The Golden Seeds: Substituting Guava (Psidium guajava L.) Seeds for Sustainable Applications: Baked Goods, Animal Feeds, and Organic Fertilizers

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Guava seeds, often discarded as waste during fruit processing, represent a significant untapped resource. In 2023, Egypt produced over 363,000 tons of guava, resulting in approximately 54,000–72,000 tons of seed waste. India, the largest producer, generated 5.42 million tons of guava and lost up to 1.1 million tons of seeds. In addition, there is greater expense and lower nutrition from imported grains like wheat, quinoa, and oats; thus, my present study proposes guava seed flour as a low-cost eco-friendly alternative for bakery products, animal feed, and organic fertilizer. Guava seeds were soaked (24–42 h), dried (<70 °C for 10 min), and ground to flour or crushed grain based on application by grinder. The processed seed material was incorporated into bread and gluten-free biscuits (40%), regular and diet biscuits (30%), livestock feed (40%), poultry feed (20%), and organic fertilizer (20%)—on Food and Agricultural Organization(FAO)-recommended nutritional value basis. The enzyme activity measurement test confirmed raising a-amylase activity, improving digestibility. Chromatography testes revealed low calorie, high fat, and vitamin content. Neither mycotoxins nor phenols were found by toxicity and phenol tests, respectively. Rheological analysis established the functionality of guava seeds flour in the dough, while compost decomposition tests validated its use in organic fertilizers. Plant growth experiments compared guava seed-based fertilizers with regular ones, controlling for soil, plant, and time of measurement. This study aims to address global challenges like food loss and environmental sustainability by transforming agricultural by-products into practical solutions for everyday use.

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