



Why add Stolle ingredients to your yogurt?

The health benefits of yogurt are well understood by the consumer. The majority of consumers associate yogurt with improved GI health and enhanced immune function. The greatest challenge facing yogurt manufacturers in today's market is product differentiation. How do you make your yogurt stand out from the crowd? Stolle can help! Stolle's line of patented bioactive dairy ingredients will add a new dimension to your marketing efforts by providing additional health claims over and above the claims traditionally associated with yogurt and other fermented dairy products.

Stolle ingredient claims

The active components in all of Stolle's ingredients are natural, healthy and safe. The company has

THE INGREDIENTS

Stolle manufactures two yogurt-ready bioactive ingredients (specifications on reverse side, Table 1):

- ▶ MicroLactin™ is a dried bioactive milk protein concentrate (>80% protein) with a recommended dose of 4 grams per day.
- ▶ LactoMune™ is a dried bioactive whey protein concentrate (>80% protein) with a recommended dose of 1.5 grams per day.

Both ingredients are GRAS and can be incorporated into a variety of yogurt applications with only minor process modifications (Figure 1 on reverse side).

Our application specialists are ready to assist you in all phases of your formulation and process development efforts.

an extensive worldwide patent estate and decades of research and development experience in bringing high quality, clinically tested ingredients and products to the marketplace. The key consumer health benefits of Stolle's ingredients are:

- ▶ Improved Joint Health
- ▶ Immune System and GI Support
- ▶ Enhanced Muscle Recovery

Research Summary

Improved Joint Health: The health benefits of Stolle's ingredient, MicroLactin™ have been clearly demonstrated in three published studies in humans and animals.

- ▶ A 6-wk, double-blind, placebo-controlled study investigated the effects of a nutritional supplement beverage containing MicroLactin™ and fortified with vitamins and minerals, on pain symptoms and activity in adults with osteoarthritis. Daily consumption of the nutritional beverage was beneficial in alleviating symptoms and dysfunction in subjects with osteoarthritis (1).
- ▶ In a second human study, forty-two subjects with clinically diagnosed osteoarthritis were randomized into three groups and given either placebo, glucosamine, or MicroLactin™ as capsules daily for six weeks. Symptoms of osteoarthritis improved highly significantly in the MicroLactin™ as well as glucosamine groups as determined by improving WOMAC scores. By contrast, little or no improvement was detected in the placebo group (2).
- ▶ In a study focused on animal health applications, a double-blind, placebo controlled trial of eight weeks duration in older dogs with osteoarthritis showed that the response to MicroLactin™ treatment was highly statistically significant relative to pla-

cebo, as assessed by both veterinary investigators as well as by the dog owners (3).

Immune System and GI Support: In five published reports, researchers demonstrated the immune support properties of Stolle Skim Milk Powder (MicroLactin™ and LactoMune™ are manufactured from Stolle Skim Milk) in mice that were immunosuppressed or had defective or declining immune systems. The investigators demonstrated that oral administration of Stolle Skim Milk to mice provided the following benefits:

- ▶ Augmented their immune defenses and protected them from endogenous infection by invasive intestinal bacteria (4, 5).
 - ▶ Increased the activities of the gut-associated lymphoid tissues against the invasion of intestinal bacteria (6).
 - ▶ Delayed the onset of proteinuria and prolonged the life span in autoimmune-prone mice (7).
 - ▶ Resulted in fewer enteric bacteria, a lower concentration of serum antibodies against enteric bacteria and more competent immune systems in aged mice (8).
- Enhanced Muscle Recovery:** The safety and efficacy of Stolle Skim Milk Powder as an ergogenic aid to performance enhancement in non-seasonal, highly trained runners was demonstrated in a double-blind, placebo-controlled study. After the six-month treatment period, 70% of the Stolle Skim Milk Powder runners reported overall improvement in training and racing versus 20% of the runners on placebo (conventional skim milk powder). "Overall improvement" correlated with improvement in recovery times between training or racing episodes (9).

