NUTRITIONAL STUDIES ON FRESH AND DEHYDRATED ONION (ALLIUM CEPA LINN)

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In India dehydration of many food products specially vegetables and some fruits are in practices at home and industry level through out year. There are some nutritional loses but these products are useful in many food preparation, it is readily available for whole year. The present study was taken to observe the nutritive value of fresh and dehydrated onion. Onion is the bulb of Allium Cepa Linn a biennial plant belonging to liliaceace, or lily family. It's nativity is not definitely known but it is believed that it probably originated in the eastern Mediterranean regions and the middle east. It's caltivation is wide spread in temperate and tropical region (pary-1986). Onion is the one of the most important but perishable groups grown in our country. India is the second largest producer of onion in the world. In India onion is grown in the states of Maharastra, Gujarat, Orissa, Haryana, Bihar, Uttar pradesh.Production of onion during 2006-07 is estimated at 6.21 million tones.Exports of all varities of onion by NAFED and other State Trading Enterprises during 2006-07 were relatively higher at 9.14 lakh tones. (E.S.-2006-07). Gujrat is the second largest producer of onion in India with an annual production of about five lakh tone. The export potential of onion is quite high and already a large number of dehydration plants in operation in many parts of the country. Drying of onion flakes has the potential to not only reduce the storage losses but it also helps in stabilizing the price (Philip-1994). In India, onion dehydration plants are firewood, groundnut shell or diesel oil for hot air generation. These dehydration plants use tray dryers for drying the onion flakes. The drying is done using hot air at 55 to 70'C. Onion is dehydrated in the form of sliced, large, standard and small chopped, mince, granulated, kibbled, 6MM dices and ground or onion powder. It is widely used in canned soups, salads, hamburgers, Pizzas, dry soup mixes and other fast food preparations. The dehydrated onion products are available in two types i.e. very pungent and mildly pungent (Debnath et.al. -2004). **Therefore, the aim of this study was to observe the effect of drying on onion compared to fresh onion.**

METHODOLOGY -The present investigations was carried out to evaluate and compare the nutritive value of dehydrated onion with fresh sample of the same variety (Nasik) and of the market variety were used for comparison of the onion samples. The dehydration was carried out at SPRERI Sardar Patel Renewable Energy Research Institute,Vallabh Vidyanagar,Anand,Gujarat.] is one of Co-oprating center of the Indian Council for Agricultural Research (ICAR) in their all India co-ordinated scheme on renewable energy resources. The onion dehydration plants use tray dries of capacity 1000kg. of fresh onion. The final product usually has a moisture content of about 5 to 8% and weights about 100 kg. The drying time is about 4 to 5 hrs. and the driers are used round the clock. The onion bulb is first cleaned and then cut into thin flakes. After washing, the flakes are loaded in trays up to 2.5 cm bed thickness. The drying is done using hot air at 55 to 70'C. Wood or groundnut shell is burnt in a burner to heat water or oil. The hot fluid is then circulated through the drier using a blower. Hot air is introduced at the bottom of the drier and it passes through all trays and then goes out. Hence the bottom trays dry first which are immediately removed. After removing all the trays fresh material is again loaded. The dried product from the tray drier is immediately loaded into bin driers where air at 45 to 50'C is passed for about 6 hours. This helps the onion to remain crisp. The onion flakes are shifted immediately to an air-conditioned room were burnt pieces are removed and the produce packed in a plastic bags. Further, the dried flakes are ground in to powder using a willey Mill when there is an export demand. For this study market samples of onion were purchased from the wholesale market at Anand. The dehydrated and fresh test sample being provided by SPRERI. In the present investigation a market variety of onion, dried onion, rehydrated onion and fresh onion were analysed for their nutrient content.

PARAMETER STUDIED - A. Food analysis of fresh (market), fresh (SPRERI) and dehydrated (SPRERI) Onion samples.

1. Total Solids. 2. Moisture 3. Protein 4. Thiamine (Vit.-B_1) 5. Riboflavin (Vit $B_{2)}$ 6. Ascorbic Acid (Vit-C) B. Rehydration Ratio

Total solids was calculated by subtracting the moisture content from 100. Moisture content of the sample was determine by the method given by AOAC

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(1963). Protein estimation was done by macrokjeldhal method given by Oser (1976). Sample preparation for B_1 and B_2 vitamin was done by the method given in AAVC (1951). Thiamine (B_1) was estimated by the thiochrome method given in AAVC (1951). Riboflavin was estimated by the fluorometric method given in AAVC (1951). Asorbic acid was determined by the colorimetric method of Roe and Kuether (1943).

REHYDRATION PROCESS-Known amount of the dried onion flakes tied in muslin cloth. kept for 1 minutes in the boiled water, taken out, drained excess water and blotted dry on a filter paper (Rangana-1980) **Rehydration Ratio** = Weight after Soaking/Weight before Soaking

STASTICAL ANALYSIS-The result were expressed as mean + Standard error of mean, data were analysed with student " t " test to determine the significance of difference (Gupta-1984).

