduce phosphate to help prevent aggressive nuisance algae growth.
- Remove any biological toxins released from corals, algae, or invertebrates.
- Promote proper gas exchange and increase oxygen level for healthy inhabitants.
- Help maintain proper pH by preventing acidic condition due to carbon dioxide buildup.
- Help support a large bioload, particularly when used in conjunction with a sump.
- Remove oily surface wastes to help improve light penetration in your aquarium.
- Improve REDOX and reduce disease-causing organisms when used with an ozonizer.

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