

STUDIES REGARDING THE CHEMICAL COMPOSITION OF SEVERAL WHEAT SPECIES, FLOUR TYPES AND PASTES ASSORTMENTS

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Summary

This essay presents the comparative study of the chemical composition for two wheat species: *Triticum aestivum* and *Triticum durum*, two types of flour, obtained by grinding the two wheat species and 4 paste samples obtained from the soft wheat flour and the hard wheat flour. The last ones have been harvested from different commercial centers owned by local and foreign producers. Using a NIR, INFRALUM, FT-10 cereal analyzer we determined the following physico – chemical characteristics: the gluten content, moisture level, the ash content, the total protein and the fats content, for the analysed samples. The obtained results have been analyzed and compared.

INTRODUCTION

Wheat is the main raw material for bakery, biscuits and pastes. The species producers have been interested in obtaining new more productive species, with an increased disease and parasites resistance and with improved bakery characteristics. There are thousands wheat species but the ones used in the bakery and paste industry are classified into soft wheat (*Triticum aestivum*) and hard wheat (*Triticum durum*). The common soft wheat has a lower gluten content so it is fitted for bakery products, while the hard wheat, which is more glassy than any other bakery wheat species and has a less elastic gluten is not proper for bakery and is used for pastes. These ones plus some several by products like the cus-cus and some other insignificant assortments, are the only products obtained from durum wheat. In France, Italy and Greece, the pastes are produced using only durum wheat flour, its quality being the most satisfying for the paste industry needs. Using the hard wheat flours allows the obtaining of fine surface pastes, white – yellow coloured, that maintain their shape after modeling. If they are dry, the pastes are more resistant, glassy, and after boiling they increase their volume at least three times; they don't disintegrate after boiling and the boiling water remains almost clear.

METHODS AND MATERIALS

We analyzed samples of *aestivum* and *durum* wheat, hard and regular wheat flour and four paste samples obtained from *aestivum* and *durum* wheat flours, according to the declaration on the product label.

I Bean preparation

The wheat beans have been grounded with a lab (morisca).

We similarly prepared the four paste samples

The two flour samples have been used as powder.

II The determination.

The analysis has been realised using the NIR, Infralum FT 10 cereal analyzer. The spectral period in which we made the determinations has been $8000 - 14000 \text{ cm}^{-1}$. The powder samples have been put into the analyzer until they reached the top. The wall width was 6mm. The physico – chemical parameters values have been directly displayed in the analysis report of the analyzer. [4,5,6]

RESULTS AND DISCUSSIONS

The amounts (in %), from each determined parameter, read on the analyzer, are presented in table 1.

Table no. 1

Sample	Gluten content [%]	Moisture [%]	Ash [%]
Wheat T.aestivum	22	14	1.752
Wheat T.durum	28	13	1.749
Flour din T.aestivum	26	14	0.445
Flour din T. durum	30	14	0.448
Pasta from T.aestivum		13	0.520
Pasta from T.aestivum		13	0.568
Pasta from T.durum		11.5	0.490
Pasta from T.durum		12	0.485

In Table no. 2 we presented the quantities (in %) from each determined chemical parameter read on the analyzer.

Table No. 2

Sample	Total protein [%]	Total Fat [%]
Wheat T.aestivum	12	1.752
Wheat T.durum	14	1.955
Flour din T.aestivum	11	1.826
Flour din T. durum	14	1.875
Pasta from T.aestivum	10	1.752
Pasta from T.aestivum	10	1.775
Pasta from T.durum	13	1.789
Pasta from T.durum	13	1.814

Analyzing the values in tables 1 and 2 we observed a homogeneity of the values determined for moisture, ash and fat in the case of the 8 analyzed samples, which makes us say that these parameters don't depend in a significant measure on the wheat species we obtained the flour, respectively the pastes.

Regarding the gluten content of the analyzed flours and wheats, respectively the protein content of the wheat, flour and paste obtained from durum wheat, these are obviously bigger than the ones of the aestivum wheat and products samples, fact that gives an increased energetic and nutritive value for these products.

The physical parameters variation after the wheat species is presented in charts no1 and no 2, and the chemical parameters variation is presented in charts 3 and 4.

