

(10) No other test yet discovered than that afforded by tuberculin can detect any considerable proportion of cases in the living subject, and this test is practically infallible.

(11) Injections of tuberculin cannot produce tuberculosis, nor are the results harmful.

Steer Feeding.

Bulletin 36 of the Maryland Experiment Station contains results of comparing a well-balanced with a poorly-balanced ration.

The following definitions are offered :

"A *well-balanced ration* is one that has the *carbonaceous*, or the heat and fat-producing constituents, in the proper proportion to the *nitrogenous*, or flesh-forming constituents. A *poorly-balanced ration* is one that contains these constituents in improper proportions ; that is, it may be a ration that contains either too little or too much nitrogenous matter. In the experiment recorded, the poorly-balanced ration had too little nitrogenous matter.

"*Nutritive ratio* is a term used to designate the proportion of nitrogenous to non-nitrogenous (carbonaceous) food constituents.

"A *wide nutritive ratio* is one that has much carbonaceous matter in proportion to the nitrogenous, and a *narrow ratio* is one that has relatively little carbonaceous matter in proportion to nitrogenous."

Bulletin 22, of the same station, reports an experiment similar to the one recorded below, and the first experiment resulted in a profit of \$9.84 per steer for those fed the well-balanced ration, while the steers fed the poorly-balanced ration returned a profit of only \$2.78 per head.

The experiment of 1894 comprised six steers, which were divided into two lots, and fed for 91 days.

The well-balanced ration comprised :

Corn and cob meal.....	15 parts
Cotton seed meal.....	4 "
Wheat bran.....	2 "

The poorly-balanced ration consisted of corn and cob meal alone.

As a result of this feeding, the steers receiving the well-balanced ration gained 438 pounds, while those receiving the poorly-balanced ration gained 447 pounds ; but the result in money showed a balance of \$3.71 in favor of the steers fed the well-balanced ration.

In 1895 a similar experiment was conducted, the rations being the same as for 1894, with the addition of ten pounds of turnips per day per steer. In this experiment the steers fed the well-

balanced ration gained 670 pounds, while the poorly-balanced ration gained only 438 pounds, while the profit on the two lots was \$37.52 and \$12.34 respectively.

Taking the average results for the three tests, the well-balanced ration gave a profit of \$3.78 per steer, while the poorly-balanced ration resulted in a loss of \$1.98 per steer.

Bone Meal versus Superphosphate.

Bulletin 35 of the Hatch Experiment Station, Massachusetts, contains a compilation by Charles Wellington, Ph.D., of the latest results of comparative experiments with bone meal and other phosphates, applied as fertilizers on various soils for various crops.

There are various kinds of bone meal ; e.g., raw bone meal, prepared by simply grinding the bones ; steamed bone meal, prepared by steaming and grinding ; and "glue-free" bone meal, obtained from what remains after the glue has been removed from the bones by cooking.

Superphosphate is made from bones, or mineral phosphate, by treating them with sulphuric acid, and differs from bone meal in that the sulphuric acid treatment renders the phosphoric acid soluble and readily available to plants, while the phosphoric acid of bone meal is insoluble and with difficulty available to plants.

It has been claimed by its manufacturers that, since bone meal is not easily soluble, its effect will be all the more lasting, and that its influence will be felt for a number of years after its application.

To test the truth of this claim, extensive experiments have been conducted by eminent German investigators, and the results have been very disappointing to the manufacturers of bone meal, since, in every instance, while superphosphate gave a marked increase in yield, bone meal had little or no influence, and the influence of bone meal on succeeding crops was not so satisfactory as that of superphosphate.

An attempt was made to render the bone meal more soluble by treating it with small quantities of sulphuric acid—20 per cent. of sulphuric acid for raw, and 40 per cent. for glue-free bone meal. This preparation is known as "dissolved bone meal," and its effect proved nearly as satisfactory as that of superphosphate, while for stocking the land with a supply of phosphoric acid dissolved bone meal is better adapted than is superphosphate.

It is, therefore, concluded that the superior value which has hitherto been accorded to undissolved bone meal as a fertilizer is due solely to the nitrogen which it contains ; that undissolved bone meal as a phosphate fertilizer is no more valuable than the raw mineral phosphates ; and that the best form in which to apply bone meal is as "dissolved bone meal."