RAPID TESTING OF FOOD PRODUCTS QUALITY (ШВИДКА ПЕРЕВІРКА ЯКОСТІ ХАРЧОВИХ ПРОДУКТІВ)

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Якість харчових продуктів, їх відповідність установленим стандартам може перевірятися за допомогою звичайного смартфона, оснащеного сучасним програмним забезпеченням.

Whether fruit, meat or cheese – the quality of food is not always as consumers would like it to be. But, in future, a spectrometer will allow them to gage the quality of food before they buy it. No bigger than a sugar cube, the device is inexpensive to manufacture and could one day even be installed in smartphones.

Buying the right food is often a question of sheer luck for consumers. But all that is set to change. In future, all you will need to do is hold your smartphone near the product in question, activate the corresponding app, choose the food type from the menu – e.g. "pear" – and straight away the device will make a recommendation: the fructose content of the pear is high, so buy it! The application is based on a near infrared spectrometer which measures the amount of water, sugar, starch, fat and protein present in the products. The system "looks" several centimeters below the outer surface of the foodstuffs – which means it can detect, for instance, whether the core of an apple is already rotting.

But how does the device actually work? By shining a broad-bandwidth light on the item to be tested – for instance a piece of meat. Depending on the meat's composition, it will reflect different wavelengths of light in the near infrared range with different intensities. The resulting spectrum tells scientists what amounts of which substances are present in the foodstuff.

Spectrometers are usually manufactured by assembling individual components: the mirrors, optical gaps, grating and detector each have to be put in place individually and properly aligned. The thin silicon wafers are large enough to hold the components of several hundred spectrometers, which means that hundreds of near infrared systems can be produced in one go.

The device can also detect forgeries, for example, and can verify whether a product is made of high-quality original materials or whether it is a cheap fake. It can also reveal whether parts of a vehicle's body have been repainted, as well as test the contents of drugs and cosmetic creams.