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Powdered superfood

Maltodextrin-free fruit powder from cranberry juice
with added health value



Since ancient times, cranberries have been known for their medicinal and nutritional properties. Today they are considered to be superfoods because of their

high content of antioxidants and vitamins, and are the perfect inclusion for functional drinks, smoothies or yoghurt preparations. However, in order to transform fruit juice into the powder form preferred by the food industry, carriers are used in the drying process – mostly maltodextrin. Yet the use of this polysaccharide has serious nutritional disadvantages and is therefore not well received by consumers. That's why Taiyo, the specialist in ingredients with health benefits, has developed SunCran™ cranberry juice powder, a maltodextrin-free and therefore sugar-free variant that is obtained through a gentle drying process.

Sunfiber® made from well-known dietary fibre partially hydrolysed guar gum (PHGG) additionally enriches the fruit powder and confers further functional benefits.

Nutrient-rich and growing in popularity

When it comes to urinary tract infections (UTIs), it's women who tend to suffer the most. Such infections are usually diagnosed by the examination of a urine sample and the number of E. coli bacteria found to be present. Antibiotics are then often prescribed. In fact, about 25% of antibiotic prescriptions in GP practices are for urinary tract infections.¹ However, the overuse of antibiotics in recent years means they're becoming less effective, with many consumers increasingly reluctant to take them. As a result, they're seeking alternative solutions, often in the

form of herbal products that are based on cranberry or cranberry extract.

Cranberries are native to North America, with more than 80% of these fruits grown in the USA and Canada. Accordingly, knowledge of their health benefits is also widespread there. But the popularity of cranberries is growing steadily in Europe, too. The nutrient-rich berries are known to prevent the adhesion of certain bacteria with the help of their proanthocyanidins (PACs). In particular, E.Coli bacteria associated with urinary tract infections are prevented from adhering and are more easily flushed out in the urine. This not only helps treat UTIs, but also prevents their recurrence. Such anti-adhesion properties mean cranberries can also alleviate gum disease and stomach ulcers, as well as liver problems and other



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intestinal disorders.

They are valued for their high antioxidant content, too, and support a healthy cardiovascular system. Cranberries are an excellent source of vitamin C, as 100 grams of the fruit contains 13.3 milligrams of vitamin C – 18% of the recommended daily intake. They are also rich in vitamins C, B6, K, provitamin A, iron, calcium, potassium, magnesium, sodium, folic acid and secondary plant substances such as polyphenols and anthocyanins.

Fruit powder without maltodextrin

The flesh of the red berries is firm, crunchy and sour. They are usually eaten dried but can be processed into fruit juices. However, as they have a sour taste, large amounts of sugar must be added to minimise the tart flavour. Furthermore, many cranberry drinks have a low fruit juice content of sometimes just 25%.² The powder form is ideal for further processing into other products but a high proportion of carriers – around 50-75% – such as maltodextrin is usually required to transform natural cranberry juice into a powder. Maltodextrin has many disadvantages, however: As a hidden sugar, it promotes tooth decay and provides many carbohydrate calories. It directly affects the endocannabinoid system in the brain, increases appetite and thus further sugar intake. It is also high glycaemic, which means it drives up blood sugar levels. Since foods with a high glycaemic index contribute to obesity and increase the risk of diabetes and cardiovascular disease, it's perhaps not surprising that many health-conscious consumers actively avoid products that contain maltodextrin. As a result, many companies are looking for alternatives to maltodextrin as a carrier.

Fibre-rich and natural

Taiyo's new range of prebiotic fruit juice powders are maltodextrin-free and a healthier, fibre-rich alternative to conventional high-sugar fruit juice powders. Thus, fruit powders with a significantly improved nutritional profile can be produced and the fruit content can be significantly increased.

In SunCran™ – a cranberry juice powder with a 12:1 ratio of whole fruit to powder – Taiyo replaces 50% maltodextrin with 35% functional dietary fibre Sunfiber®.

This red powder is made from 100% natural

cranberries, contains 65% dried cranberry juice and 35% organic Sunfiber® (PHGG). SunCran™ is 100% clear soluble in cold and hot water, and rich in vitamin C, antioxidants, polyphenols and salicylic acid, all of which help protect against free radicals. It is ideal for use in juices, smoothies, shakes and dairy products, and also as a dietary supplement in capsules, functional bars, drinks and cereals.

