

The Advantages of Synthetically-Generated Flavors and Fragrances

By Tom McLemore
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Table of Contents

Summary	Page 3
Introduction	Page 4
Consistency	Page 5
Scalability	Page 5
Sustainability	Page 5
Safety	Page 6
Cost	Page 6
Innovation and Customization	Page 6
Conclusion	Page 8
References	Page 9

Summary:

This white paper presents a compelling argument for the use of synthetically-generated flavors and fragrances in place of or in addition to their naturally-derived counterparts.

By examining the key features of flavor and fragrance ingredients, such as consistency, scalability, sustainability, safety, and cost-effectiveness, this paper highlights why synthetic production methods should be considered over natural ingredients.

This paper also addresses some of the common misconceptions that natural flavor and fragrance ingredients are superior and highlights the benefits of synthetically-generated ingredients as it relates to meeting consumer demands and driving innovation.

Introduction:

Natural flavor and fragrance ingredients are derived from something that exists in nature – plants, animals, or fermented materials. Any flavor or fragrance ingredient that is derived from some other source would be considered synthetic. Both synthetic and natural ingredients are engineered and synthesized by various engineering processes and natural and synthetic ingredients can be indistinguishable from each other with those synthetic ingredients referred to as “nature identical”. Any health benefits associated with the ingredient would be the same regardless of how that ingredient was derived.

The flavors and fragrances industry originally relied on natural sources for flavor and fragrance production. However, as a better understanding of science grew, synthetic flavor and fragrance options were developed. In recent times, a bias toward natural ingredients has begun to dominate many places around the world despite the increased proliferation and quality of synthetic ingredients. At the same time, the definition of what is considered “natural” has added confusion with the US and EU not agreeing on a definition of natural fragrance and flavor ingredients.

It is clear that synthetically-generated flavors and fragrances offer several compelling advantages over many ingredients considered to be natural. This paper explores these benefits and aims to dispel misconceptions surrounding synthetic flavor and fragrance generation.

Consistency and Purity:

Consistency is crucial for meeting consumer expectations and maintaining brand integrity.

Natural ingredients are influenced by the soil and climate where they are grown and by the weather conditions as the material is growing. This can make the derived product different one batch to the next and can result in impurities that affect the profile of the ingredient.

One of the key advantages of synthetic flavors and fragrances is the ability to achieve consistent quality and flavor profiles as the manufacturer controls all of the variables that influence the final material.

According to a study by Market Research Future, synthetic flavors and fragrances "offer a precise control over the composition, ensuring consistency and uniformity in taste and aroma across various batches" (Market Research Future, 2022).

Scalability:

Synthetic production methods enable manufacturers to meet growing demand without relying on scarce natural resources.

Natural flavor and fragrance production can be limited by factors such as seasonal availability, land requirements, and crop yields.

In contrast, synthetically-generated flavors and fragrances offer incomparable scalability. While there are sometimes supply issues in the raw materials, typically the manufacturer's production capability is mostly influenced by its own production capacity.

A report by Grand View Research states that "synthetic production methods provide the flexibility to scale up production quickly, ensuring a reliable and sustainable supply for the industry" (Grand View Research, 2021).

Sustainability:

As consumers become more environmentally focused, the ability for flavor and fragrance producers to offer sustainable ingredients is critical. Contrary to common misconceptions, synthetic production methods can significantly contribute to sustainability efforts.

Unfortunately, some of the raw natural ingredients are not regenerative and many naturally-derived ingredients have a significant impact on water usage and the land that is needed to produce the ingredients. These factors also influence other plants and native animals that are also vying for those same resources.

According to a white paper by the International Fragrance Association (IFRA), synthetic flavors and fragrances "reduce the need for intensive land use, minimize the industry's impact on biodiversity, and provide a more environmentally friendly approach" (IFRA, 2019). Advanced synthetic production technologies also allow for the use of renewable feedstocks and eco-friendly processes, further reducing the environmental footprint of the industry.

Safety:

Natural Flavor and Fragrance Ingredients are dependent on the source and care of the raw materials.

Synthetic production methods provide greater control over the finished materials and that results in fewer allergens, contaminants, or naturally occurring toxins and impurities. This makes synthetically-generated flavor and fragrance ingredients a safer alternative for consumers with specific sensitivities. Since both natural and synthetic ingredients share the same constructed formula, neither is healthier than the other.

A study published in Food Science & Nutrition agreed stating that "synthetic flavors and fragrances can be precisely controlled and monitored for purity and safety, offering consumers a higher level of confidence compared to natural sources" (Food Science & Nutrition, 2020).

Synthetic flavors and fragrances undergo rigorous testing and regulation to ensure they are safe for consumers.

Cost:

Naturally derived ingredients are often three to five times more costly than the synthetic materials they compete against.

According to a report by Allied Market Research, "synthetic flavors and fragrances provide cost stability, reduced reliance on scarce resources, and economies of scale, making them more cost-effective for manufacturers" (Allied Market Research, 2020).

These cost efficiencies enable manufacturers to offer high-quality products at competitive prices, which makes the finished product more accessible to a wider consumer base.

Innovation and Customization:

Synthetically-produced flavor and fragrance ingredients empower the industry to innovate and to meet the ever-changing demand from consumers.

Because of the ability to modify and change the production, innovation and customization is easier to direct.

An article published in the Journal of Agricultural and Food Chemistry agreed, stating, "advanced technologies allow for the creation of unique and exotic flavors and fragrances that may not exist in nature, providing opportunities for customization and novel product development" (Journal of Agricultural and Food Chemistry, 2018).

Conclusion:

Synthetically-generated flavors and fragrances present a compelling case for their advantages over naturally-derived counterparts. With advantages such as consistency, scalability, sustainability, safety, cost-effectiveness, and innovation, synthetic production methods are reshaping the industry and driving unprecedented growth.

By embracing these advancements in synthetic flavor and fragrance ingredient production, manufacturers can meet consumer expectations, unleash their creative potential, and usher in a new era of flavors and fragrances that are sustainable, cost-effective, safe, and tailored to individual preferences.

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