

Technische Universität Dresden (TUD)

The Technische Universität Dresden (TUD) has its roots in the Royal Saxon Technical School that was founded in 1828. Today it is a university that unites the natural and engineering sciences with the humanities and social sciences, as well as medicine. This wide range of disciplines, which is unique in Germany, brings with it the obligation for the university to promote interdisciplinarity and to contribute to the integration of science into society. As a university with 18 faculties in five schools, TUD offers a broad variety of 121 degree courses and covers a wide research spectrum in the Research Priority Areas (RPAs) Health Sciences, Biomedicine & Bioengineering, Information Technology & Microelectronics, Smart Materials & Structures, Energy, Mobility & Environment as well as Culture & Societal Change.

Since 2012, TUD is officially one of eleven “Universities of Excellence” in Germany. Its core elements are the Institutional Strategy “The Synergetic University” with the unique research alliance DRESDEN-concept, the Clusters of Excellence “Center for Advancing Electronics Dresden” (cfaed) and “Center for Regenerative Therapies Dresden” (CRTD) as well as the Graduate School “Dresden International Graduate School for Biomedicine and Bioengineering” (DIGS-BB).

About 33,500 students are enrolled at TUD – more than three times as many as in 1990. Internationally, TUD has earned an excellent reputation, about one eighth of the students come from abroad. Today, about 11,300 employees from 70 countries are working at Technische Universität Dresden. TUD is among the 20 most innovative universities in Europe (“Reuters Top 100: Europe’s Most Innovative Universities”). In 2016, the third-party funding was EUR 257.7 million, and the number of patent applications was 131.



Institute of Natural Materials Technology (INT)

The Institute of Natural Materials Technology at Technische Universität Dresden comprises competencies in the retrieval, processing and refinement of natural materials along the entire value chain with respect to, for example, foods (Chair of Food Engineering), biotechnological

products and processes (Chair of Bioprocess Engineering), or wood and fiber-based products (Chair of Food and Fiber Material Technology). The Chair of Agricultural Systems Engineering as well as the Chair of Processing Machines and Processing Technology account for the respective engineering competencies. The recently established Chair of Technology of Productive Biofilms (joint appointment with the Helmholtz Center for Environmental Research - UFZ) and the appointment of the spokesman of the Papiertechnische Stiftung as Honorary Chair of Paper Technology additionally strengthen the Institute of Natural Materials Technology. This enables a strong linkage of academic education with application-based research and development, which is also documented by the intense cooperation with the Fraunhofer IVV for Processing Machines and Packaging Technology.



The Chair of Food Engineering at INT

Food Engineering can be regarded as a scientific discipline which covers nearly all aspects from the transformation of agricultural raw materials into products used for human consumption. Food Engineering comprises a broad spectrum of applied engineering subjects which are partially characterized by a significant contribution from natural science. The main activities of the Chair of Food Engineering at the Technische Universität Dresden are technological in nature. The research activities mainly deal with challenges at the interface between engineering and science, showing a particular context to food quality and food safety. On the one hand emphasis is placed on selected unit operations used in food processing and on physical properties of foods and, on the other hand, on certain dedicated food systems such as milk and fermented dairy products, bakery products, and sweets and confectionery.

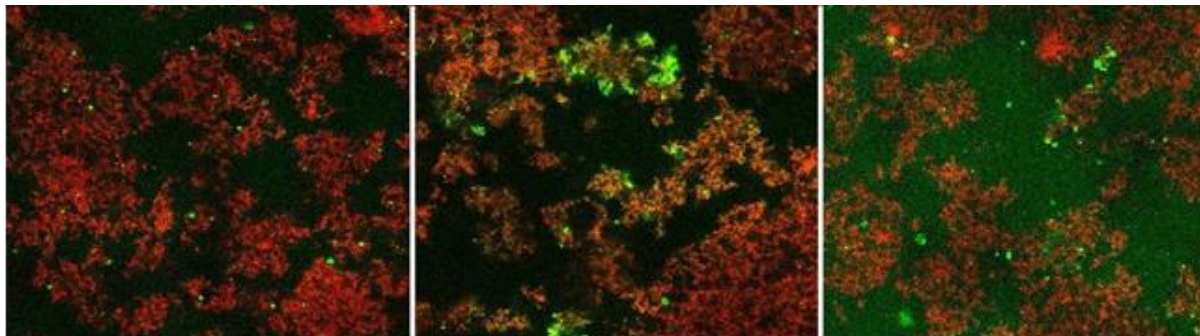
Research focus: Product technologies

In the traditional, vertical research approach of food technology – where the development of food products from raw materials is considered – the primary focus is on chocolate and confectionery products, bakery products, and dairy products. As regards the product cycle, main emphasis is placed on both aspects of raw materials quality but also on technological factors of influence, and on the quality of the resulting end products. Some of the projects are carried

