

# THE EFFECT OF ULTRASOUND AND COOKING TREATMENTS ON *IN VITRO* DIGESTIBILITY AND ANTIOXIDANT PROPERTIES OF WHOLEGRAIN WHEAT FLOURS

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## INTRODUCTION

The majority of wheat-based products are made from refined flour which lacks some essential nutrients that are lost during the milling process due to the removal of bran and germ. The abundance of dietary fibers, as well as antioxidant properties of polyphenols in the wholegrain wheat flour, are the key health-promoting contributors associated with the amelioration of cancers, cardiovascular diseases, and metabolic disorders such as type-2 diabetes and obesity. The aim of this study was to investigate the effect of ultrasound and cooking treatments on *in vitro* digestibility, the content of total phenolic compounds, and antioxidant capacity of wholegrain wheat flours.

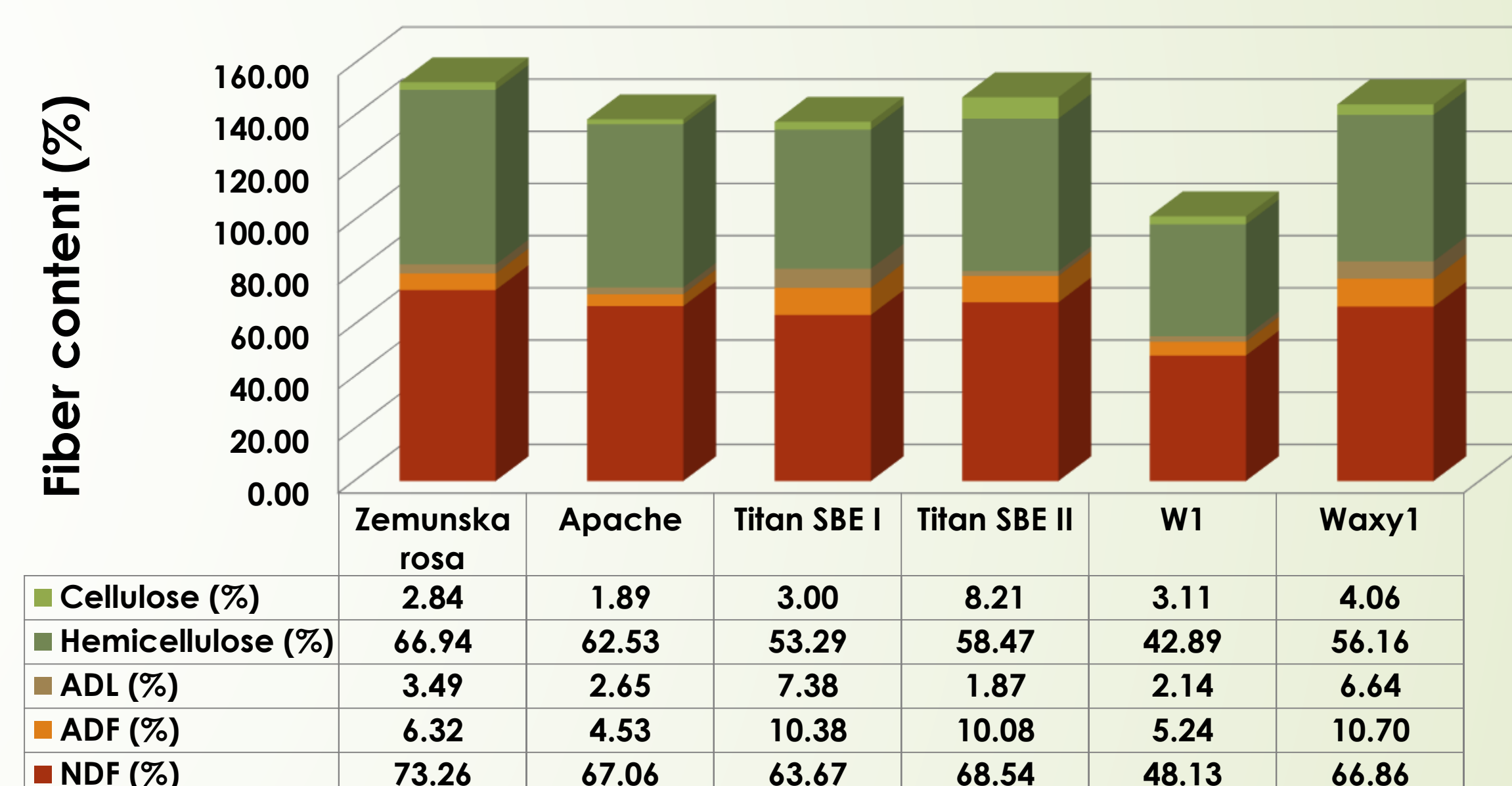
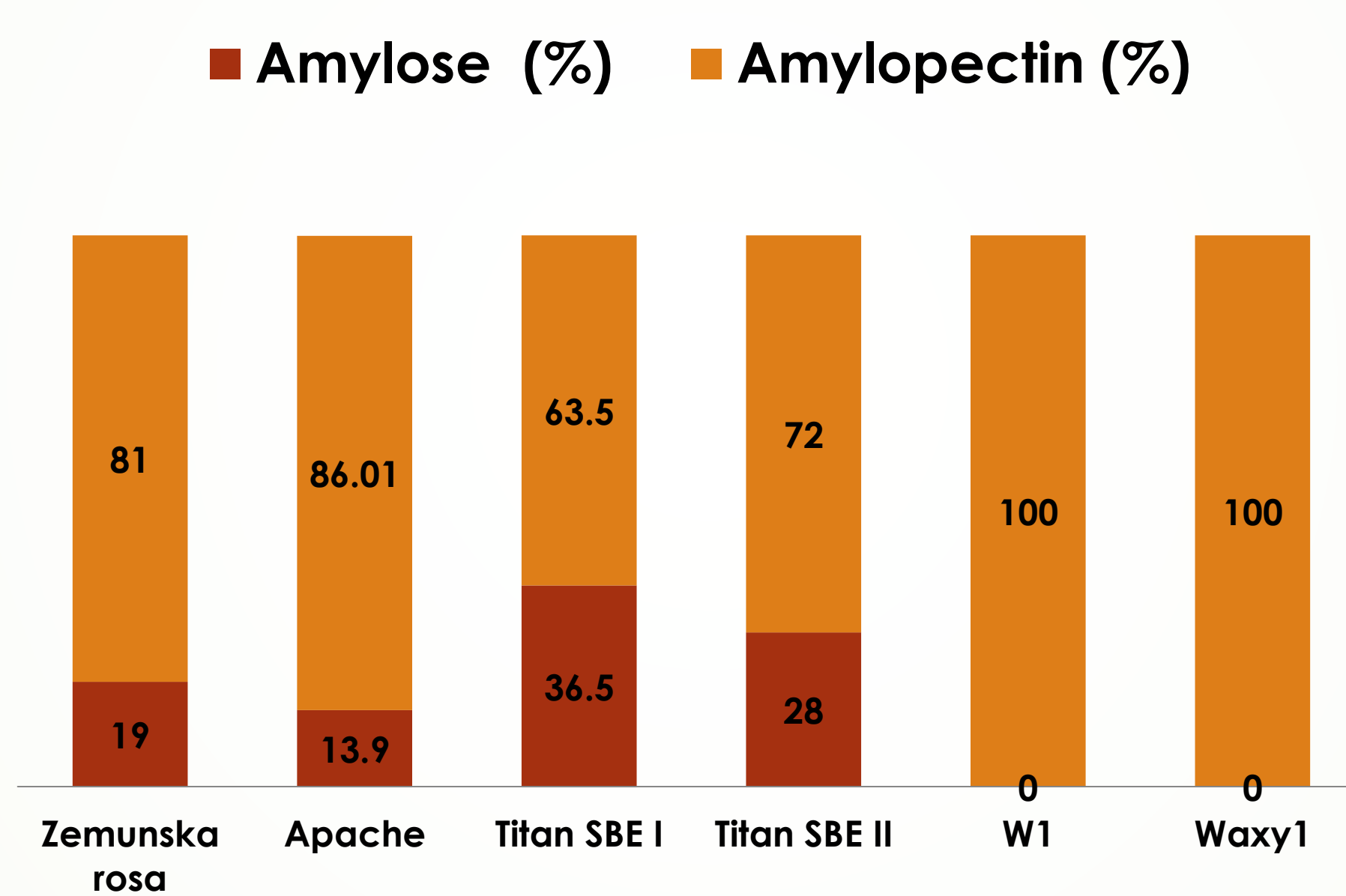
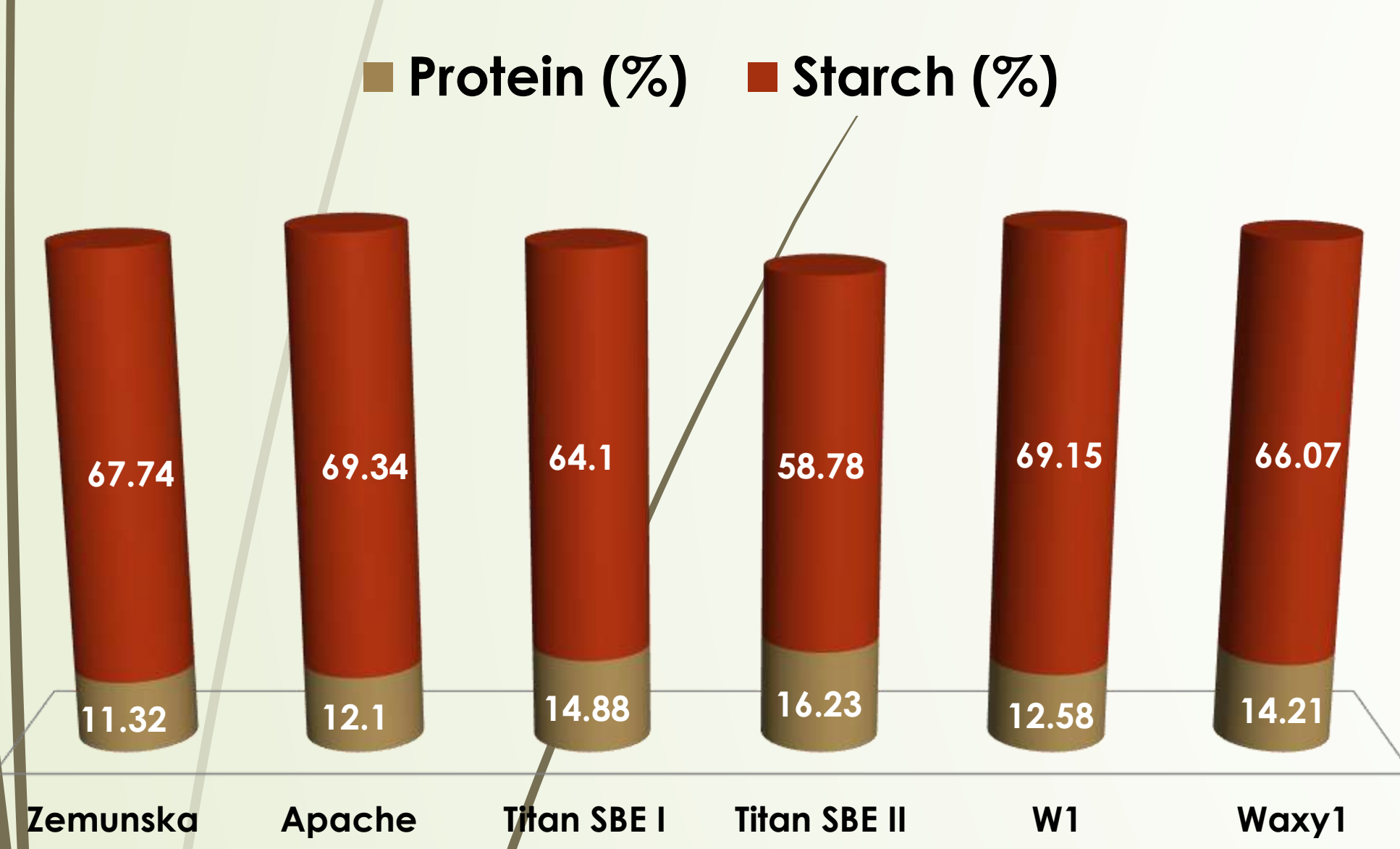


