

NUTRITIONAL COMPOSITION AND PROCESSING OF ARID FRUIT KER (CAPPARIS DECIDUA)

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ABSTRACT

The arid fruit *ker* (*capparis decidua*) was studied for its method of processing, preparation of recipes and its nutritional composition in fresh & processed forms. Processing of *ker* was standardised by using different possible techniques. The method of soaking in 10 percent saline with 50 percent buttermilk, for 10 days with change of solution at alternate days was most acceptable. Drying of *ker* was standardised by using sun-drying and shade-drying of processed *ker*. Shade-dried *ker* were more acceptable (8.26) than sun-dried (6.75) on nine-point hedonic rating scale by the panellists. Fresh, fresh oven-dried, freshly processed and processed dried *ker* were analysed for their nutritional composition. Moisture, crude protein, fat, crude fibre, total ash, carbohydrate, energy, sodium, potassium, iron, zinc, manganese, copper and vitamin C (in fresh) contents of the *ker* ranged from 10.5-73.7g, 13.6-13.9g, 6.6-6.7g, 13.6-13.9g, 5.8-27.3g, 38.6-59.9g, 268.8-355.5kcal, 3.5-102.4mg, 161.2-167.0mg, 2.5-2.8mg, 1.42-1.52mg, 2.2-2.31mg, 1.68-1.82mg and 50mg/100g respectively. *Ker* based recipes like vegetable & pickle were found to be highly acceptable by the panellist.

INTRODUCTION

Ker (*Capparis decidua*) is an unconventional dessert plant, which grows wildly without much care. *Ker* belongs to family capparaceae & genus capparidaceae. It is a straggling shrub, fruits are berry globous and start appearing in April to May & Oct. to Nov. distributed in west Rajasthan, Gujrat, Punjab, U.P. & Haryana (Chandra et al, 1994). *Ker* is used in the community for its varied medicinal value in diabetes, rheumatism, hypertension, vomiting, and inflammations and in curing cardiac troubles (Goyal and Sharma, 2006). Since *ker* is available for a limited period, it is essential to process or preserve it for off season use, when other vegetables are scarce. However, each of the processing methods employed to fresh *ker* may influence the quality of product in different ways. But information regarding chemical composition, sensory characteristics, uses & preservation of *ker* is scanty in literature. Therefore the present study was planned & conducted to identify nutritional composition and processing of arid fruit *ker* (*Capparis decidua*).

RESEARCH METHODOLOGY

Locally available fresh *Ker* were purchased in April from Market in single lot. After cleaning & sorting, *Ker* were processed by soaking and drying. Soaking was carried out for ten days with change of water at alternate days. *Ker* were dried under two drying conditions i.e. open sunlight and in shade. Drying process was continued till the completion of drying. (Berry et al, 1979) Processing techniques were standardised through sensory evaluation on nine-point scale. Fresh, fresh oven dried, freshly processed, and processed dried (sun-dried & shade-dried) *Ker* were analysed for moisture, fat, ash, crude protein, crude fibre, carbohydrate & energy as suggested by (A.O.A.C., 1995), vitamin C was estimated by the methods suggested by the (Association of Vitamins chemists, 1966). Sodium & potassium were determined by flame photometer as suggested by (Allison et al., 1968), whereas iron, zinc, manganese & Copper were analysed by using Atomic Absorption Spectrophotometer (Bishnoi & Brar, 1988). Standardisation of recipes based on *ker*- Recipes like Vegetable & pickles were standardised with both freshly processed & processed dried *ker* using

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sensory evaluation technique (Swaminathan, 1987).

RESULTS AND DISCUSSION

Standardisation of processing technique

The most acceptable processing technique was noted to be soaking fresh *ker* in 10% saline containing 50% buttermilk for ten days with change of

solution every alternate day. The *ker* sample obtained by this processing technique scored 8.8 on nine-point scale as compared to 5.83 to 7.85 scores obtained by other processing techniques. (Table-1).

While comparing sensory quality of *ker* dried by two drying methods, shade-dried sample was found to be better acceptable (8.26 scores) in com-

Table 1: Mean scores obtained by fresh *ker* after processing (soaking and drying)

S. No.	Processing technique (soaking & drying)	Scores of sensory characteristics on nine point scale					Overall mean score
		Appearance	Colour	Flavour	Texture	Taste	
1.	Soaking fresh <i>ker</i> in plain water	6.0	5.9	5.6	5.8	5.8	5.83
2.	Soaking fresh <i>ker</i> in saline solution	8.0	7.8	7.8	7.8	8.0	7.83
3.	Soaking fresh <i>ker</i> in saline containing buttermilk	8.7	8.8	8.9	8.7	8.9	8.8
4.	Sun dried	6.6	6.5	6.2	8.0	6.4	6.75
5.	Shade dried	8.4	8.4	8.6	8.3	8.7	8.26

