

# DETERMINATION OF TOTAL FOLATE CONTENT IN TRADITIONAL FOODS FROM BLACK SEA AREA COUNTRIES

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## BACKGROUND

Folates occur naturally as a variety of polyglutamates, with different biological activity. Folate is a generic term for a B complex water-stable vitamin, which exists in many chemical forms. It is essential for many of the methylation reactions involved in the synthesis of DNA and RNA, and hence plays a crucial role in cell division. The recommended daily allowance (RDA) is 400 µg/day (for both men and women) of dietary folate equivalents [1]. Food folates have approximately 50% lower bioavailability than folic acid. The ingestion of a supplement of folic acid during the periconceptional period significantly reduces the risk of giving birth to a child with a neural tube defect. In order to promote and preserve traditional foods from Black Sea Area countries, one of the aims of the European Project BaSeFood (Sustainable Exploitation of Bioactive Components Black Sea Area traditional foods) is to produce new and reliable data of the overall nutritional composition, where the determination of total folate content in Traditional Foods is included (Figure 1) [2].

## MATERIALS AND METHODS

The determination of the total folate content in Traditional foods was carried out by a microbiological assay (EN 14131:2003) [3] with turbidimetric detection of the growth of the microorganism *Lactobacillus casei*, subspecies *rhamnosus* (ATCC 7469). The analyses were performed in an accredited laboratory according to ISO/IEC/17025.

**BULGARIA**

(A) Baked layers of pastry stuffed with pumpkin; (B) Halva; (C) Millet ale; (D) Mursal tea; (E) Rodopian dried beans; (F) Rose jam

**GEORGIA**

(A) Nettles with walnut; (B) Tsiteli doli bread; (C) Churchkhela; (D) Flax oil; (E) Wild plum sauce.

**ROMANIA**

(A) Cornmeal mush; (B) Nettle sour soup; (C) Herbal dish; (D) Elderberry soft drink; (E) Plums jam.

**TURKEY**

(A) Black tea; (B) Bulgur pilaf; (C) Fruit of the evergreen cherry laurel; (D) Sautéed pickled green beans; (E) Kale soup.

**RUSSIAN FEDERATION**

(A) Buckwheat porridge crumby; (B) Kvass southern; (C) Watermelon juice; (D) Mustard oil; (E) Vegetable okroshka.

**UKRAINE**

(A) Sauerkraut; (B) Ukrainian borsch; (C) Transcarpathian green borsch; (D) Roasted sunflower seeds; (E) Uzvar; (F) Sour rye bread; (G) Cottage cheese with dill and garlic.

Figure 1. Selected Traditional Foods from Black Sea Area countries.

## RESULTS

### Cereals and cereal based foods

> Total folate content ranged between 9.1 and 29.9 µg/100 g of edible portion, for Bulgur pilaf - *Bulgur pilavi* and Baked layers of pastry stuffed with pumpkin - *Tikvenik*, respectively (Figure 2).

### Vegetables and vegetables based foods

> Total folate content ranged between <5 and 97.2 µg/100 g of edible portion, for Vegetable okroshka - *Овощная окрошка* and Nettles with walnut sauce - *Chinchris mkhali nigvzit*, respectively (Figure 2).

### Oilseeds or oilseed products

> Total folate content varied between <5 µg/100 g of edible portion for Fax oil - *Selis zeti* and Mustard oil - *Горчичное масло*, to 113 µg/100 g of edible portion, for Roasted sunflower seeds - *Smazhene nasinnya* (Figure 2).

