



## Australian Ingredients in Kalari Crush™



### Kalari plum \*

**What is it?** The Australian Kalari plum or *Terminalia ferdinandiana*, is not actually a plum but more closely related to almonds. It is wild harvested in Northern Australia predominantly by Aborigines.

**What's in it?** A rich source of vitamin C, vitamin E, ellagic and gallic acids, folate, lutein, calcium, magnesium, iron and zinc

The Kalari plum is now well known as the world's highest fruit source of vitamin C, a record it has held despite 25 years of bio-exploration. However, it also contains significant absorptive enhancers such as iron and folates. These make the vitamin C more biologically available than if they were not present.

Additionally, an important point to note is that the enhanced benefits of Kalari plum are found when it is used as a whole fruit purée not just a juice or an extract. The purée includes all the fibre and soluble carbohydrates and also the intact cellular biochemical feedback systems which preserve the high levels of vitamin C until digestion and absorption occurs in our gut. This is an extremely important innovation in nutritional supplementation.

By comparison, recent reports in the USA suggest that increased refined juice consumption by children is a contributing factor to the rising incidence of obesity in America. The intake of fruits has risen as recommended by the Dietary Guidelines but the fruits themselves are nutrient poor and the juices consumed do not include the dietary fibre and are often brought up to the high levels of sugar 'naturally' found in the fruits. Additionally, the sugars added are generally straight sucrose and not other simple sugars as in wild fruits.

Interestingly, more recent studies into antioxidants and wild fruits at two universities (Charles Sturt University in the Riverina and The University of NSW, Sydney) and the Australian Government's research organization, the CSIRO as a non-academic institution have revealed a high level of some other nutritionally important polyphenolic antioxidants along with the vitamin C in the Kalari plum. Incidentally, other fruits were included in these tri-institutional studies and most of the commercial species under scrutiny are highlighted here.

Two of the phytochemicals in Kalari plums are gallic and ellagic acids (and some closely related compounds) and both have excellent antioxidant properties:

Gallic acid has anti-bacterial, anti-viral and anti-fungal activities and also shows anti-inflammatory, anti-tumor, anti-mutagenic and anti-bronchodilatory activities and has been found to show cytotoxicity against cancer cells without harming healthy ones.

Ellagic acid also has anti-carcinogenic effects against a wide range of damaging compounds which can be present in many human tissues.

The interaction between certain phytochemicals like ellagic acid and other compounds in foods is not well understood but it is unlikely that any single compound offers the best protection against degenerative diseases such as cancer. A balanced diet that includes five or more servings a day of fruits (and vegetables) along with foods from a variety of other plant sources such as herbs and spices is likely to be more effective in maintaining overall health and well-being than eating one particular food in large amounts. Consider then, the convenience of innovative snack and food beverages that integrate the approach of blending other superfoods with wild Australian natives for variety and nutritional properties.



### **Wild Rosella**

**What is it?** Rosella is a cosmopolitan plant found growing wild in many countries along the equator. The fruit is formed from the modified leaves or calyx. We source Australian rosella from our warmer States.

**What's in it?** A rich source of anthocyanins, particularly two of the most biologically active polyphenolics.

Another noteworthy food component in Kalari Crush™ is the botanically curious fruit of the Wild rosella. Not only do these fruits contain appreciable levels of anthocyanins and antioxidant activity but the particular anthocyanins present are two of the more active chemical moieties of this family of polyphenolic antioxidants. These compounds are known as restoratives and appear to have a relaxant effect on smooth muscles, particularly the vascular system. This suggests some role in relieving or normalizing blood pressure and rosella is commonly recognized as an anti-hypertensive.



### **Illawarra plum\***

**What is it?** Illawarra plums are unusual because of their external seed. The fruit is botanically known as a swollen pedicel or stem and the tree, along with several related species, is found along the eastern seaboard of Australia. They are an ancient genus with both male and female trees.

**What's in it?** Anthocyanins, mucopolysaccharides (soluble fibre)

Next we have the Illawarra plum which not only contains appreciable quantities of mucopolysaccharides or sticky sugars, which are hugely beneficial for our gastrointestinal tract health but the deep crimson colour of Illawarra plum purée is due to the content of still other anthocyanins. The antioxidant activity of Illawarra plums has been shown to be up to 7 times that of blueberries by the ORAC test for antioxidant activity.

Some recent research by the CSIRO in Adelaide's Human Nutrition Unit suggests that some components in Illawarra plums slow the growth and replication of fat cells in our bodies and therefore help to maintain an ideal body weight.



### **Mountain pepper leaf and berries \***

**What is it?** Although a traditional food flavouring used by highland Australian Aborigines for eons, mountain pepper was exported into Britain in the early 1800s as a peppery spice from the Antipodes.

