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The Use of Solid Fermentation Based on *Bacillus licheniformis* Led to Changes in the Composition, Viability and Digestion of Olive Oil Cakes

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Abstract

Solid fermentation using *Bacillus licheniformis* is a promising approach for enhancing the utilization of olive oil cakes, a by-product of olive oil production. This process can lead to significant changes in the composition, viability, and digestion of these cakes, offering several potential benefits. Olive oil production generates large amounts of waste in the form of olive oil cakes, which are the solid remnants left after pressing the olives for oil extraction. These cakes are rich in nutrients but are underutilized, often ending up as low-value byproducts or being discarded. Solid fermentation using *Bacillus licheniformis* presents a sustainable and environmentally friendly method to enhance the value of olive oil cakes. This article explores the impact of solid fermentation on the composition, viability, and digestion of olive oil cakes.

Keywords: Solid fermentation • Organic compounds • Amino acids

Introduction

Solid fermentation with *Bacillus licheniformis* can significantly alter the composition of olive oil cakes. One of the key changes is the breakdown of complex organic compounds into simpler, more bioavailable forms. For example, proteins in the cakes can be enzymatically hydrolyzed into peptides and amino acids, which are easier for animals to digest. This process also leads to the release of vitamins and minerals trapped in the cakes, further enhancing their nutritional value. Another important aspect of solid fermentation is the enhancement of microbial viability in the cakes. *Bacillus licheniformis* is known for its ability to produce antimicrobial compounds, which can inhibit the growth of harmful bacteria and fungi. By fermenting olive oil cakes, the population of beneficial microbes such as *Bacillus licheniformis* can be increased, creating a more stable and healthier product. SSF with B. licheniformis has been shown to enhance the digestibility of olive oil cakes by degrading anti-nutritional factors and complex molecules into simpler, more bioavailable forms. This results in an increase in the release of nutrients during digestion, improving the nutritional value of the cakes [1,2].

Literature Review

The digestion of olive oil cakes can be improved through solid fermentation. As mentioned earlier, the breakdown of proteins into peptides and amino acids makes them more digestible. Additionally, the fermentation process can increase the availability of other nutrients such as carbohydrates and lipids. This improved digestibility can lead to better nutrient absorption and utilization by animals, resulting in enhanced growth and productivity. Solid fermentation can significantly increase the nutritional value of olive oil cakes. The release of vitamins, minerals, and other nutrients from the cakes during fermentation enhances their overall nutrient content. This is particularly beneficial in animal feed applications, where the nutritional quality of feed directly impacts the health and performance of livestock [2,3].

Discussion

The use of solid fermentation with *Bacillus licheniformis* has promising applications in various fields, including animal feed production and organic waste management. By converting olive oil cakes into a more valuable product, this approach contributes to the circular economy and sustainable agriculture. Future research could focus on optimizing fermentation conditions, exploring the use of other microbial strains, and evaluating the economic feasibility of large-scale implementation. Olive oil cakes are by-products of olive oil production, rich in nutrients but underutilized due to their limited digestibility. Solid-state fermentation (SSF) using *Bacillus licheniformis* has emerged as a promising method to enhance the nutritional value and digestibility of these cakes. This article reviews the effects of SSF with B. licheniformis on the composition, viability, and digestion of olive oil cakes, highlighting its potential as a sustainable approach to valorize this by-product [4-6].

Conclusion

Solid fermentation using *Bacillus licheniformis* can bring about significant changes in the composition, viability, and digestion of olive oil cakes. By enhancing the nutritional value and digestibility of these cakes, solid fermentation offers a sustainable solution for utilizing olive oil production waste. Further research and development in this area could lead to broader applications and benefits in agriculture and waste management. Solid-state fermentation with *Bacillus licheniformis* is a promising approach to enhance the nutritional value and digestibility of olive oil cakes. By modifying the composition, increasing the viability of beneficial bacteria, and improving digestibility, SSF offers a sustainable method to valorize this by-product of olive oil production. Further research is needed to optimize SSF conditions and assess the potential of SSF-treated olive oil cakes as a functional food ingredient.

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Conflict of Interest

There is no conflict of interest by author.

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