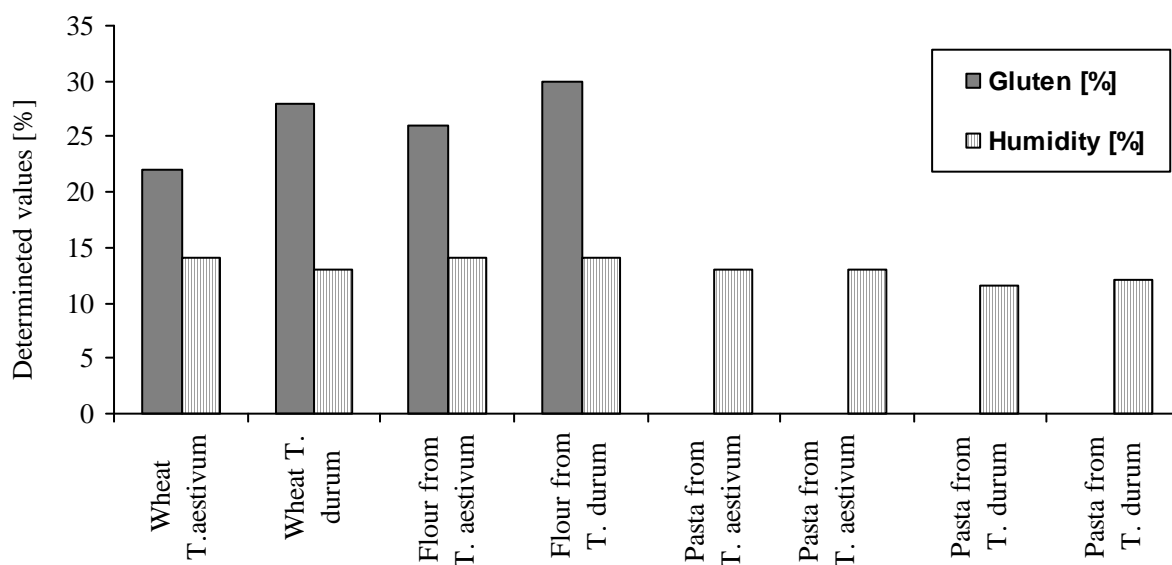


Fig.1 Gluten content and moisture variation after the wheat species.

In Chart No1 we observe that the moisted gluten content of the samples are different by the wheat species so the determined percentage for the durum samples is 4 times bigger than the one in the case of the estivum samples. in the case of the moisture, the differences are minimal and do not depend on the wheat species.

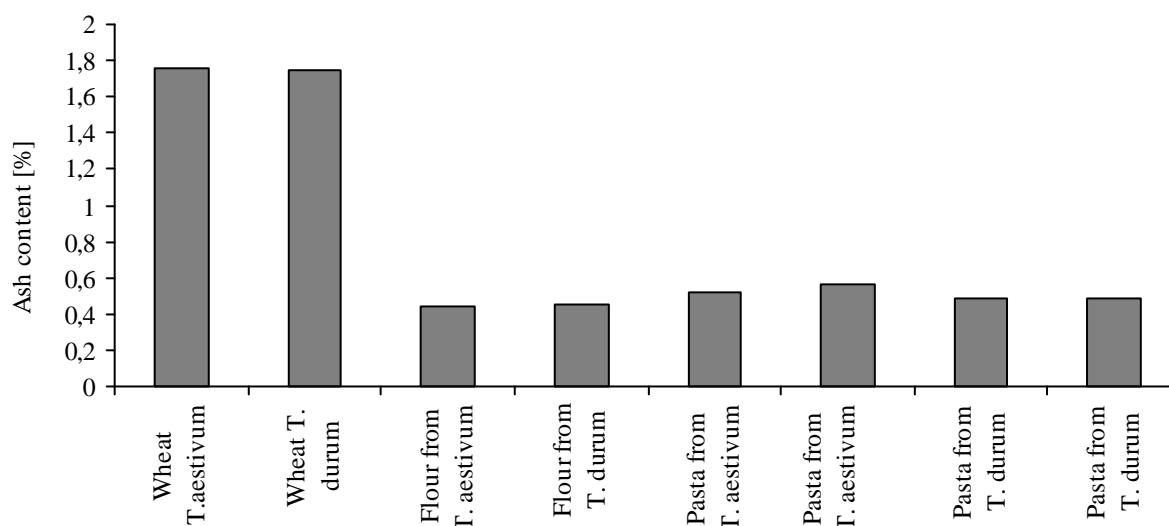


Fig.2. Ash content variation by the wheat species.

Analyzing Chart No 2 we can declare that the observed value difference is a natural one and it's dued to the different extraction grades of the flours used for producing the pastes. From the same reason the values obtained for the pastes are very close to the ones of the

flours they are obtained from and the technological process has no influence over this parameter.

