“Comparative study of antioxidant activity of the extracts obtained from the waste materials of Georgian grape seed oil production”

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Abstract

Recently, animal food has attracted significant attention because of the synthetic antioxidants they contain. These antioxidants are associated with various negative effects, such as toxicity, carcinogenicity, and non-biodegradability. Consequently, there is an ongoing pursuit to discover natural alternatives to replace synthetic antioxidants. Extensive global research is currently being conducted to identify natural sources of antioxidants and evaluate their effectiveness. Ensuring the cost-effectiveness of natural supplements and minimizing environmental pollution are also crucial considerations.

Our research aims to extract antioxidant-rich fractions from the waste of Georgian grape seed oil production. By comparing their effectiveness, our ultimate goal is to enhance the antioxidant properties of animal feed.

The focus of our study is on the oilcake obtained from the waste of grape seed oil production. Grape seeds are known to contain polyphenols, which have one of the highest antioxidant activity. Therefore, our research holds significance as it presents a potential source of natural antioxidants that can refine and improve animal feed. Moreover, it also allows for efficient production, because we will use a previously unexplited resource. Besides, the use of natural antioxidants will automatically reduce the use of synthetic alternatives. This shift towards natural antioxidants has the potential to improve animal health and minimize environmental impact.

Additionally, our research is even more valuable because we employed two different solvents in the study: ethyl acetate and ethanol-water solution. Each process was conducted using both solvents, considering the diverse properties of different polyphenols, including polarity,

solubility, and hydrophobicity. The comparative analysis of these solvents provided valuable insights into their productivity and the relative effectiveness of each fraction's antioxidant activity. Consequently, this information can guide future research and industrial processes to optimize extraction techniques. Furthermore, we quantitatively assessed total polyphenols (and total flavonoids) using appropriate methods. This quantitative assessment offers insights into the antioxidant productivity potential, which allows us to be better informed in case of their potential use. Besides, the antioxidant activity of the fractions was evaluated using the luminol chemiluminescence method induced by hydrogen peroxide.

In conclusion, this study has identified a potential source of natural antioxidants through the waste generated during grape seed oil production. The research holds promise for refining and enhancing animal feed, promoting efficient production, and reducing the dependence on synthetic antioxidants.