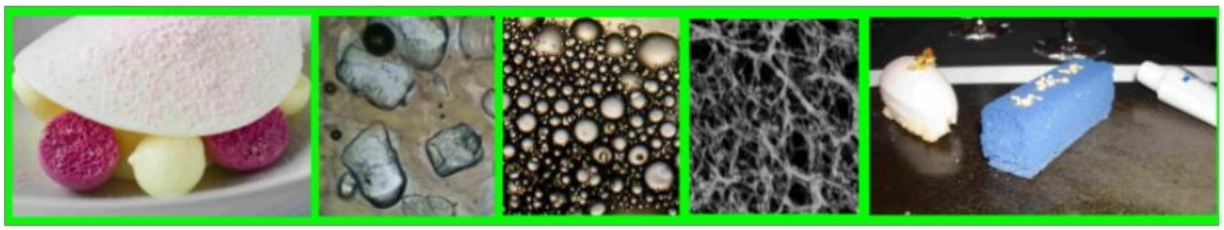

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Image for thought

Intruding into fresh berries non-destructively

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Figure 1. Interior of a fresh berry using high-resolution X-ray micro-computed tomography. Objects inside are seeds. The fruit was eaten after the analysis. Marker: 0.5 mm.

Berries are valued for their flavor and health-promoting benefits, attributed mainly to their antioxidant properties. However, they also contain a high proportion of fibers in the peel and pulp. Their seeds, often a sensorial and processing nuisance due to their hard texture, contain valuable essential fatty acids and bioactive compounds (Sławińska *et al.*, 2023; Van Hoed *et al.*, 2009).

For example, blueberries contain up to 50 small seeds per berry, around 1 mm in size (Castro *et al.*, 2012). Wild berries and similar small wild fruits abound around the world and are traditionally consumed by local people as safe, tasty, and nutritious foods, often used as medicine. These wild fruits have played an important role in the nutrition and biocultural aspects of rural communities worldwide (Aguilera and Toledo, 2022).

We are currently studying *Ribes magellanicum,* a small round wild berry from Patagonia about 5 mm in diameter, that has an abundant seed content. More important perhaps, these wild berries are finding their way into novel dishes by prominent chefs in haute cuisine. They exploit local berries in their restaurants as fresh and freeze-dried fruits and also as fermented products like sauces, miso, vinegar, kombuchas, and garums (Pieroni, 2021; Redzepi and Zilber, 2018). Pictures of fruits of *Ribes magellanicum* can be found at: https://biblioteca.inia.cl/bitstream/handle/20.500.14001/68065/NR42599.pdf?sequence=1&isAllowed=y

The figure here shows a fruit of *Ribes magellanicum* and its many seeds (17 ± 3 per fruit). The berry, was observed with high-resolution X-ray micro-computed tomography (micro-CT) (Skyscan 1272, software version 1.1.17, Bruker Corp., Kontich, Belgium). The sample was fixed to a holder and scanned over the range of 0-360 ° with a rotation step of 0.2 °, 0.9 s exposure time per frame, with a source voltage of 42 kV, a current of 195 µA and a pixel size of 5 µm. No filters were used during the scanning. Image reconstruction was performed with NRecon software (v. 1.7.4.2, SkyScan, Kontich, Belgium). Ct-Vox software (v.3.3.1, Bruker micro-CT, Kontich, Belgium) was used for volume rendering.

In the figure, the skin and the calyx (top) are faintly delineated but the seeds are prominently revealed. We suggest that this technique be used for non-invasive and non-destructive observation of the microstructure of foods, and in the future by the food industry for quality control (as do our luggage in airports). As reviewed by Schoeman *et al.* (2016), X-ray μCT imaging characterizes structures three-dimensionally, allowing evaluation of microstructural changes at resolutions as high as a few hundred nanometers

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