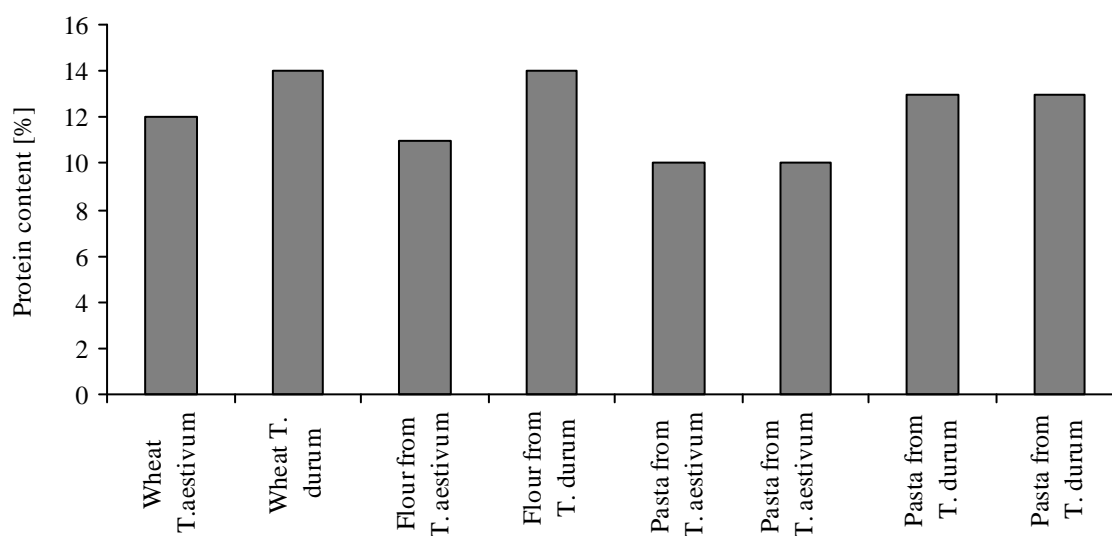


Fig.3 Protein content variation by the wheat species

Analyzing the content in total protein from chart no 3 we can tell that this parameter inregistered values until 2% bigger in every samples who appartinent T. Durum species in comparison with T.aestivum species.

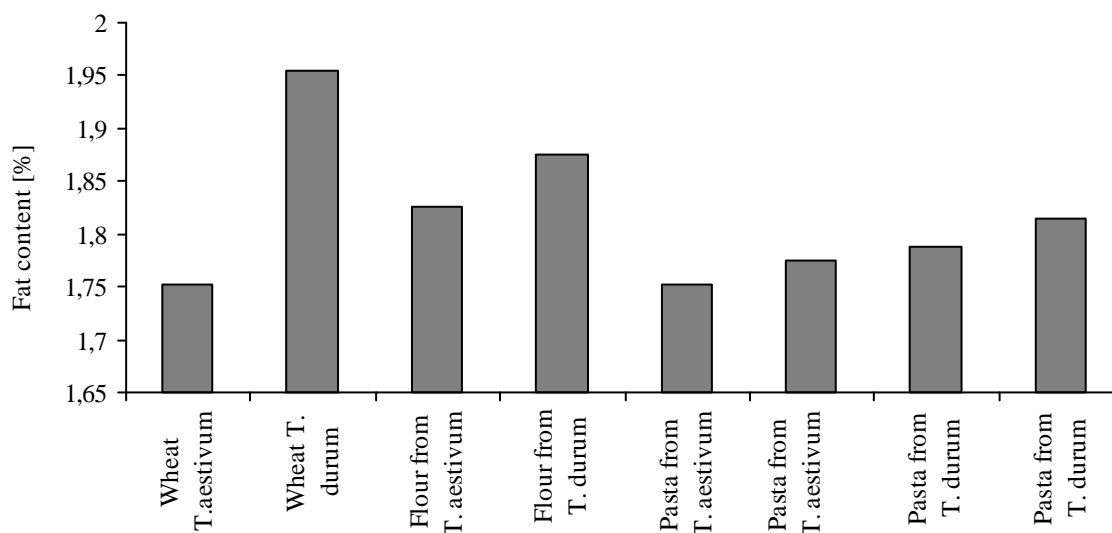


Fig.4. Fat content variation by the wheat species

Analyzing chart no 4 we can declare that the total fat variate with the wheat species. In this way samples case who appartined species T.durum determineted values was bigger in comparison with those who was inregistered for wheat, flour and pasta from T.aestivum. In fact these values are smaller in the case of finit product because the processing.

CONCLUSIONS

The samples content of wetted gluten is different from the wheat species. The determined percent for samples by T. Durum is four times higher than T. aestivum samples, parameter which has significant influence on the quality of final products.

The humidity isn't influenced by wheat species, only by the wheat storing conditions, flour, respectively by the manner technological parameters of pasta's drying process are followed.

The total protein content depends of the wheat species, too, and the protein quantity of T. Durum is higher than T.aestivum, with straight consequences on pasta quality, too.

Fats too, was found in higher quantities in T. Durum, but with no straight effect on the pasta analysed; these degrading during the technological process.

Based on the values determined for the physical, chemical parameters analysed and referring to the fact that, sensorially speaking, the pasta „declared” on the label as being made of T. Durum flour were qualitatively superior to those obtained from T.aestivum, we may conclude that, T.durum flour is that recommended to process pasta. This may be said for the qualitatively superior and nutritive considerations, too.

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