

RESEARCHES ON QUALITY OF TOMATO PASTA

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Abstract: *Tomato paste is often used in Romanian cuisine as a frequent ingredient and a food item with real health benefits. The aim of the study was to present the water content, vitamin C and total antioxidant capacity of some tomato paste samples available on the Romanian market.*

Key words: *tomato, vitamin C, antioxidant capacity, water content.*

INTRODUCTION

Tomatoes are one of the main vegetables with great importance in food and food industry. The biggest share is in industry conserves vegetable (tomato juice, tomato paste etc.). Another use of the tomatoes can be to obtain pectin and natural colors (lycopene).[2,10]

Tomato paste is obtained by reducing the content of water thus the growth of microorganisms being prevented,. The main method of tomato preservation is concentration.[2]

For processing tomatoes, the technological maturity of these horticultural products should be characterized by a high content of soluble solids (5-7%) and a favorable balance between carbohydrate content and acidity. [1,10]

Tomato products like tomato sauce and paste, are used primarily in gastronomy for colouring and improving the taste of dishes. [10]

Besides the high taste properties, these tomato products have a high nutritional value due to content character, antioxidant substances (pro vitamin A, lycopene, vitamin C) and remarkable mineral content (potassium, sodium, magnesium, calcium, iron). [6,7]

The health benefits of tomato concentrates are remarkable because, by thermal processing lycopene becomes more active biologically. [4,9]

Lycopene bioavailability in processed tomato products is higher than in unprocessed fresh tomatoes. The composition and structure of the food also have an impact on the bioavailability of lycopene and may affect the release of lycopene from the tomato tissue matrix. [9]

"The evidence also suggests that consumption of tomatoes should be recommended because of the nutritional benefits and because it may be a simple and effective strategy for increasing overall vegetable intake." [4]

MATERIAL AND METHODS

Six type of canned tomato pasta available on the Romanian market were selected to determine the water content of the tomato pasta by thermo-gravimetric analysis, total antioxidant capacity and vitamin C content (A, B, C, D, E, F).

All chemicals and reagents were analytical grade from Sigma.

Water content determination by thermogravimetric analysis of the samples was carried out using the Sartorius thermo balance as described in by Bordean DM et al 2011. [3]

Total antioxidant capacity (TAC) by FRAP method and vitamin C content of tomato pasta samples was made as described by Raba D-N et al, 2013. [8]

As reference substance, we have used Trolox (6-hydroxy-2,5,7,8-tetramethylcroman-2-carboxylic acid), an antioxidant with a structure similar to vitamin E. [7]

Statistical analysis was performed using PAST software, which runs on standard Windows computers and is available free online. [5]

RESEARCH RESULTS

Depending on the type of tomato pasta, the water content accounts between 53,85 and 62,27 percent (figure 1 and 2).

