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RESEARCH ARTICLE

POPULAR FRUIT SPECIES IN THE WORLD

***Ayşen Melda Çolak and Hakan Çulha**

Department of Horticulture, Faculty of Agriculture and Natural Science, Usak University, Uşak, Turkey

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ABSTRACT

Rapidly increasing population and industrialization, pollution of the earth's atmosphere, underground and aboveground sources, chemicals that are added to and accumulated in the consumables, unnecessary and overuse of medical drugs disrupt human health, adversely affect the quality of life and shorten life-expectancy. In recent years, societies, with the effect of the research done on the usefulness of the foods they have found tasty, have started to enrich their diets with fruit species that will protect them from harmful environmental conditions and substances and help them to control and stop these harmful effects and have raised their awareness of natural diet and quality life. This awareness has lead peoples of the world to the consumption of particular fruit species. These fruits are popular fruits. It is possible to define the popular fruit species in the world as fruit species which are known by the majority of the world nations, which are appealing to their tastes, which are produced by many countries in the world and which have the greatest amount of production and export. In the current study, it is aimed to determine which fruit species are popular and are in the way of becoming popular, their features and the reasons that make these fruit species popular; thus, to reveal their spreading patterns and potentials.

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INTRODUCTION

The most important factor for a healthy life is a balanced diet. This is achieved by making conscious use of both animal and vegetable origin nutrients. Eating one type of food causes irregularities in human metabolism and disrupts physiological balance. While addressing the issue of eating which affects human growth, development and many other functions in people's lives, a special emphasis should be put on fruits (Yaman karadeniz, R., 1981). Some of the ingredients in our fruits which are indispensable for our diets are a key factor in the vital events taking place in our bodies. Thus, our appetite causes us to develop a consumption habit of fruits that contain the ingredients we need. Though in varying proportions, fruits include carbohydrates, vitamins, oils, minerals, proteins and water. Vitamins; except for vitamin D, that are vital for human life can be supplied from fruits and vegetables. The formation, health, functioning and repair of our biological systems and structures from birth to death are ensured by vitamins and their indirect effects. These effects can be listed as follows: strengthening the immune system and at the same time fighting against cancer, healthy functioning of digestive-muscle-respiratory systems, preservation of the body's shape, tissue

formation, regular functioning of vision mechanisms, protection of cardiovascular health, protection of blood and bone calcium balance, ensuring calcium phosphorus balance, healing of heavy tissue damages, removal of chemicals with toxic properties delaying the effects of aging, blood clotting, preservation of the integrity of the tissues, ensuring the orderly functioning of enzymes by adding to their structure, prevention of dementia and Alzheimer, and neurological disorders and improving the absorption of nutrients and their benefits. Another substance found in fruits is carbohydrates. These are the active, energizing, single sugar, double-sugar and multi-sugar compounds.

They provide the energy needed for chemical reactions with all systems and structures working in our bodies and participate in DNA structure. There have been rapid developments in fruit production and consumption in the world since 1950s. Factors affecting these developments are; people's recognizing the existence of exotic fruits as a result of developing travel opportunities, delaying the deterioration of fruit thanks to developing cold stores and transportation network, shortening of the transportation time, developing processing methods, the transformation of fruits into more durable forms, developing distribution systems, accelerating access to information, the mechanization of the production methods and increasing amount of research on technological innovations (Storey, 1969; Samson, 1980).

*Corresponding author: Ayşen Melda Çolak

Department of Horticulture, Faculty of Agriculture and Natural Science, Usak University, Uşak, Turkey.

MATERIALS AND METHODS

In the current study, by using the data found in international and national documents as well as the statistical data issued by FAO and TÜİK, all fruits species officially recorded and produced worldwide and exported have been determined and from among them, the ones complying with the definition of the popular fruit were included in the sampling.

RESULTS AND DISCUSSION

When the fruit production amounts of 211 countries and administrative units that are members of the United Nations and constitute the sources of Agricultural research and statistical data in the period between 1996 and 2016 are examined, it is seen that while the total amount of production in 62 fruit categories was 622,463,314 tons in 1996, it was 1,155,180,028 tons in 2016 with an increase by 85.58% (Anonymous, 1996; 2016a).

