



Understanding the Bad Odor in Garbage



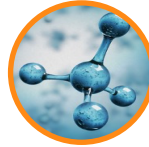
TechDigestant II™

White Paper

Prepared by:
Solvedify Team

info@solvedify.com • www.solvedify.com • 1-888-427-8101

07 Jan 2020



Introduction:

Unpleasant odors emanating from rooms and garbage containers pose a persistent problem in various settings including residential buildings, hotels, restaurants, hospitals, and landfills. The impact of these foul odors extends beyond mere environmental pollution, as they may also pose health risks due to the proliferation of insects and rodents. In addition, they may negatively affect the user experience, particularly in the restaurants and hospitality industry.

Historically, conventional solutions have proven ineffective, with the use of fragrances exacerbating the situation rather than providing lasting relief. Facilities have been forced to rely on regular cleaning using additional detergents to maintain proper hygiene and minimize user complaints.

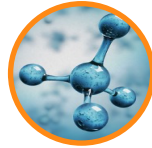


This issue is particularly pronounced in residential buildings, where the accumulation of garbage, averaging 4 pounds per person per day, creates an extremely unpleasant and at times uninhabitable living environment. In the hospitality industry and restaurants, bad odor emanating from decomposing garbage could drive users away, adversely affecting the reputation of a facility and discouraging repeat patronage.



In warmer climates, the high temperatures accelerate the decomposition of organic matter, leading to more frequent instances of putrefaction-related bad odors. The proliferation of rats, snakes, flies, and other insects attracted to garbage dumps further exacerbates the problem, as these pests introduce harmful bacteria and infections into the area.





What Causes Bad Odor in Garbage?

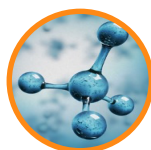
The putrid smell emanating from garbage can be attributed to the decomposition of organic matter in the waste. Organic materials such as food leftovers and plant matter undergo chemical reactions that result in the release of malodorous gases, including hydrogen sulfide (H_2S), ammonia (NH_3), and methane (CH_4).



Bacteria and fungi also play a significant role in the production of bad odors, as they decompose the organic matter and produce malodorous compounds. These compounds, in addition to the gases released during the chemical reactions, create an unpleasant odor that can pose health hazards.

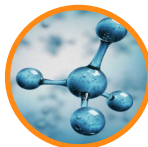


Environmental factors such as temperature and humidity also influence the decomposition process, affecting the production of bad odors. In warmer climates, the decomposition of organic matter accelerates, leading to a higher production of malodorous gases and an increased presence of bacteria and insects in garbage dumps.





| Cause of bad odor in garbage | Explanation |
|---|---|
| Decomposition of organic matter | Moisture in garbage can create ideal conditions for the growth of bacteria and fungi that produce bad odor. |
| Lack of ventilation | If the garbage is in an enclosed space without ventilation, gases produced by the decomposition of organic matter accumulate and cause bad odor. |
| Presence of chemical substances | Some chemical products, such as household cleaners, can emit bad-smelling gases when they decompose. |
| Lack of cleaning | If the place where the garbage is stored is not cleaned regularly, residues and debris can accumulate and generate bad odor. |
| Gases  | Description |
| Methane | Inodorous gas produced by the decomposition of organic matter in the absence of oxygen. |
| Sulfur dioxide | Gas with an acrid and unpleasant odor produced by the decomposition of materials containing sulfur.  |
| Hydrogen sulfide | Gas with a strong and unpleasant odor of rotten eggs produced by the decomposition of materials containing sulfur. |

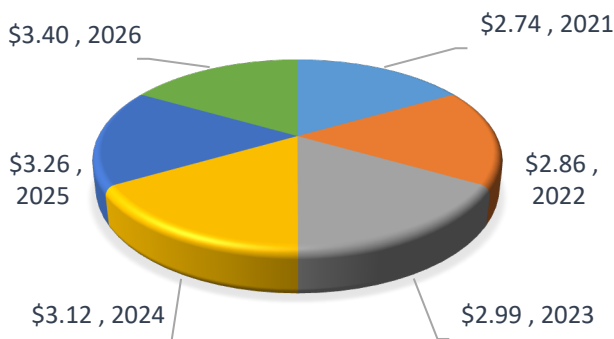


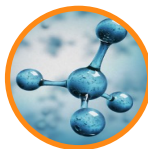
Value of the Trash Odor Control Products Market:

According to a market research report published by MarketsandMarkets in 2021, the global market for trash odor control products is expected to reach a value of 3.4 billion US dollars by 2026, with a compound annual growth rate of 4.2% between 2021 and 2026.



VALUES IN BILLIONS OF DOLLARS

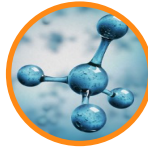







Costs Associated with Bad Odor in Trash

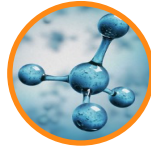
1. **Cleaning and maintenance costs:** To maintain a clean and odor-free environment, it is necessary to invest in cleaning products and cleaning personnel who can keep the rooms and trash containers clean.
2. **Trash container replacement costs:** In some cases, the bad odor can be so strong that the trash container must be completely replaced to solve the problem. 
3. **Health costs:** The presence of insects and rodents due to bad odor in the trash can be a public health problem and increase the risk of vector-borne diseases.
4. **User experience impact costs:** In the case of restaurants, hotels, and hospitals, the presence of bad odor can affect the user experience and decrease customer satisfaction. 
5. **Fragrance and odor-mitigating product costs:** In some cases, fragrances and other products can be purchased to disguise bad odor, however, these products do not always work and can be expensive in the long term if constant use is required.