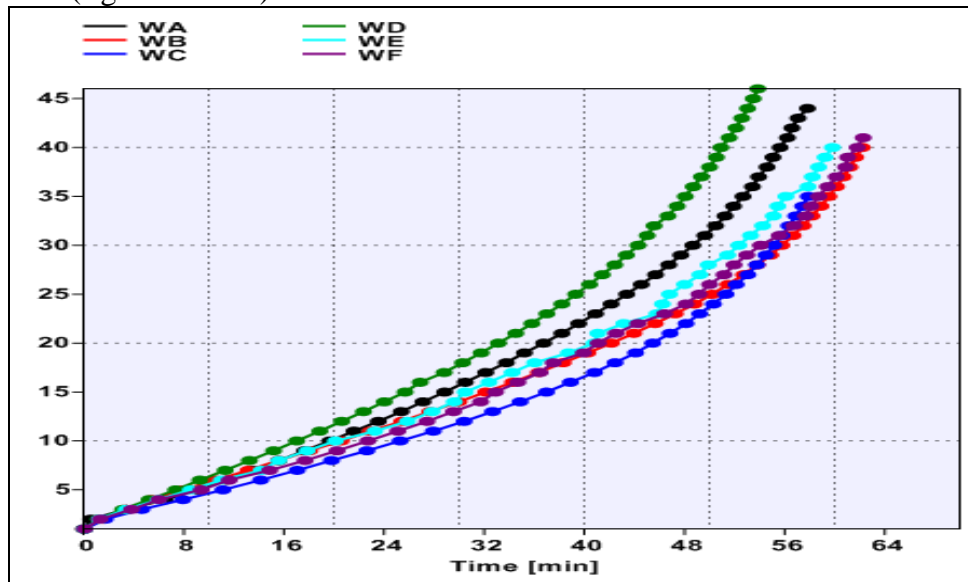


Figure1 Graphical representation of dehydration process of tomato pasta

Legend: water content of tomato pasta samples: A = WA; B = WB;
C = WC; D = WD; E = WE; F = WF

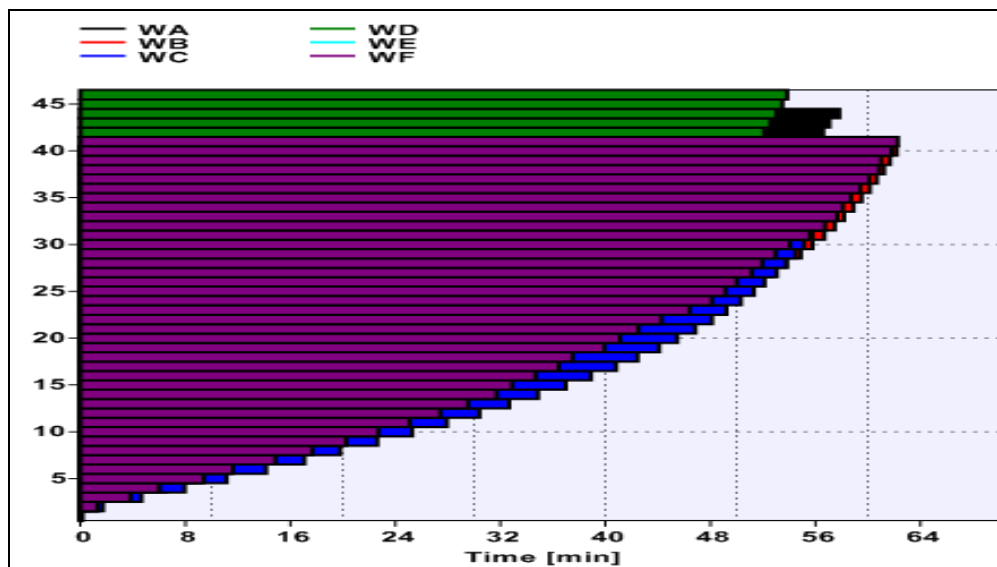


Figure 2 Graphical representation of dehydration process of tomato pasta

Legend: water content of tomato pasta samples: A = WA; B = WB;
C = WC; D = WD; E = WE; F = WF

Cluster analysis based on Paired Group Algorithm using as similarity measure Euclidian distance (Coph Corr: 0.788) is showing 2 main clusters based on the water content percent (figure 3).

