

The nutrient composition of watermelons *Citrullus vulgaris* in Turkey

S. Ötles*

Keywords: Watermelon — Vitamins — Minerals.

Summary

The nutrient content of variety of watermelons from Turkish markets has been determined. Data for thiamine, riboflavin, vitamin B, vitamin C, folic acid, niacin, pantothenic acid are presented. Mineral element concentrations are also given.

Résumé

La composition en éléments nutritifs de la pastèque de Turquie est déterminée. Les contenus en thiamine, riboflavine, vitamine B, acide folique, vitamine C, vitamine PP, acide pantothénique sont fournis. Des résultats sont donnés pour la composition en minéraux.

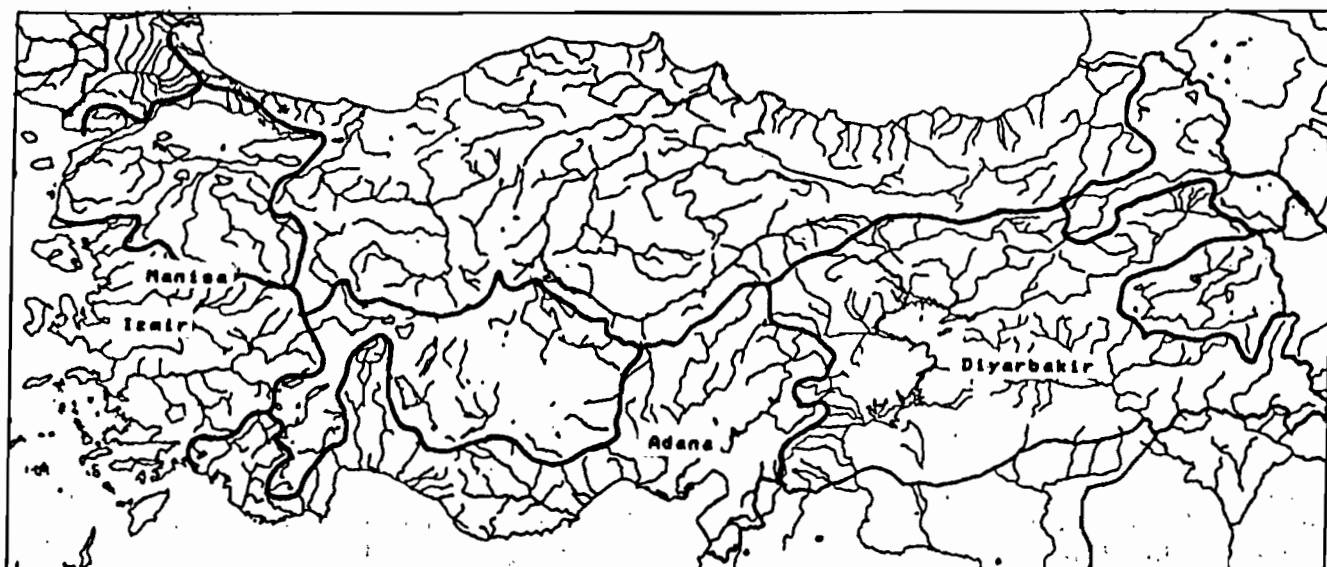


Figure 1 — The map of Turkey

Introduction

A large amount of watermelons is consumed by the people in Turkey. The results of a recent survey by the Turkish Institute of Statistics have shown an increase in the consumption of watermelons; however, the nutrient composition of this food has received little prior attention (4). This study was undertaken to determine the nutrient composition of watermelons available to the customer in four geographical regions/cities in Turkey.

On the other hand, the data basis of new revised and increased nutrients are important and necessary for the useful and reliable food composition tables.

Material and methods

The samples of watermelons were obtained from wholesale distributors from four cities (Adana, Diyarbakir, Izmir, Manisa. (Figure 1). The two subsamples were analysed in duplicate for each nutrient.

The Official Method of the Association of Vitamin Chemists was used to determine the pantothenic acid and vitamin C contents of watermelons (2). The other water-soluble vitamins were determined by HPLC (high pressure liquid chromatography) according to Wehling and Wetzel's method (9). This method was modified as follows: mobile phase was a mixture of methanol/water (78 : 22), and contained 2.4×10^{-3} M PIC B6 (hexane sulfonic acid - Paired Ion Chromatography reagent, Waters Associates) and a UV detector was used. Minerals (by AAS - Atomic Absorption Spectrophotometry) and other analyses were determined according to the Official Methods of Analysis of A.O.A.C. (3).

Results and discussion

The chemical composition of watermelons is presented in Table 1.

* University of Ege, Faculty of Engineering, Department of Food Engineering, Bornova TR-35100 Izmir, Turkey.
Received on 04.02.92 and accepted for publication on 23.03.93

TABLE 1
The chemical composition of watermelons (g/100 g).

