

More Chemical Engineering Called for in British Food Industry

Successful approach to materials handling problems in flour milling and sugar refining based on chemical engineering methods

LONDON.—The main problem facing the British food industry today is the insufficiency of trained engineers, according to Sir Ben Lockspeiser, Secretary, Department of Scientific and Industrial Research. The food industry is well served on the chemical and biological side, but in the United Kingdom few food companies have adequate staffs to design required equipment. Lockspeiser spoke here before the recent Symposium on Chemical Engineering Methods in the Food Industry, sponsored by the Society of Chemical Industry.

Rapid development of the food industry requires an increased volume of fundamental data in the fields of biophysics, biochemistry and microbiology, said the DSIR spokesman. Conversion from batch to continuous methods is an important objective of chemical engineering practice, and this objective is being applied in the food industry. It is retarded only because of the lack of trained food technologists and chemical engineers.

Referring to training facilities for food technology in the United States, Lockspeiser pointed out that the first steps have been taken to provide similar training facilities in the United Kingdom. Five of the DSIR research associations are concerned with the general field of food technology, he added.

Satisfactory dehydration techniques are one of the important recent accomplishments of the food industry. Two to three million tons of water are imported in foods into the United Kingdom each year. Lockspeiser revealed that, should it ever become necessary, methods have been worked out for reducing this by 80%.

Advances in Flour Milling Practice. Engineering techniques in the flour milling industry have been kept up to date and continuous processes have been used for a great many years, pointed out J. F. Lockwood, Henry Simon, Ltd. The conversion from mechanical to pneumatic conveying during the past 10 years has been a remarkable engineering accomplishment in itself, he said.

This conversion to pneumatic handling, together with increasing use of bulk storage and delivery, has been the main postwar development in flour milling technique. In most, cases suction sys-

tems are to be preferred to blowing systems, Lockwood said, although for handling high tonnages over long horizontal runs the pressure drop may be such that a blowing system is required. This is particularly true in handling the finished products, flour and wheat feed.

Turning to the problem of delivery, Lockwood declared that Britain is probably one of the most suitable countries in the world for bulk delivery. The population is concentrated, distances are short, and the tendency is toward large plant bakeries. Capital cost of equipment is high, but even after allowing for this, the cost of handling might be halved in the mill, warehouse, or bakery, he said.

Handling Sugar. The sugar industry, as well as the flour milling industry, is benefiting from improved materials

handling techniques in Great Britain. The first experimental shipment of sugar in bulk was made to the United Kingdom in 1949. Since that time, handling techniques have been worked out and today a portion of a dock at Liverpool has been specially equipped for unloading bulk sugar, as has been a new wharf at one of the London refineries. Tate & Lyle's E. T. Moss told the group that many pieces of equipment designed primarily for other industries have failed to work satisfactorily with raw sugar. Special designs or slight adaptations have had to be made.

Delivery of granulated sugar in bulk began in Britain only a few years ago, but has been so successful that at the present time bulk deliveries amount to about 1000 tons per week. According to Moss, the preferred capacity of road tankers is between 12 and 13 tons. Tankers now in service are equipped with hydraulic tipping gear, which is used for both filling and emptying.

One of the early troubles encountered in bulk sugar deliveries was that the sugar would not run freely from the tank at the end of a journey. Insulated tankers improved the situation, but the final answer was found in cooling the sugar prior to filling.

British Turn to Improved Food Packaging Techniques

LONDON.—Recent trends in flexible food packages here in Britain indicate increasing use of multiwall paper sacks, transparent film packages, single serving packs, and vacuum- and gas-filled flexible containers. It is unlikely that revolutionary changes in packaging or some remarkable new packaging material will be forthcoming. These were the opinions of G. L. Riddell, director of research, The Printing, Packaging and Allied Trades Research Association. Riddell spoke here before the recent Symposium on Chemical Engineering Methods in the Food Industry, sponsored by the Society of Chemical Industry. Although the field in which the paper sack can be employed is limited to products of low to medium bulk density, Riddell classed it as an economic package. The textile sack is being replaced by the paper sack for such commodities as flour and sugar.

Riddell sees further development of the single serving package. Such packs are already in use for breakfast cereals, soft drink powders, custard powders, and dehydrated soups.

Frequently, vacuum or gas packing can be employed to overcome the deteriorative effect of oxygen. The technique is applicable to flexible packs. The prod-

uct is first heat-sealed in a pack. The heat seal is punctured, vacuum applied, and the puncture resealed, he explained.

Transparent wrapping materials in use are: cellulose film, cellulose acetate, ethylcellulose, polyvinyl derivatives, polyvinylidene chloride, polyethylene, and rubber hydrochloride. In Britain in recent years a considerable number of products, such as rice, dried peas, and pearl barley, have been packaged in a transparent film wrapper instead of a printed paper bag. The water vapor permeability of the film is often an important consideration. Moistureproof cellulose, polyethylene, and polyvinyl chloride films were described as having good resistance.

Describing the shrink wrap technique for meat and poultry, Riddell explained that the product is placed in a bag of polyvinylidene chloride, vacuum applied, the bag heat-sealed, and the package then heated. This technique is being used in the U. S., but polyvinylidene chloride film is not generally available in Britain.

The end of rationing and return of branded goods in the U. K. will undoubtedly lead to further developments in packaging and display, it was predicted.