New High-solids

TOMATO PRODUCTS

Long Shelf Life and New Forms Easily Reconstituted with Water

A new high-solids tomato product that resists spoilage by yeasts, molds and bacteria and has a greatly extended shelf life has been developed by researchers in the Department of Food Science and Technology, University of California, Davis. Several forms of the dried product have been developed, including ribbons, spaghettis, and powders—all easily reconstituted with water for use in many food commodities.

CALIFORNIA PRODUCES more than two million tons of canning tomatoes annually. This tonnage is commercially canned or processed into a variety of products to be consumed either directly or for use by remanufacturers. The secondary user or remanufacturer utilizes this material in the preparation of such commodities as soups, relish, sauces, Italian dinners and a variety of other products in which tomatoes are an essential ingredient. This research was aimed at obtaining a high quality product for this purpose that would also have a satisfactory storage life at ambient temperature, be easily reconstituted to the desired solids content and be economical to transport.

Combined processes

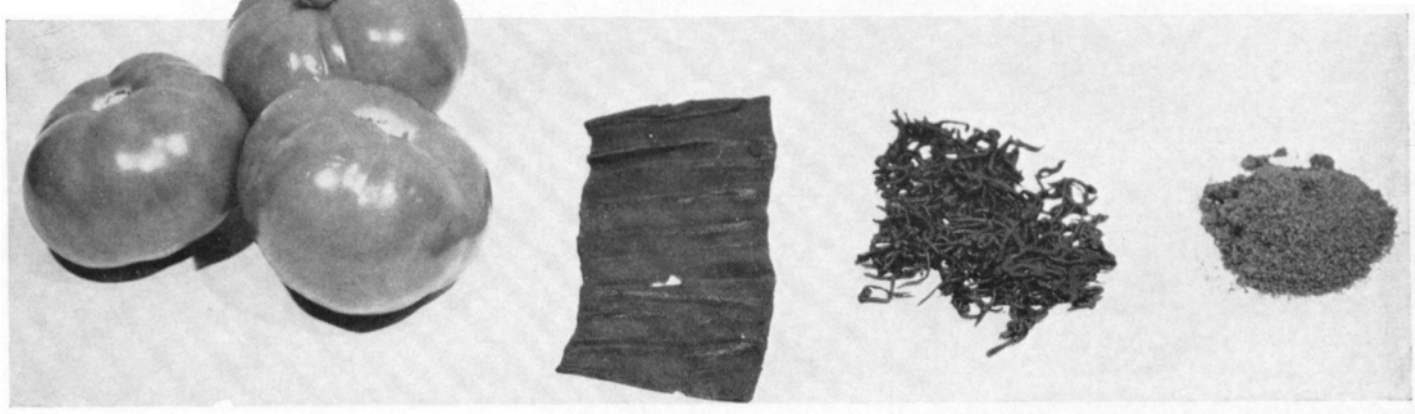
Previously established commercial methods for concentration by vacuum, plus the latest developments in dehydration techniques, gave rise to the idea of employing the best features of each process in developing a procedure for producing a tomato product in various forms, such as spaghetti-like strings, ribbons or powder.