Comparing Fragrances vs. Enzymes for Mitigating Odors in Trash

| Aspect | Fragrances | Enzymes |
|--|--|--|
| Function | Fragrances mask the bad odor in trash, creating a more pleasant scent. | Enzymes eliminate the bad odor in trash by breaking down organic waste and converting it into non-smelly substances. |
|  Effectiveness | Fragrances have a temporary effect, and frequent reapplication is required to maintain the effect. | Enzymes are effective in eliminating the bad odor in trash as they tackle the root cause by breaking down organic waste. |
| Duration | Fragrances have a temporary effect, and frequent reapplication is required to maintain the effect. | Enzymes have a long-lasting effect as they continue working even after the initial application.  |
| Environmental impact  | Fragrances may contain harmful chemicals to the environment and contribute to air and water pollution. | Enzymes are environmentally safe and do not contribute to air or water pollution. |
| Cost | Fragrances may be cost-effective, but frequent application is necessary to maintain the effect. | Enzymes may be more expensive than fragrances, but their long-lasting effect reduces the need for frequent application. |

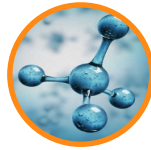


In brief, the use of enzymes to mitigate odor in trash has significant advantages over the use of fragrances.

Enzymes are more effective in eliminating the root cause of bad odor by breaking down organic waste and converting it into non-smelly substances.

Moreover, enzymes have a long-lasting effect and are environmentally safe. Although enzymes may be more expensive than fragrances, their long-lasting effect reduces the need for frequent application, making their long-term use more cost-effective.





Our Solution

We have developed an enzyme capable of producing colonies of bacteria with 200 billion cfu/gal (indicating the number of microorganisms present per gallon of liquid) specifically designed for this purpose. This enzyme is periodically applied to garbage waste to promote the growth of bacteria with digestive activity. These bacteria digest the decomposing matter and eliminate the gases produced by the putrefaction process.



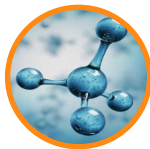
The chemical explanation behind this solution is that certain bacteria can digest organic matter and use it as a source of energy. During this process, the bacteria produce enzymes that break down the organic matter into simpler molecules and, as a byproduct, generate gases such as carbon dioxide (CO₂) and water (H₂O). These bacteria are known as aerobic bacteria, as they require oxygen for their metabolism.



In the case of bad odor in garbage, specific bacteria can be used that feed on decomposing organic matter and do not produce foul-smelling gases such as hydrogen sulfide. These bacteria are known as anaerobic bacteria, as they can live and metabolize in the absence of oxygen. By introducing these bacteria into garbage containers, the decomposition of organic matter is promoted, and the production of foul-smelling gases is reduced.

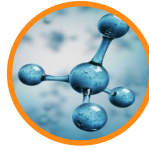
Our product is a cost-effective and sustainable solution for reducing bad odor in garbage rooms and containers. In addition to the enzyme, our solution includes a programmable and easy-to-use dispenser to dispense the enzyme on specific days, every few hours, and for a determined duration.





In addition, it has **unique** (optional) features such as activation through an air quality sensor that measures the level of methane in the environment, and a level sensor in the enzyme container that, when connected to Wi-Fi, can send information about the remaining liquid. This way, the user does not need to personally check the amount of enzyme left in the container, as the system, through Wi-Fi and an internally developed mobile phone application, allows for status updates and programming changes of the dispenser as needed.





Benefits of Our Solution

1. Reduces bad odor: The enzyme promotes the growth of bacteria with digestive activity that eliminates the process of putrefaction and reduces bad odor.



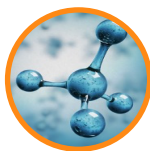
2. Improves hygiene: Our solution helps reduce the presence of insects and rodents that can be carriers of diseases and helps keep trash rooms and containers cleaner.

3. Cost savings: Our solution is cost-effective and sustainable, which means it can reduce the costs associated with purchasing ineffective products and constantly cleaning trash rooms and containers.



4. Enhances user experience: Reducing bad odor in restaurants, hotels, and hospitals can enhance the user experience and therefore increase customer loyalty and return.





Our Conclusion

Our product is an innovative, cost-effective, and sustainable solution to reduce bad odor in rooms and trash containers. Unlike fragrances, our solution addresses the problem of organic matter decomposition, making it more effective. The benefits include reducing bad odor, improving hygiene, and enhancing user experience.



In addition to being effective, our product is cost-effective in the long run. Reducing the decomposition process decreases maintenance and cleaning costs, and the use of our biodegradable enzyme reduces the use of harmful chemicals to the environment.

We conducted extensive testing in different container and trash room situations to ensure the quality of our product. The results were very positive, as our enzyme eliminated bad odor in all cases.

In summary, our specialized enzyme is an effective and cost-efficient solution to reduce bad odor in residential buildings, hotels, restaurants, hospitals, and landfills. It not only eliminates bad odor but also improves air quality and overall hygiene.

