DOG FOOD

water content determination

Dry food is probably the most common and convenient method of feeding dogs. Dry food usually comes into existence in the extrusion process concerned with processing starch materials under the influence of higher temperature, humidity and high pressure. In the engineering process, materials are ground and mixed, boiled, dried and coated with flavor substances. To obtain a long-life product, it is necessary to assure low water content which ranges from 5 to 8,5%. The low water content prevents development of bacteria and mold, thus it is not necessary to use preservatives. The water content in the dry food can be quickly and precisely specified through the drying method that uses IR radiation. This method has been laboratory-tested in the Radwag Research Laboratory. For the purposes of testing, MA R, MA X2, MA X7 and MA 5Y moisture analyzers by Radwag have been used.



The application note includes basic information for validation of the dog food 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 a 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 the sample down (with a grinder).

ACCESSORIES

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

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^{o}C for 3 hours. After this period, remove vessels and put into the desiccator until they cool down and then weigh. Place 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 or record the sample mass growth after drying.

RESULTS

Sample name	TROPI DOG PREMIUM	BASIC STERLET I	HIGH PROTEIN DISC
Water content (%)	7.82	2.51	7.60
Standard deviation (%)	0.01	0.01	0.01

DOG FOOD – THE 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 the sample down (with a grinder). The example of samples before and after grinding is showed on the side.



ORIGINAL SAMPLE



GROUND SAMPLE

ACCESSORIES

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

METHOD DESCRIPTION

Set drying parameters presented below. Collect the sample with a mass of ca. 2.5 ÷ 4 g and distribute a thin layer of the sample throughout the weighing pan. Lock the drying chamber manually or automatically.

DRYING PARAMETERS / RESULTS

Sample name	TROPI DOG PREMIUM	BASIC STERLET I	HIGH PROTEIN DISC
Drying profile		Standard	
Drying temperature	110°C	90°C	105°C
Sample mass (g)	~ 4	~ 3	~ 2.5
End of analysis		Auto 2	
Water content (%)	7.75	2.62	7.66
Standard deviation (%)	0.12	0.06	0.07
Analysis time $\acute{x}$ (min)	10	4	6

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

Sample name	TROPI DOG PREMIUM	BASIC STERLET I	HIGH PROTEIN DISC
Water content (%) – Ref.	7.82 ± 0.01	2.51 ± 0.01	7.60 ± 0.01
Water content (%) – MA R/X2	7.75 ± 0.12	2.62 ± 0.06	7.66 ± 0.07
Analysis accuracy (%)	|0.07|	|0.11|	|0.06|

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.