

**Assessing the impact of spent coffee ground (SCG) concentrations on shortbread:
A study of physicochemical attributes and sensory acceptance**

ABSTRACT

Currently, every 1 kg of instant coffee produced results in 2 kg of wet SCG, accounting for 45% of total annual production. Instead of being wasted and causing environmental issues, SCG can be utilized for its potential to create valuable products with added value. This study explores the underutilized potential of spent coffee grounds (SCG) as a functional ingredient in shortbread biscuits, with the aim of improving their nutritional value and reducing waste in the coffee industry. In this study, six different shortbread formulations were developed using various concentrations of SCG powder (ranging from 0 to 10%). The samples were subjected to physical, sensory, proximate, and chemical analyses to assess their storage quality, physicochemical properties, and sensory acceptability. The results showed that the SCG-containing shortbread had higher moisture, protein, ash, fibre, total phenolic content, and antioxidant activity than the control sample, with the 10% SCG shortbread proving to be the most desirable in terms of aroma and hardness. Overall, this study highlights the potential of SCG as a valuable source of bioactive compounds in innovative cookies, offering opportunities for the utilization of industrial by-products, reducing waste, and improving nutritional properties.