out jointly with partners from the food industry to solve their individual and specific problems. In public funded projects that have a more basic or pre-competitive character, it is intended to develop new applications for new raw materials or production processes. In the BERRYPOM project performed with partners from Sweden, United Kingdom, Spain and New Zealand as part of the ERA-Net action, possibilities for the use of berry pomace as techno-functional food ingredient were evaluated, and the basis for a broad application was achieved.

Research focus: Functional ingredients and biomacromolecules

Biomacromolecules comprise a heterogeneous group of biogenic natural materials that, whether they are added as hydrocolloids or whether they are produced *in situ* as fermentation by-products, play an important role for food quality. Biomacromolecules are able to significantly influence product properties such as energy content or texture, but also show consequences on the efficiency of technical processes such as the cleanability of food contact surfaces. The work in this research area specifically points towards the interface between basic and application-oriented questions. Only once the mechanisms of interaction between biopolymers and other food constituents are known, it is possible to generate potential application fields in food technology, and to reasonably transfer the results into practice.

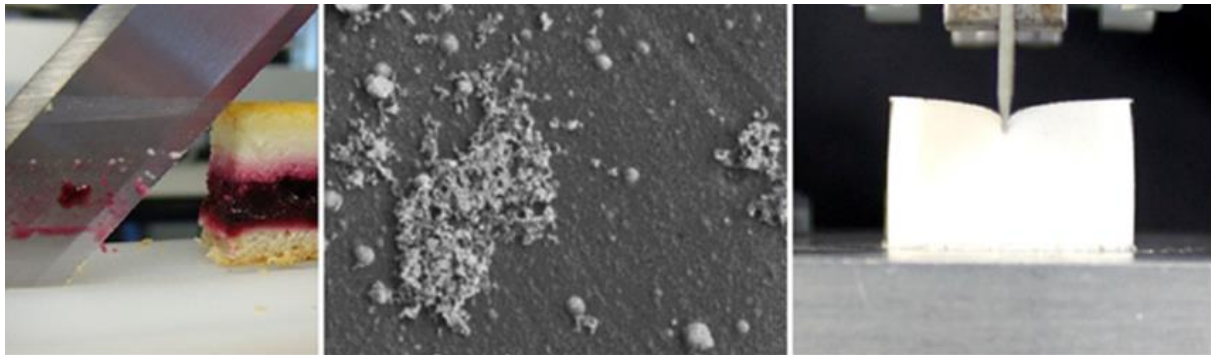


Research focus: Sensory and consumer science

Human nutrition behavior is, to a large extent, determined by sensory perceptions that arise during consumption of foods. Sensory science basically deals with properties of foods that are perceived by the human senses. There are a large number of procedures and methods to determine, to verbalize and to quantify these perceptions. In many cases, however, the respective results depend on the method of choice, and on the interpretation of the statistical evaluation. The work of the Chair therefore focuses on the applicability of sensory methods and their statistical evaluation. Influences on food choice are also considered, as is the potential of functional food ingredients and that of energy- and nutritionally optimized foods. There are respective co-operations with colleagues from marketing, psychology, food chemistry, and medicine. The main aim of the COSUS project, jointly carried out with partners from four EU member states, was to find possibilities for the reduction of food waste. The necessary sensory experiments were designed and carried out by the Chair of Food Engineering.

Research focus: Food process engineering

In the working areas related to cutting techniques, and to soiling and cleaning, emphasis is placed on the analysis of distinct phenomena in unit operations. In the focus are interactions between materials and machines, but also between materials and process. By featuring towards model systems, the main aim is to solve basic correlations to have a basis for further verification by using complex real systems. These research projects are performed in co-operation with manufacturers of food products which directly apply the respective processes, but also with machine suppliers of the food industry. These co-operations ensure that the research findings can be transferred easily into practice, and that they are finally accessible to a large group of users.



Further information and contact

Prof. Dipl.-Ing. Dr. habil. Rohm Harald
Technische Universität Dresden
Bergstraße 120
D-01069 Dresden, Germany

harald.rohm@tu-dresden.de

<https://tu-dresden.de/ing/maschinenwesen/int>