

# MK-7: the big gun of vitamins

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Oil fortified with the vitamin MK-7 could help combat brittle bones and heart disease in humans and animals.

Humans and animals can be deficient in [vitamin](#) MK-7, say University of Sydney chemical engineers, who together with industry partner Agricure Pty Ltd have invented a cost-effective process for the production and extraction of the mighty vitamin.

The process was developed by the University's Associate Professor Fariba Dehghani and Dr John Kavanagh, who led the research team from the School of Chemical and Biomolecular Engineering with input from Agricure Pty Ltd.

Recent international research has shown that vitamin MK-7 assists in reducing the risk of a number of common health disorders such as arterial calcification, cardiovascular disease and [varicose veins](#). It is also essential to strong, healthy bones and minimising the effect of osteoporosis.

Professor Fariba Dehghani says her team was initially approached by Agricure Pty Ltd, a manufacturer and designer of premixes for animal and human foods, to assist in its quest to produce dietary supplements that improved the [bone density](#) of racehorses and poultry. Together, the team developed a simple, cost effective process.

Professor Dehghani says: "In this one-step process MK-7 is naturally produced by the fermentation of bacteria found in rice straw and

recovered via an oil that can be used in cooking. The oil plays three pivotal roles in the process, firstly as a nutrient for the bacteria, secondly as an anti-foaming agent and lastly as an extractant for MK-7."

"We increased the concentration of MK-7 in the edible oil by eight hundred percent more than in natto, a commercially available Japanese food product that is considered a rich source of MK-7," says Professor Dehghani.

While recent research is highlighting the benefits of MK-7, many western consumers find the texture and aroma of natto unpalatable, says Professor Dehghani.

An alternate source of naturally forming MK-7 is found in fermented food products such as cheese. However, the concentration of the MK-7 in cheese is too low for any health benefit for humans, including prevention of cardiovascular blockage or reducing the risk of bone fractures, says Dr Kavanagh.

"Our challenge was to produce a cheaper natural source of MK-7 that can be readily available for daily consumption by a large population."

Renowned biochemist Hubert Regtop from Agricure, who was part of the team, says: "Recent research has discovered a series of proteins in body tissues that are vitamin k-dependant for their role in controlling bone development, calcification of arteries, and the immune system."

"Vitamin K has variants. All are vital in our diets. vitamin K1, which we get from green leafy vegetables, is important for humans and animals as is K2, which we get from eggs, milk and fermented products such as cheeses. But this breakthrough is a special K2 referred to as MK-7. It has a longer serum half-life than K1 and is distributed throughout the tissues in the body more effectively."

An Australian Provisional Patent Application has been filed for the invention.

Provided by University of Sydney

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