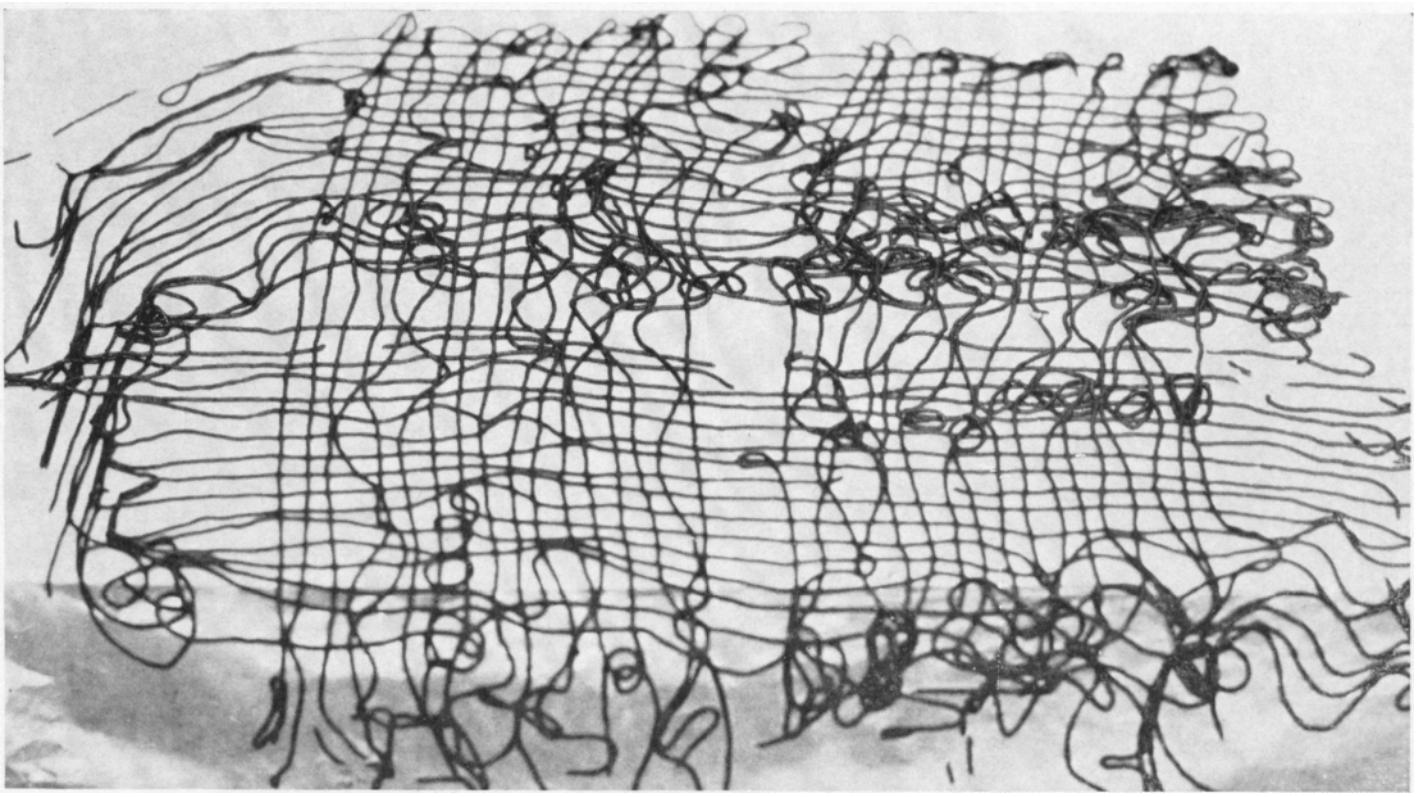
In the experimental procedure, fresh canning tomatoes were washed, crushed, and the juice extracted by conventional methods. The extracted juice was then concentrated, under vacuum, to approximately 50% solids, at a temperature low enough to minimize damaging heat effects on the product. From the vacuum concentrator, the product was pumped by one of two methods through specially adapted spreader valves to either a dehydration tray or continuous belt. In one method, the valve used was adapted to spreading the product in a thin ribbon-like layer which was then dehydrated, under carefully controlled temperature and humidity, to approximately 95% solids. The second method used a valve which extruded the concentrated paste through a stream of hot air and then was delivered to the trays or a belt. This extruded product is spaghetti-like in appearance when the desired degree of dehydration is attained.

Spaghetti-like

The spaghetti-like product was found to be dry enough to be ground into a powder. This powder will dissolve readily in water, resulting in an acceptable tomato juice. With proper mixing equip-

Tomato shown below in the form of ribbon, spaghetti, or powder is equal to the solids content of the three tomatoes seen to left.





The new high-solids tomato product in extruded, spaghetti-like form.

ment, either type of dehydrated material can be reconstituted to the required consistency.

Packaging

Although processing and production methods have received primary attention to date, considerable thought has also been given to the ultimate problem of packaging. Various types of plastic films are being used in the form of bags, tubes, or pouches, and storage and stability tests are being conducted. It is hoped that these tests will result in a simplified packaging material to permit ease of handling, shipping and storage and thus aid the remanufacturer in making new products available to the housewife—and consequently provide new outlets for California tomato crops.

Researchers involved in the development of this process include: Frank H. Winter, Jack F. Shaver, D. Tombropoulos, and Harry J. Stein, Department of Food Science and Technology, University of California, Davis.

The small amount of tomato "spaghetti" or powder shown in photo below, as produced in the new high-solids process, will make a glass of tomato juice when reconstituted with water.