



THE LAND OF SMELL, TASTE, AND TOUCH



Photography by Jakub Ostałowski

The Institute of Animal Reproduction and Food Research, Polish Academy of Sciences, one of the most robust centers for research on food and its improved quality. This year, the Olsztyn-based Institute celebrates the 30th anniversary of its establishment.



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ACADEMIA: The year 1988 would not seem to have been the best year for science in Poland, and yet it saw the establishment of the Institute in Olsztyn. How did that happen?

MARIUSZ K. PISKUŁA: In March, Prof. Kozłowska was recruiting people for a team that would conduct food research in the newly-founded PAS Center for Agrotechnology and Veterinary Sciences. When the project was launched, the whole of the Center consisted of around thirty enthusiasts and a stamp. It comprised the Department of Reproductive Endocrinology and the Department of Food Technology in Olsztyn as well as the Department of Experimental Pathology in Poznań.

Initially, we rented empty rooms from the Academy of Agriculture and Technology in Kortowo. It was necessary to get all the equipment up and running. We stayed there for two or three years, and that was the most difficult period. A certain turning point took place after 1991. The Department of Food Technology moved to a separate location, to the barracks in Pożorty. It became a partner in a project that brought a small amount of money for research. The barracks were also occupied by other tenants. Sounds of family

fight were heard through the walls, and there was the smell of cutlets in the air. The situation was simply dramatic. Finally, we made a rather risky decision and started building our own head office. We wanted to construct the bare bones of the building at our own expense and then present the authorities with an accomplished fact, thus demonstrating our determination. Then, the Scientific Research Committee gave us what back then was enormous funding, namely 4 million zlotys. We moved into the new building in 1999.

Our colleagues from the Department of Reproductive Endocrinology and Pathophysiology were in a similar situation – they had been renting for many years, too. First, we obtained a ruined building from the University of Agriculture and Technology and renovated it – it was called “twelve” (there were no street names in Kortowo, the buildings only had numbers). After that, by virtue of a decision made by the governor of the province, we took over another ruined property that we brought back into use. Our colleagues responsible for animal reproduction moved into the building as their final location. We’ve occupied these two buildings ever since. Several years ago, we opened new departments in Białystok under



an agreement between two divisions of the Academy – back then they were Division II and Division V, or medical sciences and agricultural sciences, respectively – and the Medical University of Białystok. The Department of Biology and Pathology of Human Reproduction is located at the Teaching Hospital of the Medical University of Białystok and the Department of Prophylaxis of Metabolic Diseases in the Białystok Science and Technology Park. We don't have the required qualifications to treat patients, so we deal with prophylaxis and look for links between the environment, including food, and its effects on health, both the positive and the negative ones.

It would be more convenient if all those scattered units were in the same place. Is there a chance of that happening?

Yes, six years ago, the idea was put forward to build a new seat at the Olsztyn Science and Technology Park. The city of Olsztyn helped us a lot, because we managed to buy a plot of two hectares at the Park at a 90% discount. The following step involved obtaining funds. The only way to get the money from the Regional Operational Program of Warmia and Mazury

involved situating the investment project within the framework of the Science Ministry's Polish Roadmap for Research Infrastructures. We didn't hope to receive funding from the Ministry, but that opened up the road to regional funding. In December last year, we and the marshal of the Warmińsko-Mazurskie Province signed a project worth 93 million for the construction of a new head office. Everything looked beautiful, but the trouble was that we needed a 15% deposit. We didn't have such resources, so we opted for a public-private partnership: we would commission a contractor to carry out the project, the contractor would finance it, and we would repay the money after using the property for a decade or so. I would like to add that there is a considerable interest in this project. We assume that the construction will start at the end of this year and will finish before the end of 2020. We hope that we will be working in our new head office in 2021.

Your institute is one of very few PAS institutes that deals with so many topics. Is conceptual mobility something internally required here?

