

SPRINKLE GENEROUSLY WITH RASPBERRY POWDER

We discuss meal colors, food-drying secrets, and changing consumer demands with **Dr. Anna Michalska** from the PAS Institute of Animal Reproduction and Food Research in Olsztyn.

ACADEMIA: These days we don't really think of many fruits as seasonal anymore, with imports from other continents being accessible throughout the year. For instance, this applies to strawberries, raspberries, blackberries and blueberries. So why do we need fruit powders?

ANNA MICHALSKA: Above all they offer an easy-to-use form of natural food additives. Rather than eating imported fruit, the price and availability of which varies depending on the season, the idea is to have access to a healthy product on a daily basis. Fruit powders can be an addition to our everyday meals, on one hand enriching products with biologically active compounds, and on the other they may be used as a natural dye to make our meals more colorful.

What are the fruit powders available on the market today made of? How many ingredients do they contain that aren't beneficial to our diet?

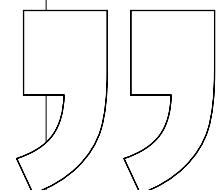
The fruit powders available on the market today contain carrier agents, which facilitate the drying process while at the same time affecting the structure of the powders. Unfortunately, it is virtually impossible to pulverize fruit or juices without the use of such carriers. But manufacturers add these substances in excessive amounts, so that the proportion of natural fruits and juices in the final product is often less than 30%, which greatly reduces its potentially beneficial properties.

What prompted you to attempt to improve fruit powders?

It all began during my internship at the University of Applied Sciences in Sion, Switzerland, where I conducted research on juice from goji berries, açai and whole pomegranate fruit. It turned out that pure juices from these fruits simply do not taste good and are

often very bitter. We are accustomed to fruit juices that are sweet. Knowing how valuable these fruits are in terms of their content of biologically active compounds, which are beneficial to health, the idea arose to pulverize them and obtain a product that would contain these compounds, and at the same time could be added to a wide range of food products. My research showed that it is difficult to retain those beneficial compounds. That's why I have been working on technologies to obtain powders that retain as much of the beneficial content as possible with minimal use of carrier substances.

Fruit powders will not replace the taste of fresh fruit, but can be a healthy addition to other products.



What technology did you use to develop new, improved powders?

It's still a secret. I can, however, reveal that we are developing new, innovative food-drying methods, as well as other techniques, such as removing sugars from juices, which mainly determine the process of water elimination from such products.

What part of the work proved to be the most difficult?

Research work is primarily about continually pursuing an objective, often through very winding, unexpected paths.

I can't really say what the most difficult part was because there were new challenges at every step. However, I wouldn't consider the challenges difficult. They motivate me to work harder and be more creative.

What are the chances that the new fruit powders developed by you will replace artificial additives in the food industry?

I think there is a very good chance of that happening, especially since consumers are increasingly forcing manufacturers to use natural additives. This increasingly widespread awareness of healthy-eating issues among consumers will make manufacturers who use artificial additives lose money, as they will not be able to sell their products.

Which fruits did you choose for your research?

When conducting research funded by Poland's National Science Centre, I have worked with blackcurrants, apples and plums, which are common fruits in Poland. I also work with chokeberries, cranberries, and blueberries.

Did you partner with foreign research centers?

To be honest, it all began with partnerships with Europe's leading research centers. I had the pleasure of working with scientists from the Miguel Hernandez University in Spain, the Norwegian University of Technology in Norway, the University of Applied Research in Switzerland, the Spanish Institute of Industrial Fermentations (CSIC) in Madrid and the Hacettepe University in Turkey. I also participated in the TOP 500 Innovators program financed by the Polish Ministry of Science and Higher Education, thanks to which I was a visiting researcher at the prestigious Stanford University in the United States.

Which bioactive compounds contained in fruit powders are the most beneficial to our health?

It is difficult to mention a few such compounds. It all depends on the raw material, because each fruit has its own groups of compounds that are beneficial to human health. It is important to provide these compounds in a natural form that can compete with artificial additives.

Is fruit-drying completely safe, or are there any harmful substances that occur during the process?

Processing always brings consequences, both negative and positive. For example, higher temperatures during the process of drying fruits or fruit juices into powders can lead to a series of reactions between the components found in the fresh material. This may cause a degradation of compounds that are beneficial

to human health, during which harmful compounds may be formed, but it may also lead to a beneficial combination of compounds, resulting in healthy products. It all depends on the degree of processing, the drying technique used and the composition of the starting product.

Do you think it is advisable to enrich powders with additional substances, even those good for us, if they are not present in the fresh fruits?

Since in my research I strive to develop products rich in natural biologically active compounds while eliminating harmful substances, I see no point in creating such products. We are talking about designing new additives with targeted properties and a special purpose.

Are the powders developed by you a kind of futuristic food that will become part of our daily diet in the future?

I don't think so. It is simply extracting the healthy, natural products from raw materials and offering them to consumers in the form of healthy additives and food ingredients.

Could food powders be used as an alternative source of healthy, fresh food, should it one day become scarce due to climate change, overpopulation and pollution?

In a sense, they are already an alternative source. Fruit powders have a much longer shelf life than fresh fruits, so they can be more readily available. In addition, their transport is much cheaper than fruit, which can contain up to 95% water. Therefore, their global distribution will be more economical and sustainable. Of course, they do not replace the taste of fresh fruit, but can be a healthy addition to other products.

Will you try to interest the Polish industry in your new technology? Or maybe you've already done so? In other words, when will Poland begin manufacturing your new fruit powders?

Soon. We are currently working on reducing the cost of producing fruit powders because it is relatively expensive. In order to maintain the highest quality, as similar as possible that of the raw materials, we have to use special multi-stage production technology. Currently, their production cannot compete in terms of price with the use of cheap artificial additives. Soon, however, food manufacturers will be forced to change their approach to using natural products.

INTERVIEW BY ANNA KILIAN

PHOTOGRAPHY BY JUSTYNA CIEŚLIKOWSKA



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works at the Department of Food Chemistry and Biodynamics of the PAS Institute of Animal Reproduction and Food Research. She does pioneering work developing pre-treatments and suitable drying methods for fruit commonly grown in Poland, including apples, plums, blackcurrants, chokeberries and cranberries. This year's winner of the L'Oréal Poland Award for Women and Science for developing methods of obtaining fruit powders that can replace artificial additives in the food industry.

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