The Staff of Life

For millenia, bread, and bread-like products, have been a major part of the diet of peoples in many areas of the world. Even when offered to people who have never before eaten them, bread products are generally accepted. It seems logical, therefore, to consider the possibility that bread, if made from good nutrients, could fill a basic food need in many developing countries.

But, as always, there are problems. For example, throughout the ages, the technology of breadmaking has been based on wheat. Eighty per cent of the world's wheat is grown in the developed countries (Australia, Europe, New Zealand, Russia, and the United States). Yet, nearly 70% of the world's population lives outside these wheat-raising areas, mostly in the less developed countries. For these areas to make bread from wheat requires its importation. Most of the developing countries do not have an adequate export volume to provide the needed foreign currency.

One solution to this economic impasse is to reduce the amount of wheat needed by using maximum amounts of indigenous foodstuffs. Cassava, corn, and sorghum, which grow abundantly in many of the developing countries, have been tried. However, flours made from these crops are low in protein content. Consequently, other flours which are high in protein content, such as soya, cottonseed, peanut and sesame seed, have been used as supplements. Fish protein concentrate has also been used. Minerals, vitamins and essential amino acids, such as lysine, can also be added to make such breads more nearly complete foods.

There are other hurdles, too. Comparatively speaking, wheat flours are standardized and uniform. This is not true of nonwheat flours. They vary considerably in color, flavor, and physical properties.

In the beginning, replacing wheat with other flours frequently resulted in an unacceptable product. The new bread had the wrong color, texture, taste and appearance. Thus, it was necessary to develop new processing techniques in order to get a manageable dough which would bake out more like the familiar wheat-based bread. The discovery of such dough conditioners as glyceryl monostearate, calcium stearyl lactylate and the sucrose esters has made it possible to compensate, at least in part, for the deficient physical properties of the nonwheat cereals.

The advent of fast continuous dough processing systems has allowed greater flexibility in the use of nonwheat flour blends. Such systems result in greater uniformity of cell structure in the bread. Even a fluid, cake-like batter can be handled satisfactorily. However, the new dough processing systems require a considerable capital investment and sophisticated management. This can be justified only for a large production, which, in turn, seems to indicate that urban and institutional areas are the best suited for marketing this type of bread.

Baked goods other than bread also offer excellent possibilities and fewer problems. Biscuits and crackers which are high in protein content and quality can be made from indigenous ingredients. Structural problems associated with breadmaking are minimized. Biscuit and cracker doughs have a relatively high density; air cell structure becomes less important. The keeping quality of biscuits and crackers is longer than for bread; their packaging problems are simpler. One drawback must be mentioned and that is the high temperatures at which biscuits and crackers must be baked. These temperatures tend to cause protein quality damage.

Despite the apparent problems and limitations, the incentives to create this ready-to-eat food remain strong. We can now visualize bread products, made to an increasing extent from indigenous crops, which are relatively low in cost, of good sanitary quality, high in protein content, excellent in protein quality, and with acceptable eating qualities.

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Executive Director of L.I.F.E.

• Industry Items

A new company, LOVIBOND OF AMERICA INC., has been formed to handle U.S. sales of the range of products made by the Tintometer Ltd., of Salisbury, England. The range includes colorimeters and comparators for chemical analysis. Up to now sales in America have been handled by Hayes G. Schimp Inc. of 870 Willis Avenue, Albertson, Long Island. The new company will have the same address and Mrs. Betty Czemba, daughter of the Schimp company's founder, will be its president.

BASF AG, Ludwigshafen am Rhein, West Germany, has begun production of ethylenediamine using a new process. Currently producing 6,000 metric tons of ethylenediamine per year, BASF plans to increase this figure to an annual output of 24,000 metric tons. The new BASF process employs ethanolamine rather than dichloroethane as starting material, thereby eliminating the waste water disposal problem. Raw materials required for the process are available from BASF's own production facilities. Ethylenediamine is an important intermediate in producing pesticides, sequestering agents and surfactants.

Sodium *n*-Butylate is now being produced and shipped in commercial quantities by THE HARSHAW CHEMICAL COMPANY, Cleveland, Ohio. Manufactured at the Company's Gloucester City, New Jersey plant, Harshaw is believed to be the only producer of Sodium *n*-Butylate on a large scale commercial basis in the United States. Chemically written $NaOC_4H_9$, Sodium *n*-Butylate is sold as a 19% solution in *n*-Butyl alcohol in both drum and tank car quantities. Sodium *n*-Butylate, when reacted with phosphorous oxychloride, produces a principle plasticizer, tributyl phosphate. Also, Sodium *n*-Butylate catalizes the polymerization of acryronitile much faster and with a greater yield than sodium methylate or sodium ethylate.