

Development of barnyard millet snack food : Part I

R.V. JAYBHAYE AND P.P. SRIVASTAV

Barnyard millet (*Echinochloa frumentacea* L.) is a carbohydrate rich coarse grain which can be used to develop a ready-to-eat (RTE) puffed product. Cold extruded dough sheet pieces prepared from barnyard millet flour, potato mash and tapioca powder in the proportion 60:37:3 were steam cooked and then puffed using high temperature short time (HTST) process in hot air puffing machine. The experiments were designed using central composite rotatable design (CCRD) and the effect of process parameters viz. steaming pressure (0 – 1.43 kg cm⁻²); steaming time (5 – 25 min); air temperature (210 – 250 °C) and puffing time (10 – 50 s) on the product quality attributes like moisture content, expansion ratio, colour (L-value), crispness and hardness were investigated and optimized using response surface methodology (RSM). The texture characteristics of puffed product were prominently dependent on moisture content while volume expansion was highly dependent on steaming pressure and puffing time. The final puffed product with optimum moisture content (0.106 kg kg⁻¹ dm), expansion ratio (2.06), colour (72.19 L-value), crispness (11.65 peaks) and hardness (480.66 g) was obtained. The optimum process conditions were: steaming pressure, 0.85 kg cm⁻², steaming time, 10.0 min, air temperature, 234 °C and puffing time, 39 s. The sensory evaluation of the optimally developed product added with spices to enhance taste, showed the product to be highly acceptable.

Key Words : Barnyard millet, Cold extrudates, Puffing, Texture, Crispness, Responses

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MEMBERS OF RESEARCH FORUM

Author for correspondence :

R.V. JAYBHAYE, Department of Agricultural Engineering, College of Agriculture, OSMANABAD (M.S.) INDIA
Email : rvjay003@gmail.com

Associate Authors' :

P.P. SRIVASTAV, Department of Agriculture and Food Engineering, Indian Institute of Technology, KHARAGPUR (W.B.) INDIA
Email : pps@agfe.iitkgp.rss.in