Functional Particles and Powders

Microfluidic spray drying is a versatile route to engineer high quality powders with better functionality and ease of handling. It allows precise control of functional particles, including thermal sensitive / bioactive particles and microencapsulates for controlled release, and is useful for testing new formulations in functional foods and nutraceutical applications.

More Information

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Competitive advantage

- Spray drying is already commercially available and used in various manufacturing processes
- The microfluidic spray drying method can produce very precise and controllable particle properties for specific applications, for example:
- Mesoporous particles for catalytic and bio-adsorption applications (Prov. Patent AU2013904021),
- Core-shell particles for controlled release,
- Microparticles as carrier of nanoparticle vaccine for pulmonary delivery
- Dairy powders with improved functional properties

Impact

- Improved functional properties of specialty food and dairy powders
- Improved targeting and controlled release for pharmaceutical applications
- Improved efficiency in industrial spray-drying processes

Successful applications

- Developed knowledge to extend shelf life for specialty dairy powders in collaboration with Bega
- Improved the properties of heat-sensitive and high-protein dairy powders in partnership with Dairy Management Inc. and Land O' Lakes
- Better understanding of operations of the Bionov spray dryer at INRA (France) and the multi-stage spray dryer at Davis Dairy Plant (US)
- Developed formulations for a new product range in collaboration with Nutrition Innovation Singapore

Capabilities and facilities

- Microfluidic spray drying to develop new formulations
- Pre-treatment facilities for feed emulsions, prior to spray drying
- Analytical facilities including an ARES G-2 controlled strain rheometer

Our partners

- Dairy Management Inc.

- Land O' Lakes, Inc.
- Bega
- Saputo Dairy Australia
- Fonterra Australia
- Nutrition Innovation Singapore
- INRA
- Jacobs Douwe Egberts