

SUN-DRYING OF APRICOT IN BALTISTAN

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Quality apricots are produced in abundance in Baltistan. Due to improper post-harvest handling and lack of ready market transportation and adequate storage facilities, the fruit quality deteriorates rapidly. Climatic conditions of the area seem quite favourable for a quick sun-drying of apricots. The application of some simple techniques to preserve apricots by sun-drying was found satisfactory.

Key words: Rural Fruit Preservation.

INTRODUCTION

Northern Areas of Pakistan comprise Gilgit, Baltistan and Diamir districts. Baltistan spreads over 10,188 sq. m. of land consisting of mountainous terrain and five valleys, namely, Shigar, Skardu, Rondu, Khaplu and Kharhong. The annual rainfall is 2" to 3", which necessitates irrigation by the channel system.

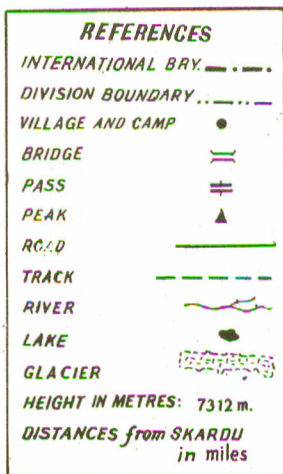
Baltistan is the most important fruit producing district. Fruit so far has been the major source of income and sustenance of the people, but most of the produce deteriorates due to the lack of adequate storage facilities and technology vacuum to preserve the surplus produce [1].

Apricot is the major crop produced. Harvested apricots are usually heaped in the fields prior to pit removal.

Pits are removed by placing baskets of apricots in running stream water and the fruit is pressed with hands or feet thus washing away the flesh after which the fruit pits are collected and cracked to obtain the kernal (estable portion) for sale or for domestic use. Some villagers recover the apricot pulp and mix this with mud to make walls and roof plaster [2].

Several varieties of apricots are produced in the area and a small quantity is sun-dried by primitive methods. After destoning, apricots are spread to dry on rocks, stones, and roofs. The sun drying of apricot being practised in this area is crude drying, a method that is without any consideration for sanitation, varietal suitability, correct stage of maturity and pre-treatments. Consequently, the quality of dried apricot so obtained is poor.

MAP OF BALTISTAN



No scientific work has been done on the drying of apricots under the prevailing conditions in Baltistan. The present study investigated simple techniques which could easily be adopted for the sun-drying of apricots in various villages of Baltistan. The results obtained may be of interest to the growers and research workers as well.

MATERIALS AND METHODS

The following varieties were selected for this study: Halman, Hawalapa, Morghulam, Quetta White, Khu-Chuli, Kartuqsha, Sharippa, Yar-Qand, Karfochulli, Shatra-Karfo. In each case, fruit of the same size, colour, and maturity (a bit riper than that used for canning) was selected. The fruit after careful sorting was weighed, thoroughly washed in potable water and drained well.

Apricots were halved and manually destoned. The halves were placed close together in cup-upward position, one layer deep on the trays at the rate of about one kg of the prepared fruit per sq. ft. of the tray area (3). The fruit-loaden trays were stacked on the sulphuring tent and were exposed to the fumes of sulphur dioxide coming from the burning sulphur in the pit (4, 5). The trays were removed from the sulphuring tent after the completion of the fumigation process (Table 4). The trays loaded with sulphured fruit were placed on the ground in sunshine in such a way that the north side of each tray was resting on the south side of the neighbouring tray. The fruit was allowed to remain in the sun for two days until the fruit was approximately 75% dried. The trays were then stacked under a shelter (shade). After about six days' stacking, the fruit was found ready for packing and storage. The final sorting of the dried apricot was done by removing, pits, debris, coloured pieces and other foreign matter. The dried fruit was packed in polyethylene bags which were placed in larger cloth bags and stored.

RESULTS AND DISCUSSION

The period of harvesting apricots varies from valley to valley as indicated in Table 1.

