

Drying of Sweet Potatoes and Preparation of Flour Biscuits and Cakes

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Introduction: The sweet potato, (*Ipomoea batatas*), belonging to the family of Convolvulaceae, is a crop that has established itself very well in our country. In view of the increased interest in this crop as an article of diet, it is proposed in this paper to give simple directions in drying for storage and for the manufacture of flour products, such as biscuits, bread and cake.

The sweet potato is a plant of tropical America, its original home probably being the West Indies and Central America. Its cultivation is simple as it comes up in almost every kind of soil, though it makes its best growth on sandy or well drained soils. It is fairly well known that sweet potato forms an exceedingly nutritive food. It can be and is eaten raw, fried, roasted or boiled. But its usefulness when the tubers are sliced and dried in the sun and ground into flour and baked into bread, biscuit and cake is not so widely known. The sun dried chips converted into flour can be used in a variety of ways as an article of food. The sweet potato can also be preserved for a long time by a simple process of boiling the tubers, pressing the cooked tubers into cakes and drying in the sun.

Preparation of Sun Dried Chips: The tubers are washed well prior to slicing and scraped with a knife to remove the rind. The rind-free tubers are then sliced into chips of not more than quarter of an inch in thickness, spread over a cloth or on a clean cement floor and dried in the sun. Freshly cut slices are white in colour which change to cream yellow after two hours of drying. After about eight hours of drying, the slices are generally of dull white colour and crumble easily on pressing. In about 10 to 12 hours the drying is complete.

Flour: The sun dried chips are converted into flour by pounding in an iron or stone mortar and sieving. The flour prepared thus is creamy white in colour.

Chips: The sun-dried chips will be from $\frac{1}{3}$ to $\frac{1}{2}$ the weight of raw tubers taken for drying. The moisture content of the sundried chips will vary from 5 to 10 per cent depending upon the thickness of the slices. Sweet potato chips were prepared by the method mentioned above in a number of places and the samples were analysed in the laboratory for moisture, cooking quality and palatability. Cooking tests

were carried out by putting the chips in twice the volume of water and boiling. All the samples got cooked between 30 and 45 minutes. The results of cooking tests are given in the statement appended.

It may be seen that the taste of the cooked product was generally insipid. Hence, it is possible to use the dried chips for preparing the usual dishes after reconstituting them with water prior to cooking. They will be similar to any dehydrated vegetable in flavour and taste. The composition of sweet potato chips and flour is given below :

TABLE I
Analysis of Sweet Potato
Chips and Flour (different samples)

Heads of Analysis	Desiccated chips %	Flour %
Moisture	.. 10.46	11.33
Ether extractives	.. 1.18	0.62
Crude fibre	.. 1.91	2.21
Ash	.. 3.04	1.84
Protein	.. 4.50	1.94
Starch	.. 46.22	50.03
Dextrose	.. 18.55	10.75
Sucrose	.. 10.93	19.61
Undetermined	.. 3.21	1.67

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to quality. A recipe for the preparation is given below. For comparison, the amount of ingredients used for making ordinary biscuits is also given along with.

TABLE II

Ingredients Quantity—3 pounds of flour	Sweet potato biscuit	Ordinary biscuit
Sweet potato flour	.. 24 oz.	..
Maida flour	.. 24 "	48 oz.
Sugar	.. 20 "	24 "
Butter	.. 12 "	8 "
Ghee	.. 4½ "	2½ "
Baking powder	.. 2 "	1 "
Flavouring etc.	.. Q. S.	Q. S.

a longer time than the maida flour. Sweet potato biscuits prepared with about 50 per cent of the flour analyse the following: Moisture—0.70%; Protein—5.31%; Ether extractives—12.27%; Acid value—4.5 mgms./gram of fat.

These biscuits keep well and crisp for a long time. Biscuits prepared in a local bakery according to the above recipe and kept in

Preparation of Bread, Biscuit and Cake with Sweet Potato Flour: Sweet potato flour can be used with maida flour for the manufacture of bread, biscuit and cake. For bread, equal parts of sweet potato flour may be used with maida. The bread so made is naturally a bit "heavy" and does not rise satisfactorily but when made into toast is palatable.

