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EVALUATION OF VARIOUS POTATO CULTIVARS OF JAMMU REGION FOR PROCESSING ATTRIBUTES

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ABSTRACT

Potato tubers of six varieties viz., Kufri Jyoti, Kufri Sindhuri, Kufri Badshah, Kufri Chandermukhi, Kufri Chipsona-I and Kufri Chipsona-II were stored at room temperature (22-38°C, RH 37-80%) after harvest and evaluated for their losses due to rottage, sprouting weight loss and chemical composition. Kufri Chandermukhi and Kufri Chipsona II were found to be the best, since they have the highest amount of specific gravity (0.78%,0.79%) each, Dry matter content (18.23%,17.84%), and Crude fiber (0.49%,0.40%) respectively. From the above values Kufri Chipsona-II was considered best for the development of chips and Kufri Chandermukhi for the development of flour. The finding of the study suggests that 60 days storage of potatoes at normal temperature with proper ventilation could be explored for storing processing potatoes.

INTRODUCTION

Potato (*Solanum tuberosum* L.) is one of the unique and most potential crops having high productivity, supplementing major food requirement in the world. It is rich in carbohydrates, proteins, phosphorus, calcium, vitamin C, and carotene and has high protein calorie ratio. Amongst the world's important food crops, Potato is the fourth important food crop after wheat, rice and maize because of its' great yield potential and high nutritive value. Harvested potatoes are subjected to tremendous weight loss rottage and sprouting under ambient conditions. In Jammu regions, the ambient temperature during harvest of potato is very high and results in higher weight loss and rottage and results in higher weight loss and rottage. Hence processing and value addition of potato for effective utilization/consumption is very important. Processed products like chips, flour, french fries and other dehydrated potato products are very common in market. Cold stored potatoes are not desirable for processing because of non enzymatic browning due to increase in reducing sugar (Ezekiel *et al*. 2005). Lack of improvement on farm storage structures, high post harvest losses, low domestic utilization and processing are the major problems of potato utilization in our country (Murata *et al*.1987).Therefore it is needful to store potatoes under ambient conditions and subject them to processing and evaluate their quality.

MATERIALS AND METHODS

The present investigation entitled "Processing of potato (*Solanum tuberosum L.*) cultivars for value addition was carried out in the Division of Post Harvest Technology, Sher-e-Kashmir University of Agricultural Sciences and Technology, Udheywalla Jammu during the year 2010-2012. Representative samples of six commercially important potato cultivars, viz. Kufri Baadshah, Kufri Sindhuri, Kufri Chandermukhi, Kufri Chipsona-I, Kufri Chipsona-2 and Kufri Sindhuri harvested in the mid of February 2010-2011 were obtained in the month of early March from the farm at village Bishnah, District Jammu under the State Department of Agriculture, Jammu. The tubers of normally medium to large size, with shallow eyes and thin peel were selected for evaluation. The potatoes procured were kept at room temperature (28-350C and RH 59-83%) in a well ventilated room for 60 days for storage. Out of 30 kgs of stored tubers, 5kg from each replicate were taken for determining weight loss and spoilage after 60 days of storage. Rotted tubers were sorted out at 60 days of storage and remaining tubers were used for biochemical analysis.dry matter content was determined immediately after harvest drying 50g of slice of tuber per replication in a hot air oven at 70^0 C for 48h and then at 60^0C till constant weight was obtained. Losses through weight loss sprouting and rottage were determined. Ash (%) and Fiber content (%) was recorded at an interval of one month (Ezekiel *et al*.2005, Mbata *et al*. 2002, Mehta and Singh 2004 and Nelson 1994).

RESULTS AND DISCUSSION

From the investigation it was recorded that after 60 days of storage, sprouting ranged between 88-96.99 per cent and the mean sprouting was 97.91per cent (Table 1). Sprouting was found to be significant when Kufri Chipsona was compared with Kufri Baadshah where as it was found significant with

Table 1: Different variety of potato tubers stored at ambient temperature for the shelf life studies

Variety	Weight loss	Sprouting	Tuber rottage (%)	Peeling loss (%)	
				At harvest	60 days
Kufri Chipsona-1	14.30	88	4.8	6.6	7.90
Kufri Chipsona-2	15.39	96	3.3	6.4	8.00
Kufri Chandermukhi	15.50	88	3.5	6.9	8.90
Kufri Baadshah	19.90	120	5.9	11.02	14.28
Kufri Jyoti	16.80	98.49	4.0	13.20	16.70
Kufri Sindhuri	16.99	96.99	4.9	13.44	16.99
Mean	16.48	97.91	4.4	9.59	12.12
CD (p = 0.05)	2.2	4.3	2.1	1.52	3.37

Table 2: Different variety of potato tubers stored at ambient temperature for the shelf life studies

Variety	Peeling loss %		Trimming and Cutting Loss		Processing losses (%)		Yield of fries%	
	0 days	60 days	0 days	60 days	0 days	60 days	0 days	60 days
Kufri Chipsona-1	7.80	8.90	2.4	2.9	10.02	11.50	56.60	53.00
Kufri Chipsona-2	7.20	8.00	1.8	2.4	10.60	11.87	55.77	51.03
Kufri Chandermukhi	8.10	9.02	3.0	4.6	11.01	11.99	55.99	50.00
Kufri Baadshah	10.11	12.02	2.8	3.6	13.05	15.50	40.60	36.60
Kufri Jyoti	14.06	16.05	3.4	4.3	14.01	16.02	39.60	38.77
Kufri Sindhuri	15.00	18.05	2.5	4.9	16.60	18.02	40.01	39.09
Mean	10.37	12.00	2.65	3.78	12.54	14.15	48.09	44.74
CD (p = 0.05)	1.3	1.9	NS	0.8	1.5	1.9	3.1	4.9
T × V	1.5		1.3		NS		2.5	

