CHEMISTRY

Chemical Aids Cook

The chemist brings his knowledge to the aid of the cook by adding glycerine to cooking water. The chemical cuts cooking time by as much as one-half.

➤ COOKING TIME can be greatly reduced by adding harmless glycerine to the water in which foods are cooked, scientists at the American Chemical Society meeting in New York learned.

A chemist, a research chemical engineer and a 14-year-old girl who plans a career in science reported the addition of glycerine to cooking water can cut food cooking time by as much as 50% without changing cooking techniques, altering nutritive value or digestibility of foods.

James Kanegis, chief of the chemical section of the U. S. Department of Commerce Office of Technical Services, Washington, his daughter Brenda, and Dr. Roger Gilmont, Manostat Corporation, New York, investigated the addition of glycerine in several methods of cooking, including hard boiling, scrambling and poaching of eggs, double boiling of cereal, pressure cooking of potatoes in steam and boiling of prunes in water.

In almost all cases, the investigators found cooking time could be cut in half by the addition of about 60% glycerine by weight to the water.

Mr. Kanegis told SCIENCE SERVICE the glycerine and water technique could replace fats and oils in the frying of many foods, as demonstrated in the experiments with scrambled eggs.

"Fats and oils are used in frying," he pointed out, "to enable the cook to achieve a higher temperature than can be obtained with water. The addition of glycerine to water accomplishes this purpose without filling the kitchen air with grease and smoke. Glycerine vaporizes only very slightly from the water."

Glycerine is an inexpensive, moderately sweet, syrupy liquid technically regarded as an alcohol, but having few of the characteristics commonly associated with alcohols. It is a by-product of soap manufacture and is used in printers ink, medicinal preparations, and is called for in some recipes as a partial replacement for sugar as a sweetening agent.

In double boiling of cereals and hard boiling of eggs, there is no occasion for the food to come in contact with glycerine, Mr. Kanegis said. In pressure cooking, the experiments showed that only the water vaporized to penetrate foods, and the glycerine remained a liquid, and did not sweeten the food. In direct immersion boiling, such as with dried prunes, glycerine added "a pleasant, sweet flavor," Mr. Kanegis said.

The new technique grew out of Brenda Kanegis's desire to reduce the time she devoted to cooking for her father and 11-year-old brother, Gary. After consulting scientists associated with glycerine manufacture and uses, she enlisted her father's help in devising experiments to measure glycerine's effects on cooking.

From her studies, the Hyattsville, Md., Junior High School student devised a detailed science fair project which won second place in the chemistry section of the Prince Georges County, Md., Science Fair.

Mr. Kanegis said Dr. Gilmont, a family friend, saw the science fair project report "and told us he believed it to be significant original work that should be published." He studied the chemical thermodynamics of the technique and the three of them co-authorized the paper delivered by Dr. Gilmont.

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ASTRONOMY

Sun and Planets Formed At Temperature of Space

➤ THE SUN, earth and other planets were formed at the temperature of deep space, some 3.5 degrees above absolute zero, which is 459.7 degrees below zero Fahrenheit.

This theory for the origin of the solar system was drawn by Dr. Bertram Donn of Wayne State University for himself and Nobel Prize winner Dr. Harold C. Urey of the University of Chicago.

Dr. Donn outlined the role "free radicals" played in the early days of the solar system at a Symposium on the Formation and Stabilization of Free Radicals held at the National Bureau of Standards. Free radicals are highly reactive fragments of molecules existing only momentarily unless frozen at very low temperatures.

The theory of the low-temperature sun resulted from studies of comets and meteorites. Dr. Donn pictured the formation as starting with the accumulation of dust and gas, which gradually condensed. However, the fiery temperatures of today's sun did not occur until the pressures at the condensation's center were sufficiently great to permit nuclear reactions. Then the sun became luminous.

During the time of the cold sun, the free radicals formed by ultraviolet light or by particle radiation of molecules were preserved in their very reactive state. When the free radicals later combined, the heat released by the reaction was sufficient to melt the solid objects, separating the silicates and iron that billions of years later fell to earth as meteorites.

The theory of Drs. Urey and Donn also accounts for the flaring or sudden brightening of comets. They proposed the sharp increase in brightness sometimes observed in very faint comets results from the chemical combination of free radicals previously frozen in the comet.

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