Not to the extent we would like, partly due to the dispersed organizational structure. One of the argu-

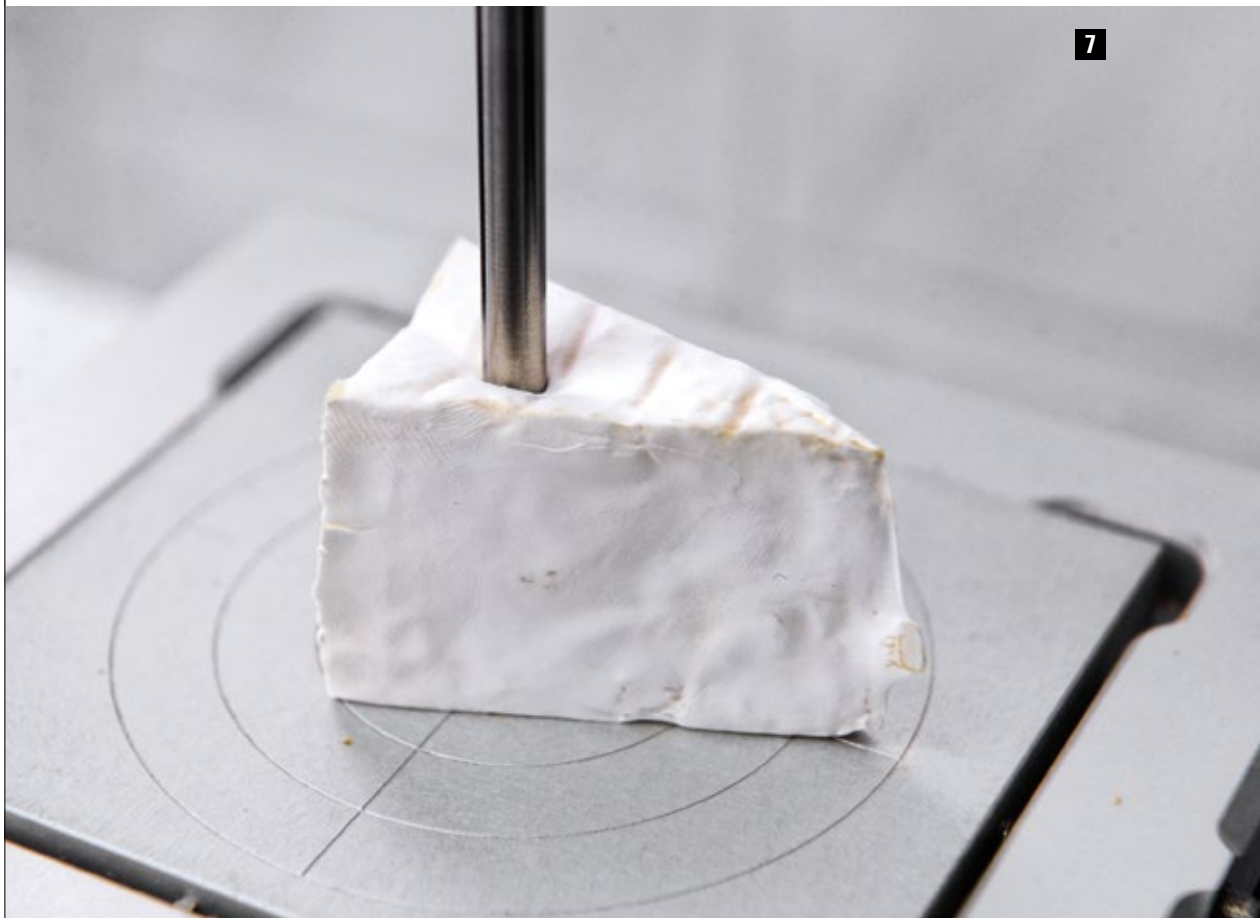
Photo on pp. 66–67
Sensory analyses (smell, appearance, flavour, texture) of innovative and market food products conducted by a highly-trained panel that performs evaluations in the Sensory Laboratory.

Photos 1 and 3:
The Metabolomics Laboratory measures the level of biologically active compounds and their metabolites in raw materials, food products, and biological material.

Photo 2:
The fractionation of cellular proteins in studies on the immunogenic properties of probiotic bacteria.