Numerous varieties of apricot are grown in this district; some of the important varieties of apricots were selected for this study. They are known by their local names, which are given in Table 2.

Table 3 indicates that Halman variety has the highest sugar content (32-35°), follows by Yargand (30-31°), Hawalapa (27-29°) and Quetta White (25-26°). Table 3 reveals that the Halman variety has the largest size (4.30 cm) while the Kartuqsha variety possesses the smallest size

Table 1. Apricots: the picking period

Valley	Period
Rondu	Mid June
Skardu	Late June
Shigar	Mid July
Khaplu/Kharmong	Late July

Table 2. Physical characterization of apricots.

Variety	Description
1. Halman	Bright, golden yellow, excellent in taste and having a fine spongy texture.
2. Hawalapa	Uniformly orange yellow in colour which deepens on full maturation; slightly fibrous; the taste is good.
3. Morghulam	Attractive light lemon colour with reddish cheeks on maturity; texture, fine; full of juice; good for table use.
4. Quetta White	Appealing cream colour with red colouration on maturity; texture, very soft; juicy; good for table use.
5. Yarqand	Shining deep yellow colour; taste and texture, fine.
6. Karfo Chuli	Cream colour with red cheeks on full maturation; soft in texture; taste, good.
7. Khu Chuli	Golden yellow in colour with a fine texture.
8. Kar-Tuqsha	Light cream colour; taste and texture, fine.
9. Shatra Karfo	Yellowish white; taste and texture, good.
10. Sharippa	Cream colour; taste and texture fairly good.

(3.70 cm) among the varieties under study. The mean fruit weight of Halman (16.66 g.) was the least of all varieties studied but had the largest fruit size, indicating a low density porous texture. In contrast, Hawalapa had compact higher density flesh. Morghulam and Quetta White possess attractive colour, soft texture, juicy and fine characteristic flavour, with red cheeks.

The climatic conditions of this district seem quite favourable for the sun-drying of fruits as the annual rain-

Table 3. Component parts of apricot.

Apricot Varieties	Total soluble solids (%) or ° Brix)	Size (dia in cm)	Weight per fresh apricot (g)		Stone components (%)		Giri (kernel) eatable
			Whole	Flesh	Stone	Shell	
Halman	32-35°	4.30	16.66	14.58	2.08	8.92	3.57
Hawalapa	27-29°	3.70	19.36	17.85	1.50	5.17	2.58
Morghulam	15-18°	3.80	29.26	26.60	2.66	5.60	3.57
White Quetta	25-26°	3.70	20.00	18.34	1.66	6.90	1.40
Yarqand	30-31°	3.40	23.40	22.00	1.40	3.42	2.56
Karfochuli	25-28°	3.40	25.00	23.50	1.50	2.52	3.48
Khuchuli	20-22°	4.0	24.16	21.83	2.33	5.50	4.14
Kartuqsha	19-21°	3.70	18.56	16.86	1.70	5.23	3.93
Shatrakarfo	18-20°	3.50	26.30	24.00	2.30	4.94	3.80
Sharippa	16-18°	3.80	27.50	25.00	2.50	5.45	3.64

*100-apricot sample.

**Percent on the whole fresh fruit basis.

Table 4. Apricots: the drying conditions.

Variety	Weight of pre-prepared apricot per tray (2' x 3") kg.	Fumigation time (hr.)	Total drying time in the sunshine (hr.)	Wheather conditions
1. Halman	5.5	3.5	30	Fine; slight cloud.
2. Hawalapa	6.0	3.5	30	Fine
3. Morghulam	6.5	3.0	40	"
4. Quetta White	6.0	3.75	40	"
5. Yarqand	6.0	3.0	30	"
6. Karfo Chuli	6.0	3.5	30	"
7. Khu Chuli	6.0	3.5	30	"
8. Kartuqsha	6.0	3.5	30	"
9. Shatrakarfo	6.0	3.5	30	"
10. Sharippa	6.0	3.5	30	"

fall ranges 2" to 3" and direct sunshine during the summer is available for about 8 to 10 hr to the fruit spread for drying when air temperature ranges between 28 and 34°C. About 3 days are required for drying under the direct sun.

