

# Experimental analysis of thermal performance of solar food dehydrator

■ G.R. CHAVHAN, S.S. BALKAR, M.S. PAWAR AND R.K. RATHOD

**SUMMARY :** A solar food dehydrator were designed and fabricated from a galvanized steel sheet with a slope of 20°. Experiments were conducted at different time of day in the month of February and March in India. The performance was also studied by connecting flat plate collector to solar food dehydrator. It has been found that coupling of solar collector with food dehydrator has decreased the moisture content. The installations of combine flat plate collector and solar food dehydrator simplicity of design, cheapness of manufacturing, convenience of operation and high quality of drying agricultural production.

**KEY WORDS :** Thermal performance, Solar food dehydrator, Experimental analysis

**How to cite this paper :** Chavhan, G.R., Balkar, S.S., Pawar, M.S. and Rathod, R.K. (2012). Experimental analysis of thermal performance of solar food dehydrator. *Internat. J. Proc. & Post Harvest Technol.*, 3 (2) : 203-205.

**Research chronicle : Received :** 21.03.2012; **Revised :** 28.07.2012; **Accepted :** 18.09.2012

Since its evolution man has needed and used energy for his sustenance and well being. Up till 18<sup>th</sup> century man was utilizing energy from wood, wind and water. Till this time we say that sun was supplying energy needs of man directly or indirectly and that man was only utilizing renewable energy sources.

With discovery of steam engine in AD 1700 man began to use new sources of energy viz., coal, in large quantities. A little latter,(AD 1870)internal combustion engine was invented and the other fossil fuels, oil and natural gas began to be used

extensively. The fossil fuel era of using nonrenewable sources had begun and energy was now available in concentrated form.

Renewable energy sources are the sources that are replenished by natural processes on a sufficiently rapid time scale so that they can be used by humans more or less indefinitely, provided the quantity taken per unit of time is not too great. Examples are the animals dung, ethanol, wood, wind, falling water and sunlight.

Many groups and individuals are proposing that our government spend tax money on research and development of systems to utilize solar energy. They urge construction of vast solar energy collectors to convert sunlight to electricity to supply our energy needs. They would even put solar collectors on roofs of homes, factories, schools, and other buildings. Proponents of this technology claim that energy obtained from the sun will be safer and cleaner than coal, oil, or nuclear energy sources.

## EXPERIMENTAL METHODS

*Experimental setup and operation :*

A cross sectional view of a solar food dehydrator was fabricated of galvanized sheet is shown in Fig.A. Build a box as a base for solar dryer. Measure and cut 2 pairs of pieces of 0.826 m x 0.13m and 0.776m x 0.13m of 19mm thick plywood,

### MEMBERS OF THE RESEARCH FORUM

Author for Correspondence :

**R.K. RATHOD**, Krishak Bahvan, Zonal Agricultural Research Station, SOLAPUR ( M.S.) INDIA

Email : signkiran@gmail.com

Coopted Authors:

**G.R. CHAVHAN**, Department of Mechanical Engineering, Government College of Engineering, CHANDRAPUR ( M.S.) INDIA

Email : ganeshchavhan007@gmail.com

**S.S. BALKAR**, Department of Chemical Engineering, Government Polytechnic College, JALNA ( M.S.) INDIA

**M.S. PAWAR**, MIT College of Food Technology, Rajbag Educational Complex, Loni Kalbhor, PUNE ( M.S.) INDIA

Email : mangalpawar32@gmail.com