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Fermented, Food-based Therapeutics: Methods for Manufacture and Analysis

Scientists at Stanford have developed a new method to manufacture sterile microbial food that contains levels of key bioactive metabolites derived from fermented foods.

Fermented foods such as yogurt and kimchi are widely believed to confer health benefits due to their unique microbial composition. However, fermented foods are highly variable, and it remains unclear which products, strains, or doses provide measurable benefit. Live probiotic bacteria may not survive industrial processing or long-term storage, and their health effects are often inconsistent and difficult to standardize. Furthermore, fermented foods may contain elevated levels of histamine, which can result in adverse reactions in individuals with impaired histamine metabolism. Additionally, certain fermented foods have been associated with increased cancer risk, highlighting the need for improved standardization and safety evaluation.

Researchers at Stanford developed a novel method of treating disease using fermented foods by shifting the focus from live microorganisms to the bioactive metabolites produced during fermentation. By identifying, quantifying, and manufacturing these compounds at defined concentrations, this approach enables the formulation of standardized, sterile products with predictable biological activity and improved safety. This metabolite-based strategy is designed to produce more consistent and effective functional foods for reducing inflammation, treating allergic disease, and preventing obesity, with the potential to redefine how fermented food–based interventions are developed and clinically evaluated.

Stage of Development: *Fermentation process and pre-clinical mouse models*

Applications

- Development of therapeutic foods with standardized health benefits
- Dietary supplements with therapeutic metabolites for reducing inflammation, preventing obesity, and managing allergies
- Sterile food products for individuals sensitive to live microbes or histamine

Advantages

- Predictable and reproducible biological activity
- Enhanced safety by reducing risk from live microbes
- Improved dosing precision for therapeutic metabolites
- Bypasses variability in microbial survival and activity

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