



## We added to nature

### Phenylcapsaicin – pure efficiency

The health benefits of chili with its active ingredient capsaicin, has been known for centuries. But chili is also known for being hot and not so easily consumed. aXichem's Phenylcapsaicin combines the naturally occurring phenyl group with capsaicin, bridged by a triple bond, resulting in an innovative, natural analogue capsaicin with high purity, where the pungency is greatly reduced. Innovative Phenylcapsaicin adds to nature. Ecology and nature meet science to create a healthier, safer and more sustainable natural ingredient.



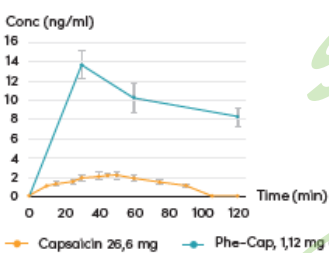
## Pure efficiency

Phenylcapsaicin is a capsaicin engineered molecular structure, introducing a triple bond within the phenyl group that offers several benefits compared to its naturally occurring analogue. It has a purity of 98%, is easier to handle with 1% formulation in powder form and is stable in production with a high bioavailable making it very potent. Because of its higher efficiency regarding uptake, you also need a much lower dosage. It is better suited for industrial production compared to natural capsaicin, due to higher purity, reliability and the lower price.

## Improved health

aXivite® is an innovative natural analogue capsaicin solution for weight control and treating high blood pressure. It is also known to ease irritation in the gut and promote a healthy gut microbiota. This is the result of extensive research with proven positive health benefits for improving human health in line with nature. Its purity and concentration are exceptional, making it reliable and efficient for high volume industrial production.

### Pharmacokinetic study of the effect of Capsaicin



Five grams of capsicum providing 26.6 milligram of capsaicin "Pharmacokinetic and The Effect of Capsaicin in Capsicum frutescens on Decreasing Plasma Glucose Level Kamon Chalyasit MSc\*, Weerapan Khovidhunkit MD, PhD\*\*, Supeecha Wittayalerpanya MSc\*\*"

Clinical Trial Dose of 1,12mg BID of PheCap/aXivite "Effects of Phenyl-Capsaicin on Weight Loss and Body Composition, Tim N. Ziegenfuss, Ph.D., CSCS\*

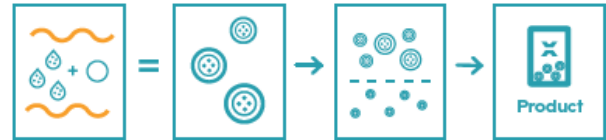
Pharmacokinetic Study Following o.d and b.i.d Oral Dosing of Phenylcapsaicin to Healthy Human Subjects.

Studies show that capsaicin consumption has proved to reduce body weight and has the potential to treat anti-obesity. Recognised as a bioenhancer, its bioavailability is more than 4 times higher than natural capsaicin. It also works to prevent microbial dysbiosis, gut barrier dysfunction and chronic low-grade inflammation.

## Pungency control

To control the pungency, aXichem has developed a unique microencapsulation, engineered for specific release. The microencapsulation also enhances absorption and improves the nutrient uptake, as shown in the CACO trial<sup>1</sup>.

### aXivite® process description



Hot air  
 Water-based emulsion Phenylcapsaicin  
 Microcrystalline cellulose (MCC)  
 Encapsulated Phenylcapsaicin  
 Sieving of product

- 1) The core material microcrystalline cellulose (MCC) particles is fluidized by hot air.
- 2) A water-based emulsion of a Phenylcapsaicin containing matrix is sprayed onto the MCC. The hot air evaporates the water from the emulsion and leaves a phenylcapsaicin containing matrix coating on the MCC particles.
- 3) Oversized particles are sieved and removed.
- 4) Particles are packaged into ready product.

## Safe to use

The unique microencapsulated active ingredient at 1% concentration, also serves as an easy to handle food additive which can be further developed into a finished product. According to several tests, Phenylcapsaicin shows no sign of genotoxicity, whereas high dosage of natural pure capsaicin can be toxic. This makes aXivite® safe for long-term use. Approved by the Novel Food in EU and GRAS Food in US, we have a guaranteed safe and approved product for the market, which provides improved industrial efficiency combined with strong sustainability.

aXivite® can be used in a variety of new applications, as well as a more effective and safer replacement to naturally extracted capsaicin.

<sup>1</sup> A comparative study on the relative uptake of Capsaicin, Phenylcapsaicin and Curcumin in single and combination formulations using a Caco-2 In vitro cell assay.

### Bioenhancement effect of aXivite®

Treatment	Dilution	Curcumin Apical 0h ug/well	Curcumin Apical 2h ug/well	Curcumin Basal 2h ug/well
Cap+Cur 001	1:1	123,3	99,5 <sup>a</sup>	22,4 <sup>a</sup>
Cap+Cur 002	1:1	12	9,2 <sup>b</sup>	2,7 <sup>a</sup>
Cap+Cur 003	1:1	1,2	0,8	0,3
Phecap+Cur 001	1:1	122,4	77,1 <sup>ac</sup>	43,9
Phecap+Cur 002	1:1	12,3	7,4 <sup>bd</sup>	4,8
Phecap+Cur 003	1:1	1,3	0,6 <sup>c</sup>	0,6

The presence of Phenylcapsaicin increased the uptake of Curcumin at all three dose levels even as compared to the Capsaicin + Curcumin formulation (P < 0.05) (CACO in vitro study).

