

# Fact sheet Natamycin

Natamycin, also known as pimaricin, is a substance produced by the bacterium *Streptomyces natalensis*. It is naturally occurring and prevents growth of yeasts and moulds. Natamycin was first isolated from a culture of *Streptomyces natalensis* in the DSM research laboratories in 1955. A DSM employee found this micro-organism in a soil sample from the state of Natal, South Africa, hence its name. Pure natamycin has no colour, odour or taste.

## Applications of natamycin

Natamycin is used in the food industry as a preservative; it prevents growth of all known food spoilage moulds and yeasts. Natamycin is widely used on products such as cheese and sausages. In some countries, natamycin is also used in other products such as juices, wine and yoghurt. Natamycin is applied in liquid sprays and dips or as powder on whole, shredded, and soft cheeses. As natamycin is a natural ingredient, it is also used in organic and biological cheeses.

## Harmful and useful moulds and yeasts

Moulds can be divided into harmful and useful moulds. Useful moulds are necessary to produce blue cheese, brie and camembert. The same applies to yeasts. Useful yeasts are used in the production process of beer, wine and bread. However, on most foods the growth of yeasts and moulds is not appreciated.

Yeasts and moulds should not be confused with bacteria; these are a different type of micro-organisms. Bacteria are not affected by natamycin. Useful bacteria can thus do their work in the natural ripening processes in e.g. cheese and dry sausages.



Figure 1 - *Streptomyces natalensis*

Contamination of food products with harmful yeasts and moulds may lead to food spoilage. Nowadays up to 30% of raw materials for food production and final food products is thrown away because of contamination and/or spoilage.

## How natamycin works

Natamycin binds to ergosterol, a building block in cell walls of yeasts and moulds. The natamycin that binds to the ergosterol causes leakage of the cell wall, leading to cell death. Bacteria do not contain ergosterol and are therefore not affected.

## Little natamycin needed for food

Natamycin is very effective in extremely small quantities against all known yeasts and moulds that may occur on food products. Natamycin is only active against yeasts and moulds, not against bacteria. Therefore, it will not interfere with the natural ripening processes.

Depending on the application, the amount of natamycin needed varies. To prevent growth of all known food spoilage yeasts and moulds, up

to 0.01 gram per liter/0.04 gram per gallon is sufficient.

Use on whole coated cheeses is somewhat different. Here natamycin is added to the coating. As cheese ripening takes months and sometimes even years, sufficient natamycin should be added to the coating to remain active. The exact dosage is higher than in other applications and depends on a number of factors. Then again, the quantities of natamycin used pose absolutely no threat to food safety.

## Not toxic

Natamycin has been tested extensively and the test levels in toxicity studies are well-determined. In the quantities applied to food products, there is no risk. For example, even if a child would eat up to 500 kg of Gouda cheese including the rind every day, natamycin has no effect on the child's health at all!



Figure 2 - 500 kg Gouda cheese

## Safety of natamycin in human food

The Joint FAO/WHO Expert Committee on Food Additives (JECFA) is an international scientific expert committee to evaluate the safety of food additives. JECFA developed safety assessment principles for chemicals in food. To date, JECFA has evaluated more than 1,500 food additives. JECFA conducted the first safety study on natamycin in 1966 and has continued to update its studies in food. The latest JECFA natamycin study was conducted in 2002.

## Natamycin an antibiotic?

By definition an antibiotic is an antimicrobial agent, produced by a microorganism. This includes both antibacterial and antifungal compounds. Most antibiotics used in clinical practice are antibacterial, for the treatment of bacterial infections. As mentioned above, natamycin does not fight bacteria, only yeasts and moulds. Natamycin is an antimycotic. It is sometimes used in creams for specific fungal infections in the eye or skin.

## No resistance because of natamycin in yeast and mould

Resistance would occur if a microorganism can survive when treated by the appropriate antibiotics. For a microorganism to become resistant and survive the antibiotics, it needs to adapt or mutate. In the case of natamycin the development of resistance has never been observed over the many years of use.

Please remember: natamycin has no activity against bacteria, so the issue of resistant bacteria

(which is of concern to the medical sector) has no relation to the use of natamycin.

## How can I recognize natamycin in my food?

This depends on legislation in your area. Often, natamycin is recognizable on the packaging of food as a food additive. For example, in the EU it has E number E235. In the US it is simply called “natamycin”.



## Where is natamycin sold?

Since 1967, DSM has been selling natamycin in 155 countries. DSM has expertise in the use of natamycin for the surface treatment of practically all types of cheese and sausages.

Permission for the use of natamycin on cheese has been given by the EU, Armenia, Argentina,

Azerbaijan, Australia, Bahrain, Belarus, Brazil, Canada, Chile, China, Finland, Georgia, India, Israel, Japan, Kazakhstan, Kyrgyzstan, Kuwait, Mexico, Moldova, New Zealand, Norway, Oman, Philippines, Qatar, Russia, Saudi-Arabia, South Africa, Switzerland, Tajikistan, Turkey, United Arab Emirates, U.S.A., Ukraine, Uzbekistan, and Venezuela

## More information

DSM's Product Application Specialists and Scientists can answer your specific question(s). Please email [Info.Dairy-Ingredients@dsm.com](mailto:Info.Dairy-Ingredients@dsm.com) or visit [www.dsm-dairy.com](http://www.dsm-dairy.com) for more contact details.

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