On many packages of cranberry products or food supplements, the amount of PACs they contain is indicated. These products contain mainly insoluble PACs from the cranberry pomace, which is obtained as a by-product from cranberry juice production. Insoluble PACs, however, are much less bioavailable to the human body and there is as yet no recognised method of determining the content of PACs or their bioavailability. Conversely, soluble PACs from Taiyo's cranberry juice powder and the fibre galactomannan from the guar bean have a synergistic effect. The combination with PHGG enhances the antibacterial effect of the cranberry juice powder, in that the fibres of the Indian guar bean have an anti-adhesive and anti-invasive effect. They strengthen the good intestinal bacteria and these form a barrier on the

intestinal wall to repel "bad" intestinal bacteria. The prebiotic fibre PHGG promotes the good bifidobacteria and lactobacillus bacteria, which in turn compete with pathogenic bacteria and thus protect the intestine.

Thanks to Sunfiber®, SunCran™ scores with further nutritional benefits. Sunfiber® is the only certified low FODMAP fibre (fermentable oligo-, di-, monosaccharides and polyols) for this purpose. FODMAP compounds can cause flatulence and bloating in some people. The ingredient is also suitable for people with irritable bowel syndrome (IBS). Several clinical studies have shown that Sunfiber®, when consumed daily, alleviates the symptoms of IBS as well as gas formation. The developers of the low-FODMAP diet recognised its outstanding tolerability by certifying Sunfiber® as the first and still the only low-FODMAP dietary fibre.

SunCran™ is ideal for products that are to be promoted as high in fibre. As a carrier-free and maltodextrin-free fruit powder, it is already very successful in the USA and used in numerous applications. Furthermore, in a recent study, SunCran™ at a dosage of 2.5mg per day was found to have a particularly strong anti-adhesion effect on E.Coli bacteria. The in-vitro tests showed that the raw material can agglutinate the E.Coli, which then clump together and precipitate.^{3,4}

The use of SunCran™ also allows for EFSA-approved health claims such as 'contributes to vascular health which in turn helps maintain a healthy heart', 'helps to maintain the health of the urinary system' and 'helps to increase growth of beneficial microflora'.

Authenticity guaranteed

As local fresh fruits can only be used during their peak season, in order to be used during the rest of the year, they may need to be preserved by cooking, which can destroy many of the valuable health-promoting ingredients. Or they may need to be flown in from other parts of the world, which obviously raises environmental concerns. The prebiotic Sunfiber® fruit juice powders, however, protect all the natural ingredients and health benefits of the whole fruits – without the need for preservatives.

SunCran™ uses whole, premium grade A Canadian cranberries, which contain valuable nutrients and phytonutrients. The authenticity and non-adulteration of the berries are checked using



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Maldi-T analysis to guarantee the use of pure cranberries. No pesticides, herbicides, fungicides or fertilisers are used in the cultivation of the fruit. And in order to guarantee the safety of the material, the heavy metal and microbiological content is also checked on a regular basis.

The juice powder is free from genetically modified ingredients: It contains 65% gently dried organic cranberry juice and 35 per cent organic Sunfiber® (PHGG). It convinces sensorially with its typical cranberry flavour and appealing pink-red colour. SunCran™ is free from artificial colours, allergens, gluten, preservatives, added sugar and sweeteners, and can therefore also be used in dietary supplements and weight management products.

Innovative processing prolongs freshness

To preserve the natural nutrients of cranberries, a very gentle drying process is used. The patented Infidri™ infrared drying technology was developed in order to prevent natural, sensitive phytonutrients from being destroyed by heat or oxygen. In addition, the technology prolongs freshness and keeps the product as close to natural as possible.

Patented by PowderPure™ in the 1990s, Infidri™ technology provides gentle infrared drying technology to simplify the production of powdered products like SunCran®. The targeted wavelengths of infrared light resonate with water molecules to remove moisture without damaging delicate and healthy ingredients. The technology also enables a carrier and filler-free material.

Infidri™ extends shelf life, too, and keeps the product as natural as possible. And unlike traditional methods such as spray drying or freeze drying, infrared technology does not rely on intense heat or a vacuum to remove moisture. While these harsh conditions of other processes damage the delicate nutrients and colouring of the fruit, this gentle technology keeps all the nutrients intact.

Also, Infidri™ can achieve a higher drying efficiency of 73-88% and the patented technology guarantees 100% vitamin C retention. Thanks to the gentle technology, SunCran™ retains all the natural antioxidants and vitamins of the cranberry juice, so there is no need to add stabilisers.

SunCran™, which also has an organic variant, is the first, but no longer the only prebiotic fruit juice powder: Taiyo offers numerous other versions made from elderberry (Eldermune), the Stevnsbaer sour cherry (CherryShield), blueberry (SunBlue), amla (SunAmla), cranberry (Lingon-Shield) and chokeberry (AroniaShield), with further raw materials already in development. And beyond this, there are numerous other possible combinations of PHGG with other antioxidant-rich berries. Sunfiber® can also be added to the maqui berry, for example, with the agglomeration of both ingredients called SunMaqui. The Chilean berry has strong anti-inflammatory properties and can be used in anti-ageing products or for diabetes prevention.

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