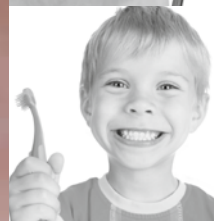
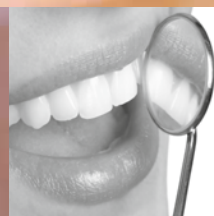


BLISTM M18

Oral Probiotic Providing Advanced Protection
for Teeth and Gums



 **FRUTAROM**
FOUNDED 1933

What is BLIS M18?

BLIS M18 is a totally new approach to managing oral hygiene. BLIS M18 is a patented oral probiotic providing advanced protection for teeth and gums. BLIS M18 was developed from a specific strain of *S. salivarius*, a common and beneficial oral bacteria, which has been clinically proven to promote the health of the oral cavity by **continuously supporting and promoting the health of teeth and gums**.

The mouth is a constant battleground where, on a daily basis, billions of invasive bacteria attempt to displace the native and generally beneficial bacteria of the mouth, teeth and gums. Common problems people often experience in their oral cavity, such as dental cavities, bad breath or gum disease, result from an

imbalance of our oral bacteria. Most people practice regular oral hygiene routines, such as brushing their teeth, flossing and using mouthwash to reduce the “bad” bacteria in their mouths and freshen breath. However, these practices, while important, only provide short-term results and in some cases can actually disrupt the natural balance of beneficial microorganisms in the oral cavity.

BLIS M18 is a new generation of advanced probiotic, friendly bacteria that can be used in conjunction with regular oral hygiene practices to establish a healthy balance of bacteria in the mouth and naturally protect the teeth and gums from oral and dental pathogens.

What makes BLIS M18 so unique?

S. salivarius is among the most important and beneficial bacteria of the mouth and oral cavity. It is also one of the most dominant bacteria found in the oral cavity and substantial research links *S. salivarius* with good oral health. However, some *S. salivarius* are more beneficial than others and BLIS M18 is one of those highly beneficial bacteria. Unfortunately, only a very small number of people produce the kind of *S. salivarius* with BLIS M18 activity.

BLIS M18 is a special kind of *S. salivarius*

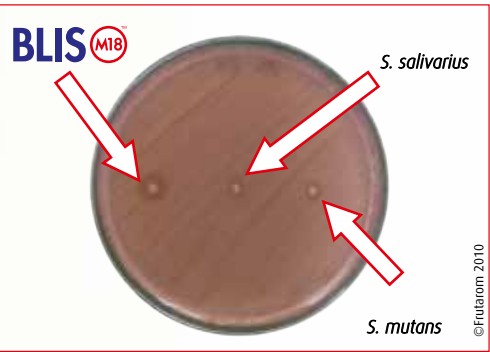
Not all strains of *S. salivarius* act equally to inhibit oral and dental pathogens. BLIS M18 is a naturally occurring strain that is especially potent at inhibiting *S. mutans*, the oral bacteria widely accepted to be a main cause of dental caries and tooth decay.

BLIS M18 with Punch

In addition, M18 goes above and beyond regular probiotic activity because it produces anti-microbial proteins called BLIS (**Bacteriocin-Like Inhibitory Substances**). Most other probiotics work by competing with bacteria for space and nutrients in the mouth and in this way help prevent over-growth of bad bacteria. **BLIS M18 is different**. Not only does it compete for space and nutrients but it also produces three potent antibacterial BLIS molecules;

- **Salivaricin A**
- **Salivaricin 9**
- **Salivaricin X**

These naturally occurring and potent antimicrobial proteins actively target and selectively kill pathogens giving BLIS M18 a wider range of activity against dental pathogens.



The plate shows M18 on the **Left** compared to other *S. salivarius* (Middle and Right) against *S. mutans*.

A Unique Enzyme

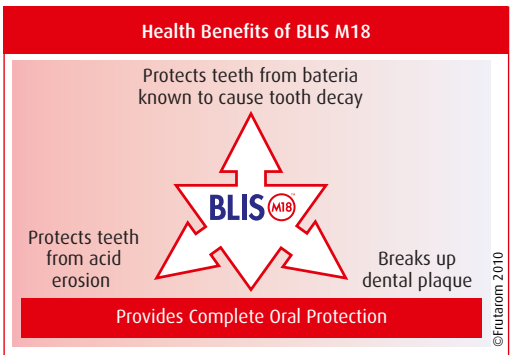
Finally, M18 has unique enzyme producing abilities that allow it to break up dental plaque and neutralize acid that can be harmful to teeth and gums. This is a unique attribute of BLIS M18 and not found in any other oral probiotics.



