

## CHEMISTRY

# Food Gets Super Taste Appeal

**Chemical which has no taste of its own, stimulates mouth watering and brings out flavors. It was Oriental cooking secret.**

By ANN EWING

► A PILL that will be just as nutritious as a steak dinner, or even more so, will still have a tough battle replacing a good, old-fashioned meal with its stimulating aroma and delightful taste.

For we judge food by its flavor, and pills even though nutritious, are not likely to have the flavor of a steak smothered in mushrooms.

One of the newest chemical substances that will perk up, or enhance, food flavor is MSG. This is an abbreviation for monosodium glutamate. Now sold as pure white crystals, the chemical was known in a crude form by Orientals for centuries.

MSG is a natural protein product that can be made from vegetables or grain. It has no flavor of its own in the way that salt and pepper, for instance, do. But it does intensify the flavors already in food as well as bring out flavors that might otherwise remain hidden.

At one time gourmets in the United States could buy it under the name of "aji-no-moto." While its use in Chinese food and in canned and dehydrated soups is fairly well known, its possibilities in the preparation of home-cooked foods are not so familiar.

## Increases Saliva Secretion

MSG not only increases the secretion of saliva for some time, but also stimulates a tingling feeling in the mouth. To some, it has no taste at all. Even to most of these people, however, MSG does perk up the taste of foods to which it is added.

Because earlier preparations of monosodium glutamate, with a relatively low degree of purity, exhibited a meatlike flavor, the general belief existed that glutamate should be used as a seasoning for imparting meat flavors.

Continued refinement in production methods has been responsible for progressive increases in purity. Most of the MSG products available on the market today are over 99% pure. Only when the pure product became available was its unique property of accentuating natural food flavors fully appreciated.

## Glutamic Acid in Vegetables

To determine whether vegetables contained free glutamic acid, 16 varieties of canned vegetables of recognized brands and six kinds of fresh vegetables were

analyzed. They found that all contained glutamic acid, with mushrooms, peas and corn ranking highest. Fresh peas and fresh young sweet corn contained even more glutamic acid than older samples from the same field.

Meats, poultry and seafood analyzed revealed the presence of glutamic acid, also. Studies were made of chicken, seafoods such as salmon, tuna and clams, and meats such as roast beef, and meat products such as sausages.

Hominy, one of the vegetables studied, turned up without any glutamic acid. But researchers pointed out that hominy is made from mature corn which has less glutamic acid than young corn, and they said, the small amount of the acid which may have been in the corn might well have been washed out during the hominy process.

Cooked vegetables stored in the refrigerator kept most of their glutamic acid. Stored raw vegetables lost from 25 to 35% of their glutamic acid, most of it in the first 24 hours of storage.

As a result of these studies, it was thought that part of the superior flavor of young and freshly harvested vegetables may be due to their higher glutamic acid content. Also the glutamic acid in meats contributes

to their natural flavor.

## Undesirable Flavors Suppressed

The flavor-enhancing properties of MSG are retained indefinitely regardless of the length of time the food with which it is used may be stored.

On the other hand, undesirable flavors in certain foods are suppressed by monosodium glutamate. Such unwanted flavors include the sharpness of onions, the rawness in many vegetables and some meats, and the flavor of peel and earthiness in other vegetables, such as potatoes.

## Found in Proteins

Glutamic acid is one of the most common of the amino acids, being one of those found in practically all proteins. Wheat gluten is one of the richest and probably the most economical source of this amino acid. The proteins in wheat gluten contain approximately 40% glutamic acid.

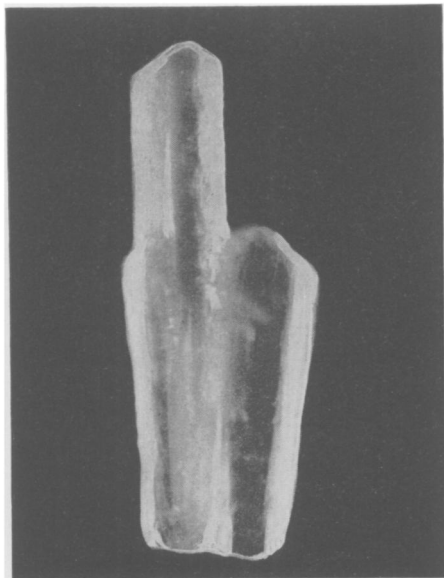
In one of the commercial methods for preparing MSG from wheat gluten, the protein is completely digested by boiling or autoclaving with strong hydrochloric acid. After filtering and adjusting the amount of acidity, glutamic acid crystallizes in long, white needles.

## Commercial Preparation

These crystals are then filtered off, purified and neutralized by dissolving in a solution of soda. This solution is then concentrated and allowed to crystallize over



**ENHANCES FLAVORS**—Added to almost any kind of food, monosodium glutamate perks up the taste, bringing out flavors that might otherwise remain hidden. Here it is tried on ham and eggs.



