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Optimization of antioxidant activity, textural and sensory characteristics of gluten-free cookies made from whole indian quinoa flour

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1 **Optimization of antioxidant activity, textural and sensory characteristics of gluten-free**
2 **cookies made from whole Indian quinoa flour**

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8 **Abstract**

9 The present study deals with optimization of the process parameters for formulation of
10 gluten-free cookies from quinoa flour. The levels of major ingredients and process conditions
11 were varied to determine their effect on responses (color, spread factor, hardness, antioxidant
12 activity and overall acceptability) defining consumer acceptance of cookies. Response
13 surface methodology was used to optimize levels of ingredients and process conditions and
14 the selected variables had a dominant effect on responses. Increase in fat and sugar content
15 increased spread factor and decreased the hardness of cookies, while an increase in baking
16 temperature and time decreased spread factor and increased hardness. The optimized values
17 obtained for independent variables i.e. fat content, sugar content, baking temperature and
18 baking time were 41.83 %, 33.95 %, 181 °C and 18 min, respectively. Experimentally
19 determined values for responses were color 53.05 spread factor 7.16, hardness 47.05,
20 antioxidant activity 20.67 (% DPPH inhibition) and overall acceptability 7.61. Results
21 obtained from this study validate the production of functional and acceptable gluten-free
22 cookies made from quinoa.

23 Keywords: Quinoa; Cookies; optimization; antioxidant activity; overall acceptability

24 **1. Introduction**

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