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# Section Food Science and Technology

A vertical strip on the left side of the page shows a microscopic image of food cells, likely plant tissue, stained in shades of blue and purple. The cells are irregular in shape and show internal structures.

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# Section Information

The Section on Food Science and Technology deals with the advancement of food quality; (bio)chemical characterization such as of nutritional composition, flavor compounds (volatiles and non-volatile compounds), bioactive compounds (antioxidants and other phytochemicals), and bioactivity; microbiological issues; and the design and evaluation of new formulated foods. It also includes some other aspects related to food technology, such as the effects of processing, stor-age, and preservation to maintain not only the quality but also the safety of foods. The main focus is on novel techniques for analytical purposes that could lead to increased food quality and safety and the development of new foods and in-gredients. *Applied Sciences*, in general, and this Section on Food Science and Technology, in particular, offer high-quality peer review followed by rapid publication.

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## Section Editor-in-Chief

Prof. Dr. José Manuel Moreno-Rojas

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# Selected Papers

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## Insight into the Impact of Food Processing and Culinary Preparations on the Stability and Content of Plant Alkaloids Considered as Natural Food Contaminants

**Authors:** Natalia Casado, Natalia Casado, Gema Casado-Hidalgo, Lorena González-Gómez, Sonia Morante-Zarcelero and Isabel Sierra

**Abstract:** Pyrrolizidine alkaloids, tropane alkaloids and opium alkaloids are natural plant toxins that have recently gained special interest in food safety due to their concerning occurrence in many foods and feeds. Although a legislation for these alkaloids has recently been established, the concentration levels of these toxins in food exceed in many cases the maximum limit established by the competent authorities. Moreover, these regulations only establish maximum limits of these compounds for certain raw materials, but processed products are generally not considered. However, it is important to correctly assess the potential health risk of these alkaloids through the diet. Accordingly, this review aims to provide insight into these alkaloids and give an overview on how food processing and culinary preparation can influence their content and stability. For this purpose, the most relevant works that address the effect of heat treatment, fermentation, infusion preparation (transfer rate) and other treatments (milling, washing and soaking) on these natural toxins are reviewed. To date, this research field has been scarcely studied and many of the results published are contradictory, so it is not always possible to establish conclusive findings. In many cases, this is due to a lack of experimental design and exhaustive control of the different variables that may affect these treatments and preparations. Likewise, considering the transformation of these alkaloids into toxic degradation products it is also of high interest. Therefore, further studies are needed to delve deeper into the stability of these toxins and to understand how their content may be affected by the transformation of contaminated raw materials into processed products, so that the risk exposure of the population to these alkaloids through diet can be determined more precisely. Hence, this topic constitutes a research line of great interest for future works with many challenges to be resolved.

<https://doi.org/10.3390/app13031704>



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## Quality Assessment of Banana Ripening Stages by Combining Analytical Methods and Image Analysis

**Authors:** Vassilia J. Sinanoglou, Thalia Tsiaka, Konstantinos Aouant, Elizabeth Mouka, Georgia Ladika, Eftichia Kritsi, Spyros J. Konteles, Alexandros-George Ioannou, Panagiotis Zoumpoulakis, Irini F. Strati and Dionisis Cavouras

**Abstract:** Currently, the evaluation of fruit ripening progress in relation to physicochemical and texture-quality parameters has become an increasingly important issue, particularly when considering consumer acceptance. Therefore, the purpose of the present study was the application of rapid, nondestructive, and conventional methods to assess the quality of banana peels and flesh in terms of ripening and during storage in controlled temperatures and humidity. For this purpose, we implemented various analytical techniques, such as attenuated total reflection-Fourier transform infrared (ATR-FTIR) spectroscopy for texture, colorimetrics, and physicochemical features, along with image-analysis methods and discriminant as well as statistical analysis. Image-analysis outcomes showed that storage provoked significant degradation of banana peels based on the increased image-texture dissimilarity and the loss of the structural order of the texture. In addition, the computed features were sufficient to discriminate four ripening stages with high accuracy. Moreover, the results revealed that storage led to significant changes in the color parameters and dramatic decreases in the texture attributes of banana flesh. The combination of image and chemical analyses pinpointed that storage caused water migration to the flesh and significant starch decomposition, which was then converted into soluble sugars. The redness and yellowness of the peel; the flesh moisture content; the texture attributes; Brix; and the storage time were all strongly interrelated. The combination of these techniques, coupled with statistical tools, to monitor the physicochemical and organoleptic quality of bananas during storage could be further applied for assessing the quality of other fruits and vegetables under similar conditions..

<https://doi.org/10.3390/app13063533>



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## An Overview on Management and Valorisation of Winery Wastes

**Authors:** Violeta-Carolina Niculescu and Roxana-Elena Ionete

**Abstract:** As we address important societal needs, the circular economy equips us with the means to jointly combat climate change and biodiversity loss, including the revaluation of waste. The wine-making process is a huge generator of waste, creating problems for manufacturers every year; therefore, an appropriate management and valorisation of winery wastes are crucial, even if it is difficult. This results from the hardship of disposing of grape marc, which is considered a pollutant for the environment. In the past, the simplest option for this waste disposal was the payment of a fee around EUR 3000, which recently increased up to EUR 30,000–40,000. Several environmentally friendly technologies have been proposed for the recovery of cellar waste. Fermentation of grape residue, pruning, or wine-making lees have been reported to yield lactic acid, surfactants, xylitol, ethanol, and other compounds. In addition, grape pulp and seeds are rich in phenolic compounds, which have antioxidant properties, and tartaric acid from vinasse can be extracted and marketed. Additionally, complex phenol mixtures, such as those found in wine residues (seeds, bark, stems, or leaves), are effective as chemotherapeutic agents and can be used in medicine. In this review, the potential of using wine-making by-products, extracts, and their constituent parts as raw materials for adsorbents, biopolymers, natural reinforcing fillers, and sustainable energy production will be a key point of discussion. An overview on how wine producers, based on wine and wastes chemistry, can implement the circular economy as an alternative to the conventional linear economy (make, use, dispose) will be provided.

<https://doi.org/10.3390/app13085063>

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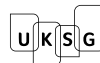
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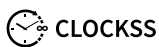
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