



ISSN 2278 – 0211 (Online)

## Storage Practices of Dehydrated Vegetables in Marathwada Region

**Jayshree P. Zend**

Senior Scientist, Department of Family Resource Management, VNMKV Parbhani (MS), India

**Manjusha Revanwar**

Research Associate, Department of Family Resource Management, VNMKV Parbhani (MS), India

**Jyotsna Nerlekar**

Research Associate, Department of Foods and Nutrition, VNMKV Parbhani (MS), India

### **Abstract:**

Survey of 480 households from Marathwada region of Maharashtra state was carried out to elicit information on preservation and storage of dehydrated vegetables. Most of the families from Marathwada region stored vegetables in dehydrated form for six months. Majority of these families stored dehydrated vegetables in stainless steel or tin containers. Wrapping of the dehydrated vegetables in polyethylene bag or cloth before storing it in containers was also observed in some of the families. Most popular vegetables consumed in dehydrated form were potato, carrot, okra and brinjal.

**Keywords:** Dehydration, drying of vegetables, Ambat chukka, Bengal gram leaves, Coriander leaves, curry leaves, Fenugreek leaves

### **1. Introduction**

Vegetables are an important part of the daily diet of human being. Vegetables and fruits are the main source of vitamin and minerals required for growth and maintenance of health. Vegetables are highly seasonable and are usually available in plenty at a particular part of year. Dehydration of vegetables is one of the feasible methods of surplus products for use in shortfall. Hence, many families dehydrate the vegetables at home (Patel, S.P.1994). The preservation of vegetables by dehydration offers a unique challenge (Singh and Heldman 1993). Drying of food products results in considerable reduction in weight which is beneficial as it reduces the storage space and can be transported easily even too far off places. (Sadhna Arora and Rupa Bakshi, 1994). Recent efforts to improve sun drying have led to solar drying. Hence, solar drying is said to be an elaboration of sun drying and is an efficient system of utilizing solar energy ( Bala and Janjai, 2009). Similar to sun drying, solar drying also uses the sun as the source of energy. Hence, it refers to methods of using the Sun's energy for drying, but excludes open air sun drying (Mnkeni *et al.* 2004.)

Proper storage of dehydrated vegetables is an important factor in preventing its dehydration in quality and quantity, storage containers are important in preserving the quality of the product without causing deterioration. The present investigation was carried out for collecting information on preservation and storage practices of dehydrated vegetables in vogue in Marathwada region.

### **2. Materials and Methods**

Survey of Marathwada region of Maharashtra was carried out to elicit information on preservation and storage of dehydrated vegetables. A total sample of 480 households was selected randomly from two blocks of each selected district. An interview schedule was prepared for collecting the information. The investigators personally visited the areas under study and collected data.

### **3. Results**

Data on storage period and type of containers used by selected families for storing dehydrated green leafy vegetables depicted (table 1) that green leafy vegetables like ambient chukka, Bengal gram leaves, coriander leaves, curry leaves, fenugreek leaves, garlic leaves, gogu, mustard leaves, onion leaves, Safflower leaves and Spinach are the most common green leafy vegetables dehydrated in the Marathwada region. Most of the families stored the dehydrated green leafy vegetables for six months of period (79.5 to 100.0 %). Very low percent of the families (1 - 20 %) stored dehydrated green leafy vegetables for 12 months of period. Most of the families stored it in stainless steel or in tin container (30-100%), whereas near about similar percentage of families (7-26 %) stored it in the plastic container, earthen pot, wrapping in polyethylene bag or cloth and in polyethylene bag only.

Other vegetables viz.ash gourd, bitter gourd, bottle gourd, brinjal, cabbage, cauliflower, cluster beans, cow pea, french beans, green chilies, okra, raw mango, tomato and wild cucumber were preserved in dehydrated form . Storage period and types of container used for the dehydrated other vegetables like bitter gourd, bottle gourd, cauliflower found that these were stored for 6 months by all families, whereas 70-97 percent of families stored remaining vegetables for 6 months of period. Very less percent of families (3-28 %) stored the dehydrated other vegetables for 12 months of period. All the families stored the dehydrated vegetables like bitter gourd, bottle gourd, tomato and wild cucumber in a stainless steel container, whereas the varied percent of families stored the dehydrated other vegetables in plastic container, earthen pot, wrapping with polyethylene bag and only in polyethylene bag.

Roots and tubers such as carrot, ginger, onion, potato, radish, and sweet potato were dehydrated for preservation purpose. The storage period and types of containers used for storage indicated that (Table 3) all the families preserved the radish in dehydrated form for 6 months of period. Whereas potato was stored in dehydrated form for 12 months of period (99 %). The percentage was varied for the storage of other roots and tubers in dehydrated form. Most of the families were stored the dehydrated roots and tubers in a stainless steel container (43-58 %), Whereas Ginger and carrot was mostly stored in polyethylene bag.

