Value Addition of Quinoa (Chenopodium Quinoa Willd.) Using an Indigenously Developed Saponin Removal Machine

Authors : M.A. Ali, M. Matloob, A. Sahar, M. Yamin, M. Imran, Y.A. Yusof

Abstract : Quinoa (Chenopodium quinoa Willd.) is known as pseudocereal was originated in South America's Andes. Quinoa is a good source of protein, amino acids, micronutrients and bioactive components. The lack of gluten makes it suitable for celiac patients. Saponins, the leading ant-nutrient, are found in the pericarp, which adheres to the seed and transmits the bitter flavor to the quinoa grain. It is found in varying amounts in quinoa from 0.1% to 5%. This study was planned to design an indigenous machine to remove saponin from quinoa grains at the farm level to promote entrepreneurship. The machine consisted of a feeding hopper, rotating shaft, grooved stone, perforated steel cylinder, V-belts, pulleys, electric motor and mild steel angle iron and sheets. The motor transmitted power to the shaft with a belt drive. The shaft on which the grooved stone was attached rotated inside the perforated cylinder having a clearance of 2 mm and was removed saponin by an abrasion mechanism. The saponin-removed quinoa was then dipped in water to determine the presence of saponin as it produced foam in water and data were statistically analyzed. The results showed that the raw seed feeding rate of 25 g/s and milling time of 135 s completely removed saponin from seeds with minimum grain losses of 2.85% as compared to the economic analysis of the machine showed that its break-even point was achieved after one and half months with 18,000 s and a production capacity of 33 g/s.

1

Keywords : quinoa seeds, saponin, abrasion mechanism, stone polishing, indigenous machine

Conference Title : ICAFNS 2024 : International Conference on Agricultural, Food and Nutritional Science

Conference Location : Sydney, Australia

Conference Dates : January 18-19, 2024