In the World fruit production, Indonesia produces 17.12% of the world production with 197,750,848 tons and is ranked the first in fruit production, followed by China producing 16.45% of the world production with 190,045,909 tons and India producing 8.98% of the world production with 103,710,080 tons (Anonymous, 2016b). In Table 1, for the year 2016, the fruit categories most produced by the countries in the world production; their shares in these categories in the world production and the shares in all the fruit categories are given. Thus, Indonesia is the world's first in 3 fruit categories and produces 49.52% of world production in the related categories, China is the world's first in 19 fruit categories and produces 45.28% of the world production in the related categories and India is the world's first in 8 fruit categories and produces 29% of the world production in the relevant categories. While the world population was 7,109,545,968 in 1996, it increased to 8,901,712,434 by 25.21% (Anonymous, 1996-2016c). Parallel to this population growth, the world fruit production has also increased. World fruit production was 622,463,314 tons in 1996, 720,709,486 tons in 2001, 886,264,925 tons in 2006, 1,021,876,442 tons in 2011 and 1,155,180,028 tons in 2016

Table 1. Countries Producing the Greatest Amounts of Fruits in the World

Countries and the Categories of the Fruits they Produce	Country Production in the Related Fruit Categories (ton)	World Production in the Related Fruit Categories (ton)	The Share in the World Production of the Related Fruits (%)	The Share of the Related Fruit Categories in all the Fruit Production in the World (%)
INDONESIA Coconut, Kapok, Oil Palm	178,065,204	359,567,650	49.52	15.41
CHINA Apple, Chestnut, Citrus ¹ , the Hard Kernelled ² , Grapefruit Grape, Kiwi, Hard-shelled Tropical Fruits ³ , Oil Seeds ⁴ , Peach and Nectarines, Pear, Persimmon, Plum, Strawberry, Tallow Tangerines, Walnuts, Tea, Tung nuts	147,753,764	326,308,035	45.28	12.79
INDIA Areca Nut, Banana, Some Fresh Fruits ⁵ , Tropical Fruits Lemon, Mango, guava, Coconut, Papaya	72,691,385	250,198,951	29.05	6.29

Source FAO, 2016

¹Bergamot, Citron, Citrus, Kumquat

²Apricot, Sour Cherry, Peach

³Pikan Nut, Butternut (pili nut, Java Almond, Chinese Olive), Lecythis zabucajo, Macadamia ternifolia, Pinus Pinea

⁴European Beech, Aleurites moluccana, Andiroba Tree, Croton, Bassia latifolia, Guizotia abyssinica, Licania rigida, Perilla frutescens, Kurkas, Shorea robusta (Sal), Pongamia glabra, Astrocarium spp

⁵Azarolus, Babaco, Sambucus Nigra, Ziziphus, Chinese Tree Fruit, Maltese Plum, Medlar, Common Papava, Pomegranate, Indian Fig, Rose, European Mountain-Ash, Mountain-ash, Iron Turkey, Arbutus

Table 2. World Fruit Production and Rate of Increase in Fruit Production Across the Years

Product	Amount of Production (ton)					Rate of Increase in 1996-2016 (%)
	1996	2001	2006	2011	2016	
Oil Palm	93570455	129154833	196209270	244090400	300252193	220,88
Banana	58175221	70262271	88867444	109735946	113537864	95,16
Apple	54343099	57103560	63254579	77074025	89329964	64,38
Grapes	58772411	60946991	67084813	69642215	77518609	31,9
Orange	60871908	60281741	65637958	72567479	73318555	20,45
Coconut	49483500	52021832	57971099	58473601	59030229	19,29
Mango, Guava	22918060	25314699	34326687	40252580	46615462	103,4
Plantain (Banana)	30212820	32576683	34458095	32189826	35063803	16,06
Some Fresh Fruits ¹	19259319	23222293	26172411	29420425	33374092	73,29
Mandarin	16064838	21099205	26109339	27504325	32952172	105,12
Pear	13590780	16504836	20066503	24210214	27457353	102,03
Pineapple	13142085	16028539	20321346	23343816	26336195	100,4
Peach and Nectarine	11761837	13938925	18406947	21312318	25003907	112,58
Tropical Fruits	15548073	15660110	18869727	21369018	24678480	58,72
Olive	15460046	15337034	18715471	21231004	19270115	24,64
Other Fruits	89288862	111255934	129793236	149459250	171441035	