Table 2: Nutrients composition of *ker*

S. No.	Nutrient	All Nutrient per 100 g of Sample					SE M \pm	F-value/ C.D.1%
		Fresh <i>ker</i>	Fresh oven dried <i>ker</i>	Fresh Processed	Processed dried Sun dried Shade-dried			
1.	Moisture(g)	69.5	10.5	73.7	10.6	10.9	0.7	3.142
2.	Crude protein (g)	13.9	13.8	13.6	13.7	13.7	0.491	NS
3.	Fat (g)	6.7	6.7	6.6	6.6	6.7	0.405	NS
4.	Crude fibre (g)	13.9	13.7	13.8	13.6	13.6	0.758	NS
5.	Total Ash (g)	5.9	5.8	27.3	27.3	27.2	0.738	3.308
6.	Carbohydrate (g)	59.7	59.9	38.6	38.7	38.7	1.139	5.105
7.	Energy (K Cal)	354.5	355.5	268.8	269.3	269.6	0.730	3.606
8.	Mineral (mg)							
a.	Sodium	3.6	3.5	102.4	101.4	101.7	0.762	3.413
b.	Potassium	161.2	161.5	166.8	165.7	167.0	0.593	2.661
c.	Iron	2.5	2.5	2.8	2.8	2.8	0.587	NS
d.	Zink	1.5	1.52	1.42	1.51	1.49	0.321	NS
e.	Manganese	2.2	2.25	2.31	2.30	2.28	0.571	NS
f.	Copper	1.8	1.82	1.68	1.70	1.76	0.487	NS
9.	Vitamin C (mg)	50	Nil	Nil	Nil	Nil		

Note : All the value are on dry weight basis except moisture and vitamin C.

N.S. = Not significant at 5 percent level.

Table 3: Mean scores obtained by vegetables of ker

S. No.	Type of vegetable	Scores of sensory characteristics on nine point scale					Overall Mean Score	SD±	T-value
		Appearance	Colour	Flavour	Texture	Taste			
1.	Vegetable based on freshly processed <i>ker</i>	8.4	8.0	8.4	8.5	8.5	8.28	0.168	5.55*
2.	Vegetable based on processed dried <i>ker</i>	7.4	7.4	7.4	7.6	7.9	7.58	0.203	

*Significant at 1percent level of significance

Table 4 : Mean Scores Obtained by Pickles of KER

S. No.	Types of Pickle	Scores of sensory characteristics on nine point scale					S.D.±	SEm ±	F-cal	
		Appearance	Colour	Flavour	Texture	Taste Overall acceptance				
1.	Pickle with only <i>ker</i>	8.4	8.2	8.3	8.6	8.3	8.38	0.134	0.178	1.75
2.	Pickle with <i>ker</i> & sliced mango	8.2	8.0	8.2	8.2	8.2	8.13	0.094		
3.	Pickle with <i>ker</i> & grated mango	8.1	7.8	8.0	8.0	7.8	7.92	0.171		

C.D. - NS

parison to sundrying ones (6.75scores) by the panellist. (Table-1)

Nutrient composition of fresh & processed ker

Fresh , fresh oven-dried, freshly processed & processed-dried(sun-dried& shade-dried) *ker* were analysed using standard methods for moisture, crude protein, fat, crude fibre, total ash, carbohydrate, energy, vitamin C, sodium, potassium, iron, zinc, manganese & copper contents. (Table-2).

Ascorbic acid content in fresh *ker* was 50 mg/100 g and it was found to be destructed 100 percent in fresh oven-dried & freshly processed *ker*. It was noted that there was a significant increase in total ash (21.42 %), sodium (98.28%)& potassium (5.1%) content. But a decrease in carbohydrate (21.14%) & energy (85.76 %) contents were noted after processing. The increase in total ash content, sodium and potassium content in processed *ker* may be due to addition of common salt and buttermilk during processing. The decrease in carbohydrate content may

be attributed to leaching losses. Here variations in carbohydrate content must have led to the difference in the energy content of the *ker* samples.

The result of the present study comparable to the findings of Chouhan et al(1986) regarding crude protein, fat, crude fibre, total ash, carbohydrate, energy, vitamin C , iron, zinc, manganese & copper.

Development and evaluation of recipes based on ker

Sensory evaluation of *ker* recipes indicated that vegetable prepared with freshly processed *ker* was more acceptable scoring 8.28 on nine-point scale as compared to those prepared with processed dried *ker* scoring 7.58.(Table-3)

Similarly three types of *ker* pickles were prepared i.e. pickle only with *ker*, pickle with *ker* along with grated raw mango and pickle with *ker* along with sliced raw mango. The difference in the acceptability scores of pickles was found to be non significant as ranged between 7.92 and 8.38 (table-4).

CONCLUSION

Thus it can be concluded that by using standardized processing technique and shade drying, nutritionally good and traditionally valued *ker* can be preserved for off-season use.

The daily diets of people can be enriched with the inclusion of well acceptable *ker* based recipes like vegetables and pickles thereby encouraging food security in arid regions.

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