

## **EFFECT OF FOOD PROCESSING (PULPING AND JAM MAKING) ON SOME CHEMICAL AND PIGMENTS CONTENT OF PEACH FRUITS.**

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### **ABSTRACT**

Peach Fruits are designated into two main groups : clingstone and freestone .

In these study clingstone peach fruits its flesh adheres tightly to the pit which are common and preferred for both processing ( pulping and jam making ). Moisture content, Tss, Brix/acid ratio, pH value, sugars, ascorbic acid ,total carotene, anthocyanein were analyzed in fresh fruits, and after processing for pulping and jam making .

It was observed from our data take during pulping of peach fruits and jam making ,that ascorbic acid and color pigments markedly were affected by processing and operation

**Keywords:** Peach Fruits, Cling stone, Sultani Cultivar, Chemical Composition, Pulping and jam making process.

### **INTRODUCTION**

Peach (*Prunus persica* L) along with its smooth skin mutant nectarine is one of the most important temperate stone fruits grown in the world. the world production of peach fruits is over 11,065,000metric tons (Askar *et al.*, 1996) . Peach fruits are designated into two main groups: clingstone and freestone. Freestone fruits peach can be easily separated from the stone or pit , in clingstone peach the flesh adheres tightly to the pit .Both types have yellow -fleshed and white fleshed cultivars .Yellow -fleshed cultivars are common and are preferred for both processing and fresh for market uses .Processors prefer clingstone for canning and only 17.25 % of the U.S pack is freestone and cultivar fruits(Askar *et al.*, 1996 and Aczel 1977 ).

### **MATERIALS AND METHODS:**

Peach fruits was used in this study clingstone called sultani cultivars.Method for preparation pulp and jam was described in details (a)and (b) .

Chemical composition of fresh fruits, pulp and jam were chemically analyzed for moisture , total soluble solids , total acidity , brix , acid ratio, pHvalue, ascorbic acid, B-carotene ,anthocyanin and total phenols for fresh fruits . According to A.O.A.C.(1990 ) .

**(a)Processing of Peach Pulp:** clingstone peaches (sultani cutivar) 100kg were used for pulp preparation .Fruits were mechanically pulped using the juice processing line (Bertuzzi-Italy)at Dept. of industries ,Fac. of Agric.

Mansoura University . Pulp Preparation was carried out after sorting and washing .Fruits were blanched in boiling water at 95 c for 3 min. Fruits were cooled using cold water containers 1% citric acid . Fruits pulped . The peels and fibers eliminated using two finishers (1.0 and 0.5 mint ). The pulp was pasteurized at 90 c for 2 min. and cooled quickly to 35<sup>2</sup>-40<sup>2</sup> c for 15 min. samples of pulp were frozen for analyzed .

(b) **Peach jam:** clingstone peaches (sultani cultivar) was used to prepare jam according to the Egyptian Standards (1985) as following .Peach fruits were washed , halved and pitted .Fruits were sliced into small slices and weighted. Sucrose was add to the prepared pulp ( 50%) in a ratio of 1:1. The mixture was heated in an open cooking pan and stirred . Pectin mixed in small amount of sugars ( 3.5 g pectin / 1 kg sugar ) was added to the mixture when the total soluble solids ( TSS) reached 60% .Citric acid (1.75g citric /1kg jam ) was also added to mixture as soon as the TSS 65 Brix and pH was adjust to 3.3 . When the TSS of the mixture reached 68 Brix , the heating was ceased and the jam immediately poured into the metal cans and the glass jars and sealed .The metal cans and the glass jars were left hot for 15 min. then cooled at room temperature (25± 5c) .Jam samples were taken for further analysis every 3 months.

**Method of analysis:**

Fresh fruits of ( SU) cultivars were chemically analyzed for :

- (a) **Moisture content:** using according to AOAC (1984) .
- (b) **Total Soluble Solids (TSS) :** using a Car-Zeies refractometer at 20 c .
- (c) **Total acidity:** as malic acid by AOAC (1990) .
- (d) **Brix / acid ratio:** as equation follow :  
$$\text{Brix / acid ratio} = \frac{\text{Tss of Brix}}{\text{Titration acidity}}$$
- (e) **pH value:** were determined by Backman glass electrode pH meter (tybe Hanne 9124) at 25c
- (f) **Sugars ( Fructose , glucose and sucrose ) :** were determined according to the method described by Brandau *et al.* ( 1980 ) using HPLC (Perkin Elmer Co. USA ) .
- (g) **Ascorbic acid :** by using the direct titration method 2,6 dichlorophenol indophenol reagent according to AOAC (1990) .
- (h) **B-Carotene :** The extraction and determination of B-Carotene were carried out according to the method described by AOAC ( 1990)
- (i) **Total Carotene :** T.C was determined according to method of Wettstein (957) .
- (j) **Anthocynin :** was determined according to Francais (1982) .

