A SIMPLE METHOD FOR PREPARING CUBE JAGGERRY FROM LOW QUALITY SUGARCANE JUICES

By G. GANAPATHY AYYAR, B. A.,

Assistant Agricultural Chemist.

It will be within the experience of almost all the cane growers in the district of Coimbatore and round about that low quality juices from badly lodged, diseased or insufficiently irrigated canes often fail to form into the usual cube-shaped jaggery that is so popular in these markets. It is usual in such cases to make the jaggery into big lumps weighing about 2 mds. each. These lump jaggeries are, however, held at a discount in the markets of Coimbatore, Madura, Malabar, and Tinnevelly as they are usually associated with low quality. It is, therefore, the aim of every cane grower in these districts to convert his whole crop into cube jaggery, if he can possibly manage it. The development of a simple process for arriving at this result should accordingly be a matter of some importance to the cane growing ryots of these areas.

Difficulty in making cube jaggery is encountered ordinarily when the juice is of about a purity of 80% or thereabouts. To prepare cube jaggery in such cases, it is the usual practice to add a large excess of lime to the juice both before and during boiling. The result is often successful ; but the colour of this product is dark and unattractive. When the lime is added in moderate quantities, cubes do not form.

In trying to devise a process for overcoming the above difficulty, it is essential to examine critically the local method of jaggery making with a view to remedy any apparent defects found therein.

In the preparation of cube jaggery, the syrup is usually concentrated to such a consistency that a sample of it when dropped into cold water solidifies to a brittle mass. The pan is removed from the fire and the contents stirred slowly and steadily till sugar crystals begin to appear. The crystallised mass is then transferred to the proper mould board and after cooling, the solid cubes are thrown out by striking hard on the top of the inverted mould board.

When the original juice is of high quality having a purity of about 90%, the crystal formation takes place within 5 minutes after removal from the fire. With juices of moderate purity viz., about 85% it takes about 10 to 15 minutes for the crystals to make their appearance. When the juices are of much lower purity say about 80%, the crystallisation does not occur even after half an hour by which time, however, the mass becomes cooled and so viscous that it is no longer fit for charging into the usual mould.

The problem, therefore, seems to resolve itself into one of devising a simple method to make the thick syrup crystallise in time. As is well known, crystallisation of sugar from a supersaturated sugar solution is, apart from its purity, largely dependent upon the temperature and the viscosity of the syrup. The greater the temperature and the lower the viscosity, the more rapid is the formation of crystals.

It has also been found that the greater the temperature to which the sugar solution has been heated in the preparation of the syrup, the greater is the time required for the subsequent formation of crystals.

On a consideration of the above facts, it would appear that the local practice suffers from the following two drawbacks.

(1) The juice is concentrated to too high a consistency.

(2) The thick syrup is cooled down rather at too rapid a rate.

These two factors apparently operate together in delaying the formation of crystals from the concentrated syrup and it was felt that suitable modifications regarding the two operations mentioned above would solve to a certain extent the difficulty in question.

A series of experiments were accordingly tried with low purity juices on the laboratory scale, varying the striking temperature from 118° to 124°C and altering the process of cooling in various ways. It was found for juices of low quality that a temperature of about 122°C was the optimum to which they may be heated for preparing cube jaggery. Crystallisation from the thickened syrup was found to be considerably hastened when the rate of cooling was slowed down. This was carried out as follows.

The pan with its contents on removal from the furnace is placed in hot water kept at a temperature of 80°—90°C and the contents stirred gently from time to time. In about 20 to 30 minutes crystals begin to appear when the crystallised mass may be transferred into the mould and cube jaggery obtained in the usual way.

The modified method has been invariably found a success whenever cube jaggery could not be obtained by the usual process.

Recommendations. (1) The juice should not be concentrated to too high a consistency. The pan may be removed from the furnace when the temperature rises to about 122°C. This roughly corresponds to the consistency required for making lump jaggeries ; (in vernacular, to the உருண்டைப்பதம் of the local jaggery boilers).

(2) The rate of cooling of the thick syrup may be slowed down by placing the pan in hot water kept at 80°—90°C and stirring the contents gently from time to time.

(3) On the appearance of crystals, the mass may be transferred to the mould board and proceeded with in the usual way.

In this connection, it will not be inappropriate to make a mention of the great usuefulness and convenience of the new mould board that has recently come into use in this district. It is, no doubt, a great improvement on the ordinary mould and differs from the latter in having the conical cavities open at both ends. The lower ends of these are, however, closed with movable wooden pegs, of suitable size and these pegs are prevented from falling out of the cavities by small nails driven into them crosswise. On charging the mould with the crystallised syrup and on turning it over after a few minutes, a slight pressure on the pegs causes the whole of the solidified jaggery to drop down in perfect condition.

When using the new board there is no need for the hard and severe hammering that is required to throw out the jaggery cubes from the old mould board and there is, therefore, no doubt that the improved mould board should last considerably longer than the ordinary one.

A NOTE ON THE INDIAN JUTE INDUSTRY

By P. V. HARIHARAN, B. Sc. (Hons)

Agricultural Research Institute, Coimbatore.

Among the textile fibre crops of the world jute comes next to cotton and flax in commercial importance. The English word 'Jute' probably derived from Sanskrit '*jhat*' or '*jhout*' meaning "to be entangled" seems to have been in use since the middle of the eighteenth century but its mention for the first time in customs list was about the year 1828.

Jute is cultivated in Bengal from comparatively remote periods for its fibre from which coarse cloth for wear and cordage used to be made. The possibilities of this crop in international trade either being not well understood or more possibly an organised endeavour for its development on a commercial scale not obtaining, jute cultivation and jute manufactures remained in a primitive condition until in the first quarter of the last century, when, with the development of export trade of food grains, the need for a general packing material was keenly felt and jute bags were found handy enough to meet the situation. From that time onwards jute fibre came into the market and began to be exported to Europe and in particular to the Dundee mills in Scotland, chiefly through the efforts of the East India Co. Thus with the opening up of foreign market and the subsequent increased application of the fibre, the jute industry of Bengal came into prominence and grew to phenomenal proportions by the end of last century. Since then, and side by side with the increase in cultivated area, several jute manufacturing and exporting concerns were also established on the banks of the Hooghly.