IISER team uses LED device to detect rotten food

Jul 30, 2023, 08.30 AM IST

Pune: What if consumers know that fruits are rotten even before cutting them? Researchers from the Indian Institute of Science, Education and Research (IISER), Pune, have developed an LED light source that could detect freshness of food.

When the light flashes on the food, consumers, store owners, farmers, and stockists would be able to identify rotten fruits and vegetables which look fresh from the outside.

The device would also be able to identify the rot at a very early stage such that the fruits and vegetables are still good for consumption reducing wastage. The product has still not been commercialised yet as researchers are working on making it cost-effective for everyday use. The paper has been published in the journal 'Angewandte Chemie' this month. The team has modified the LED light with a material called 'perovskite' that could simplify the quality control of fresh fruits and vegetables and contact-free monitoring of food.

The team comprising Sajid Saikia, Animesh Ghosh and Angshuman Nag, from IISER Pune, used modified LEDs to examine apples or strawberries and observed dark spots that were not visible in standard camera images.

"Illuminating the food with both white and near-infrared (NIR) light revealed normal colouring that could be seen by the naked eye, as well as those parts which were starting to rot and not visible to the naked eye," Nag said.

The team has successfully developed the device with LEDs but commercially available infrared cameras used to detect the rot in images of the food are expensive running into lakhs of rupees.

"We will have to work on low-cost infrared cameras. Once that happens, it can be developed for market use," Nag added.

NIR is already used in the food industry to examine freshness in fruits and vegetables. Saikia said, "Food contains water, which absorbs the broad near-infrared emission at around 1,000 nm. The more water that is present due to rotting, the greater the

absorption of near-infrared radiation, yielding darker contrast in an image taken under near-infrared radiation. This easy, non-invasive imaging process can estimate the water content in different parts of food, assessing its freshness."