Health Benefits of BLIS M18

As a result of its multi-functional activity, taking daily doses of BLIS M18 can:

- **Protect teeth from bacteria known to cause tooth decay**
- **Protect teeth from acid erosion caused by high acid foods**
- **Help break up dental plaque**



Supported by Proprietary Science

BLIS M18 Protects from dental pathogens

Streptococcus mutans is considered a leading causative agent of tooth decay. *In vitro* studies have shown BLIS M18 is a potent inhibitor of this bacteria.

BLIS M18 Protects teeth from acid erosion

Organisms responsible for dental plaque like *S. mutans* produce lactic acid from dietary carbohydrate. Lactic acid degrades tooth enamel and dentine (a major component of teeth) which can lead to cavities and eventually tooth loss. Research has shown that M18 produces an enzyme called urease which neutralizes acid in the oral cavity.

BLIS M18 Breaks up dental plaque

While *Streptococcus mutans* are able to produce acid they also produce extracellular polysaccharides which contributes to the plaque biofilm or the sticky structure which allows the problematic bacteria to be in close association with dental tissue. Limited numbers of *S. salivarius* strains, including M18, produce an enzyme called dextranase, which can help break up the plaque biofilm caused by *S. mutans*.

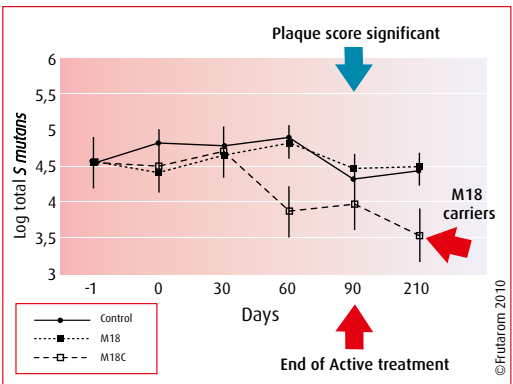
Clinical Study in School Children

The School of Dentistry at the University of Otago in New Zealand performed a clinical study with M18 in children ages 5 to 10 years who had experienced dental caries (with at least 3 restorations). Additionally, the children selected had at least 10⁴ cfu/ml of salivary *S. mutans* and no natural BLIS-producing *S. salivarius*.

Clinical examination recorded soft tissue health, gingival health and dental plaque scores at monthly intervals during the active treatment and at time points post treatment.

Treatment was either two M18 or placebo lozenges daily for 3 months with 50 subjects in each group. The data showed that when strain M18 colonizes in the oral cavity it has the ability to significantly

decrease *S. mutans* levels in saliva (see graph). At three months, plaque scores were significantly reduced in subjects in the M18 group, not only those that had managed to maintain long-term colonization of M18.



Product Applications

Because BLIS M18 is an oral cavity probiotic, ideal applications are those that allow contact with the mouth, such as:

- Chewable tablets or lozenges
- Fast-melt tablets
- Chewing gum
- Stick packs
- Powders

Our technical experts are available to assist you in the development of your product containing BLIS M18.

Advantages of BLIS M18

- Oral cavity probiotic with advanced activity against dental pathogens
- Proprietary strain of bacteria that produces potent BLIS antibacterial molecules: Salivaricins A, 9 and X
- Unique enzyme producing abilities which provide added protection for teeth
- Able to colonize and persist in the mouth because it is a dominant oral strain (*S. salivarius*)
- Proprietary science showing it is safe and effective for children
- Patent protected

Enjoy Health Ingredients

This data is presented in good faith and we made our honest effort to ensure its accuracy. The information is offered for your consideration and is to be used with appropriate professional judgment.

For further information, please contact us.



Frutarom Switzerland Ltd. Tel +41 44 782 64 64 • Email: switzerland@frutarom.com
Frutarom Belgium NV Tel + 32 52 31 95 34 • Email: belgium@frutarom.com
Frutarom Germany GmbH Tel. +49 221 454 623-0 • Email: germany@frutarom.com

Frutarom Ltd.(Israel) Tel +972 9 950 5607 • Email: info@frutarom.com
Frutarom Netherlands BV Tel +31 318 582 202 •Email: netherlands@frutarom.com
Frutarom USA Inc. Tel. +1 201 861 9500 • Email: info@us.frutarom.com