Source FAO,1996, 2001, 2006, 2011,2016

¹ Azarolus, Babaco, Sambucus Nigra, Ziziphus, Chinese Tree Fruit, Maltese Plum, Medlar, Common Papava, Pomegranate, Indian Fig, Rose, European Mountain-Ash, Mountain-ash, Iron Turkey, Arbutus

Table 3. The Amounts of Fruit Export in the World and Rate of Increase across the Years

Product	Amount of Export (ton)					Rate of Increase in 1996-2016 (%)
	1996	2001	2006	2011	2016	
Banana	1874658	2235757	2876390	3218043	3728398	98,88
Orange	2247918	2104700	2257407	2542145	3048713	35,62
Apple	2192132	1992468	2613881	2533236	2748774	25,39
Mandarin	1432085	1294780	1812024	1943199	2184581	52,55
Cacao	261373	1140172	1036496	1165754	1858039	610,88
Green Coffee	1000734	979575	1138976	1259280	1469364	46,83
Grapes	850922	1005354	1044791	1178542	1372381	61,28
Peach and Nectarines	723213	812063	983713	1023150	1269322	75,51
Pear	570969	607088	711984	804428	915692	60,38
Lemon	517124	583140	618515	701114	889130	71,94
Cashew	50135	257248	330893	266492	727725	1351,53
Kiwi	340149	308698	441460	484585	595821	75,16
Tea	419045	483670	525469	500136	568867	35,75
Banana	176855	441241	699162	641626	539409	205
Avocado	72965	80377	139646	244816	501765	587,68
OTHER FRUITS	1663246	2114546	2496964	2922906	3884405	

Source: FAO, 1996, 2001, 2006, 2011, 2016

Table 4. The Number of Countries Producing Fruits in Different Categories in the World

Product	The Number of Countries Producing				
	1996	2001	2006	2011	2016
Some Fresh Fruits ¹	171	169	170	170	164
Banana	136	136	136	136	134
Orange	121	121	122	121	120
Lemon	111	110	110	110	108
Mango, Guava	105	104	103	103	102
Apple	93	94	95	95	94
Coconut	95	95	95	95	94
Grapes	93	93	93	93	92
Pineapple	90	90	90	90	90
Pear	87	87	88	88	87
Plum	86	87	88	87	86
Green Coffee	84	84	84	84	82
Peach and Nectarines	81	81	82	82	81
Grapefruit	82	82	81	81	79
Strawberry	77	78	78	78	77

Source: FAO, 1996, 2001, 2006, 2011, 2016

¹ Azarolus, Babaco, Sambucus Nigra, Ziziphus, Chinese Tree Fruit, Maltese Plum, Medlar, Common Papava, Pomegranate, Indian Fig, Rose, European Mountain-Ash, Mountain-ash, Iron Turkey, Arbutus**Table 5. Fruits on the way of Becoming Popular**

Fruit	Üretim (ton)		1996-2016 Yılları Arası Artış Miktarı (%)	İhracat (ton)		1996-2016 Yılları Arası Artış Miktarı (%)
	1996	2016		1996	2016	
Mandarin	16064838	32952172	105,12	1432085	2184581	52,55
Pineapple	13142085	26336195	100,4	176855	539409	205
Strawberry	3600353	9126337	153,48	290390	480480	65,46
Avocado	2239398	5567043	148,59	72965	501765	587,68
Persimmon	1708930	5492244	221,38	0	190980	19097900
Cashew	1373936	4898208	256,51	50135	727725	1351,53
Kiwi	976191	4274870	337,91	340149	595821	75,16
Walnut	1078772	3747549	247,39	26703	81899	206,7
Almond	1291755	3.214.306	148,83	46307	128154	176,75
Chest nut	678443	2261589	233,35	29053	59171	103,67
Cranberry	154089	552505	258,56	4072	60301	1380,87

Source: FAO, 1996-2016

Table 6. Fruit Species that are Processed and Consumed and Amounts of their Exports (ton)

Fruit	1996	2001	2006	2011	2016
Coffee	266261	372615	626981	804963	1051190
Cacao	447641	710513	823055	980457	1136082
Palm Fruit	873671	1428059	2114750	2630822	4002580
Olive	620057	1020349	1007670	1419775	1809098

Source: FAO, 1996, 2001, 2006, 2011, 2016

(Anonymous, 1996, 2001, 2006, 2011, 2016d). In Table 3, fruit export amounts are given in 5-year periods between the years 1996-2016 over a 20-year period. On the basis of 2016 statistics, the changes in the export ratios of the top 15 fruit categories in comparison to 1996 are given in the table.