### Herbs, spices and aromatic plants

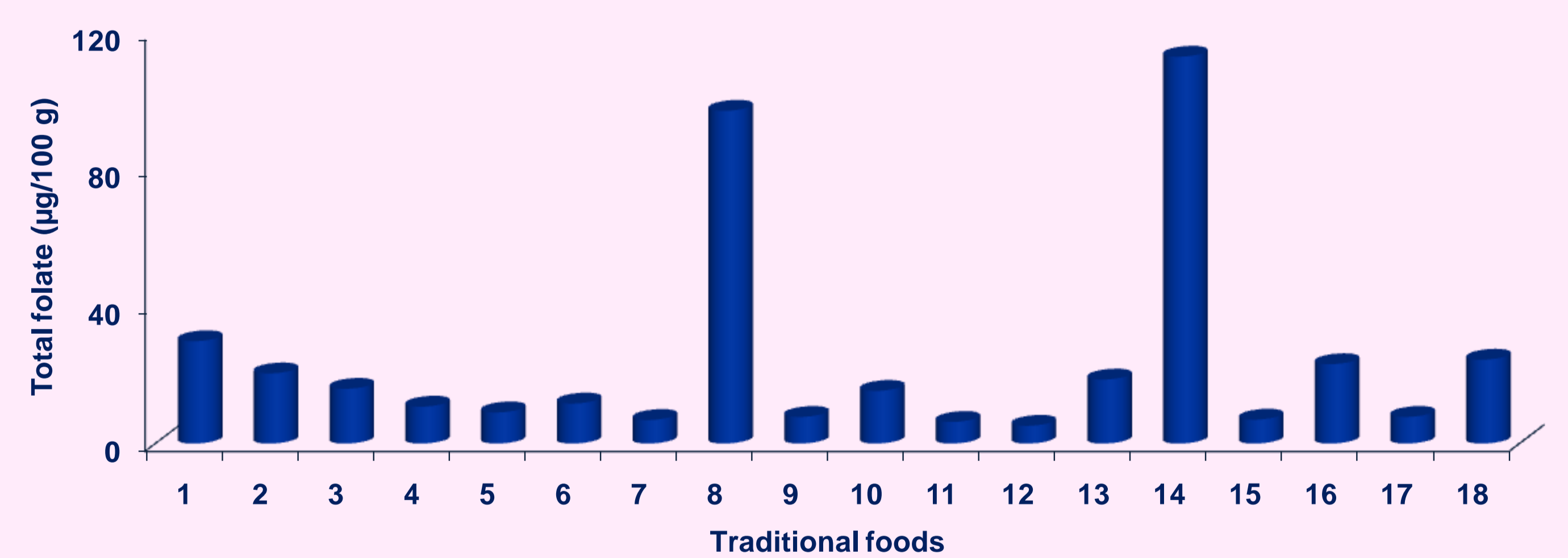
> For this group the Traditional Food with the highest content was Cottage cheese with green and garlic - *Pomazanka* (23.2 g/100 g of edible portion) (Figure 2).

### Fruit or fruit based foods

> In this group total folate content was lower than 5 µg/100 g of edible portion for all the analysed Traditional Foods (Figure 2).

### Low or nonalcoholic fermented foods and beverages of plant origin

> For this group the Traditional Food with the highest content was Sauerkraut - *Капуста білокачанна квашена* (24.5 µg/100 g of edible portion) (Figure 2).



1 - Baked layers of pastry stuffed with pumpkin; 2 - Tsiteli Doli Bread; 3 - Cornmeal mush; 4 - Buckwheat porridge crumby; 5 - Bulgur pilaf; 6 - Sour rye bread; 7 - Rodopian dried beans; 8 - Nettles with walnut sauce; 9 - Nettle sour soup; 10 - Kale soup; 11 - Transcarpathian green borsch; 12 - Ukrainian borsch; 13 - Halva; 14 - Roasted sunflower seeds; 15 - Herbal dish; 16 - Cottage cheese with dill and garlic; 17 - Sautéed pickled green beans; 18 - Sauerkraut

Figure 2. Total folate content (µg/100 g of edible portion) for the selected Traditional Foods from Black Sea Area countries.

## CONCLUSION

Our results show that some of the analysed traditional foods are a good dietary source of natural folates in the diet of Black Sea Area countries. Fruit based foods presented the lowest total folate content and products from oilseeds were the group with the highest content.

## ACKNOWLEDGEMENTS

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