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Development of a solar tunnel drier and quality analysis of dried food products

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Solar drying is an energy efficient way of producing high quality dried products. In this research, effectiveness of solar drying was compared with open sun drying to establish the most favorable drying in terms of drying kinetics and product quality. A prototype solar tunnel drier was tested by drying little gourds. The maximum drying air temperature was 54o C and average temperature was 48o C, which is feasible for drying fruits and vegetables. The initial moisture content of little gourds (93%) got reduced to 9.06% in 5 drying hours where it took 6 hours to get reduced to 12.1% in open sun drying. The quality of dried products was measured. Quality parameters were color (L*, a*, b* coordinates) and textural characteristics (hardness). The color co-ordinates (L*, a*, b*) for fresh little gourd were 46.7, 10.9 and 26.54 respectively. The lightness parameter L* increased to 50.9 and 48.23 in solar dried sample and open sun dried sample respectively. The redness parameter a* decreased to 9.24 and 4.21 for solar dried and open sun dried samples respectively. The yellowness (b*) parameter was almost same in the case of solar dried sample and reduced to 19.5 in open sun dried sample. The color deviation (ΔE) for solar dried and open sun dried samples was 4.59 and 10.1 respectively. Texture property of dried fruit was measured as puncture force, which was a measure of the hardness (N) of the product. Force for fresh product is 37.16 N and for solar dried it was 19.96 N which is less compared to open sun dried sample (30.87 N).

Biography

A Sreekumar is currently working as an Assistant Professor in Centre Green Energy Technology, Pondicherry Central University. He has received his PhD from Cochin University of Science and Technology, India with specialization in Solar Thermal Engineering. He has obtained his MTech in 'Energy Management'. He has several years of work experience in industry and institutes in renewable energy sector. He has delivered many lectures and technical speech on renewable energy in both India and overseas. He has published several research papers in national and international journals.

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