

Salmonella Infection of Pigs.—Experiments have been initiated with a view to elucidating the role played by *Salmonella cholerae suis* as a swine pathogen. From infected pigs in seventeen different outbreaks *Salmonella cholerae suis* was isolated. These strains have been examined biochemically and serologically and all proved to be the diphasic variety, which is in contrast to the monophasic variety, which predominates in Australia and America.

TRACE MINERALS

Cobalt.—Of 19 pasture samples examined in connection with the diagnosis of cobalt deficiency 9 were low and 1 borderline, and of 81 livers 8 were low and 5 borderline. Liver and pasture analyses have confirmed the existence of dual cobalt and copper deficiency at Pakipaki, Hawke's Bay.

Iodine.—The analytical procedure for iodine has been under investigation, as the present procedure does not always give satisfactory results.

Copper.—It has been found that molybdenum solutions drenched to cattle and sheep grazed on pasture containing normal quantities of copper will reduce the storage of copper in the liver. In cattle on copper-deficient pasture, results were not the same. Molybdenum drenches did not reduce the already low copper stores. When molybdenum and copper were drenched together, the extra copper reduced the storage of molybdenum.

The work confirms the interrelationship of copper and molybdenum and the possibility previously suggested that peat scours may be a low-grade molybdenosis, and not a simple copper deficiency.

Aerial Top-dressing.—Trace elements are at the present stage of technical development the most suitable top-dressing materials for application from the air. A successful trial with bluestone was carried out in 1946 in co-operation with the Public Works Department—1,100 acres of copper-deficient land on the Hauraki Plains were top-dressed in nine hours with 3 lb. bluestone per acre. Subsequent pasture analyses showed that an effective increase in pasture copper was achieved and stock kept on the area have shown no symptoms of copper deficiency.

Preliminary arrangements have been made to top-dress a property near Taumarunui with cobalt sulphate during June of this year.

Radioactive Tracer Elements.—Preparations are being made to undertake work on radioactive tracer elements, and the first to be employed will be radioactive isotopes of minor elements such as cobalt. Some preliminary work was carried out in 1939 with radioactive cobalt, but the war interrupted this. New supplies are now becoming available, so that the work can be resumed.

It is hoped to develop the tracer technique using radioactive and heavy isotopes, and to apply this to a great variety of problems of animal metabolism.

Enzootic Icterus.—An extensive outbreak of enzootic icterus occurred for the first time in Hawke's Bay. Deaths commenced in September, 1946, and some are still occurring. The area affected was all of one soil type, Takapau silt loam, and was badly affected by drought the previous autumn. The outbreak is under investigation, as it presents some special features of interest.

GENERAL BIOCHEMICAL WORK AT RUAKURA

Considerable work has been carried out on the validity of nitrogen determinations for pasture feed under the Kjeldahl method.

Work designed to identify the large undetermined portion of the "nitrogen-free extract" fraction of green feeds has continued, as also have more detailed investigations on the lignin complex of stock-feeds. These two projects are possibly interrelated.

Milk samples have been analysed for fat, casein, and total solids from all dairies throughout the year. This routine task, essential in relation to various experiments, absorbs a large proportion of the chemical staff's available time.