RESULTS AND DISCUSSION-This investigation was carried out for the nutritional studies on fresh and dehydrated onion. Table-1 indicates the total solids content of the different onion samples. Total solids of fresh (market) and fresh (SPRERI) samples was almost similar and it ranged between 9.01 gm % to 10..22 gm % and as expected the dehydrated onion samples showed high total solids (79.6%) and on rehydration total solids content was 17.7% Bajaj et.al. (1984) studied the total solids content of twelve varieties of onion bulbs and total solid on an average was 12.2% Table1. also indicates the moisture and protein content of different type of onion. Fresh (market) and fresh (SPRERI) as expected showed the same range of moisture ie. 89.79 gm % - 90.99 gm % content and it is statistically significant ($P < 0.01$). Analysis carried out on SPRERI indicated the moisture content of the same variety of fresh onion to be 82%. Dehydrated SPRERI showed very less moisture content as expected and when compared to fresh (SPRERI). It was statistically significant ($P < 0.001$). Dehydrated (SPRERI) onion showed only 82% moisture which indicates that moisture imbibition was not total and when compared to both fresh (market) and fresh (SPRERI), it was statistically significant ($P<0.001$).

Table-1 shows protein content of the different type of onion samples. Fresh (market) and fresh (SPRERI) were in the same range i.e. 1.60 gm % to 1.33 gm % and when compared they were not statistically significant. Dehydrated (SPRERI) sample showed very high protein content i.e. 8.13% became it's on a moisture free basis while comparing fresh (SPRERI) and dehydrated (SPRERI) it was statistically significant ($P<0.01$). Again rehydrated (SPRERI) showed 1.80 gm % protein which was higher when compared to fresh because total solids was high.

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- values are mean + SEM.
- Number in parentheses indicate the number of trials.
- Statistically significant for moisture, and protein ($p<0.01$)^{a,e}, ($p<0.001$)^{b,c,d} and for thiamine, riboflavin and ascorbic acid at ($p<0.1$)^{d}, ($p<0.05$)^{a,b}, ($p<0.01$)$^{i.e}$, ($p<0.001$)^{f},

Table-1 also indicates the thiamine, riboflavin and ascorbic acid content of different types of onion. Thiamine content of the fresh (market) onion was 0.15 mg %, where as the fresh (SPRERI) onion was 0.09 mg % which is less compared to the market sample. when compared they are statistically significant ($P<0.05$). Dehydrated onion showed 0.16 mg % thiamine content which is similar to fresh (market) sample because TS content of dehydrated onion is 8 times more than that of the market sample. Rehydrated (SPRERI) onion showed 0.03 mg % of thiamine which is very less compared to the fresh (market) and fresh (SPRERI). This may be because thiamine is heat sensitive and therefore is lost during the dehydration process. When it was compared to fresh (market) sample it was statistically significant ($P<0.01$) and again with fresh

TABLE-1 Moisture (gm %), Protein (gm. %), Thiamine (mg. %), Riboflavin (mg %) and ascorbic acid (mg%) content of the different onion samples.

Type	Moisture gm. %	Protein gm. %	Thiamine mg %	Riboflavin mg %	Ascorbic Acid mg%
Fresh (market)	89.79^{a,d} (10) $\pm$0.21	1.60 (15) $\pm$0.08	0.15^{a,c}(3) $\pm$0.018	0.04^{d}(7) $\pm$0.002	9.64^{f}(5) $\pm$0.77
Fresh (SPRERI)	90.99^{a,b,c}(10) $\pm$0.23	1.33^{e}(10) $\pm$0.16	0.09^{a,b}(3) $\pm$0.009	0.03^{d,e} $\pm$0.008	23.30^{f}(8) $\pm$1.72
Dehydrated (SPRERI)	20.44^{b}(10) $\pm$1.76 -	8.13^{e}(18) $\pm$0.77	0.16(5) $\pm$0.064	0.21^{e}(7) $\pm$0.040	-
Rehydrated (SPRERI)	82.30^{c,d}(10) $\pm$0.39	1.80(18) $\pm$0.17	0.03^{b,c}(5) $\pm$0.014	0.04(7) $\pm$0.009	-

(SPRERI) ($P<0.05$) it was statistically significant. Bradula et.al. (1987) indicated that thermal processing caused a decrease in thiamine (82%) content.

Riboflavin values of fresh (market) and fresh (SPRERI) values were in close range (0.03 mg % - 0.04 mg. %) being statistically significant ($P<0.1$). Dehydrated sample as expected showed more amount of riboflavin content when fresh (SPRERI) and dehydrated were compared it was statistically significant ($P<0.01$). Rehydrated (SPRERI) had 0.04 mg % riboflavin content which is the same as the fresh (market) and fresh (SPRERI) i.e. 0.03 mg. % - 0.04 mg. %. This is because riboflavin is not very easily destroyed by heat. Fennema (1985) indicated that riboflavin is thermo stable and unaffected by atmospheric oxygen.

Table-1 also indicate the ascorbic acid content of different onion samples and it is clear that market (fresh) sample contain less ascorbic acid than the fresh (SPRERI) sample, both being statistically significant ($P<0.001$). Franco et.al. (1995) indicated that microwave cooking led to a significant loss of ascorbic acid in fresh cabbage and cauliflower.

CONCLUSION:

Overall the study indicates that when dehydrated onions were used moisture imbibitions is not total on rehydration and total destruction of ascorbic acid and thiamine high than riboflavin. But dried onions are very useful for various food preparations like canned soup, salads, hamburgers, pizzas and other fast food preparations. Dried onions are also useful during scarcity of fresh onions.

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