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# NUTRITION AND FOOD

## Browning

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Major

Food preservation and processing

### ■ Research topics

## Browning of foods

### Keywords

Browning, enzymatic browning, Maillard reaction, fruits, vegetable

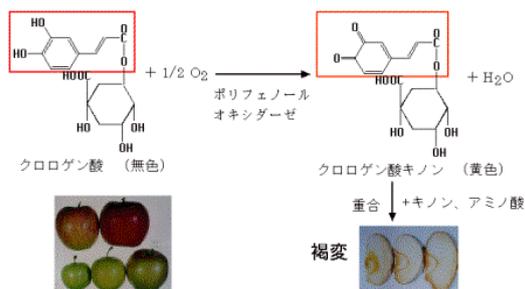
### Contents

#### ■ Overview (background, goal, detail)

Color of foods is changeable during food processing and preservation, and foods often turn brown or dark. This phenomenon is called browning. The browning is categorized in two: one is enzymatic browning and another is non-enzymatic browning. Oxidative enzymes are essential for enzymatic browning and the enzymatic browning often happens in fruits and vegetable such as apples and lettuce. Non-enzymatic browning that is the Maillard reaction or amino-carbonyl reaction happens by reacting carbonyl compounds with amino groups during heating and processing of foods. As almost foods contain sugars and amino acids, this reaction is ubiquitously apparent. Our group chemically and biochemically investigate these browning reactions to regulate them.

#### ■ Process, case study

- 1) Enzymatic browning of apples and polyphenol oxidase
- 2) Enzymatic browning of cut lettuce and phenylalanine-ammonia lyase
- 3) Low-molecular weight pigments formed by the Maillard reaction of xylose
- 4) Color of soy sauce



Intellectual properties (Patents, computer programs), productization, publications and social/industrial contributions

- Commissioner, Food Safety Commission, Cabinet Office, Government of Japan

Potential of social/industrial contribution