References

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- 4** Ishida, A., Yoshikai, Y., Murosaki, S., Hidaka, Y., Nomoto, K. (1992) Administration of Milk from Cows Immunized with Intestinal Bacteria Protects Mice from Radiation-Induced Lethality. *Biotherapy* 5:3, 215-225.
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- 6** Kobayashi, T.; Ohmori, T.; Yanai, M.; Kawanishi, G.; Yoshikai, Y.; Nomoto, K. (1991) Protective effect of orally-administering immune milk on endogenous infection in X-irradiated mice. *Agric. Biol. Chem.* 55: 2265-2272.
- 7** Murosaki, S., Yoshikai, Y., Kubo, C., Ishida, A., Matsuzaki, G., Sato, T., Endo, K., Nomoto, K. (1991) Influence of Intake of Skim Milk from Cows Immunized with Intestinal Bacterial Antigens on Onset of Renal Disease in (NZB X NZW)F1 Mice Fed Ad Libitum or Restricted in Energy Intake. *Journal of Nutrition* 121:11, 1860-1868.
- 8** Ishida, A., Yoshikai, Y., Murosaki, S., Kubo, C., Hidaka, Y. Nomoto, K. (1992) Consumption of Milk from Cows Immunized with Intestinal Bacteria Influences Age-Related Changes in Immune Competence in Mice. *Journal of Nutrition* 122:9, 1875-1883.
- 9** Stolle Wellness internal report (1993)

TABLE 1. KEY SPECIFICATIONS

	MicroLactin™	LactoMune™
Total Calories (Kcal/100g)	360	405
Calories from Fat (Kcal/100g)	17	67
Protein (%)	>80.0%	80.0%
Carbohydrate (%)	<11.5%	<12.0%
Ash (%)	<8.0%	<3.5%
Moisture (%)	<6.0%	<5.0%
Fat (%)	<3.0%	<8.0%
Aerobic Plate Count (cfu/g)	<15,000	< 30,000
Immunoglobulin G (µg/g)	>6,000	>35,000
Specific Antibody (Titer)	>6,000	>40,000
Kosher	Yes	No
GRAS Affirmed	Yes	Yes
Recommended Dosing (g/day)	4	1.5

About Stolle Wellness

Stolle Wellness (Stolle) is a science based company that specializes in the development and sale of health-enhancing, milk based bioactive ingredients. Stolle’s technology involves stimulating dairy cows to naturally produce milk with increased levels of selected bioactivity. The milk is then specially processed to concentrate and preserve the bioactives that support immune/gastrointestinal, muscle recovery, cardiovascular and anti-inflammatory functions. Stolle has conducted a series of clinical trials demonstrating the safety and efficacy of these unique bioactive dairy ingredients. Stolle has been awarded nearly 100 worldwide patents for its bioactive dairy ingredient technology.

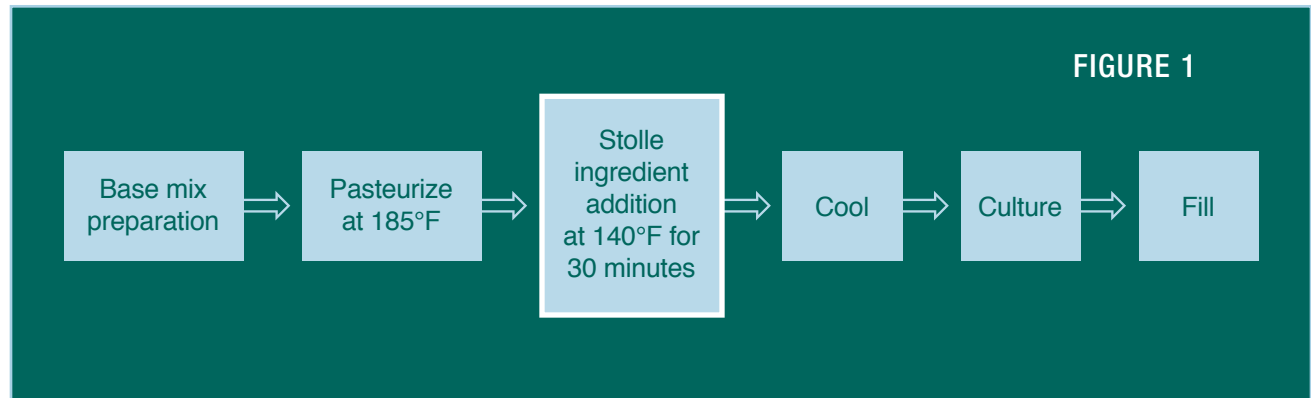


FIGURE 1

The flowchart above illustrates a typical process along with modifications required to preserve the bioactivities present in Stolle’s ingredients.