Photos 4, 7, and 8:
Analysis of the texture
of food products, which
often determines consumer
acceptance.





ments in favor of having all the units situated in the same place is daily contact, for example over breakfast or lunch. A lot is happening in such relations. Whether willingly or not, you touch upon research issues. One great example was Prof. Leslie Kozak, who implemented a project from the Welcome Program of the Foundation for Polish Science in our institute, and he introduced new research lines for us – thermogenesis and nutritional programming. Concepts for several other projects were born during informal, sometimes social meetings. That's what we lack on a daily basis.

How does the Institute manage with the modest funding for science?

We're trying to engage the world of business in joint projects, for example in the large pan-European consortium called EIT Food. We are one of the partners in this project. The initiative was launched last year, we submitted several projects, some of them were granted, and we've already submitted other projects for 2019. The whole of the EIT Food means 50 partners with a target budget of 400 million euros over seven years. That's a large pool of funding, and there's a chance for some of this money. That's not an easy way of obtaining money, but it allows us contacts with Europe's best, even with the world's best. Moreover, in order to secure funding from independent sources, we allot around 30% of our investment in the Olsztyn

Photo 5:
The isolation of potentially probiotic strains of bacteria from kefir grains.

Photo 6:
Samples of different types of honey prepared for sensory evaluation.

Photo 9:
The assessment of the impact of differences in the grinding and fractionation of raspberry pomace on the content and composition of polyphenols, fiber fractions, and fatty acids.

Photo 10:
Examination of the unique structure of kefir grains.

Photo 11:
Studies of the impact of biologically active compounds obtained from fruit pomace on the process of the alleviation of metabolic disorders.



Science and Technology part to collaboration with business partners. If companies start investing in research and development, that will be very good.

What research do you mean?

For example, animal *in vitro* studies. In a normal cycle, a highly fertile cow can give birth to one calf a year. My colleagues are perfecting a technology that involves collecting eggs from a cow after adequate hormonal treatment, fertilizing them *in vitro* with the semen of a highly fertile bull, and placing the embryos in surrogate cows. In this way, we can have several dozen calves a year, as opposed to one. I think this has a considerable business potential.

