

## Practical Example: Comminution of Nuts – generation of representative samples

### Detailed sample preparation of nuts according to regulation (EG) no. 401/2006 with tips, approaches and photos of the individual steps

With the REGULATION (EG) no. 401/2006 of the COMMISSION of 23rd February 2006 binding standards for sampling procedures and analysis methods for the official testing of the mycotoxin content of food stuffs for example nuts was established.

#### The task in the laboratory is as follows:

„Each laboratory sample is to be prepared with a verifiable procedure which guarantees a complete homogenisation, ground finely and meticulously mixed.“

#### The regulation allows two means:

1. The nuts in the shell may be peeled and the aflatoxin content is to be determined for the edible share. This might be still feasible for peanuts. With walnuts, filberts or almonds this is very problematic though.
2. The other possibility is to use the nuts „inside the shell“ for the sample preparation.

#### The task:

10 kg peanuts, walnuts, filberts, Brazil nuts or also almonds must be comminuted so fine in a passable period so that a homogenous sample evolves which eliminates contamination with other samples and the cleaning of the instrument is possible in an acceptable time.



Fig. 1: Base material – 1 kg walnuts

#### The solution for the comminution of walnuts:

Besides the result, the needed time for the comminution always is a major factor. In order to test this 1 kg of walnuts were comminuted. Limiting element of the sample addition is the diameter of the funnel.

A standard funnel for long and bulk solids was chosen. On the one hand this funnel is easy to clean and, on the other hand the mill has the chance by slowly adding the nuts to comminute the material and discharge it from the cutting chamber. Otherwise if too much material is in the cutting chamber the material may get warmer and oil separates. Utilized was the 4 mm sieve cassette.



Fig. 2: Feeding into den standard funnel for long- and bulk solids

**The result:**

In less than 2 minutes were all nuts comminuted. Approximately 15 to 20 minutes have to be assumed for a sample of 10 kg. An ensuing glance into the opened Cutting Mill shows a good throughput of the walnuts. The sieve was unclogged. Additional material could have been put through. The rotor was removed without tools from the engine shaft and placed in front of the sieve. The sieve cassette was also removed without tools. Therefore all parts which need to be cleaned are very easily accessible.



Fig. 3: Walnuts comminuted with a 4 mm sieve



Fig. 4: The view into the opened grinding chamber shows an optimal throughput of the walnuts

**The solution for the comminution of almonds:**

Also almonds with shell may be put through very well. Used was again the 4 mm sieve cassette. After the opening of the mill almost no residue was left inside the grinding chamber.



Fig. 5: Almonds comminuted with a 4 mm sieve

**The solution for the comminution of peanuts:**

No problem with the Universal Cutting Mill with a 4 mm sieve cassette, the funnel for long and bulk solids and the steel standard rotor with V-cutting geometry.



Fig. 6: Peanuts comminuted with a 4 mm sieve

The norm also includes the sample preparation of grain, spices and coffee. Here also very good results are achieved with the **Universal Cutting Mill PULVERISETTE 19**.

**Author:** Dipl. Chem. Wieland Hopfe, Fritsch GmbH, E-Mail: [info@fritsch.de](mailto:info@fritsch.de)

**Editor:** Leos Benes, B.Sc.Pharm. Technology • Global Laboratory Manager, E-Mail: [benes@fritsch.de](mailto:benes@fritsch.de)