Accordingly, population and production increase also encouraged consumption and export values to follow a rising trend. The total export volume of fruits all over the world was 14,393,523 tons in 1996, 16,440,877 tons in 2001, 19,727,771 tons in 2006, 21,429,452 tons in 2011 and 26,302,386 tons in 2016 (Anonymous, 1996, 2001, 2006, 2011, 2016e). Table 4 shows the number of countries producing fruit in the related categories in 5-year periods between the years 1996-2016 over a period of 20 years. The first 15 fruit categories produced in the largest number of countries based on the year 2016 statistics are as in the table. This offers some opinions about fruit species that are popular and becoming popular. When Table 2, Table 3 and Table 4 are examined, it is seen that the most popular fruits as they are produced and exported in the largest amounts and produced by the largest number of countries are banana, apple, grape, peach and nectarine, orange and pear. The total production amount of these fruits in 2016 was found to be 406, 166, 252 tons, accounting for 35.16% of the total fruit production. When the production amounts of the fruits, their rates of increase across the years and export volumes are considered, it is apparent that there is a trend of their popularization.

This trend is clear from the high rates of increase in the amounts of production in the period 1996-2016 and from the continuously increasing amounts of export. The fruits which are on the way of being popular account for 8.52% of all the fruit production in the world (Table 5). The total export value of the fruits in 1996 was 14,078,552 thousand dollars, the value of the popular fruits was 6,066,165 thousand dollars and the value of the fruits that are on the way of popularization was 3,081,299 thousand dollars. In 2016, the total export value of the fruits increased by 182.26% to 39,737,638 thousand dollars, the popular fruit value increased by 91.53% to 11,618,328 thousand dollars and the value of the fruits that are on the way of being popular increased by 221.74% to 9,913,652 thousand dollars (Anonymous, 1996; 2016i). There are some fruit species that we cannot be included in the current study although their consumption is widespread as they are produced and then consumed as end-products and they are exported in large quantities.

They are the indispensable raw materials of the manufacturing industry as their consumption, production and use have been continuously increasing. Correlation and regression analyses were conducted based on the production and export quantities of fruit species produced between 1996 and 2016 in the world. The results of the tests showed that there was a linear relationship between the production and the export quantities. The fruit types the increase in whose export has triggered an increase in their production point to the fruit species that are loved and widely consumed by the peoples of the world. As a result of the regression analyses carried out, it was found that the export can explain 90.67% of the variance in banana production, 90.47% of the variance in peach and nectarine production, 84.17% of the variance in grape production, 77.60% of the variance in pear production, 60.85% of the variance in orange production and 46.03% of the variance in apple production.

Conclusion

Increasing amount of scientific research on fruits and humans, increasing communication and education opportunities and increasing level of human welfare have led to increasing demand for fruits that are popular and on the way of being popular in our country and all over the world within 20 years since 1996. In order to meet this demand, countries make their own production to the extent that their climate and production conditions permit, and those who lack these opportunities meet their needs with imports. When the data are examined carefully to observe the trend and intensity of consumption demand; it is seen that in order to meet the increasing demand, export rates in the world have increased, countries have expanded their production areas and aim to obtain more products from the unit area by improving themselves in the cultivation techniques. Considering the current and expanding fruit consumption preferences, it is clear that we need to expand production areas and raise the awareness of our farmers in order to increase the production of popular fruits such as banana, apple, grapes, orange, peach and nectarine, pear, pineapple, and that of the ones on the way of becoming popular such as mandarin, strawberry, avocado, persimmon, cashew, kiwi, walnut, almond, chest nut, cranberry to be competitive in an expanding market, to increase our revenues and to obtain more economic benefits.

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