The adequate range of sulphuring time for fumigation of fresh apricots was determined as about 3 to 4 hr shown by significant change in colour of apricot and the filling of "cups" with juice (Table 4).

The Morghulam and Quetta White varieties are quite soft and juicy. They required a longer drying time (40 hr.) than the other varieties and could not retain their shapes after drying.

Yields of various varieties of apricot fall within a range of 15 to 20% and their moisture contents run from 15% to 19%. These determinations seem to be within a satisfactory range for dried apricots (Table 5).

Halman, Hawalpa, Yarqand, Khu Chulli, Karstuqsha, Shatra Karfo and Sharippa apricot varieties, on drying, yielded products of acceptable quality (Table 6). All of these varieties possessed attractive colour, soft and pliable texture, and acceptable characteristic flavour. The product obtained from Quetta White, Morghulam, Karfo Chulli varieties possessed dark-brown patches resulting from the

Table 5. Yields of dried apricot.

Variety	Original apricot weight (kg)	Dried apricot weight (kg)	Moisture content (g/100g)		Yield % of dried* apricot (kg/100kg) original wt.
			Fresh	Dried	
1	2	3	4	5	6
1. Halman	95.0	17.50	81.5	18.0	18.82
2. Hawalapa	96.0	18.00	83.0	18.3	18.75
3. Morghulam	94.0	19.50	85.0	18.5	20.74
4. Quetta White	95.0	14.00	84.5	19.0	18.23
5. Yarqand	96.0	17.50	82.0	17.0	16.03
6. Karfochuli	92.0	14.75	84.0	16.5	17.78
7. Khuchuli	90.0	16.00	85.0	15.0	18.09
8. Kartuqsha	94.0	17.00	84.0	17.5	18.00
9. Shatra Karfo	96.0	18.00	84.0	18.0	20.00
10. Sharippa	95.0	19.00	85.0	17.5	18.94

*On the basis of total fresh apricot.

Table 6. Quality attributes of the treated sun dried apricots.

Variety	Colour	Flavour	Texture
1	2	3	4
1. Halman	Golden yellow	Significant	Pliable
2. Hawalapa	Deep orange	"	"
3. Morghulam	Deep cream with dark brown patches	"	"
4. Quetta White	"	"	"
5. Yarqand	Bright yellow	"	Leathery
6. Karfo Chuli	Yellow	"	Fine
7. Kartuqsha	Deep cream	Fair	Fine
8. Khu Chuli	Deep orange	Fairly good	Soft
9. Shatra Karfo	Cream	Significant	"
10. Sharippa	Deep cream	"	"

Table 7. Quality attributes of locally dried apricot (Halman variety).

Quality attributes	Observations
1. Appearance	Uneven dark brown in colour; the mixed size appears unattractive.
2. Taste	Slightly fermented; fine sand, straw and dust particles present.
3. Texture	Elastic, tough and unappealing.

naturally occurring red and creamy pigments on the white or cream background surface. This phenomenon imparts an unacceptable finish to the dried product. Quetta White and Morghulam varieties, on account of their very soft texture and juicy nature, do not retain their shape during the drying process. In view of the defective appearance such varieties may not find ready acceptance for drying purposes and should be consumed as fresh product.

Samples of the locally sun-dried apricot of Halman variety were obtained and examined for quality attributes. It was noted that there was no size gradation of the product. The samples examined were of shrivelled texture, unattractive brown in colour and had a slight fermented taste. Fine sand and dust particles were also detected during chewing.

These quality defects are due to the adoption of primitive methods of sun-drying which have not been selected for size, varietal suitability and the stage of maturity, nor have they been properly treated prior to drying. The present study indicates that an acceptable dried apricot product can be prepared using local varieties.

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