

OCCURRENCE OF DIASTASE IN THE SWEET POTATO IN RELATION TO THE PREPARATION OF SWEET POTATO SYRUP.

By H. C. GORE.

*(From the Bureau of Chemistry, United States Department of Agriculture,
Washington.)*

(Received for publication, July 18, 1920.)

The manufacture of syrup from sweet potatoes by the use of malt has long been a matter of public record.¹ Directions for the small scale production of sweet potato malt syrup were issued by the Department of Agriculture in February, 1919. The necessity for use of malt, however, apparently has prevented any wide use of the method.

Further work on the production of the syrup has unexpectedly revealed the fact that the sweet potato is so rich in diastase that nearly all the starch becomes converted into soluble carbohydrates by autolysis upon slow cooking. Moreover, the hot pulp formed by crushing the cooked sweet potatoes drains readily, thus permitting the easy recovery of the sweet juices. Sweet potato syrup, therefore, can easily be made without the use of malt.

The method consists simply in so heating the potatoes in the water that the tissues are heated at the temperature of maximum diastatic activity for from 10 to 20 minutes, then heating to boiling in order to soften the tissues, crushing, and separating the sweet juices from the insoluble pulp. The juice is then evaporated to syrup with or without further treatment.

For example, 1 kilo of Porto Rico potatoes was covered with water in an aluminum kettle, placed over a Fletcher burner, and the water heated to 60°C. The gas was then turned down and the heat applied very slowly so that the temperature gradually rose from 60 to 80°C. during an hour and from 80° to the boiling point during the next $\frac{1}{2}$ hour. The boiling was continued for $\frac{1}{2}$

¹ U. S. Patent 109,991 was granted to Charles Delamarre on December 6, 1870.

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hour, when the potatoes were thoroughly soft. They were then mashed in the water in which they were cooked and enough water was added to form a thin pulp. The sweet juice in the pulp was then freed from the insoluble pulp ingredients by suction, using a Buchner funnel and filter paper, and the residue on the filter repeatedly exhausted with hot water. The filtrates were combined, evaporated to a thin syrup, and weighed. The weight was 714 gm. and the Brix reading at 20°C. was 37.6°. Thus, 714×37.6 or 268.5 gm. of syrup solids had been exhausted from 1 kilo of sweet potatoes. The dried pulp weighed 59 gm. The syrup was finally evaporated to a solids content of about 75 per cent. It was a slightly turbid, amber-colored liquid with a faint, pleasant odor and a sweet taste, with a slight flavor of the sweet potato. It contained a little soluble starch as shown by the iodine test, but not enough to cause it to thicken upon standing.

The sweet potatoes can be prepared for extraction by simply cooking them in water as in preparing for table use, but the resulting syrup will contain enough soluble starch to cause it to thicken upon cooling and standing. Tests on the diastatic power of extracts of sweet potato and sweet potato flour were made by Lintner's method as described by Brown.²

	<i>Degrees Lintner</i>
Porto Rico fresh pulp ³	300
Nancy Hall " " ³	125
Porto Rico flour ⁴	500
Nancy Hall " ⁴	300
Big Stem Jersey flour ⁴	160

SUMMARY.

Sweet potatoes are high in diastatic power and it is possible to convert nearly all their starch into soluble carbohydrates by slowly cooking the potatoes in water. The pulp formed by mashing the cooked potatoes with hot water drains readily, permitting the easy recovery of the sweet juice.

² Brown, A. J., Laboratory studies for brewing students, New York, 1904.

³ Reduced to pulp in a Herles press (Herles, F., *8th Internat. Congr. Appl. Chem.*, 1913, xxvi, 5).

⁴ Produced by shredding sweet potatoes with beet knives, drying in a rapid current of hot air, grinding, and bolting.