

Suggestions for . . .

Cherry Brining

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Circular of Information 597
April 1959

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Corvallis

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Cherry Brining

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Although the Brined Cherry Research Project is continuing and its end is not yet in sight, here are some current suggestions for the cherry briners.

The Cherries

While it is possible to brine cherries at almost any stage of ripeness, the fact remains that best quality is obtained at only certain stages of maturity. It is recommended that cherries for brining should not be overripe, not only because soft cherries might result, but because there might be a tendency toward blemishes which reduce the amount of fruit suitable for U.S. No. 1 grade. It should be pointed out, however, that if the cherries are picked too early, they will tend to have more seed in proportion to the amount of flesh. Always brine cherries as soon as possible after picking.

Only cherries of good quality should be brined. Spoiled, damaged, belt-rejects, and other substandard fruit should not be used. Mildewed fruit will show a blemished skin after brining, as will overripe fruit, which is difficult to bleach in dark varieties. Remember that the cherry brine is not a cure-all solution.

The Brine

The following strengths of solutions have been found suitable for brining cherries:

| <u>Sulfur Dioxide (SO₂) Solution</u> | <u>Hydrated Lime</u> |
|---|----------------------------|
| 1% (8.4 lbs./100 gal) | 5 lbs. per 100 gallons |
| 1 1/4% (10.5 lbs./100 gal) | 6 1/4 lbs. per 100 gallons |
| 1 1/2% (12.6 lbs./100 gal) | 7 1/2 lbs. per 100 gallons |

Hydrated lime should be fresh so air slaking will not have taken place. Check on the purity and the available calcium content. If SO₂ strength is lower than that desired, it will be necessary to add more SO₂. The amount to add can be roughly calculated from the following formula:

(Percent SO₂ desired - %SO₂ found) multiplied
by the total gallons of brine² and by 8.4, the
weight of a gallon of brine, all divided by 100.

$$\frac{\text{Percent difference} \times \text{gallons} \times 8.4}{100} = \text{lbs. SO}_2 \text{ to add}$$

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If the test shows that SO_2 is too high, it will be necessary to add more lime. Do not add water as this will dilute the lime in the brine as well as the SO_2 . To determine the approximate amount of lime to add, use the following formula:

(Percent SO_2 found - % SO_2 desired) multiplied by
total gallons of brine and by 6.0, all divided by 100.

$$\frac{\text{Percent difference} \times \text{gallons} \times 6.0}{100} = \text{lbs. hydrated lime to add}$$

Brine strength should check the desired SO_2 value within approximately 0.1%, higher or lower. For example, suppose a desired 1 1/4% (1.25%) SO_2 brine is found by titration to be 1.1% in a 1500 gallon tank:

$$\frac{0.15\% \text{ difference} \times 1500 \times 8.4}{100} = 18.9 \text{ lbs.}$$

Add approximately 19 more lbs. of SO_2 . In another case, suppose the brine tests 1.45% SO_2 instead of the desired 1.25%:

$$\frac{0.2\% \text{ difference} \times 1500 \times 6.0}{100} = 18.0 \text{ lbs.}$$

Add approximately 18 lbs. of hydrated lime. After necessary corrections have been made, check the SO_2 strength of the brine again.

Some briners modify this brine in anticipation of latent softening tendencies of the fruit, or just as a safety factor. This is usually done by use of additional calcium in one form or another. Great care must be exercised in altering the brine drastically. If too much calcium is used with firm brining fruit, the pits may cling so tightly that difficulty is encountered in the mechanical pitting operation. Drastic changes in pH of brine will be caused by some calcium salts, resulting in softening or cracking of fruit.

Addition of calcium chloride (Ca-Cl_2) in preparation of regular brine (as described earlier) has been used by some briners as a safety factor. The approximate amount to use will vary between 0.5% and 1.0%, i.e., between 4 and 8 lbs. of calcium chloride per 100 gallons. This is in addition to the lime used. The actual amount must depend on judgment concerning condition of the fruit.

Calcium chloride may also be added to brined cherries after storage when firming appears to be sluggish or incomplete. If a regular nonchloride brine had been used originally, 1 to 2 lbs. of calcium chloride added per barrel had appeared to be beneficial in increasing firmness. Barrels should be rolled, or the dry chloride stirred in thoroughly in some manner.

Care should be taken to see that no iron comes in contact with the brine, as it will cause discoloration to appear in the cherries during processing. Use stainless steel, wood, or concrete.

When making the sulfur dioxide solution by bubbling, use floating wood lids to keep the bubbles from breaking on the surface.

It has also been found desirable to place a sheet of polyethylene film on the surface of the brine during the entire brining process. The film can be used on storage tanks of brined cherries or brine preparation tanks. It will prevent loss of sulfur dioxide by vaporization and

its dilution by rain water. Place some SO_2 solution on the polyethylene film to weigh it down in order to maintain a good contact between the film and the brine surface. In windy areas, the film may have to be cinched down by wooden frames or other devices. To use or not to use the film covers depends on the individual briner's operations and physical set-up. It is advisable to try the film first on one or two tanks to determine whether it is advantageous to use. Only high quality food-grade polyethylene film should be used.

Testing the SO_2 Solution

Take a 500-cc Erlenmeyer flask and fill one-fourth with distilled water. Pipet 25 cc of the standard iodine solution (0.2 normal) into the flask. Add a few drops of starch solution (1% soluble starch) and titrate with the SO_2 solution from a burette or a graduated pipet. Shake the flask constantly. As the reaction nears completion, the color of the iodine solution becomes purple. At this point, add the SO_2 solution very slowly and at the point where one drop dispels the color from the iodine solution, stop the titration and read the volume used. Always read to bottom of the curved surface of the SO_2 solution in the burette or pipet.

