FRIED CHEESE

dry matter content determination

To produce fried cheese, it is necessary to use cottage cheese and butter. At the first stage the cottage cheese matures in a warm place for a couple of days and then is mixed with butter and other additives while being fried. The quality of cheese is determined by the quality of cottage cheese and butter as use of wrong ingredients makes the fried cheese have a way worse sensory properties. Every additive contains water that is partially removed while frying, yet some of it remains and serves as a plasticizer. The amount of water must be strictly inspected because it makes the structure of fried cheese remain resilient. While producing the large-scale fried cheese, big amounts of materials are processed, which requires maintenance of engineering parameters within specific limits. It is possible to quickly and precisely check the water content with the use of MA R, MA X2, MA X7 and MA 5Y moisture analyzers by Radwag.



The application note includes basic information for validation of the fried cheese drying method with the use of MA R, MA X2, MA X7 and MA 5Y 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.

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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 – for the sample in question, guidelines specified in the EN ISO 5534:2005. Cheese and processed cheese — Determination of the total solids content (Reference method).

SAMPLE PREPARATION

Before testing, samples must be stored in sealed packaging. Mix the sample if it takes a form of a semi-fluid product. Collect a small amount of the sample for testing. Collect samples from various spots.

ACCESSORIES

Laboratory dryer, weighing vessels, AS 220.X2 balance, laboratory spoon, quartz sand, glass rods

METHOD DESCRIPTION

Weigh glass vessels with a glass rod and pre-dried quartz sand in the amount of ca. 20 g. Place the sample with a mass of ca. 3 g in glass weighing vessels on pre-dried quartz sand. Mix the sample with sand by means of the glass rod that must be left in the vessel. The use of sand as a foundation is aimed at eliminating creation of the shell on the surface of the sample in question. Weigh vessels again and 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 102^{o}C for 3 hours. After this period, remove vessels and put into the desiccator to let them cool down and weigh afterwards. Place samples in the laboratory dryer again and keep on drying them for 60 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. Calculate the dry matter content.

RESULTS

Sample name	**FRIED CHEESE**		
Type	no additives	with dill	with chives
Dry matter content (%)	27.45	30.99	30.82
Standard deviation (%)	0.16	0.09	0.34

DRY MATTER CONTENT OF THE FRIED CHEESE CALCULATED 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.

SAMPLE PREPARATION

Before testing, sample must be stored in sealed packaging. Mix the sample if it takes a form of the semi-fluid product. Collect a small amount of the sample for testing. Collect samples from various spots.

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. Distribute a thin layer of the sample with a mass of ca. 2 ÷ 2.5 g throughout the weighing pan. Lock the drying chamber manually or automatically to start drying.

DRYING PARAMETERS / RESULTS

Sample name	**FRIED CHEESE**		
Type	no additives	with dill	with chives
Drying profile	Standard		
Drying temperature	110°C	120°C	
Sample mass (g)	~ 2 ÷ 2.5		
End of analysis	Auto 3	Auto 1	Auto 2
Dry matter content (%)	27.33	31.10	30.78
Standard deviation (%)	0.10	0.09	0.20
Analysis time $\acute{x}$ (min)	~ 13	~ 9	~ 13

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

Sample name	**FRIED CHEESE**		
Type	no additives	with dill	with chives
Dry matter content Ref. (%)	27.45 ± 0.16	30.99 ± 0.19	30.82 ± 0.34
Dry matter content MA (%)	27.33 ± 0.10	31.10 ± 0.09	30.78 ± 0.20
Analysis accuracy (%)	|0.12|	|0.11|	|0.04|

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.