# THE INFLUENCE OF THE VARIETY, OF THE ZONES AND CULTURE TECHNOLOGIES ON SOME CHARACTERISTICS OF THE TOMATOES USED FOR INDUSTRIALIZATION

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## Abstract

*The paper deals with the specific problems regarding tomatoes production used for industrialization from two countries located in Balcanic peninsula: Romania and Greece. It has been studied the content of the characteristic features of the tomato fruits that are parts of recently created cultivars that are grown in both countries. The results shows similarities and also differences and these conclusions can be used to improve the qualitative and quantitative parameters of the tomatoes in order to be used for industrialization in the future.*

***Keywords***: *tomatoes, glutamic acid, licopen, industrialization*

## Introduction

The tomatoes used for industrialization represent for South-east side of Europe an important culture due to the fact that tomatoes can be consummated as fresh vegetables and also industrialized.

The main qualities that are requested in order to industrialize the tomatoes are high level of dry matter and intense and uniform pigmentation.

## Experimental

The experimental cultures have been realized in the center of the Greece, at the north of the capital Athena (experimental field of the Pioneer society) and in the north-east part of the Danube Plain. The cultivars that have been used are presented in the tables 1 and 2.

As biologic material, in Greece have been used hybrids from Italy, North America and in Romania has been used autochthon cultivars and foreign ones.

**Table 1**: The characteristics of some tomato varieties cultivated in Romania

| Nr. crt. | Cultivar | Origin | Destination | Soluble dry matter, % | Glutamic acid (g/ kg fresh matter) | Lycopen (g/ kg fresh matter) |
|---|---|---|---|---|---|---|
| 1. | Kristin | Romania homologate | Industrialization Fresh matter | 6.02 | 2.07 | 0.151 |
| 2. | Buzau 47 | Romania homologate | Industrialization Fresh matter | 6.48 | 1.96 | 0.164 |
| 3. | Buzau 22 | Romania homologate | Industrialization Fresh matter | 5.62 | 2.15 | 0.144 |
| 4. | Linia 64 | Romania during homologation | Industrialization Fresh matter | 4.52 | 2.03 | 0.156 |
| 5. | Linia 60 | Romania during homologation | Industrialization Fresh matter | 5.29 | 2.68 | 0.198 |
| 6. | Linia 44 | Romania during homologation | Industrialization Fresh matter | 4.41 | 2.37 | 0.132 |
| 7. | Linia 68 | Romania during homologation | Industrialization Fresh matter | 5.25 | 2.59 | 0.124 |
| 8. | Linia 71 | Romania during homologation | Industrialization Fresh matter | 3.74 | 1.78 | 0.142 |
| 9. | Heinz 1370 | SUA and Romania homologation | Industrialization Fresh matter | 6.00 | 2.08 | 0.136 |

The main elements of the technology are as it follows:

- in Greece, the experimental culture with a density of 30.000 plants/ha has been set up during 5-10 of May. It has been applied fertilizers with macro elements, as it follows:

N – 180kg/ha, $P_2O_5$ – 150 kg/ha and $K_2O$ – 160 kg/ha.

- the harvest was in the second decade of the September using a mechanized method. It has been chosen this method because in the area where the experimental lot was set, the farmers use usually combines for tomato harvest.

- the experimental culture from Romania was set up in the same calendaristic period with a density of 40.000 plants/ha. The technologic level of the culture was affected by the excessive temperatures of this summer.

The harvest was handling made starting from the second part of June till the beginning of the September.

At the harvest moment, the yields were recorded and cumulated, the quantity being expressed as tones/ha. The determination of the characteristics of the tomatoes was determined as it follows:

Soluble dry matter was carried out with an Abbe refractometer according with 5956-71 STAS.

Glutamic acid determination was made using HPLC/fluorescence.

The licopene determination was carried out through colorimetric method.

**Table 2**: The characteristics of some tomato varieties cultivated in Grecia

| Nr. crt. | Cultivar | Destination | Soluble dry matter, % | Glutamic acid (g/ kg fresh matter) | Lycopen (g/ kg fresh matter) |
|---|---|---|---|---|---|
| 1. | 1560 | Industrialization | 4.1 | 2.02 | 0.151 |
| 2. | 1580 | Industrialization | 4.4 | 2.36 | 0.162 |
| 3. | 1425 | Industrialization | 4.4 | 1.55 | 0.116 |
| 4. | Scarlet | Industrialization | 4.9 | 1.12 | 0.106 |
| 5. | Heinz 9997 | Industrialization | 4.4 | 1.98 | 0.171 |
| 6. | 915 | Industrialization | 5.6 | 2.71 | 0.221 |
| 7. | 1120 | Industrialization | 4.55 | 3.00 | 0.195 |
| 8. | 1570 | Industrialization | 4.6 | 2.94 | 0.130 |
| 9. | Tony | Industrialization | 5.6 | 2.70 | 0.199 |
| 10. | Gipson | Industrialization | 5.6 | 3.01 | 0.147 |
| 11. | Heinz 9665 | Industrialization | 4.9 | 2.41 | 0.134 |
| 12. | Heinz 9780 | Industrialization | 6.0 | 1.70 | 0.134 |
| 13. | 1000 | Industrialization | 4.6 | 1.76 | 0.159 |
| 14. | Atomic | Industrialization | 5.4 | 2.61 | 0.192 |

## Results and Discussion

The results of the laboratory determination presented in tables 1 and 2 for tomatoes grown in Romania and Greece present similarities and also differences between the tomatoes from the same variety tomatoes but also between varieties.

So, as it can be noticed from table 1, Romanian cultivars that are proper for industrialization are Kristin, Buzau 47 and Heinz 1370 because present the highest level of soluble dry matter (between 6,00-6,48%). The

glutamic acid level has been found as 2g/kg fresh matter for the majority of the varieties. Regarding the lycopene quantity (g/kg fresh matter) the limits was between 0,124-0,198 g/kg fresh matter. The highest value was found at cultivar 60 and the lowest at cultivar 68. Lycopene has an important role for human health, being the factor that prevents a lot of diseases.

Regarding tomato yield from Greece, the soluble dry matter, lycopene and glutamic acid ranges between the same values. The highest level of soluble dry matter was found at Heinz 9780(6,00%), Gibson(5,6%) , Tony(5.6%) and cultivar 915(5.6%), meanwhile the glutamic acid and lycopene quantities ranges between limit set for industrialization.

It were also analyzed the characteristics of Heinz 137 cultivar grown in Romania and cultivar Heinz 9780 grown in Greece and it has been found that both of them present the same values for soluble dry matter (6.00%), different glutamic acid concentration and approximate the same quantity of lycopene.

## Conclusion

- From Romanian cultivars the proper one for industrialization is Kristin with a content of soluble dry matter equal with 6.02 %.
- As tomatoes for fresh consumption the best is the cultivar 60 with highest glutamic acid content (2.68 g/kg fresh matter) and lycopene (0.198 g/kg fresh matter).
- Cultivars from Greece in comparison with those from Romania, present a lower level of soluble dry matter but they present higher levels of glutamic acid and lycopene, this fact being a consequence of the area and culture technologies.

## References

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