Table 3: Dry matter content of different varieties of potato stored at ambient temperature

Varieties	Storage period (days)			
	0	30	60	Mean
Kufri Jyoti	17.20	16.89	14.21	16.10
Kufri Sindhuri	17.00	16.01	13.48	15.49
Kufri Baadshah	16.90	14.21	12.21	14.44
Kufri Chandermukhi	22.40	18.91	13.40	18.23
Kufri Chipsona-1	20.70	17.71	13.68	17.36
Kufri chipsona-11	21.26	18.96	13.32	17.84
Mean	19.24	17.11	13.38	
	CD (p = 0.05)			
Variety	0.26			
Storage	0.37			
Variety × storage	0.65			

Table 4: Specific gravity different varieties of potato stored at ambient temperature

Varieties	Storage period (days)			
	0	30	60	Mean
Kufri Jyoti	1.08	0.81	0.39	0.71
Kufri Sindhuri	1.06	0.81	0.40	0.73
Kufri Baadshah	1.05	0.81	0.32	0.72
Kufri Chandermukhi	1.05	0.81	0.42	0.79
Kufri Chipsona-1	1.05	0.91	0.41	0.76
Kufri chipsona-11	1.08	0.94	0.36	0.78
Mean	1.06	0.84	0.34	
	CD (p = 0.05)			
Variety	0.01			
Storage	0.02			
Variety × storage	NS			

Kufri Chandermukhi. Rottage ranged between 3.3-5.9 per cent and weight loss between 14.30.3-19.90 per cent. Peeling loss was minimal Kufri Chipsona and Kufri Chandermukhi respectively in fresh and stored samples. Total losses were minimal or low in both Kufri Chipsona and Kufri Chandermukhi and were suitable for processing and followed by Kufri Jyoti and were in agreement with the findings of Ezekiel *et al*. (2007). Shriveling occurred due to high temperature prevailing during storage and imbalance occurred between the optimal water and solid content irrespective of cultivars. Sixty days storage does not affect the chipping quality but caused shriveling due to weight loss. Shriveling affected peeling. Rottage was less because well cured and stored potatoes were stored when the ambient temperature was below 20° C (Table 1 and 2).

Table 5: Crude fiber content content of different varieties of potato stored at ambient temperature

Varieties	Storage period (days)			
	0	30	60	Mean
Kufri Jyoti	0.38	0.36	0.35	0.33
Kufri Sindhuri	0.40	0.34	0.33	0.35
Kufri Baadshah	0.41	0.34	0.31	0.34
Kufri Chandermukhi	0.54	0.52	0.41	0.49
Kufri Chipsona-1	0.39	0.35	0.35	0.36
Kufri chipsona-11	0.50	0.38	0.34	0.40
Mean	0.43	0.38	0.34	
	CD (p = 0.05)			
Variety	0.04			
Storage	0.05			
Variety × storage	NS			

Table 3 revealed that as storage period advanced dry matter content decreased from 19.24 per cent at beginning to 13.38 per cent after 60 days. However, the treatment and storage interaction was found to be significant. The decreasing trend may be due to the activity of microorganism and catabolic enzyme activity produced by them or might be due to heat induced water losses (Dineshkumar *et al*. 2007). However Lee *et al*. (1998) investigated that dry matter in the tubers changes gradually with the maturity of the tubers and then decreases rapidly during the curing period, but remained practically constant during the storage period.

The highest specific gravity 0.80 per cent was recorded in T_4 (Kufri Chandermukhi) and lowest of 0.72 per cent was observed in T_3 (Kufri Baadshah). As the storage period advanced mean value of specific gravity decreased from 1.06 per cent at beginning to 0.38 per cent after 60 days (table 4). Moreover, the treatments and storage interaction was found to be non-

significant. Similar findings have been reported by Brackett (1987). The growing conditions as well as potato varieties may affect the chemical composition of potato, thereby influencing the processing quality of the potatoes (Sapers *et al.,* 1995).

On the other hand, potatoes of low specific gravity are preferred for canning because they slough or fall apart less during processing than potatoes of higher specific gravity. The specific gravity indicates shrinkage and it was due to loss of both solids and water in the ratio in the original composition (Pant *et al*., 1995).

During storage, crude fiber content (Table 5) decreased non-significantly. Crude fiber originates from the plant polysaccharides and may be part of starch that is resistant to hydrolysis by digestive enzymes. The reduction of crude fiber content was not significant, the result compared well with the findings of Jones *et al*., 1985 who observed little change of fiber content in fresh tubers on a dry weight basis. Ash content of potato tubers differed significantly in all the treatment as well as storage period. The highest ash content 0.73 per cent was recorded in T_4 (Kufri Chandermukhi) and lowest of 0.66 per cent was observed in T_2 (Kufri Sindhuri). As the storage period advanced mean value of ash content decreased from 0.76 per cent at beginning to 0.64 per cent after 60 days of storage. The decrease in ash content is due to increased activities of microorganism utilizing the minerals for growth (Pandey *et al*., 2007).

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Pant, S. and Kulshrestha, K. 1995. Physical characteristics of potato flour made from six potato varieties. *J. Food Sci. Tec*NATIONAL in general and the endeavour for the noble cause of environment in particular.

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