#### 4. Discussion

In most of the families, (72-100%) all the type of dehydrated vegetables were stored for 1 to 6 months period. The vegetables such as potato and sweet potato were stored in dehydrated form for the duration of one year. Preservation of vegetables such as raw mango, tomato, onion, ginger, cowpea and bengal gram leaves in dehydrated form for 12 month was observed only in 20-28 per cent families. Most of the dehydrated vegetables were stored in stainless steel or tin containers. Percentage of families using plastic containers for the storage of dehydrated vegetables ranged between 11-36 per cent. Nearly 10 per cent of families stored dehydrated vegetables in different containers after wrapping in polyethylene bag or in piece of cloth. Storage of dehydrated vegetables only in polyethylene bag was observed in 7-27 per cent of families. Few percentages of families (8%) used glass containers and earthen pots for storing dehydrated vegetables

#### 5. Conclusion

In conclusion, it can be said that most of the families from Marathwada region stored vegetables in dehydrated form for six months. Majority of these families stored dehydrated vegetables in stainless steel or tin containers. Wrapping of the dehydrated vegetables in polyethylene bag or cloth before storing it in containers was also observed in some of the families.

#### 6. References

- i. Bala, B. K., S. Janjai Solar drying of fruits, vegetables, spices, medicinal plants and fish: Developments and potentials. International solar food processing conference. (2009).  
[http://www.solarfood.org/solarfood/pages/solarfood2009/3\\_full\\_paper/Technologies/45\\_Bala.pdf](http://www.solarfood.org/solarfood/pages/solarfood2009/3_full_paper/Technologies/45_Bala.pdf)
- ii. Mnkeni, A.P., P. Soundy and M.O. Brutsch (2004). Solar drying of fruit and vegetables, Internet document, Department of Agriculture. [www.solar.drying.of.fruit.and.vegetables.Htm](http://www.solar.drying.of.fruit.and.vegetables.Htm).
- iii. Nawale, E. M. solar energy utilization for khoa production, unpublished M.Sc thesis. (1992) submitted to M.A.U. Parbhani
- iv. Patel S. P. Feasibility of solar cooker for dehydration of selected vegetables, unpublished M.Sc. thesis, (1994) submitted to M.A.U. Parbhani
- v. Sadhna Arora and Rupa Bakshi, Res. Punjab Agric. Univ. 31(1) (1994) 69-75.
- vi. Singh and Heldman, J. Food Sci. and Technology, 34(5) (1993) 410-412.

Annexure

Name of the Vegetable	Storage Period		Type of Storage				
	1-6 Months (%)	6-12 Months (%)	Containers			Stored in Container After Wrapping in Polyethylene Bag/Cloth	Stored Only in Polyethylene Bag
			Stainless Steel/tin	Plastic	Earthen pot / glass jar		
Ambat chuka	100	--	100	--	--	--	--
Bengalgram leaves	79.5	20.5	49.4	23.2	12.7	7.3	7.3
Coriander leaves	97.7	2.3	43.2	10.8	13.1	15.2	17.7
Curry leaves	100	--	30.1	12.2	9.8	25.2	22.7
Fenugreek leaves	94.7	5.3	46.2	17.8	9.3	14.7	12.0
Garlic leaves	98.6	1.4	38.4	--	--	35.6	26.0
Gogu	95.8	4.2	37.0	19.3	36.9	16.0	6.7
Mustard leaves	100	--	100	--	--	--	--
Onion leaves	96.4	3.6	32.0	27.2	11.4	19.1	10.2
Safflower leaves	99.3	0.7	45.1	13.3	13.3	17.5	10.8
Spinach	100	--	50	13.6	--	13.6	13.6

Table 1: Storage period and type of containers used by selected families for storing dehydrated green leafy vegetables

Name of the Vegetable	Storage Period		Type of Storage				
	1-6 Months (%)	6-12 Months (%)	Containers			Stored In Container After Wrapping in Polyethylene Bag/Cloth	Stored Only in Polyethylene Bag
			Stainless Steel/Tin	Plastic	Earthen Pot / Glass Jar		
Ash gourd	71.4	28.6	64.3	35.7	--	--	--
Bitter gourd	100	--	100	--	--	--	--
Bottle gourd	100	--	100	--	--	--	--
Brinjal	95.2	4.8	71.1	11.0	9.2	5.3	3.5
Cabbage	100	--	14.3	--	--	--	85.7
Couliflower	100	--	50.0	--	--	--	50.0
Clustre beans	94.9	5.1	66.3	16.5	5.3	1.7	10.2
Cowpea	80.0	20.0	40.0	5.0	22.5	10.0	22.5
French beans	90.2	9.8	42.1	17.5	12.5	14.5	11.3
Green chillies	83.0	17.0	42.0	29.5	12.2	5.1	5.6
Okra	96.3	3.7	68.5	13.7	4.4	4.8	8.5
Raw mango	72.5	27.5	38.8	16.3	10.6	11.3	15.0
Tomato	75.0	25.0	100	--	--	--	--
Wild cucumber	93.3	6.7	100	--	--	--	--

Table 2: Storage period and type of containers used by selected families for storing dehydrated other vegetables

Name of the Vegetable	Storage Period		Type of Storage				
	1-6 months (%)	6-12 months (%)	Containers			Stored in Container After Wrapping in Polyethylene Bag/Cloth	Stored Only in Polyethylene Bag
			Stainless Steel/Tin	Plastic	Earthen Pot / Glass Jar		
Carrot	85.8	14.2	18.4	10.7	15.4	27.8	27.8
Ginger	79.7	20.3	10.1	17.6	1.4	43.9	27.0
Onion	73.0	27.0	43.4	28.4	14.3	11.8	2.3
Potato	0.7	99.3	57.5	17.3	18.5	11.8	4.0
Radish	100	--	50.0	--	--	--	50.0
Sweet potato	35.9	65.1	49.1	17.3	21.8	9.1	2.3

Table 3: Storage period and type of containers used by selected families for storing dehydrated roots and tubers