

Development of solar dryers, Cuban experience for food preservation.

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Abstract: Well-founded studies predict the depletion of energy resources, especially petroleum resources, in just a hundred or two hundred years if the current and prospective consumption rate continues. This energy policy, based on conventional fuels, has catastrophic consequences for humanity and the environment.

A rational energy policy, supported by scientific advances, would lead to a considerable reduction in the current consumption of fuels. Energy efficiency appears as a necessary, but not sufficient, factor for the survival of man on the Earth.

Solar energy converted to heat can be used in food cooking, sea water purification, heating of fluids and drying. Its large-scale use, with a considerable economic effect, is currently obtained only in thermal processes of low temperatures (below 100 ° C).

With the aim of promoting the development of the food program, energy saving, energy efficiency and the use of renewable energy sources, different types of solar dryers have been developed in Cuba, which offer more advantages than conventional dehydrators.

Drying is the operation of reducing the humidity to a certain product, by the evaporation and elimination of the water contained therein, without altering its chemical composition. It is widely used in industrial processes, as well as in the conservation of agricultural, livestock and marine products. In Cuba, the drying of minerals, wood, tobacco, coffee, cocoa, rice, fodder, seeds, aromatic and medicinal plants, fruits, fish, meat products among others are particularly important.

The presentation will illustrate the results of the development of three types of SECSOL Dryers. The benefits of the design of a grain dryer using a rotary drum, a wood dryer and a multipurpose dryer for the drying of vegetables, fruits, medicinal plants and spices will be analyzed. It will also offer the data of its technical characteristics as well as the essential keys for its construction and correct operation.

As a complement to the presentation, the behavior of this type of dryer will be explained under real operating conditions, using as reference the production process carried out in a non-agricultural cooperative that produces condiments and nuts without using extenders or chemical additives for the conservation (100% natural). This experience is very new in Cuba. It is important to point out that the raw material used in this factory is extracted from organic farms, transforming the whole drying process into a polygon of integral development.

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