## MATERIAL AND METHODS

Wholegrain wheat samples of six genotypes differing in amylose content and dietary fibers composition were mixed with distilled water at hydromodule 1:3, and subjected to ultrasound treatment at frequency 30kHz, the temperature of 40°C for 10 minutes. Hydromodule 1:6 was used for the cooking treatment on a preheated hot plate (t=200°C) with magnetic stirring for 3 minutes after reaching the boiling point. The mixtures were dried in a ventilation oven at 40°C overnight, and ground in a laboratory mill afterward.



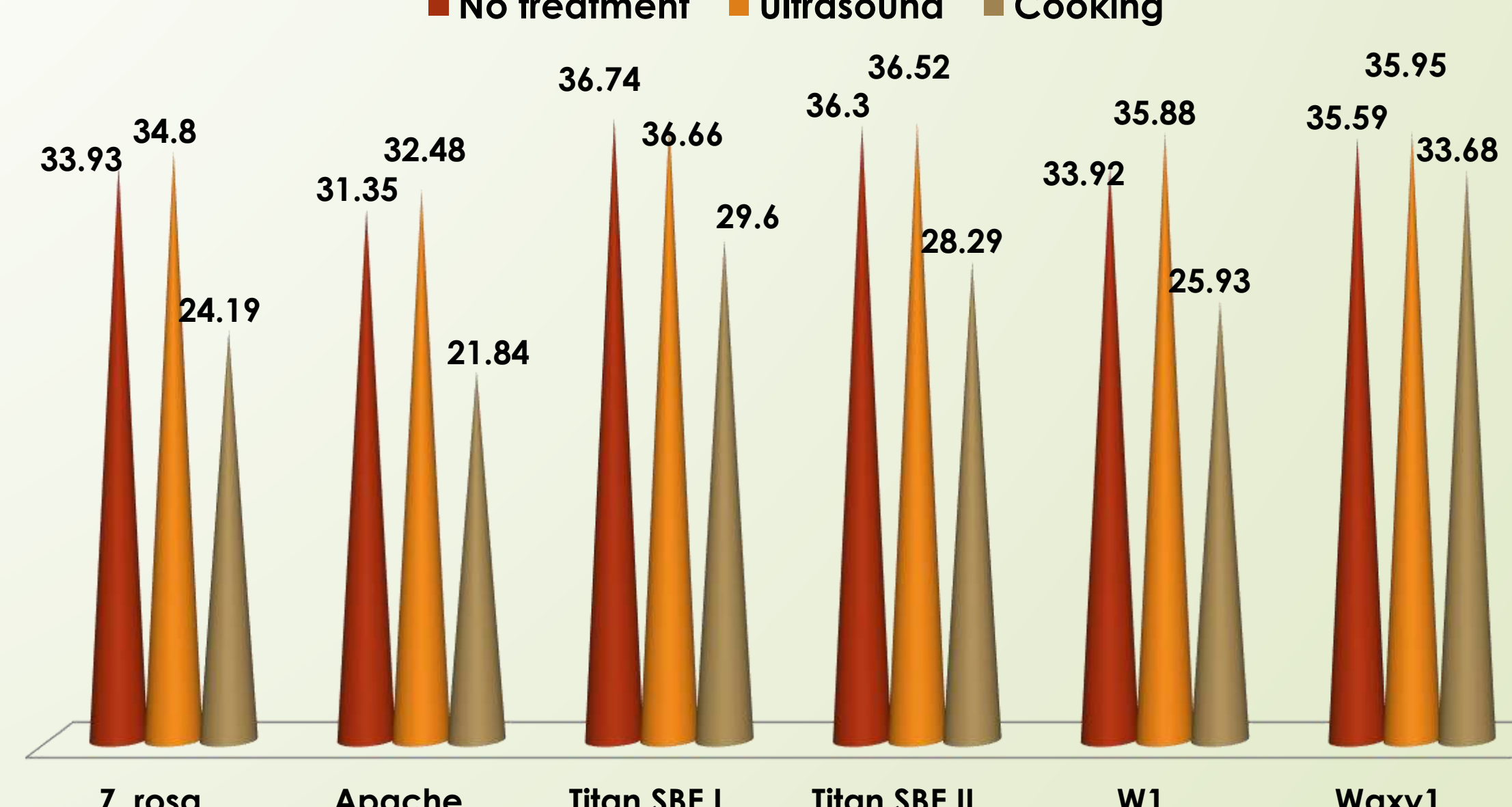
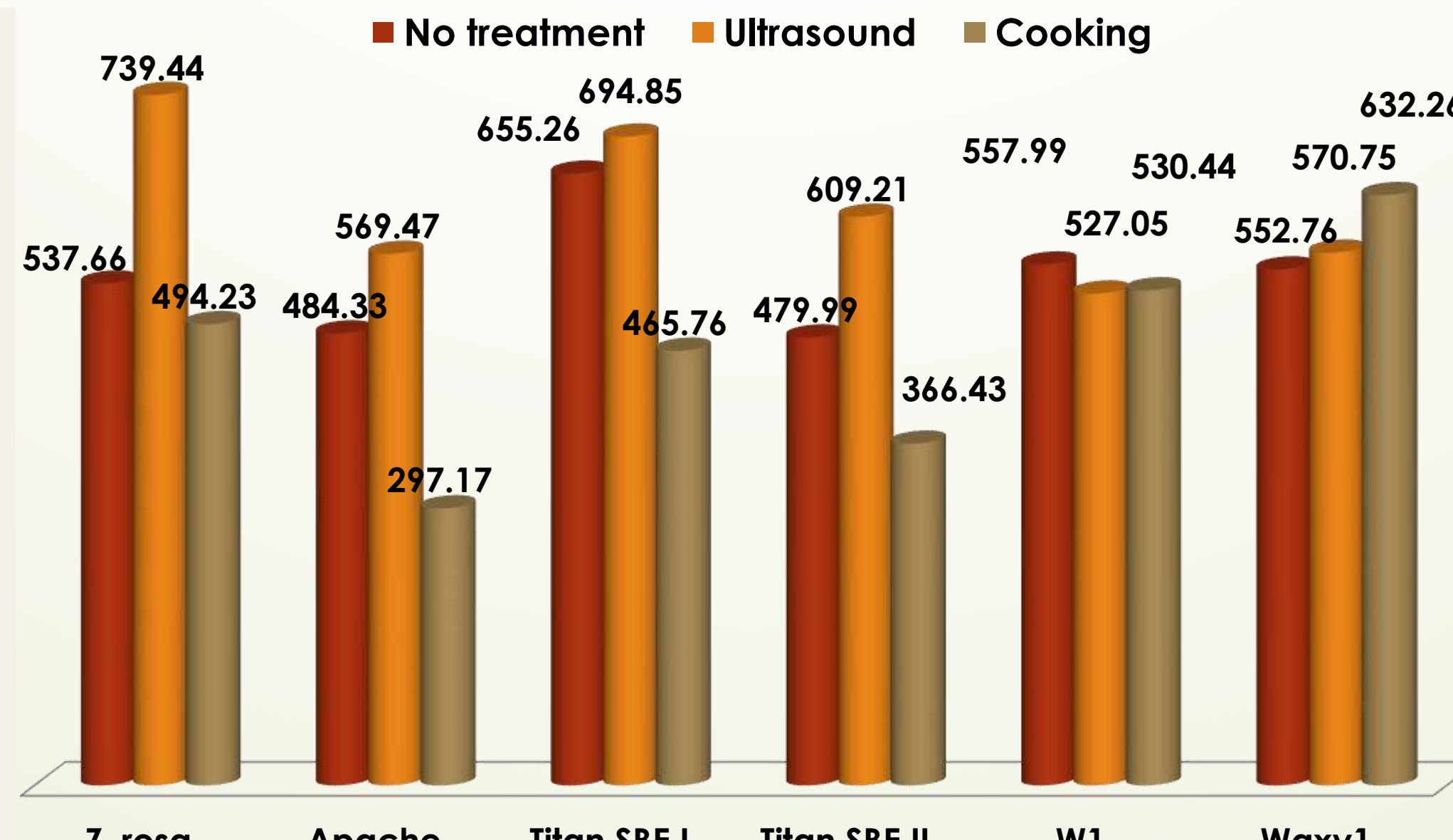
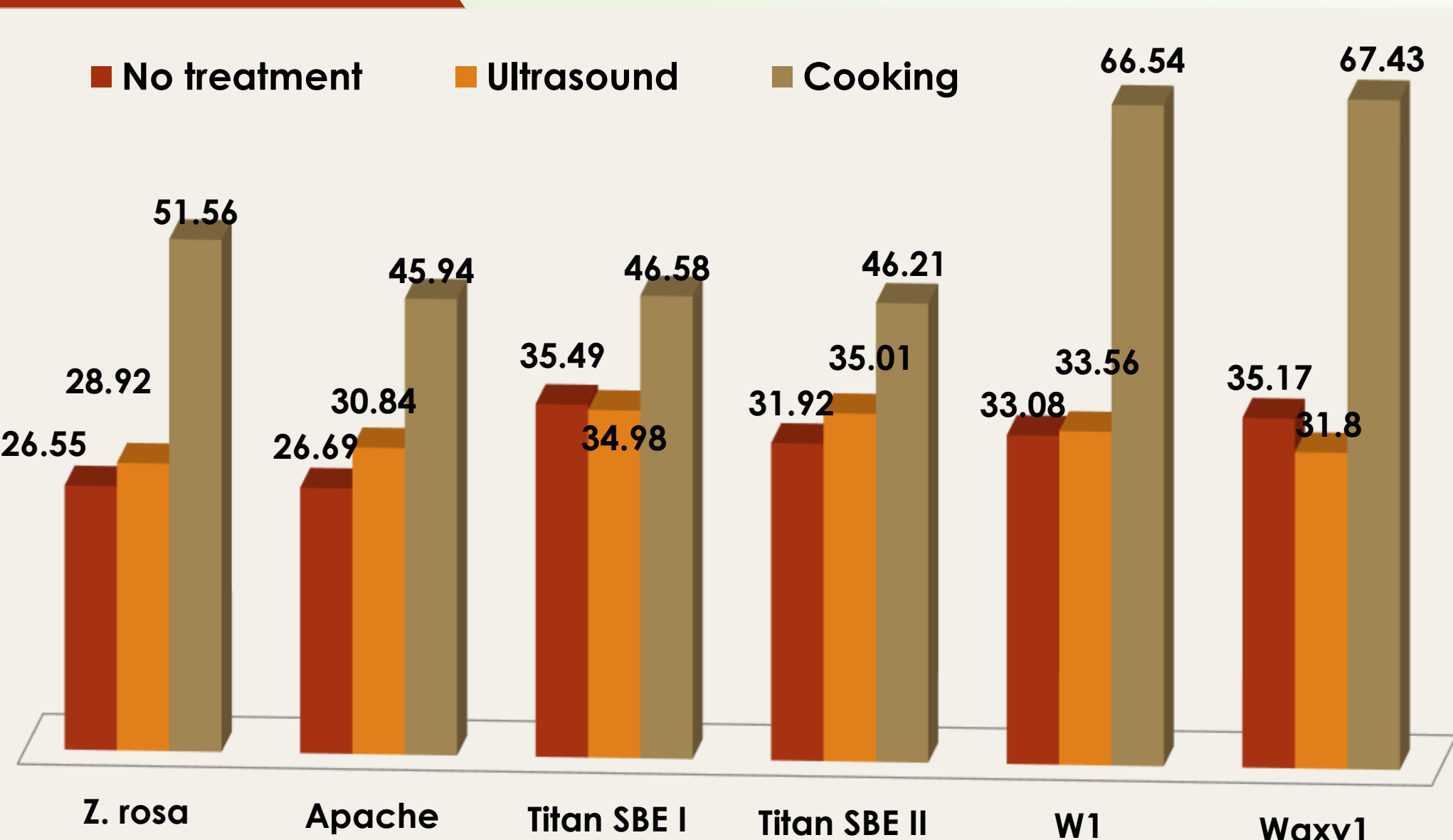
## RESULTS



### Digestibility (%)

### Total phenolic compounds (µg GAE/g d.m.)

### Antioxidant capacity (mmolTrolox/kg)



## CONCLUSION

Cooking treatment positively influenced the digestibility of the wholegrain wheat flours. Waxy wheat genotypes showed a higher digestibility increase after cooking treatment than the high amylose wheat flours, which can be explained by amylose retrogradation and resistant starch formation. Ultrasound treatment positively affected total phenolic compounds content in all samples except waxy wheat flour. Furthermore, the applied cooking treatment had an overall negative effect on the antioxidant capacity. The findings obtained in this study can serve as valuable guidelines in the formulation and production of new wholegrain wheat foods.

