

appear until the final product—bacon—is in the retailer's hands. This danger can be guarded against only by careful attention to the pig's diet. It is now generally accepted that fish-oils, certain fish-meals and meat-meals of large fat content, and maize, are especially liable to cause soft fat if used in too large quantities. The use of such foodstuffs, therefore, while often desirable, should be carefully controlled. It cannot be too strongly urged that pig-producers should exercise the greatest care in the feeding of their animals, so that the soundest reputation, based on quality, should be established for the Dominion's output of pork and bacon.

In co-operation with Lincoln College, the Waikato Pig-recording Association, and the Low Temperature Research Station at Cambridge, several shipments of carcasses of known life-history and feeding have been examined, and the results have proved valuable and have been published.

The second method of utilizing our pork for export—*i.e.*, the transportation of frozen bacon—so far has not proved promising. Opportunity must be taken here to acknowledge the valuable work for the Dominion carried out by the Low Temperature Research Station of the British Department of Scientific and Industrial Research. This is published in the Report of the Food Investigation Board for 1930, which merits full attention by all concerned in New Zealand.

QUICK FREEZING.

The Secretary returned from England via America to report, *inter alia*, on the developments in regard to quick freezing. It is realized that should this method of freezing—generally associated with the selling of frozen products in packets—quickly develop, it would have a profound significance so far as our export trade is concerned, particularly in regard to the possibilities of export of beef and fish. An abstract from this report is appended.

PLANT RESEARCH STATION.

Marked advances in a number of directions have characterized the activities of the Plant Research Station during the year. Measures have been devised whereby effective control of the serious club-root disease of turnips is now possible. This can be achieved by the use of resistant strains and the application of lime and non-acid phosphates to the soil. The simplicity of the necessary precautions is such as will make very easy their adoption by the farming community, and will make it possible again to grow swedes and turnips in many areas where on account of the ravages of this disease they have been abandoned as farm crops.

Steady development in connection with strains of pasture grasses and clovers has proceeded, and, through certification, the time is fast approaching when it will be possible, by the proper utilization of approved strains of pasture plants, to increase the per-acre stock-carrying capacity of the Dominion's grassed lands. It is a matter for much satisfaction to know that the local strains of rye-grass, cocksfoot, white clover, and other grasses, under trials conducted at the Plant Research Station, have shown themselves to be unsurpassed by the best imported lines in their suitability as permanent pasture grasses.

Control of dry-rot of swedes has been shown to be dependent upon the use of disease-free seed, supplies of which it is possible to grow locally; wheat-rust has been controlled by the use of sulphur dusts, but, while this is not practical except on small plots, useful light has been thrown on a baffling problem; great improvement in the growth of lucerne has been secured through the use of special cultures; investigations of strains of rape and lucerne have been commenced, and show promise; in top-dressing, experiments have shown the best times for application of fertilizers and the advantages accruing to frequent small applications of phosphates.

The foregoing indicates only some of the advances made by the Plant Research Station along its two main lines of endeavour—(1) the control of limiting factors, such as disease, upon crop-yield; and (2) the adoption of such measures (strain selection, top-dressing) as will give positive yield-increases. Similar progress has been made with almost every farm crop. Such progress comes most opportunely at a time when low prices have adversely affected farmers' returns; and its application will have some influence, not only in mitigating these losses, but in giving hope and encouragement for the future through higher yields per acre.

By means of a system of certification, based on research, it will be possible, rapidly and surely, to put into practice the new advances made, so that the standard returns from farming will show a steady increase. It is probable that no other branch of the Department's activities has such possibilities in this direction, since the foundation of the Dominion's wealth rests upon the use to which it puts its soil, pasture, and crop resources. The advances being made at the Plant Research Station warrant every assurance that the Dominion will be well situated to take early advantage of any improvement in the economic outlook as soon as such occurs.

DAIRY RESEARCH.

During the past year the Dairy Research Institute at Palmerston North has continued its investigations of cheese problems. It has been shown—(a) That the pasteurization of milk for cheesemaking as commonly practised in New Zealand is not responsible for any type of openness of texture; (b) that the pasteurization of average quality milk results in a cheese of a cleaner flavour, but the use of finest-quality milk results in cheese of a fuller Cheddar flavour at an earlier age than does the pasteurized milk; (c) that where it is impracticable to manufacture raw-milk cheese the temperature of pasteurization should not exceed 160° F., because above this limit the cheese develops a somewhat bitter or slightly acid flavour rather than a full Cheddar flavour—at temperatures between 150°–160° this difficulty is not observed; (d) raw-milk cheese matures rather more rapidly than does pasteurized-milk cheese; (e) when milk is pasteurized at a temperature above 165° the body of the resulting cheese is soft and most unattractive; (f) pasteurization of milk distributes the fat evenly throughout