## RESULTS AND DISCUSSION

**Some Chemical composition of Sultani cultivars (SU)of fresh fruits:**

Table ( 1 ) shows some chemical composition of fresh fruit peach (SU / C). Data revealed that moisture content , total soluble solids were 88. 5%. In mature peach fruit the TSS showed be more than 10% for acceptable quality. Sugars were content was 11.60% (Fructose 7.47% ,glucose 0.39and

sucrose 1.32%. On wet basis . Titrable acidity, pH value and Brix /acid ratio 0.85 were (as malic acid) 3.90 and 12.35 respectively. The high Brix /acid ratio of (SU/C) explained the sensory data of the more firmness of (SU/C) than other cultivars .

Pigments of (SU/C) fruit which are total carotenoids, B-Carotene, anthocyanin its concentration 13.76mg/100gm, 1.80 mg/100 gm and 150gm/100gm respectively. It was observed the (SU/C) contain a high value of B- Carotene which considered a precursor of vitamin A . Anthocyanin pigment in (SU/C) was responsible of violet, purple ,pale and red color in peach fruit .

**Table (1): Some chemical composition of fresh fruit (Peach Sultani cultivar: (on wet basis)**

Components	%	components	mg/100 gm
-moisture %	88.50	Total carotene	13.76
Total SS	11.50	B-Carotene	1.80
3-Sugars	(7.47, 0.39 and 5.76) fructose, glucose and sucrose ( wet basis)	Anthocyanin	150.00
		Ascorbic acid	11.00
Titrable acidity	0.85		
pH	3.90		
Brix/acid ratio	12.35		

**Table (2): Chemical composition of processed sultani peach fruits**

Chemical Composition	Pulp	jam
- (TSS)%	10.0	68.56
-total sugars	8.15	64.10
- Acidity	0.60	1.56
- pH value	3.85	3.30
- Ascorbic acid (mg/100gm)	6.87	0.35
- Total Carotene(mg/100gm)	7.80	2.05
- B-Carotene(mg/100gm)	1.05	0.30
Anthocyanin(mg/100gm)	37.56	64.12

\_( on wet basis ) \*

Sultani peach fruits were selected to produce pulp and jam making, this cultivars had special sensory evaluation such as color and aroma which were essential to produce products.

In Addition to (table II) shows effects of processing on chemical composition of different products from Sultani peach fruits .Data revealed that the T.S.S. of pulp and jam were 10.0and 68.50 respectively. The highest Tss % of jam was due to the added sucrose during jam making process. Total sugars percentages for pulp and jam making were 8.15 and 64.1 respectively.

The ratio of the total sugars to its T.s.s. were 8.15 and 93.6 for the two products such ratios may contribute to flavor different in the taste of the final products ( Sandhu etal 1986 and Tressler and joslyn 1961) .

However the highest ratio for jam products was due to the hydrolysis of sucrose to reduced sugars (fructose and glucose) during cooking jam process Nelson and Tressler (1980).

As for acidity data revealed that pulp product had an acidity of 0.60 % whereas jam gave 1.56 as compared to 0.85 for fresh peach fruit. pH values for the two products were 3.85 and 3.30 respectively.

Ascorbic acid content of the fresh fruits was (11.0mg/100 gm) decreased after processing to 6.78 for pulp product and 0.35 for jam.

These reductions were due to the different processing treatments e.g Pulping oxidation, heat treatment and long cooking time of jam. degree of discoloration (Dd) was 2.5 for pulp and 11.25 for jam. the highest (Dd) in jam could be due to millard reaction effect. total carotene content were 13.76 mg/100 gm for fresh fruits, but after processing it decreased to 7.8 in pulp and 2.05 mg/100gm in jam product.

The reduction in total carotene due to pulping process was 43.3% and to 80.0% in jam.

B – carotene content in pulp was 1.05 ( mg /100gm ) and 0.30 in jam.

The disappearance of B- carotene occurs more rapidly than disappearance of other pigments.

Anthocyanin pigments content were also affected by processing treatments. it decreased to 87.0 and 30.9 for pulp and jam making respectively. as compared to the content of fresh fruits (Hasia and chichester (1961)).

In conclusions during pulping and jam making of peach fruits ascorbic acid and color markedly affected by processing operation.

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### تأثير العمليات التصنيعية علي الصفات الكيماوية ومحتوي الصبغات للمركزات و المربي المصنع من ثمار الخوخ

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في هذا البحث تم التعرف علي أصناف الخوخ المنزرع بمصر وهو ثمار ملتصقة النواة وثمار سهلة نزع النواة . وقد تم اختيار الاولي لجودة صفاتها في الحصول علي عصير خوخ ومربي خوخ . وتم أيضا تقدير التركيب الكيماوي من حيث الرطوبة ، المواد الصلبة الذائبة الكلية ، نسبة السكر الي الحموضة ، السكريات الكلية ( فركتوز + جلوكوز ) ، الحموضة الكلية ، الكاروتينات الكلية وحامض الاسكوريك وبيتا كار وتين وصبغات الانثوسيانين ولوحظ ان كل من عملية تحضير لب الخوخ وصناعة المربي لهل من تأثير في خفض حامض الاسكوريك وصبغات الكار وتين والانثوسيانين .