



## BLACK OLIVE water content determination

A precise and quick water content check in olive's fruits is required both by farmers and the industry. It is a common knowledge that orchard irrigation boosts production of olives and olive oil but also increases the water content in fruits, which in effect influences the quality of olive oil. The ready and tested quick method of testing water content in olives will therefore be a useful tool in taking decisions with regard to orchard management. It will also allow specifying the optimal harvest time in order to obtain the high-quality olive oil. On the other hand the industry desires a quick olive quality check method – the initial quality of the product must be guaranteed. The olive water content analysis is therefore a must both in olive cultivation and processing. Radwag moisture analyzers prove reliable and quick in these processes.



The application note includes basic information for validation of the black olive drying method with the use of MA/R and MA/X2 moisture analyzers series by Radwag Wagi Elektroniczne. The application note may be the basis for elaborating own drying method with special regard to distinctive features of the product in question



## Black olive – water content determination

The method with the use of IR radiation

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### TERMS

ACCURACY of determining water / dry matter content is the difference between the result of the water / dry matter content received in the moisture analyzer method and the result of the water /dry matter content received while drying the same sample through a reference method.

PRECISION is a degree of compliance between independent results of the test, received in specific conditions. The measure of precision is a standard deviation from a series of several measurements.

### REFERENCE METHOD

The reference method parameters are usually specified in standards or other discipline-specific documents as the so-called guides. If such documents are unavailable, the drying temperature that does not cause the sample to change colors is used. Such an approach applies to previously dehydrated products and raw products.

### SAMPLE PREPARATION

Before testing, the sample must be stored in a tightly sealed container. Before testing, the sample must be fragmented into small pieces.

### ACCESSORIES

Laboratory dryer, glass weighing vessels with a lid, AS 220.X2 analytical balance, laboratory spoon.

### METHOD DESCRIPTION

Place the sample with a mass of ca. 5 g in pre-dried glass weighing vessels. Specify the real mass of the sample in question with the use of the balance whose weighing accuracy is 0.1 mg (AS 220.X2). Put weighing vessels with the sample and lids in the temperature-controlled laboratory dryer. Dry samples at the temperature of 105°C for 3 hours. After this period, remove vessels and place in the desiccator until they cool down and weigh afterwards. Put the samples in the laboratory dryer again and keep on drying them for 30 minutes. Cool them down and weigh again. Repeat the procedure until you obtain a stable sample mass or record the sample mass growth after drying.

### RESULTS

Sample name	BLACK OLIVE
Water content (%)	5.90
Standard deviation (%)	0.05

## BLACK OLIVE – WATER CONTENT ANALYSIS WITH THE MOISTURE ANALYZER

The water content testing with the use of the moisture analyzer (IR radiation) entails two phenomena: convection and radiation. The sample temperature rises from outer layers to the bottom of the sample. The temperature gradient in the sample structure minimizes through optimization of the thickness of the dried sample and drying temperature. Too high drying temperature may lead to surface burning of the sample, which may be hard to diagnose if the sample color is dark.

### SAMPLE PREPARATION

Before analyzing, store samples in locked containers in view of their hygroscopic nature. Before testing, fragment the sample into small pieces.

### ACCESSORIES

MA/R or MA/X2 moisture analyzer, laboratory spoon, disposable aluminum weighing pans.

### METHOD DESCRIPTION

Set drying parameters presented below. Distribute a thin layer of the fragmented sample with a mass of ca. 8 g throughout weighing pan. Lock the drying chamber manually or automatically.

### DRYING PARAMETERS / RESULTS

Sample name	BLACK OLIVE
Drying profile	Standard
Drying temperature	120°C
Sample mass (g)	~ 8
End of analysis	Auto 1
Water content (%)	5.81
Standard deviation (%)	0.13
Analysis time $\bar{x}$ (min)	14

### ACCURACY OF THE MA/R ÷ MA/X2 METHOD

Sample name	BLACK OLIVE
Water content (%) – Ref.	5.90 ± 0.05
Water content (%) – MA R/X2	5.81 ± 0.13
Analysis accuracy (%)	0.09

### RESERVATION

The method in question has been verified by the Research Laboratory, yet the results do not include factors arising from diversity of tested samples, operators' personal skills as well as measuring capability used by moisture analyzer users. For this reason Radwag shall not be held responsible for drying parameters but they can be used to elaborate own drying method.