Now, refer to the chart on page 4 to obtain the strength of the SO_2 solution. Move your pencil point to the right from the zero on the bottom line of the chart until the number of cubic centimeters (cc) of the SO_2 solution used in the test is reached. Then move upward from the bottom of the chart until the curve is met. From this point of intersection, move the pencil point horizontally to the left edge of the chart. Then read the strength of the SO_2 solution from the vertical reference line at the left edge of the chart.

Control and Observation

After cherries are brined, they should be observed frequently. Barrels should be kept full. Firmness of the cherries should be checked with the texture testing method recommended below. The SO_2 content of the brine should be checked and the degree of bleach noted. Always keep in mind that there must be a quantity of free sulfur dioxide; otherwise the product will spoil. Tying up all the sulfur dioxide with lime should, by all means, be avoided. Slow bleaching is an indication of low sulfur dioxide content.

Texture Testing

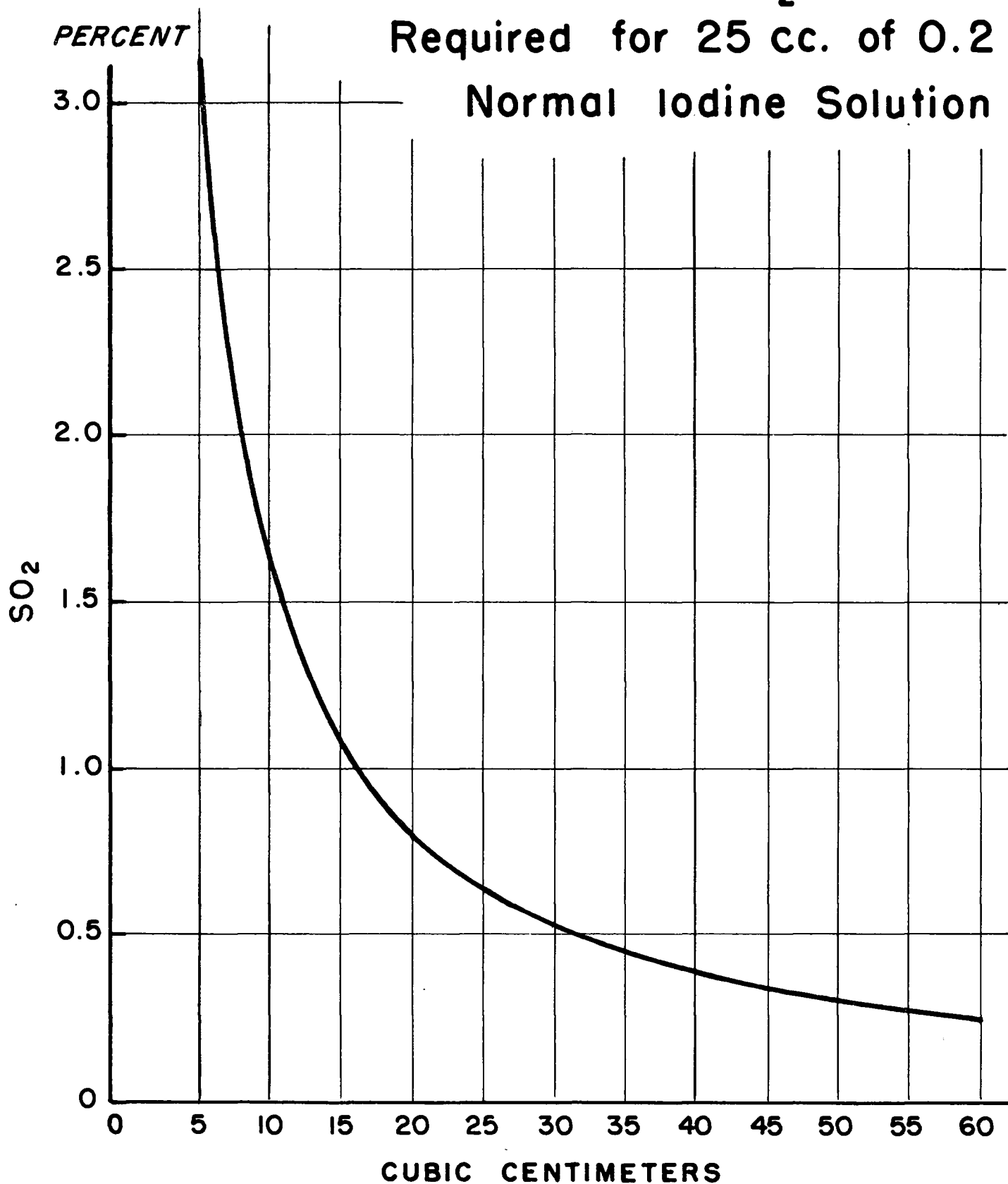
To test the texture of cherries, a puncture meter similar to the one shown on page 5 has been found suitable. This is a spring push gauge, 0-500g., complete with steel points. A puncture meter costs approximately \$60.00.

To use the meter, follow directions supplied by the manufacturer. Test about 50 cherries from each lot and average the results. An arbitrary scale can be set up to show the relation between meter readings and cherry firmness.

Enzyme and Calcium Tests

Methods for testing enzymes and calcium are available on request from either of the authors. They are not included in this paper because special precautions are required for their successful use. Individuals who wish to test for enzymes and/or calcium will receive help from the authors.

Cubic Centimeters of SO_2 Solution
Required for 25 cc. of 0.2
Normal Iodine Solution



SPECIAL FRUIT
AND
VEGETABLE TESTER

Style of 154-2 M.R.P.
but equipped with
Pin Vise and
1 set of Pins

