FORCEMEAT STUFFING

water content determination

The technologically designed quality features of the forcemeat stuffing are obtained in the so-called cuttering process, that is material hydration and fragmentation, fat emulsification and spatial homogenization of all ingredients. These actions are aimed at creating such a spatial arrangement of all ingredients of the stuffing that a properly fragmented fat is optimally spatially dispergated and surrounded with a white layer and that this arrangement becomes stable. An important factor that determines efficiency of stuffing cuttering is its temperature that depends on the quantity of water and ice added in this process. Eventually, what is desired is a good consistency of the stuffing, its elasticity, flavor and stable color. It is possible to examine the amount of water in the stuffing on the basis of the quick and precise method, for example MA R, MA X2, MA X7 and MA 5Y moisture analyzers by Radwag.



The application note includes basic information for validation of the forcemeat stuffing drying method with the use of MA R, MA X2, MA X7 and MA 5Y moisture analyzers 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.

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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, grind and stir to obtain a homogeneous sample.

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. 5g 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 0,1mg (AS 220.X2). Put weighing vessels with the sample and lids in the temperature-controlled laboratory dryer. Dry samples at the temperature of 105^{o}C for 3 hours. After this period, remove vessels and place in the desiccator until they cool down and weigh afterwards. Put samples into the laboratory dryer again and keep on drying them for 30 minutes. Cool samples down and weigh again. Repeat the procedure until you obtain a stable sample or record the sample mass growth after drying.

RESULTS

Sample name	FORCEMEAT STUFFING
Water content (%)	58.10
Standard deviation (%)	0.48

FORCEMEAT STUFFING – 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 when the sample color is dark.

SAMPLE PREPARATION

Before testing, the sample must be stored in a tightly sealed container. Before testing, grind and stir to obtain a homogeneous sample.

ACCESSORIES

MA R, MA X2, MA X7 or MA 5Y moisture analyzer, laboratory spoon, disposable aluminum weighing pans.

METHOD DESCRIPTION

Set drying parameters presented below. Collect the sample with a mass of ca. 5g and distribute it throughout the weighing pan. Lock the drying chamber manually or automatically.

DRYING PARAMETERS / RESULTS

Sample name	**FORCEMEAT STUFFING**
Drying profile	Standard
Drying temperature	120°C
Sample mass (g)	~ 4.5
End of analysis	Auto 1
Water content (%)	58.94
Standard deviation (%)	0.92
Analysis time $\acute{x}$ (min)	18

ACCURACY OF THE METHOD MA R, MA X2, MA X7, MA 5Y

Sample name	**FORCEMEAT STUFFING**
Water content (%) – Ref.	58.10 ± 0.48
Water content (%) – MA	58.94 ± 0.92
Analysis accuracy (%)	|0.84|

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.