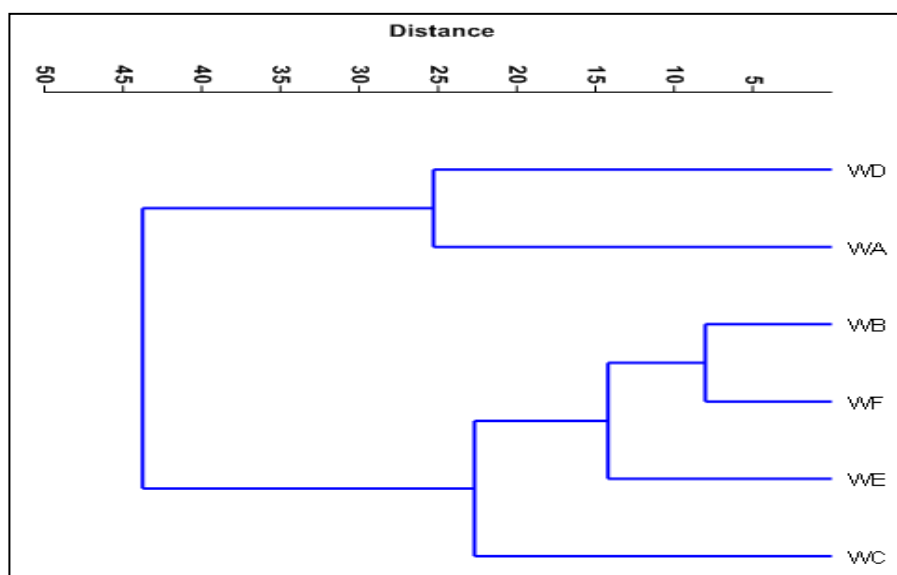


Figure 3 Cluster representation of the studied tomato pasta water content

Legend: water content of tomato pasta samples: A = WA; B = WB;
C = WC; D = WD; E = WE; F = WF

Cluster analysis based on Paired Group Algorithm using as similarity measure Euclidian distance (Coph Corr: 0.8733) is showing that D, is completely different from the other five tomato pasta assortments, based on the high content of vitamin C, but reduced water content. C and A cluster as well as B and F tomato assortments have similar behaviour based on almost identical TAC and water content. E is characterised by very low vitamin C content, and high water content (figure 4).

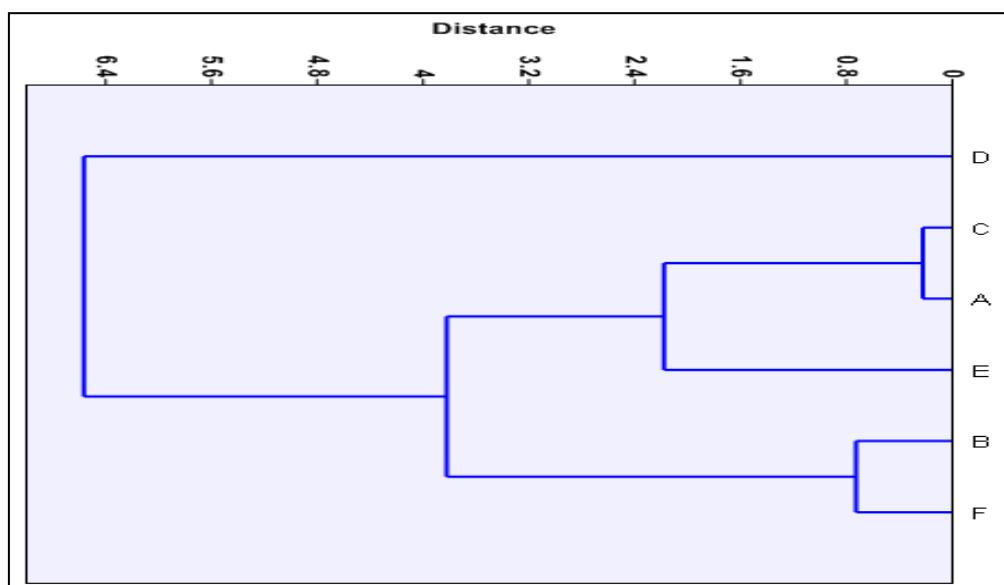


Figure 4 Cluster representation of the studied tomato pasta

Legend: A, B, C, D, E, F = tomato pasta assortments

CONCLUSIONS

Cluster analysis is an important statistical tool to identify the specific similarities between food products and gives important information about quality, recipe of production etc, if well correlated with important chemical features.

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