Vegetable Dehydration.—A study has been made of methods of determination of moisture in the dehydrated product. All methods tried, including vacuum-oven methods, various distillation methods, chemical methods (Karl Fischer method), and vapour pressure methods, have very definite shortcomings. Some compromise is essential and provided the "apparent moisture" by the method used is correlated with the keeping-qualities of the dehydrated product it does not matter much which method is selected if reasonable reproducibility of results can be obtained. Once a standard is set for "apparent moisture" it is essential that the details of the method used must be rigidly adhered to.

As the standard (Monier-Williams) method for the determination of sulphur dioxide in foods is comparatively time-consuming, a search was made for a rapid and accurate method. All published methods tried were open to objection on account of inaccuracy or bad end-points. A method was evolved which gives results in accordance with those of the Monier-Williams method. The estimation can be carried out on dehydrated vegetables and fruits in under fifteen minutes. A paper dealing with this investigation is in course of publication.

The suitability of various vegetable varieties for dehydration and general utility has been the subject of investigation. The study has been largely confined to varieties commercially available. The following varieties are recommended:—

Potato: Aucklander Short Top (New Zealand Sutton Supreme).
Cabbage: Golden Acre.
Carrot: Red Cored Chantenay.
Beetroot: Detroit Dark Red.

The trueness to type of many varieties on the New Zealand market could be very greatly improved, and careful selection work is highly desirable.

As gas-packing of dehydrated vegetables is at present not feasible in New Zealand on account of the difficulty of obtaining gastight tins, the sulphiting of carrot, in addition to cabbage, potato, and kumara, has been recommended. The presence in the dried carrot of 1,000-1,500 p.p.m. of sulphur dioxide considerably extends the storage life of the product.

Fruit Dehydration.—Apples: Some difficulty has been experienced in preparing dehydrated apple containing an adequate amount of sulphur dioxide. This is particularly the case with apples having a high acidity. The use of a sulphite dip at about pH 5·8 instead of at the pH of sodium metabisulphite considerably improves the retention of sulphur dioxide. This treatment, however, is liable to cause "bluing" of the fruit with varieties having a high content of tannins (Sturmer and Granny Smith). Bluing is minimized by increasing the acidity, but sulphur dioxide retention suffers. The bluing is associated with the presence of iron in the sulphite bath (either from the water or from the sodium sulphite or acid). The addition of a small amount of phosphate reduces the extent of the bluing considerably, while a combination of alum and phosphate treatments has given satisfactory control at pH 5·8. The peeled and cored apples are given a short dip in 0·5 per cent. alum prior to trimming, and about 0·25 per cent. of primary or secondary sodium phosphate is added to the sulphite bath with approximate pH adjustment.

Pears: Preliminary experiments on the dehydration of pears have been carried out. Steam blanching is recommended, as it improves the appearance of the product and allows much quicker drying. The use of sulphite dips for sulphuring has resulted in "off" flavours and discoloration due to "bluing." Treatment in sulphur-dioxide vapour gives a product of good flavour and appearance.

Stone-fruit: Work has been confined to peaches owing to the shortage of apricots. Steam blanching results in improved appearance and better reconstitution. It also allows quicker drying and greater volume reduction. Sulphite treatment is not advisable owing to the development of "off" flavours. Peaches given sulphur-dioxide treatment after steam blanching dehydrate to a product greatly superior to ordinary dried peaches.

Vitamin Work.—An investigation of the content of vitamins of the B complex of vegetable products is being undertaken, and in addition periodical milk samples from the Dairy Research Institute are being assayed.

Pasture Investigations.—These have been restricted on account of staff and accommodation difficulties. Analyses in connection with digestibility trials carried out by the Grasslands Division have been made.

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* Mr. J. W. Hadfield, Director, was seconded to Linen Flax Section, Industries and Commerce Department, as from 1st June, 1940.
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