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**COMPARATIVE ANALYSIS OF MORPHOMETRIC AND PHYSICOCHEMICAL QUALITY TRAITS IN
COMMERCIAL APPLE CULTIVARS (*MALUS DOMESTICA* BORKH.) SOURCED FROM THE
WESTERN ROMANIAN RETAIL MARKET**

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Abstract: This study evaluates the quality parameters of three widely commercialized apple varieties—Idared (Poland), Golden Delicious (Hungary), and Royal Gala (Poland)—available in major supermarkets in Timisoara, Romania. The investigation focused on key morphometric traits (large and small diameter, height, weight) and biochemical markers, specifically soluble solids content (Brix) and sugar percentage. To ensure the mathematical validity of the findings, the data were subjected to a rigorous statistical framework.

• Introduction

The apple is one of the most important fruit species worldwide, with a wide distribution in temperate zones. Due to its ecological adaptability and high phenotypic plasticity, it is cultivated from cold regions of Asia to subtropical areas.

• Material and method

To carry out this work, 3 apple varieties (fruits) were purchased from the supermarket in 2024. Regarding biometric aspects, fruit samples (were collected from different parts of the crown, on which the following determinations were made: large diameter, small diameter, height.

• Results and discussions

The investigation focused on key morphometric traits (large and small diameter, height, weight) and biochemical markers, specifically soluble solids content (Brix) and sugar percentage. The main effect of apple genotypes is statistically significant and large.

• Conclusions

Regarding the results obtained for the large diameter (mm), it can be observed that the highest value for this parameter was recorded for the Royal_Gala_PL. From the physicochemical analyses made on the varieties taken in the study, it is observed that the soluble dry matter (0Brix) for the Idared_PL and Golden_HU varieties had close values.