Innovative Drying Yields New Products

Energy Efficient Heat Pump Dryer an Ideas Provider

A gentle and likewise energy efficient drying technique has also found successful applications in the food sector in recent years. Benefits for operators of such drying systems include the retention of aromas, vitamins, and other ingredients in as well as an appealing appearance of the dried food. Government subsidy has meanwhile become available for using this heat pump based, low temperature drying technique.

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Stephan Ortmann, Harter

The German drying system manufacturer Harter developed the so-called heat pump based condensation drying technique more than 30 years ago and has installed more than 2,000 dryers in various industrial sectors ever since. Food producers have also discovered the benefits of such systems. Harter has successfully realised many human and pet food projects.

The big success of this low temperature drying technique is based on its physically alternative approach. Drying is accomplished using extremely dry and, thus, unsaturated air passed over or through the items to be dried. Such air perfectly absorbs any humidity present. Subsequently, the humid air is cooled – the humidity condenses to form water – reheated and returned to the drying chamber. For drying to be successful, air routeing is critical. The air must be routed precisely to obtain a good and uniform result. The drying temperature may be varied between 20 °C and 75 °C, as required for the specific product or process. If sterilisation is desired, Harter will add an optional 110 °C high temperature stage. Likewise, a cooling stage may be added if required for the specific process. The drying time depends on the residual humidity desired or required. For packaged food, where the wet package needs to be dried, drying time is often accomplished at a minute's pace to meet the specified cycle time. For direct food drying, the drying time is often longer and as needed to obtain the desired residual humidity of the product.

Product Novelty Date Flour

Date palms are one of humanity's oldest cultivated plants. Their fruits, which are rich in healthy ingredients, are truly venerated in North Africa and the Middle East. The many minerals and vitamins contained in dates are real energy boosters. And their high sugar content does not only make them a treat but also provides prolonged keepability. So, basically, dates do not require drying unless there is a special purpose for doing so. This was the case for Al Foah of Abu Dhabi, a regionally well-known producer of date products. They process the "desert bread" – another name for dates – to produce snacks, bars, spreads, sirup and the like. Their new idea was to make flour from dates. Since natural drying would have taken too much time, investment in a drying system appeared reasonable.

For Al Foah, Harter built a H03 chamber dryer featuring three chambers in a row. The system includes three trolleys holding 40 baskets each. Dates are filled in these baskets about 70 mm high. The humidity content in the dates is about 15 percent before and 5 percent or lower after drying. The dates are dried at about 60 °C for 24 hours. The power rating of the whole system in production operation is about 23 kWh.

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Fig. 1: 1,000 kg of dates are gently dried at 60 °C. The "desert bread" is then processed to obtain date flour.

From Horseradish Byproduct to Medication

A likewise old companion of humankind is horseradish. It was used as an immune system booster and an aphrodisiac as far back as in ancient Egypt. Horseradish root is not only used to give spice to dishes but is also an active agent in many naturopathic applications. The essential oils in horseradish root promote the function of the gastro-intestinal system and antagonise many kinds of harmful substances in the body. Growing horseradish entails the laborious removal of head and lateral shoots. These shoots have properties which make processing an onerous task.