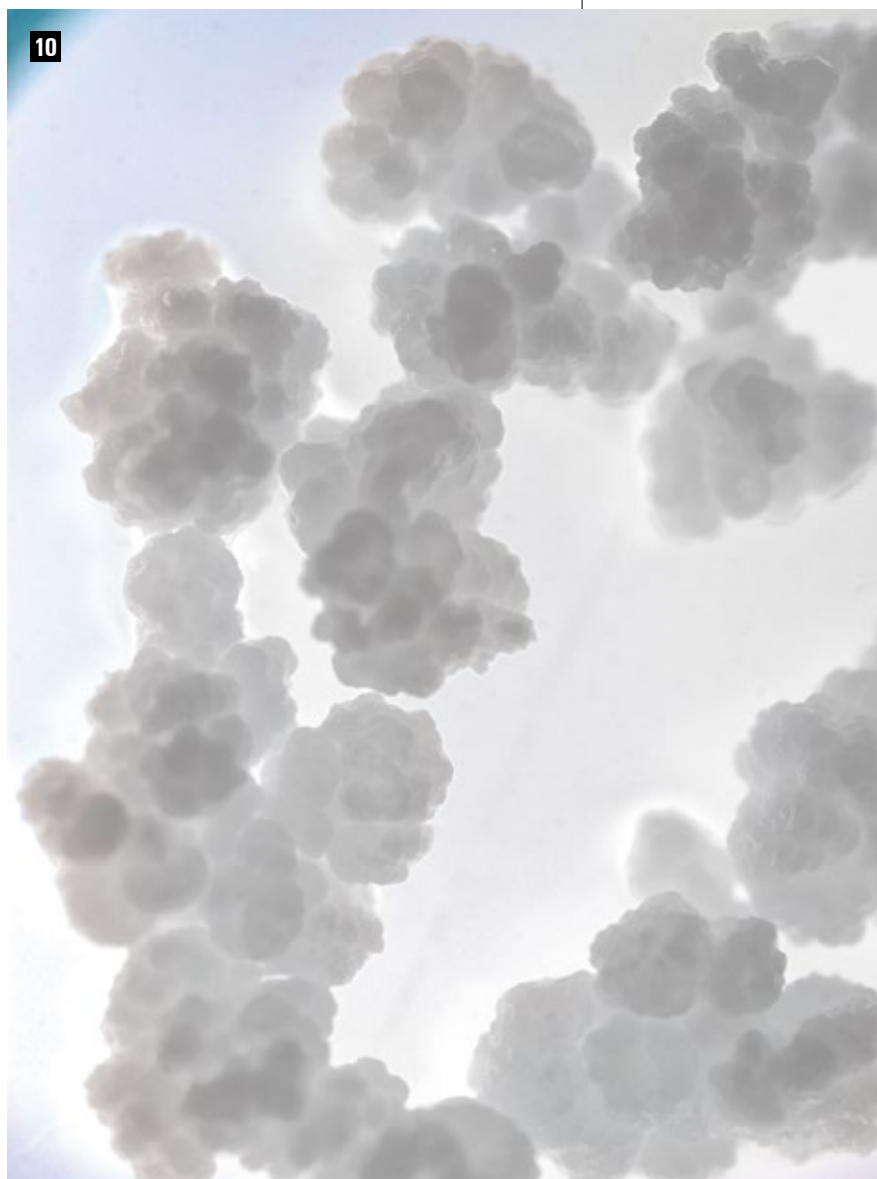
Another project in animal reproduction is fish farming. It chiefly involves the cryopreservation of semen, which can be stored and used for hundreds of years. For example, let's take the salmonids. Some of them spawn in spring, others in the fall. The idea is that maybe crossbreeding would result in a superproduct on the market. It is necessary to collect material from the fall-spawning group and from the spring-spawning group, preserve it, and produce offspring with superior performance at a convenient time. That's currently a very popular topic.

We're also interested in other areas that have practical applications: gluten-free baking mixes, various

sensors, or biosensors for medical diagnostics and environmental monitoring, prebiotics and probiotics, food with reduced allergenicity. As part of the aforementioned EIT Food, we are involved in the development of innovative poultry feed with the use of insect protein.

For the past two years, the Institute has also managed the research station in Popielno. That's a unique site, but its management poses a considerable challenge. What's the plan for the station?

It's simple. The Popielno station has 1,600 hectares of forests, where four herds of the Polish Konik horses are bred in a reserve, in natural conditions. We manage the forests, but that's unfortunately not enough to cover the costs related to the Konik horses alone. In addition to breeding horses in a reserve, we have several dozen horses in breeding stables. When we took over the station, there was also a beaver breeding program, fortunately on a considerably reduced scale. The beaver infestations in Poland have their roots in Popielno. We're considering eliminating the program and leaving two or three families as a tourist attraction. In addition to the forest, which we have been given to use, we have also taken over agricultural land for our purposes, including a base to work with large an-



imals. We also have two herds of local cattle breeds: the Polish Red and the Polish Black and White. They are maintained in the genetic resources conservation program and treated as natural heritage. As part of restructuring, we moved the cattle from Popielno into the Wielki Las farm, owned by the station. We established a new Department of Biodiversity Protection. We would like it to be ultimately located in Wejsuny, also owned by the station. As for the Popielno station, we focus on the Polish Konik horses as well education, popularization, and tourism. We manage the directions of tourist traffic on the Popielno Peninsula to protect endangered species and natural habitats. We have a small herd of cervids, which were objects of research, just like beavers, but we're now reducing them to exhibitions for tourists. Every year, we are visited by around 10,000 people. They want to ride the Konik horses and go for a walk in the woods with a guide, so there will be short- and long-term parking lots and an observation tower to make the site more attractive. It includes a former school building that offered affordable overnight accommodations, but we would like to modernize it, improve the quality of the services, and use it for the purpose of education, for example the organization of outdoor education trips for schools.

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