The diversity of foodstuffs with their often very different product properties represents a real challenge for food testing laboratories.

Before the actual analysis, the sample materials – which can vary strongly with regards to hardness and moisture – need to be homogenized and reduced to a sufficiently small particle size. RETSCH’s GRINDOMIX knife mills are the ideal tools to meet the complex requirements of sample preparation of food. The model GM 200 has proven itself for the homogenization of smaller sample volumes of up to 700 ml. For larger volumes RETSCH now offers the new GRINDOMIX GM 300 with a grinding chamber volume of 5,000 ml.

The wide range of accessories allows for easy adaptation to the individual application requirements:

**Liquid samples**
When preparing liquid samples such as soup, the use of RETSCH’s patented gravity lid with overflow channels provides the best results. The lid reduces the grinding chamber volume to the size required for thorough homogenization of the sample. It is designed in such a way that it floats on the surface of the sample.

**Hard Materials**
When grinding very hard products such as feed pellets, for example, a stainless steel grinding container should be used to minimize wear.

**Pre-grinding of medium-hard samples**
The GM 300 features a reverse mode which is suitable for medium-hard materials such as peeled nuts or frozen vegetables. To preserve the blades, the material is first comminuted with the breaking bar on the back of the knife (in reversed direction), before it is pulverized with the blades.

**Interval mode**
The interval mode improves the grinding process in such a way that the material is not permanently thrown upwards, but can settle down in defined intervals. The mixing of the sample results in a very effective size reduction, as all components are repeatedly submitted to the grinding process.
The GM 300 is very suitable for grinding plant materials which is the main application in the Regional Office of Criminal Investigation in Dresden.

In trials of drug offences, the expertise on the active components of the drug has substantial influence on the penalty. For cannabis, for example, a content of more than 7.5 g tetrahydrocannabinol (THC) is already considered critical. The expertise is usually given by the local Office of Criminal Investigation.

In the laboratory of the Regional Office in Dresden, the cannabis plants are first reduced in size, followed by an extraction of several part samples of the ground material. The extracts are then analyzed by gas chromatography.

"We usually deal with larger sample volumes", explains Thomas Paulick, Laboratory Manager at Dresden’s Regional Office of Criminal Investigation. "Therefore it is essential to extract a representative part from the entire sample amount, to ensure a reliable quantification of the active component. The GM 300 fulfills this requirement: from up to 4 liters of plant material we receive a homogeneous sample from which we can then take approximately 0.5 g for further analyses. We process leaves with remnants of thin twigs as well as highly resinous blossoms without cooling – which is no problem for the knife mill. Grinding time and speed are selected according to the properties of the plant. The closed design and removable grinding container help to reduce the formation of dust during homogenization. To sum it all up, the new GM 300 has proven to be highly suitable for our requirements."

Eurofins has built a global network of laboratories and competence centers for food and feed analyses. Their range of services includes simple chemical and microbiological tests, nutritive analyses, trace analyses of residues and contaminants, biomolecular methods, allergen analyses, analyses of authenticity and origin and many more.

RETSCH mills form an important part of the sample preparation work at Eurofins laboratories. In Hamburg the lab is equipped with two GRINDOMIX knife mills, one ultra centrifugal mill and one cutting mill from RETSCH.

We achieve very good results for the size reduction and homogenization of foodstuffs with the GRINDOMIX GM 200", says Matthias Nickel, Team Leader Sample Preparation at Eurofins GfA GmbH, the competence center for POPs, dioxins, PCB, BFR, PFC, etc. in Hamburg. "However, the packaging units are often too big for the GM 200. We are happy that RETSCH has now bridged this gap with the new GM 300."

Whereas the container of the GM 200 has a volume of 1,000 ml, the GM 300 offers a volume of 5,000 ml, so that common retail quantities (e.g. 2,500 g French fries, a whole pizza, salad or cabbage) can be processed in one go. "For ultra trace analyses of organic contaminants stainless steel jars, as available for the GM 300, are an essential accessory", explains Nickel. "The innovative pre-grinding which is effected by the breaking bar of the knife in the reverse mode accelerates sample preparation of hard feedstuffs such as sugar beet pellets."

"Due to the fact that we process a great number of different samples every day, quick and easy cleaning of the mills is of utmost importance for us", adds Matthias Nickel. "We are highly satisfied with this feature of the GM 300 – all parts can be easily removed and cleaned in the dish washer or autoclaved."