



Harnessing Natural Protection

MICROGARD® FERMENTATES

iff

Where science
& creativity meet

Fresher, naturally

Today, health-conscious consumers are leaving products with artificial ingredients, colors and synthetic preservatives on the shelf and turning to minimally processed, fresher alternatives. This trend is reshaping product formulations and sparking innovative approaches to achieving shelf life and pathogen control. At IFF, helping you keep pace with a dynamic marketplace is what we do best.

Our MICROGARD® ingredient range provides you with the protective solutions and technology you need to produce fresh, natural foods with a simplified ingredient label. This comprehensive product line enables effective, non-synthetic solutions for protecting flavor, ensuring optimal shelf life and greater control of a wide range of spoilage organisms.

Retain packaged freshness

As part of our full range of food protection solutions, MICROGARD® Fermentates provide additional hurdles to pathogen outgrowth, enhancing spoilage control and allowing for longer-lasting products and increased freshness in most refrigerated foods. In addition, the unique characteristics of MICROGARD® Fermentates add value for both consumers and manufacturers by:

- Offering food processors affordable, consumer-friendly, natural labeling options
- Creating product line extension opportunities through greater flexibility in formulation (e.g., low fat or high moisture) and storage formats (e.g., chilled vs. frozen)
- Extending distribution reach, reducing the rate of returns due to spoilage and adding days of shelf life
- Enhancing your brand image by reducing the use of synthetic preservatives, even in delicately flavored foods.

Versatility & Efficacy for Food Protection Success

MICROGARD® Fermentates have their microbial inhibition spectra based in naturally occurring organic acids and peptides that have been used to ensure food safety for generations. IFF, as a leader in fermentation technology, has mastered the art of capturing these naturally occurring antimicrobials. Our antimicrobial solutions are the result of culturing high-quality ingredients with starter cultures that have a long history of safe use in the food industry. This combination of technology and tradition brings proven food protection technology into the 21st century.

Ingredient diversity at your fingertips

The MICROGARD® product range offers as much diversity in composition as it does in functionality. Produced from dextrose, milk or wheat flour, these products are easily incorporated into a variety of food products, and the breadth of our offering provides formulators with the solution that will accommodate their specific product requirements.

Dairy

Originally developed for dairy applications, the first MICROGARD® product was, and is still, used to protect cottage cheese by limiting the outgrowth of psychrotrophic Gram-negative bacteria. Today the expanded range of MICROGARD® products continues to reduce the outgrowth of these spoilage organisms as well as select yeasts, molds and potential human pathogens. In addition, MICROGARD® is effective throughout the shelf life of a product, even after the container is opened and any atmospheric packaging hurdle has been compromised.

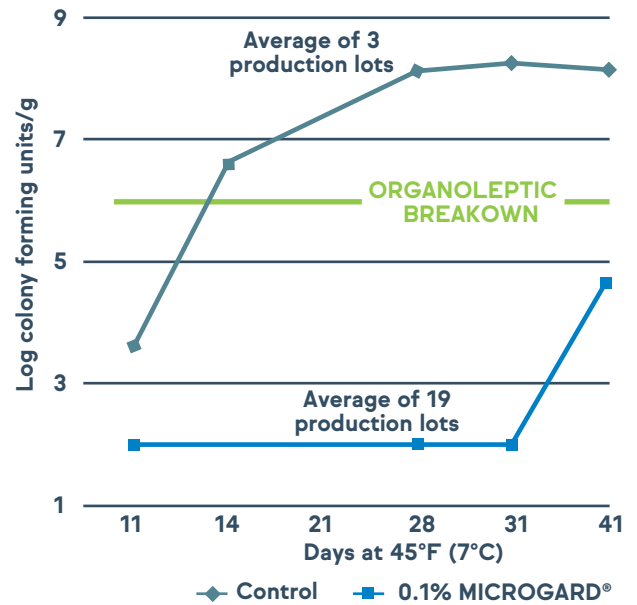
MICROGARD® Fermentates can be used effectively in a wide range of fresh dairy applications, including sour cream, yogurt, dairy beverages and many more.

Options for greater flexibility

	Dextrose-Based	Non Fat Dry Milk-Based	Wheat Flour-Based
Gluten-free	●	●	
Organic*	●	●	
Kosher dairy	●	●	
Kosher pareve*	●		●
Halal certified	●	●	●
Non GMO	●	●	●
Grade A milk		●	
Non rBST milk		●	
Identity preserved*	●		
Label Friendly	●	●	●

*Available for some product lines.