Sample Component	Region A	Region B	Region C	Region D	M
Fat	0.24	0.21	0.14	0.17	0.19
Water	91.82	92.48	92.75	93.15	92.55
Protein	0.62	0.60	0.56	0.49	0.57
Ash	0.43	0.38	0.31	0.34	0.37

(A) Adana
(B) Diyarbakir
(C) Izmir
(D) Manisa
(M) Mean value

The watermelons from Region A showed somewhat greater contents of fat, protein and ash, but its moisture was lower than for samples from other regions. The proximate composition of watermelons used in this study was found to be similar to that indicated by Adams (1) and Watt and Merrill (8).

TABLE 2
Water soluble vitamin and elemental composition of watermelon in mg/100g.

Sample Nutrient	Region A	Region B	Region C	Region D	M	RDA (%)
Vitamin B ₁ (thiamine)	0.068	0.073	0.041	0.033	0.054	3.60
Vitamine B ₂ (riboflavin)	0.028	0.032	0.018	0.021	0.025	1.47
Vitamin ₆	0.023	0.028	0.012	0.010	0.018	0.90
Vitamin C	7.350	7.130	6.550	6.380	6.850	11.42
Folic acid	0.018	0.025	0.015	0.018	0.019	4.75
Niacin	0.182	0.174	0.187	0.184	0.182	0.91
(Vitamin PP)						
Pantothenic acid	0.126	0.137	0.099	0.112	0.119	1.19
Ca	6.170	6.240	8.330	7.940	7.170	0.72
Cu	0.030	0.040	0.020	0.020	0.030	1.50
Fe	0.450	0.420	0.280	0.290	0.360	90.00
K	156.180	139.500	114.970	98.270	127.230	6.79
Mg	16.440	15.950	11.270	13.530	14.300	3.58
Mn	0.030	0.030	0.050	0.050	0.040	1.60
Na	8.950	9.510	6.730	3.180	7.090	0.64
P	17.160	17.950	14.820	15.090	16.260	1.63
Zn	0.170	0.150	0.110	0.070	0.130	0.87

(M) mean value

(RDA) percent in Recommended Daily Allowances (6).

Data on the water soluble vitamins and the mineral elements of watermelons from different regions are summarized in Table 2. The vitamin contents of the watermelons from the regions A and B were very nearly the same. The samples from regions A and B had somewhat greater concentrations of the B-vitamins (excl. niacin) and vitamin C than the samples from the other regions (C, D).

The amounts of vitamins B₁, B₂ and C in samples A and B were larger than that indicated by Adams (1) and Watt and Merrill (8) and of vitamin B₁ and niacin were lower than that indicated by Yamaguchi (10). Due to our and their data, thiamin, riboflavin, vitamin B₆, vitamin C, folic acid and pantothenic acid in watermelons affected by cultivar in different regions. The data on mineral elements, Table 2, showed uniformly a higher content of copper, iron, potassium, magnesium, sodium, phosphorus and zinc (excl. Ca and Mg) in the sample A and B than others. Yamaguchi (10) summed up available data for watermelons. These were 5 mg/100g for Ca, 0.2 mg/100g for Fe, 10 mg/100g for Mg, 14 mg/100g for P. Similar results were indicated by Adams (1), Gebhardt and al. (5), Watt and Merrill (8) in their reviews.

Conclusion

From all the results of the present research, the composition of watermelons would be expected to differ by cultivar in different regions.

Literature

- Adams C.F., 1975. Nutritive value of American foods. Agric. Handbook n° 456, U.S.Department of Agriculture, Washington, p. 25-28.
- Anonymous, 1966. The official methods of vitamin assay. Association of Vitamin Chemists, Interscience, New York, p. 197-207, 287-340.
- Anonymous, 1970. Official methods of analysis. Association Analytical Chemists, A.O.A.C., Washington, 17.006, 17.007, 17.008.
- Anonymous, 1988. Turkish Institute of Statistics, Ankara, p. 1215-1229.
- Gebhardt S.E., Cuitufelli R. & Matthews R.H., 1982. Composition of foods, fruits and fruit juices raw, processed, prepared. Agric. Handbook n° 8-9, U.S. Department Agriculture, Washington, p. 32-35.
- Ötles S. & Colagoglu M., 1987. Die reiche Quellen der Vitamine. J. Eng. Fac. **5**, 2, 119-131.
- Ötles S. & Hisil Y., 1993. High pressure liquid chromatographic analysis of water soluble vitamins in eggs. It. J. Food Sci. **5**, 1, 69-73.
- Watt B.K. & Merrill A.L., 1963. Composition of foods raw, processed, prepared. U.S.D.A. Agr. Handbook n° 8, 38-57.
- Wehling R.L. & Wetzel D.L., 1984. Simultaneous determination of pyridoxine, riboflavin, and thiamin in fortified cereal products by HPLC. J. Agr. Food Chem., **32**, 1326-1331.
- Yamaguchi M., 1983. World vegetables. AVI Pub.Co., New York, p. 327-331.