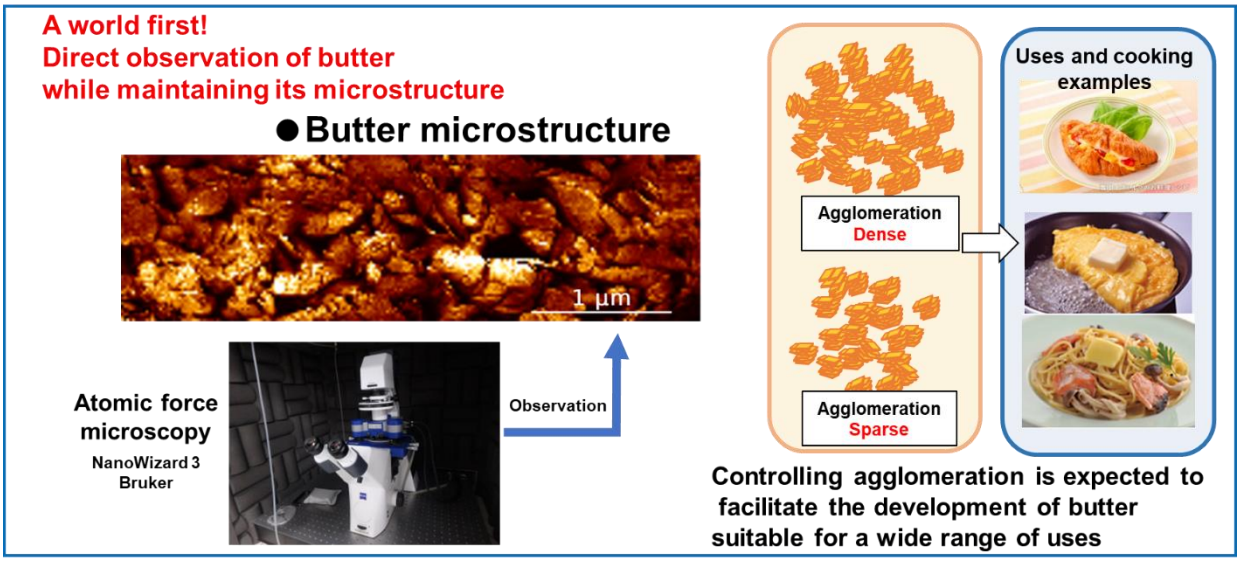
September 13, 2024

Expectations for improved butter quality and flavor in the future

MEGMILK SNOW BRAND achieves a world first in confirming that atomic force microscopy can be used to directly observe butter while preserving its organizational structure

Presented at the Dairy Science Symposium 2024 on September 6, 2024

MEGMILK SNOW BRAND Co., Ltd. (Representative Director and President: Masatoshi Sato; Shinjuku, Tokyo) has announced the world's first observation method using atomic force microscopy (hereinafter, "AFM"), which enables direct observation of butter while maintaining the microstructure related to its physical properties, presenting this at the Dairy Science Symposium 2024 organized by the Japanese Dairy Science Association on September 6, 2024. It is expected that the discovery of this observation method will prove useful in stabilizing butter quality, further improving its flavor and functionality, and developing products suitable for cooking and other uses, including confectionery and baking.



Butter is widely used in the food industry as a flavorful raw material, requiring different product quality and physical properties according to use. We have therefore wanted to analyze its organization (solid fat network), which is one of the factors determining butter quality.

Previous observation methods have required solvent extraction, which destroys the organization, and processing to remove fat by liquefying the butter, making it impossible to directly analyze the butter's organization.

The results of a comparison of our newly developed direct observation method using AFM and

observation methods using conventional technologies (Cryo-TEM and X-ray diffraction) confirm that the shapes of the oil and fat crystals constituting butter are almost the same, indicating that direct observation is possible while maintaining the agglomerated structure of the butterfat microcrystals in butter.

Going forward, by utilizing this newly developed observation method to check organizational states, the Company expects to discover techniques to control the mouth feel, hardness, and softness of butter as well as to develop products tailored to different uses and cooking methods.

Under its corporate slogan "Make the Future with Milk," MEGMILK SNOW BRAND is constantly engaged in research and development to generate new value in milk and provide delicious products to our customers. By combining its accumulated knowledge and technologies with new methods, MEGMILK SNOW BRAND will provide its customers with tasty and convenient butter, further enhance the value of milk, and aim to contribute to dairy farming production.

■ Presentation Overview

Paper title: Evaluation of crystal nanoplatelet aggregation in intact butter by atomic force microscopy

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Presentation on the day