

many, after the farmers have had an experience of about fifty years in the cultivation of beets, the owners of the factories are still obliged to grow an average of more than one-half of all the beets they consume.

VALUE OF BEET PULP FOR FEEDING.

Concerning the value of this material as food for stock there are many conflicting statements. It must, however, be borne in mind that when beet pulp is spoken of in Europe it is generally understood to be pulp which has been pressed, by which process a large proportion of the water is got rid of and the proportion of solid matter increased to about 20 to 22 per cent, thus adding very much to its value. In Canada and the United States the pulp has hitherto been offered just as it comes from the diffusers. From the analysis of Mr. Shutt of the sample sent from the Farnham factory it appears that in this condition the pulp contains nearly 96 per cent of water, and less than one-third of the nutritive matter contained in the sugar beets before treatment. On comparing the proportion of digestible matter with that contained in ordinary mangels or turnips it would appear that the pulp would average about half the value of these roots. But the relative cost of handling material so weighty with water and containing so low a feeding value would detract from its actual worth when comparing it with mangels or turnips, while the difficulty of preserving from decomposition a substance so succulent and watery would prove another objection to its use. Taking all these points into consideration, it would appear that the estimate formed of this substance by Dr. H. W. Wiley, of Washington, as given on page 21, is about correct, where he considers the feeding value of the pulp as about one-fourth of that of the beets.

PROCESS OF MANUFACTURE OF BEET SUGAR.

When the farmer delivers his beets at the factory they are weighed, and a receipt is given him for them. Samples are taken to the laboratory, where the proportion of sugar contained in them is ascertained and the price fixed accordingly. The beets are unloaded in a suitable shed, from one end of which proceeds a shallow underground sluiceway, with a smooth bottom, through which a shallow but rapid stream of water floats the beets to the washing machine. This machine is a long iron trough resting on a slightly inclined plane and partly filled with water. Revolving arms gradually carry the beets to the lower end of the vessel, by which time they are thoroughly cleaned. They are then thrown out automatically into an elevator, which carries them to the upper story of the building, where they are emptied on an inclined platform made of slats between which the water drips away from the beets. As the roots are gradually forced down the inclined platform they fall into an iron weighing chest, with a capacity of 500 kilos, equal to 1,102 lbs. As soon as this weight is reached the falling of the beam lifts a shutter, which prevents any more beets falling in until the chest is emptied, which is done by means of a movable bottom worked by a lever. The dropping of the beam also sets some internal machinery in motion, which automatically records the weighings.

From the weighing chest the beets drop into the cutter, where small ribbed knives on a revolving cylinder reduce them rapidly to shreds, almost like vermicelli. These shreds, which are commonly called cossettes, pass down as they are cut, and by means of a movable wooden carrier are transferred to the diffusers below.

The diffusers are arranged in a circular series or battery, and are connected by pipes which supply hot water for the exhaustion of the beets, and form outlets through which the sap may be forced when it is sufficiently concentrated to be removed to the treating vessels. The diffuser is a long cylindrical wrought-iron vessel, capable of holding about 2 tons of the cut beets, having a man-hole on the top with a swinging cover, and the bottom arranged so that it can be readily opened, so that the cossettes may drop out when exhausted. When the diffuser is filled the closely-fitting cover is tightly fastened and hot water introduced into the vessel from below, and gradually forced upwards