Biscuits can be prepared with sweet potato flour using upto 50 per cent of the total quantity of flour used without any detriment

From the above recipe it will be seen that sweet potato flour requires less sugar, but more of fat and baking powder. The biscuits have to be baked for a little while longer than for the ordinary biscuits. Slight darkening round the edges is likely to occur but it does not affect the quality of the product in any way. The flour requires to be kneaded for

glass jars for ten months did not show any deterioration in taste or smell. They were found good even after one year. After storage for ten months the biscuits analysed as: Moisture 4.34%; Ether extractives 11.77%; Acid value 5.58% (mgm. KOH/gm. fat).

Preparation of Cakes: Good quality cakes can be prepared with sweet potato flour. The recipe given below may serve as a guide.

	<i>Spice Cake</i>	<i>Plain Cake</i>
Sweet potato flour	80 gm.	80 gm.
Maida flour	60 "	60 "
Sugar	140 "	140 "
Eggs	4 "	4 "
Butter	150 "	150 "
Milk	120 "	120 "
Baking power	15 "	15 "
Salt	One pinch	One pinch
Spices	Cinamon Nutmeg Cloves Cardamom Mace Ginger	} $\frac{1}{2}$ teaspoon

When made each cake will weigh about a pound and a quarter.

Other ways of preserving sweet potatoes: 1. *Boiling and pressing:* The tubers are washed well to remove the adhering soil and placed in cold water and raised to a boil and kept boiling for about one hour cut into slices and dried. They can also be pressed into cake and dried in the sun for a day or two. The sun dried slices and cakes are brick hard and can be stored for over two years. When required for use they are soaked in water for a few hours, washed and cooked in the usual way. Some people claim that its taste is even better than the fresh ones. Nearly 50 per cent of the original weight of tubers are obtained by this method.

2. *Cooking and pressing through a vermicelli press:* The tubers are cooked and mashed with a little salt, pressed with a vermicelli press and dried in the sun. These can be stored in glass jars or tins for a long time. Wheat flour upto 25% can be included with the mashed tubers and given a short cooking before pressing. This product may be used in a variety of ways if one has the taste for it.

3. *Sweet potato starch and other product:* The sweet potato flour can be used for the preparation of starch, syrup and malt extracts and other useful and edible products.

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APPENDIX

No.	Samples from	Description of slices	Cooking quality, taste etc.	Moisture content of chips Per cent
1	Coimbatore Paddy Station	Brownish white thin slices rind intact	Inspid darkened on cooking	5.74
2	Kasargod	do.	Inspid	8.21
3	Palur	White thin slices	Inspid, darkened slightly	10.28
4	Ambasamudram	Brownish white rind intact	Inspid	9.10
5	Taliparamba	do.	do.	7.36
6	Gudiyattam	Grey white	No taste	6.04
7	Central Farm, Coimbatore	Thin white slices	Taste not bad	5.84
8	Pilicode	Brownish white	Inspid, darkened	7.95
9	Aduthurai	White big slices	Sweet, darkened	8.65
10	Tindivanam	White thin chips	Good—No colouration	5.77
11	Nileshwar	Light brown thin slices	Inspid—darkened	7.64
12	Pattukottai	White small thick slices	Inspid, turned brown	7.81
13	Koilpatti	Brownish thin slices	Inspid, darkened completely	9.05
14	Pattambi	Dull white big slices	Not palatable	7.14
15	Kallar	White thick slices	Inspid, darkened	8.10

Transmethylation and Methyl Synthesis

By

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Introduction: Converging lines of research by nutritionists, chemists and clinicians lead to something entirely new in dietary requirements. Nutritional requirement had usually been in terms of whole complex compounds like the fats, carbohydrates or vitamins or in terms of simple elements like calcium, phosphorus etc. But for the first time and for probably the only unique instance of dietary requirement a group like the methyl group emerges out as an entity in Nutrition. Its discovery came about in the study of the diverse metabolic reactions of apparently totally unrelated compounds like casein, cysteine, methionine, choline, folic acid and recently Vitamin B₁₂.

Research on the amino acids on the one side, with the search for lipotropic substances on the other and lately the vitamin studies soon