

AN IMPROVED METHOD OF MAKING SUGAR-BEET SIRUP

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with adaptations for Oregon

The production of beet sirup involves two distinct operations, (1) the growing of the beets and (2) the making of the sirup. The sirup making embraces two essential operations, the extraction of the juice from the roots and the boiling down of this juice to the desired consistency.

Growing Sugar Beets For Sirup

Selecting the land-

Any soil that is deep, well drained and fertile and that produces a good garden will grow good sugar-beets for sirup. A few rows of beets in the garden will generally produce enough sirup for home use. On the average good sugar-beet roots should weigh from 1 to 2 pounds. One hundred pounds of roots produce from 5 to 8 pints of sirup.

Preparation of the seed bed-

The desirable type of beet has a long tapering root that requires deep plowing or seed bed preparation. The plowing should usually be done in the spring, provided the ground has previously been in good tilth. The surface should be worked down firm, smooth, and free from lumps.

Planting the seed and caring for the plants-

Sugar-beet seed should be planted in rows about 20 inches apart and may be dropped either in continuous rows or in hills. If planted in hills, each hill should contain from three to six

seed balls, and the hills should be about 12 to 14 inches apart; if planted in solid rows the plants should be blocked. Blocking consists in cutting out a part of the plants with a hoe or other implement, so that the remaining beets stand in tufts about 12 to 14 inches apart.

As soon as the fourth true leaf appears, they should be thinned to one plant in each hill or tuft.

If the beets are irrigated, care should be taken that water does not flood the ground around the plants as flooding causes a crust to form and excludes the air from the beet roots.

The ground should be kept free of weeds.

#### Harvesting and storing the roots-

The proper stage of development for harvest will be indicated by a yellowish tinge of the foliage and by the fact that the beets when pulled leave the ground free from dirt. In no case should the beet roots be used for sirup making until they are mature. If the patch of beets is small, the beets may be loosened by means of a spade or a spading fork and thrown into piles. The beets should then be topped by cutting them off squarely at the point where the lowest leaf was attached. The topping can best be done by means of a heavy knife. The roots can then be made into sirup at once, or they may be stored until a more convenient time.

The beets may either be stored in the field by covering them with dirt to prevent wilting and freezing, or they may be stored in a cellar. If the beets are stored in a cellar, they should be packed in sand or covered with dirt or sand to keep them from wilting.

#### Making Sirup From Sugar Beets

#### Preparing the roots-

The first step in making beet sirup consists in cleaning the roots and removing the top portion. The roots from which the tops have been removed at the time of harvest are soaked in water for a few minutes, in order to loosen the dirt, and are scrubbed thoroughly, preferably with a brush having stiff bristles, in a tub of clean water or under a stream of clean water. Cool water should be used for soaking and washing, as it restores the crispness of the roots that may possibly have become slightly wilted; roots that have been stored for some time and have become wilted to the point of softness should not be used for making sirup.

The crown or top portion of the cleaned beets should be cut off squarely at the line between the green and white portions. If this line extends to a considerable point below the lowest leaf scars, the cut may be made at the line of the lowest leaf scars and the green portions then removed by trimming. The reason for this further topping is that the crown contains the greater part of the salts taken from the soil in the process of growth, and it is desirable to have the sirup as free as possible from these mineral salts, because if present in too large quantities they may impart an unpleasant taste. Coloring matter and other materials in the green portions cause a darker colored sirup and tend to impart an unpleasant taste and flavor. This is true also of the skin or peel, which should be removed.

#### Extracting the juice-

To extract the juice containing the sugar, the peeled beets are sliced and the slices permitted to fall directly into hot water of sufficient depth to cover them and prevent access of air. Exposure of the peeled or sliced beets to the air results

in the rapid darkening of the surfaces, which, if permitted to take place to any extent, causes a dark color in the sirup and tends to impart an unpleasant flavor. The slices should not be thicker than 1/16 inch and preferably much thinner, because the thinner the slices the more rapidly and thoroughly the juice will be extracted. An ordinary kraut cutter or some type of vegetable-slicing machine is very satisfactory.

The slices should be permitted to soak for about an hour at a temperature of 174° to 180°F. The proper quantity of water is just sufficient to cover the slices and keep the air from them during the time of extraction, and hot water may be added from time to time as the quantity of slices in the container increases. The top slices may be held under the surface of the water by means of a plate or small wooden rack. A 10-gallon container will hold the slices from 100 pounds of original (untopped and unpooled) beets and afford room for stirring them occasionally during the extraction.

The extracting should be done in clean vessels made of tin, enamel ware, aluminum, crockery, or in a wooden container. Copper or iron vessels should not be used either for the extracting or for the subsequent evaporating to sirup. Containers other than wood may cool at a somewhat greater rate, and it may be found advisable to maintain the proper temperature by applying heat; in this case, a thin wooden rack should be placed on the bottom of the vessel, to avoid scorching the bottom slices. After an hour the liquid is drained off and strained through cheesecloth or muslin. It is not necessary to press the residual slices.

#### Heating the extract-

The extracted juice is heated under pressure in a container

which may be sealed and is provided with a controlled valve for blowing off steam, a thermometer, and a pressure gage. Pressure cookers, such as are used in many homes in the canning of vegetables, etc., have been found very satisfactory for this purpose.

The cover having been fastened down, the extract is heated to a temperature of 226° to 230°F. corresponding to a pressure of approximately 21 pounds per square inch and maintained at this temperature for an hour, blowing off a considerable quantity of steam at approximately 15-minute intervals. When heat is first applied, the valve is left open, to permit the escape of air, and it is closed as soon as steam begins to appear. At the end of the heating period the steam is permitted to blow off rapidly, and the extract, which should be a pale yellow color and entirely clear, is strained through cheesecloth or muslin, to remove the slight quantity of coagulated material, and is then ready to be evaporated to sirup. Ordinarily this treatment removes the objectionable "booty" odor and flavor.

#### Evaporating to sirup-

The extract is placed in a kettle made of tin, aluminum, or enamel ware and evaporated to sirup by boiling briskly. A shallow, flat pan is more satisfactory, as it permits the extract to be reduced to sirup in a shorter time through more rapid evaporation and results in a lighter colored sirup.

The slight quantity of scum that collects on the surface during the evaporation should be constantly removed. Great care must be taken toward the end of the evaporation to avoid burning or scorching the sirup.

The sirup may be evaporated to any thickness desired, but a sirup containing 70 per cent total solids is suggested as

suitable for table use. This concentration is obtained when the sirup boils at 224° F. at sea level or 220° F. at an elevation of 2000 feet.

#### Storing the sirup-

The sirup should be stored in bottles, jars, or cans that have been cleaned and then thoroughly sterilized with boiling water or with steam. The sirup should be placed in the containers while boiling hot and the containers sealed at once in an air-tight manner.

#### Character of the Sirup

Sirups made by the process here described were of a light to dark-amber color and were free from the unpleasant odor and flavor which have frequently been found in sirups produced by direct evaporation of the extract, without the preliminary heating under pressure, and which have usually been found in sirups made from untrimmed and unpeeled beets.