

Functional, Textural and Sensory Properties of Formulated Garlic (*Allium sativum*) Cookie

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Consumer preference has increased for natural food additives incorporated snacks. There is a high potential to develop cookies free from synthetic preservatives or fortified with natural preservatives. Garlic is commonly used as a natural flavoring agent and preservative due to the availability of allicin. The study has focused; to formulate garlic powder incorporated cookies, evaluate the functional, textural, and sensory properties, and select the appropriate packaging for the cookie storage. Garlic powder was prepared by grinding after oven drying. Cookies were prepared by incorporating garlic powder into wheat flour at 5, 10, and 12% (w/w) levels. The best formulation, 10% garlic powder incorporated cookie ($p < 0.05$) was selected by the sensory evaluation. Cookies of the best formulation and control were analyzed for the proximate composition, total phenolic content (TPC) antioxidant activity, and textural and sensory attributes. Moreover, the effect of different packaging materials on the shelf life of the developed cookie was determined. The highest TPC (77.45 ± 0.30 mg GAE/100 mg) antioxidant activity ($IC_{50} = 398.11$ ppm) and lower hardness (1157.10 g) resulted in the cookie with 10% garlic powder incorporated. The addition of garlic powder had no significant effect ($p > 0.05$) on the proximate composition of cookies, but they showed lower pH (5.82), higher moisture (2.62%) and higher L^* (60.09), a^* (9.69), b^* (34.46) values. Shelf-life studies were carried out after packaging in paper cans, aluminum packets, and transparent LDPE packets, and stored under ambient conditions for six weeks. There was a significant effect ($p < 0.05$) of selected packaging material on the moisture content (%), pH, and microbial evaluation (10^2 CFU/g) of packaged cookies, analyzed every week from the day of manufacture. All the packaged cookies had a strong positive correlation in moisture content (0.882- 0.994), pH (0.974- 0.965), total plate count (0.881- 0.934), and yeast and mold count (0.900- 0.934) with storage period, and indicated paper cans and aluminum packets are suitable for six weeks' storage of these cookies.

Keywords: Antioxidant, Correlation, Flavor, Garlic powder, Packaging material