Supporting Information

Integrated Digital Microfluidic Platform for Colorimetric Sensing of Nitrite

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S1. Sample preparation

For preparing the vegetable sample, 200 g ±10 g of vegetable was homogenized completely immediately after collection. The homogenate was filtered with gauze to get vegetable juice. For sample of ham, 200 g ±10 g of the processed ham was homogenized before sampling for pretreatment. For pickles and bean curd, 200 g ±10 g of pickles or bean curd was homogenized regardless of the solid or liquid mixture. The homogenate was sampled for pretreatment.

S2. Pretreatment for vegetable

5 mL of the vegetable juice was sampled and mixed with 5 mL of acetonitrile, followed

by vigorous vortex for 1 min. For spiked sample, the vegetable juice was sampled with addition of nitrite solution (10 mg/L) to reach a concentration of 500 μg/L. Then, the solution was mixed with 5 mL of acetonitrile, followed by vigorous vortex for 1 min. After then, the subsidence was removed through centrifugation. The remained supernatant was added with 2 g of NaCl, and 100 mg GCB. The mixture was stirred for 1 min and sit for 5 min. The undissolved NaCl with large portion of GCB was deposited at the bottom of the mixture. The aqueous layer of nitrite ion with some floated GCB was in the middle layer. And the acetonitrile with less water was on the top. The aqueous layer containing nitrite ion was adsorbed with a syringe, and filtered with 0.22 μm PTFE membrane (hydrophobic). Finally, a transparent aqueous solution with nitrite ion was obtained, which was used for colorimetric detection.

S3. Pretreatment for meat, pickles and bean curd

5 mL of the homogenate was sampled and added with 20 mL of water initially, followed by vigorous vortex for 10 min. For spiked sample, 5 mL of the homogenate was sampled and added with 250 μL nitrite solution (10 mg/L) and 20 mL water. After then, the mixture was centrifuged to collect 5 mL of supernatant. Furthermore, the supernatant was mixed with 5 mL of acetonitrile to obtain precipitate and centrifuged to remove them. The remained supernatant was added with 2 g of NaCl, and 100 mg GCB. The mixture was stirred for 1 min and sit for 5 min. The undissolved NaCl with a large portion of GCB was deposited at the bottom of the mixture. The aqueous layer of nitrite ion with some floated GCB was in the middle layer. And the Acetonitrile layer was on the top. The aqueous layer containing nitrite ion was adsorbed with a syringe, and filtered with 0.22 μm PTFE membrane (hydrophobic).

Finally, a transparent aqueous solution with nitrite ion was obtained, which was used for colorimetric detection.

S4. Detection of the food samples

Droplets (3 μL) of the prepared samples were added to the DMF platform and detected one after another by using the measurement process as described in the main manuscript. The nitrite concentration of vegetable juice is directly measured by the DMF platform. The nitrite concentration in the homogenate of ham, pickles and bean curd are fourfold of the measured results through the DMF as the samples are diluted during the pretreatment.