**MAGIC CRYSTAL**—From such protein-yielding sources as wheat spikes come the monosodium glutamate crystals which serve as the cook's fairy wand. The taste enhancing crystal is more than 99% pure.

a period of five to six days. The crystals of monosodium glutamate are then spray-washed and dried, after which they are ready for packaging.

The best flavor in food is one which appeals simultaneously to all of our flavor-detecting senses, i.e., odor, taste and feeling. An aroma is needed to make known the presence of the food, taste to entertain the tongue, and finally a pleasant combination of texture and tang to make us feel that the food is at its best in all ways.

If any of these sensory elements is missing the food is flat and uninteresting. It is the function of taste enhancers to supply the missing element or to heighten the effect of the elements already present. Monosodium glutamate does just this, yet does not have any taste itself.

To obtain for yourself a sample of monosodium glutamate as well as a new sweetening agent, sodium sucaryl, just introduced on the market and samples of other seasonings, write for the Taste Enhancers Unit of THINGS of science. Send 50 cents to Science Service, 1719 N Street, N. W., Washington 6, D. C. The supply of this unit is limited.

Science News Letter, July 15, 1950

#### MEDICINE

### Inferior Pancreas Main Cause of Diabetes

➤ THE main cause of diabetes is an inferior pancreas, with the inferiority of this organ being hereditary, Dr. Russell M. Wilder of the Mayo Clinic stated at the meeting of the American Medical Association in San Francisco.

"There is little evidence to support the view that stress imposed by hypophysis (pituitary gland), the adrenals or the thyroid accounts for the development of the clinical entity diabetes mellitus," Dr. Wilder said. "The normal healthy pancreas possesses a capacity which is adequate to meet demands for insulin created by all degrees of endocrine overfunction encountered clinically.

"Temporary failure occurs in many instances with resulting hyperglycemia (excess sugar in blood). However, from the fact that the diabetic state so provoked disappears when the hyperfunction of the insulin opponents is corrected, the inference is clear that the overfunction of the pancreatic beta cells has not led to their destruction. Exceptions may occur but they are most uncommon.

"On the other hand, overweight or the excessive consumption of food which leads to it, imposes a demand for insulin which not only exceeds the normal demand but is of long duration, extending usually over many years and thus may lead to beta cell destruction. However, only a small proportion of persons who are grossly overweight develop diabetes.

"Therefore, in those cases in which diabetes is provoked by overweight we can logically assume that the pancreas genetically was possessed of less capacity than normal from the outset.

"Furthermore, in very many instances of diabetes, including almost all cases of diabetes in childhood, we find no grounds for assuming the existence of a pancreatic overstrain of any kind. The causation of these cases must therefore rest entirely on inferiority, anatomic or functional, of the pancreatic beta cells. Diabetes in such persons follows stresses such as those imposed by growth, puberty, pregnancy, infectious disease, etc., the stresses to which all persons are exposed."

Dr. Wilder said the theory of a single

origin of diabetes receives support from studies of heredity in this disease.

"Diabetes behaves in heredity as if it were transmitted by a single gene (a hereditary factor which carries a transmissible character)," he said.

Science News Letter, July 15, 1950

#### PHYSICS

### Better Hearing for Music And Lectures in Same Hall

➤ SMALL communities can now have halls that can be used either for lectures or for musical performances with good hearing for both. And this even when the seats are the hard-to-sit-on but easily moved kind.

This promise of relief from bad acoustics in community-type halls is made by Dr. Paavo Arni of the Finnish Broadcasting Company in Helsinki. He describes a simple, inexpensive arrangement to accomplish this improved hearing in the JOURNAL OF THE ACOUSTICAL SOCIETY (June 6).

As much wall space as necessary is covered with a specially built adjustable absorbing unit. The absorbing unit, when open, exposes a layer of rockwool covered with a sheet of thin perforated plywood. Behind the rockwool there is a plywood sheet. This combination of materials plus air absorbs most of the usable sound spectrum.

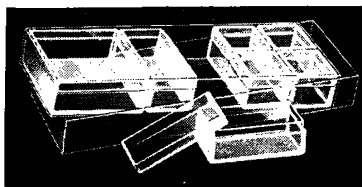
The absorbing unit can be rotated on hinges into a closed position, the absorbing surface disappearing. The reverse side of the absorbing unit, a hard glossy painted surface, is then exposed.

These units are placed one above another in two rows. The upper ones are all connected together with a steel rail; the lower ones may be individually connected to the corresponding units in the upper row. In this way all the variations of sound absorption desired may be obtained.

Science News Letter, July 15, 1950

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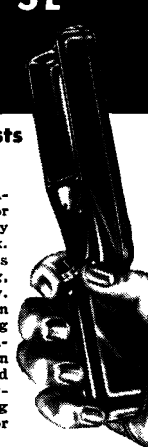
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