The diacetyl content of the butters was generally low, about 0·01 to 0·06 parts per million, but in those cases where the butter had been made from acid cream there was a definite increase in the diacetyl content of the butter.

(*d*) *Packing of Butter* (F. H. McDowall).—A study is being made of the protective capacity of Pliofilm, a new wrapping-material with a rubber base, when used for the wrapping of butter. The indications are that this material gives a very good protection both against the development of primrose colour and against the absorption of wood and other taints.

(*e*) *Manufacture of Clarified Butter* (F. H. McDowall).—The manufacture of clarified butter is being developed to a commercial scale. Dr. Barnicoat has already shown that dry butterfat can be obtained by use of a special centrifugal clarifier.

It has been found that a large proportion of the water from melted butter can be removed by passage through two ordinary cream-separators in tandem, provided that the bowls of the separators are first filled with warm water. The remaining 2 per cent. of moisture can be removed if the fat is passed at a high temperature into the second unit of a tandem Vacreator. The various subsidiary problems of cooling, filtering, and packing of the clarified fat are being studied.

Mycological Projects.

(*a*) *Cheese Storage* (T. R. Vernon).—The experimental work on the curing of cheese under controlled conditions, which was carried out during the 1939–40 season, has been repeated. The experiments were designed to give a measure of the effect of controlled temperature and humidity on (*a*) mould development, (*b*) shrinkage, and (*c*) quality.

The work was carried out at three factories in the Manawatu district with curing-rooms representative of the three main types found in New Zealand—(1) Uninsulated; single windows; uncontrolled. (2) Insulated; double windows; uncontrolled. (3) Insulated; temperature and humidity controlled. Standard export cheese from a single vat were used throughout the season. Weights were recorded ex press and at fourteen days, and gradings made on arrival at grade store.

Results show a complete absence of mould from the controlled room (humidity 80 per cent. to 85 per cent.), very occasional mould in the uninsulated room (humidity 50 per cent. to 95 per cent.), and considerable mould in the insulated uncontrolled room (humidity 65 per cent. to 95 per cent.).

Shrinkage losses were smaller in the controlled room by roughly 1 lb. per crate.

Quality was better in the controlled room by half a point.

The design of curing-rooms has progressed slowly; insulation and double glazing alone distinguish the new from the old. Refrigerated rooms, in spite of the obvious advantages of low temperatures, have suffered in popularity on account of "mould." The results of the present work suggest a new design: insulated, low ceilings, no windows, and automatic temperature and humidity control.

(*b*) *Casein* (T. R. Vernon).—Many preservatives have been suggested and many used for casein adhesives, but few have given entirely satisfactory results. In order to determine the value of different preservatives, a standardized technique has been developed using a constant inoculum of test organisms. These organisms have been isolated from defective adhesives and are representative of the two main types: (*a*) liquifiers without gas, and (*b*) gas-producers.

A number of preservatives that have been recommended in the literature have been tested, and discarded as unsatisfactory. β-naphthol at a concentration of 3 per cent. gives control, but causes discoloration, and the chlorinated phenols show promise of good results.

Similar work is being carried out with casein paint. Again the chlorinated phenols are promising and, in addition to preserving the paint, are increasing its resistance to mould attack. The trials are being conducted on wood, brick, and concrete surfaces.

(*c*) *Ultra-violet Radiations* (T. R. Vernon).—The control of mould by means of ultra-violet light has been under test in storage rooms at 45° F. Unfortunately it was not possible to equalize the humidities of the experimental and the control rooms, and the absence of mould in the experimental room may be partly explained by low humidities. In spite of this, the freedom from mould under ultra-violet radiations was remarkable, and when alterations to the method of humidity control are completed the experiment should be repeated.

Miscellaneous Projects.

(*a*) *Rusting of Milk-cans* (R. M. Dolby).—During recent years there have been a considerable number of complaints concerning the premature rusting of milk-cans. A report from one New Zealand canmaker that he had had difficulties in tinning steel sheet obtained recently suggested that defects in the finished cans might be due to a lowering in the quality of the basis metal used. An investigation of one batch of steel sheets showed the presence of black spots on the surface of the metal. When the sheets were dipped the tin failed to adhere to these areas unless the previous process of pickling had been greatly prolonged. Samples of the steel were sent to the International Tin Research and Development Council, who reported that the tinning difficulties were due to the presence of a film of polymerized grease which could be completely removed only by burning off in an annealing furnace.

When later shipments from the same rolling-mills were examined it was found that the defects were no longer present. Samples of the steel were tinned by the same process as used for milk-cans, and when tested the coating was found to be perfectly satisfactory.

A survey was made of a large number of milk and cream cans at factories in the Manawatu district. In none of the cans showing premature rusting was there any evidence of faulty tinning. In most cases the rust spots appeared where the tin coating had been penetrated by scratches. In order to