

PROTOCOL AA: WETTING METHOD TO REMOVE CYANIDE

FROM CASSAVA FLOUR AND TO MEASURE AMOUNT LEFT

Wetting Method

Cassava flour is placed in a container and its height marked on the side of the container. Water is added slowly with thorough mixing until the wet flour volume comes up to the mark on the container. The wet flour is spread out on a basket or a tray in a layer no thicker than 1 cm thick and left in the shade for about 5 hours. Time should not be less than 5 hours. This time is needed for breakdown of the cyanide compound (linamarin) by the enzyme (linamarase) to produce hydrogen cyanide gas that escapes to the air. The wet flour must be used for cooking the same day in order to prevent spoilage which may occur if it is left overnight. Less water is needed to produce the traditional porridge (“ugali”, “luku”) from wet flour than from dry flour, but otherwise the cooking is the same.

Measurement of % Cyanide Left After Wetting

The amount of cyanide present in the cassava flour immediately after wetting it and 5 hours later can be checked by the following procedure.

1. Place the small portable balance on its U-shaped plastic mount (see sketch 1) so that it swings freely. It has 100 mg of plastic glued inside one spoon.
2. Immediately after wetting the wet cassava flour is added to the empty spoon until balance is obtained as shown in sketch 1.
3. Place a round paper disc in a plastic bottle and add the wet cassava flour (sketch 2).
4. Add 0.5 ml of clean water using the plastic pipette (sketch 2).
5. Immediately add a yellow picrate paper (sketch 2). The yellow picrate paper must not touch the liquid in the bottle.
6. Immediately close the bottle with a screw capped lid (sketch 2).
7. The closed bottle must be left for 16-24 hour at room temperature.
8. The wet cassava flour after spreading and standing for 5 hour is weighed out using the balance.
9. Following sketch 2 place a round paper disc in a bottle, add the wet cassava flour , 0.5 ml water and a yellow picrate paper.
10. Immediately close the bottle and stand for 16-24 hour at room temperature.
11. Open the 2 bottles and match the colours of the picrate papers against the colour chart.
12. Read off from the colour chart the total cyanide content in ppm of the wet flour at the beginning and end of the wetting period.
13. Calculate the percentage of cyanide left in the flour using the equation
$$\% \text{ cyanide left} = 100 (\text{ppm of cyanide at end of wetting period}) / (\text{ppm of cyanide at beginning of wetting period})$$

List of Components of Kit AA

The kit has the following components:

1. Protocol AA, which describes the wetting method for removing cyanide from flour and how to measure the % cyanide left after wetting.
2. A balance with 100 mg of plastic glued into one spoon (see sketch 1).
3. 12 plastic bottles with screw lids.
4. A graduated 1 ml, plastic pipette.
5. Bottle containing 25 buffer / enzyme papers, that are marked with a small black spot.
6. 25 yellow picrate papers glued to strips of clear plastic. STORE IN THE DEEP FREEZE OF THE REFRIGERATOR. STABLE FOR ONE MONTH ONLY AT ROOM TEMPERATURE.
7. Colour chart with 10 shades of colour which correspond to 0-800 ppm total cyanide.

References

- Bradbury, J.H. (2006) Simple wetting method to reduce cyanogen content of cassava flour. J.Food Comp. Anal., Vol 19, in press.
- Cumbana, A., Mirione, E., Cliff, J. and Bradbury, J.H. (2006) Reduction of cyanide content of cassava flour in Mozambique by the wetting method. Food Chemistry, in press.

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