

# The pros and cons of anti-microbial preservatives: Balancing safety and effectiveness.

Jun Shakinaz\*

Department of Biology, University of Pendidikan Sultan Idris, Tanjong Malim, Malaysia

## Introduction

Anti-microbial preservatives are substances added to products to prevent the growth of harmful microorganisms, such as bacteria, fungi, and viruses. They are commonly used in a wide range of products, including food, pharmaceuticals, cosmetics, and personal care products. While these preservatives are effective at preventing the growth of harmful microorganisms, they are not without their drawbacks. In this article, we will explore the pros and cons of anti-microbial preservatives, and the importance of balancing safety and effectiveness. Fresh entire undamaged meat can be treated with anti-microbial dips or sprays that fight bacteria. There are certain restrictions on their direct application to the meat surface due to the possibility of the active chemicals being neutralised at the point of contact or rapidly diffusing from the surface into the meat mass [1].

The goal of anti-microbial food packaging, which falls under the category of active packaging, is to increase shelf life by extending the lag phase and lowering the growth rate of microorganisms while maintaining product quality and safety. Instead of adding anti-microbial chemicals to the meat products, it might be preferable to incorporate them into the packaging. For instance, because plant essential oils are typically very volatile, it is not required to use them in contact with food, which could have negative impacts on the product's sensory qualities.

## The Pros of Anti-Microbial Preservatives

One of the main advantages of anti-microbial preservatives is that they help to prevent the growth of harmful bacteria and fungi in products. This can help to ensure that these products are safe to use and consume, and can also reduce the risk of foodborne illness and other infections. Anti-microbial preservatives can also help to maintain the quality of products by preventing spoilage and degradation over time.

Another advantage of anti-microbial preservatives is that they can help to reduce waste and save money. By extending the shelf life of products, manufacturers can reduce the amount of products that go to waste and avoid having to replace expired products. This can also help to lower the cost of production and make products more affordable for consumers [2].

## The Cons of Anti-Microbial Preservatives

Despite their advantages, anti-microbial preservatives also have their drawbacks. One of the main concerns with these preservatives is that they can cause allergic reactions in some people. This is especially true for preservatives like Methylisothiazolinone (MIT) and formaldehyde, which have been linked to skin irritation, dermatitis, and other allergic reactions.

Another potential downside of anti-microbial preservatives is that they can contribute to the development of antibiotic-resistant bacteria. This is because some anti-microbial preservatives work by killing bacteria, and this can select for bacteria that are resistant to these preservatives. Over time, this can lead to the emergence of superbugs that are resistant to multiple antibiotics, making it harder to treat infections [3].

## Balancing Safety and Effectiveness

To balance the safety and effectiveness of anti-microbial preservatives, it is important to use them judiciously and follow recommended guidelines for their use. This includes using preservatives that have been approved for use by regulatory agencies like the Food and Drug Administration (FDA) and the European Union. It also means using these preservatives in the appropriate amounts and avoiding overuse or misuse. In addition, it is important to consider alternative methods of preservation, such as packaging techniques, temperature control, and natural preservatives. Some natural preservatives like rosemary extract, vitamin E, and grapefruit seed extract can be effective in preventing microbial growth without the potential side effects of synthetic preservatives [4].

Anti-microbial preservatives play a crucial role in ensuring the safety and effectiveness of many personal care and cosmetic products, as well as some food and pharmaceutical products. However, their use also presents some potential drawbacks, such as the risk of allergic reactions, irritation, and microbial resistance. Therefore, it is important to carefully balance the benefits and risks associated with using anti-microbial preservatives in different products, and to always prioritize the safety and well-being of consumers. Additionally, manufacturers and regulators should continue to explore alternative methods for preserving products that may be safer and more sustainable in the long-term [5].

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\*Correspondence to: Ogawa Wang, Department of Chemistry, University of Negeri Jakarta, Jakarta, Indonesia, E-mail: shakinaz@fsm.upsu.edu.my

Received: 02-Mar-2023, Manuscript No. AAFMY-23-90248; Editor assigned: 06-Mar-2023, PreQC No. AAFMY-23-90248(PQ); Reviewed: 20-Mar-2023, QC No AAFMY-23-90248;

Revised: 23-Mar-2023, Manuscript No. AAFMY-23-90248(R); Published: 30-Mar-2023, DOI:10.35841/aafmy-7.2.140

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