Growth control of Gram-negative spoilage organisms in cottage cheese

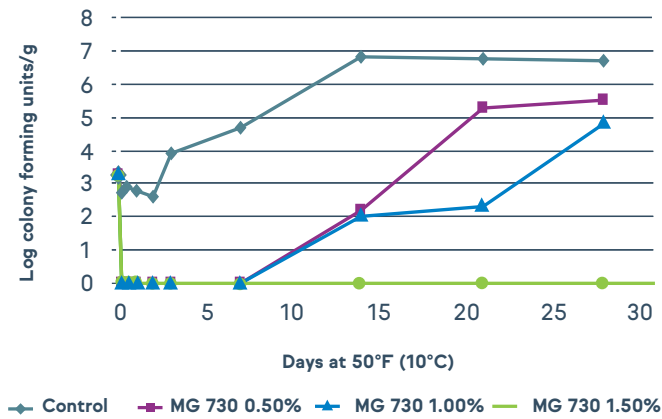


Meat and culinary

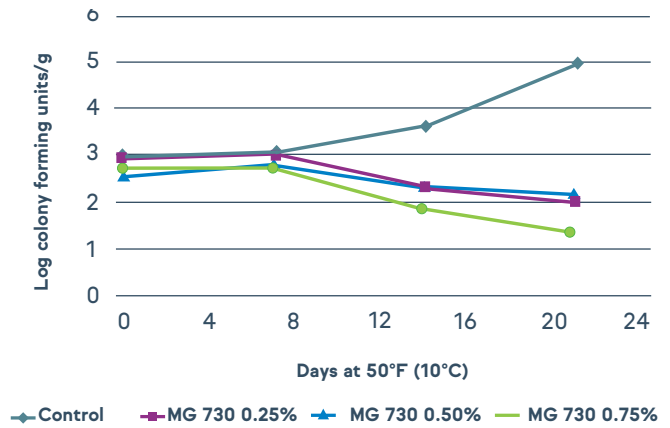
This category encompasses a diverse group of food products including pre-cooked items, prepared foods, sauces, soups, salsas, dips, deli salads, cooked meats and dressings. Consequently, finding the right combination of hurdles to maintain freshness and acceptable quality can present complex

challenges. With excellent stability, minimal flavor impact and low cost in use, the MICROGARD® product range can also offer versatility, providing you with the right solution for ensuring that your customer receives the highest quality product every time.

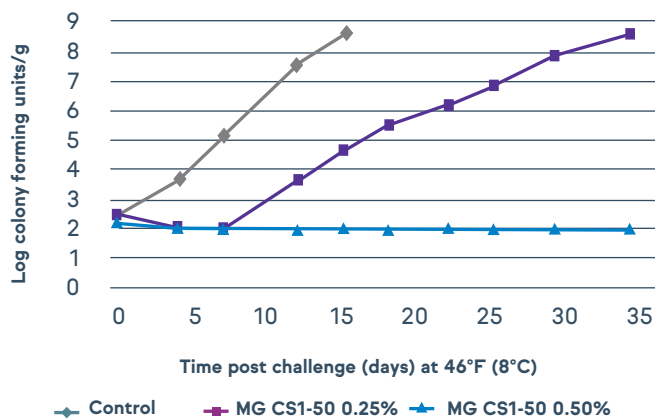
MICROGARD® 730 control of *Listeria monocytogenes* in chicken salad, pH 4.6 and stored at 50°F



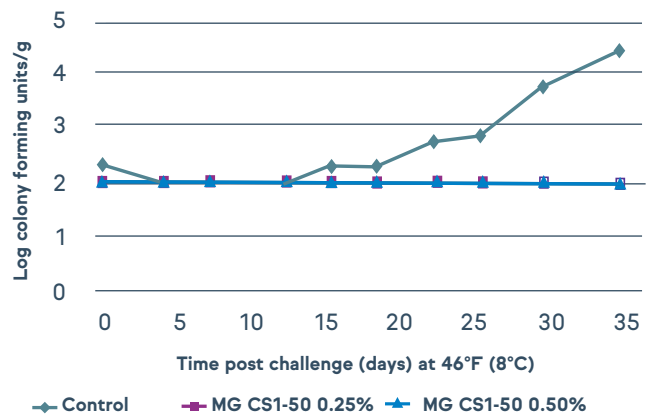
MICROGARD® 730 control of lactic acid bacteria in coleslaw, pH 4.1 at 50°F



MICROGARD® CS1-50 control of *Listeria monocytogenes* in bolognese sauce, pH 5.3 at 46°F, limit of detection 10² cfu/g



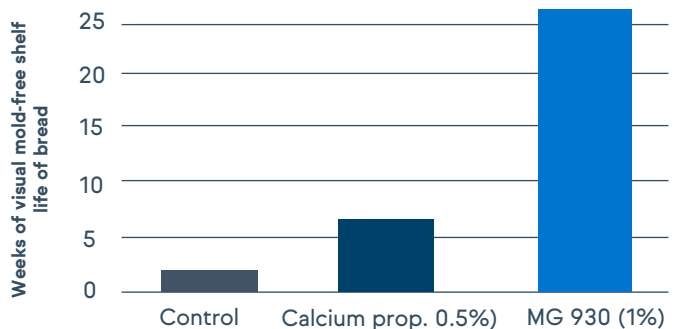
MICROGARD® CS1-50 control of spore-forming *Bacillus* spp. in bolognese sauce, pH 5.3 at 46°F, limit of detection 10² cfu/g



Bakery and confection

Microbial spoilage in most baked goods stems from mold spores which can be prevalent in commercial bakeries. Left unchecked, the growth of these spores can reduce product shelf life and harm product quality. IFF has developed ingredient solutions to help producers protect the freshness and integrity of their baked goods. MICROGARD® 930, for example, has been shown to improve the sensory quality of bread while also delaying spoilage and maintaining overall product quality throughout its shelf life (see graph to the right).

MICROGARD® 930 can enable 3 to 15 times longer shelf life of bread compared to market standard synthetic preservative and no preservative, respectively.



About IFF

IFF is the brand for a range of ingredients that help provide enhanced bioprotection, an improved nutritional profile, and better taste and texture with greater cost efficiency and lower environmental impact, meeting the needs of manufacturers of food and beverages, dietary supplements and pet food. Through the work of the global network of food scientists and technologists in IFF, the IFF range is supported by a uniquely broad spectrum of know-how across applications and processing.

www.iff.com.

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