**What's in it?** Both lipophilic (fat-loving) and hydrophilic (water-loving) antioxidants including; polygodial (a potent antioxidant and anti-inflammatory),  $\beta$ -carotene, lutein, chlorogenic acid, vitamin E, vitamin C and minerals eg magnesium, calcium and zinc.

In European folk medicine, Polygonum species or sneezeweeds are renowned for their anti-arthritic activity for which they have a long history of use as folk medicines. Native Australian sources of the active compound, polygodial, come from the spicy Australian mountain pepper. This plant has a long history of use as a culinary herb and reminds us that many herbs were once more important as medicines than as foods. (Besides, nothing improves the flavour of wombat more than a liberal seasoning of mountain pepper).

Some other research on polygodial has shown that it plays a protective role for the lining of the stomach, inhibiting lesions from chemicals such as ethanol and aspirin. Additionally, polygodial is anti-asthmatic, anti-allergic, anti-inflammatory and reduces the sensitivity to pain (antinociceptive effects). It also shows some antioxidant activity.

Another phytochemical in mountain pepper is chlorogenic acid which has anti-oxidant and anti-mutagenic activity and also appears to slow the absorption of glucose on digestion. This is yet another protective mechanism against Type 2 non-insulin dependent diabetes.



### **Quandong \***

**What is it?** Quandong or wild peach is a small dryland tree which taps into the roots of neighbouring plants to gain extra water and possibly additional nutrients in dry times. The fruit has a nutritional value second only to the Kalari plum in antioxidant capacity.

**What's in it?** Polyphenolic antioxidants, vitamin E, vitamin C, folate, zinc, magnesium, calcium, potassium, iron and molybdenum

One of the most well known wild fruits the quandong fruit which is picked as it sequentially ripens on the willow-like trees and often made into jams, sauces and baked into pies. The flesh of the fruit is only a thin covering on the gnarly, spherical seed but when fresh, it contains about the same vitamin C levels as an equal weight of oranges. From nutritional research in the 1980s by Vic Cherikoff at the University of Sydney, we know that the fruit is a rich source of minerals including calcium and potassium. Carbohydrate content is around 25% of the flesh weight yet the fruit themselves are not overly sweet.

The anthocyanins in the brilliant red skins of quandongs are not present in the flesh but the fact that Aborigines not only made annual pilgrimages to wild quandong stands but even took some ownership of heavily producing trees, suggests that the fruits are of high nutritional quality. This is certainly borne out with other similarly valued food species such as bunya nuts and milky plums.

### **Davidson Plum\***



**What is it?** Coming from an east coast rainforest tree, Davidson plums are also known as sour plums. The fruits are borne on long stems sprouting from old wood and down the trunks of established trees. Like quandong, the fruits do not ripen at one time but continue to turn from hard green unripe fruits to soft, juicy, powder-coated deep purple edible fruits.

**What's in it?** Organic acids, anthocyanins, lutein, vitamin E, vitamin C, folate, zinc, magnesium, calcium, molybdenum, potassium

### **Rainforest lime**



**What is it?** Related to conventional citrus and like lemonade lemons, rainforest limes are 100% edible. The species we use is wild harvested from private property and is often called the creek lime describing its preferred habitat.

**What's in it?** Vitamin C, limonoids, vitamin E, folate, lutein

Unlike conventional limes, rainforest limes are used skin and all. This maximizes their nutritional contribution as many of the antioxidants are in the skin, underlying pith and seeds of citrus fruits.

Research by Lam et al 1994 shows that five limonoid aglycones (limonin, nomilin, obacunone, isoobacunonic acid, ichangin) induced significant amounts of glutathione-S-transferase (GST) in the liver and intestinal mucosa. GST is a major detoxifying enzyme system which catalyzes the conjugation of glutathione with many potentially carcinogenic compounds which are highly electrophilic in nature (free radicals).

### **Lemon myrtle**



**What is it?** A rainforest tree from the sub-tropical east coast of Australia, the leaves of lemon myrtle are fragrantly aromatic with a lemon, bubble-gum note.

**What's in it?** Both hydrophilic and lipophilic antioxidants, rich source of calcium, vitamin E, folate, lutein, citral

Little research has been done on the direct health benefits of lemon myrtle but from experience and feedback we know that it contains elements that boost the immune system. However, we do know that like most wild Australian foods, the presence of both fat and water-loving antioxidants confers a greater protection from oxidative stress than conventional foods which tend to predominately provide hydrophilic antioxidants.

A major component of lemon myrtle is its essential oil, citral and this has been reported to produce expectorant, appetite stimulant (digestant), choleric, carminative, spasmolytic, anti-inflammatory, diuretic and sedative actions. It also has some role in antimutagenicity in animals.





### **Anise myrtle\***

**What is it?** A small rainforest tree of temperate and sub-tropical regions of east-coast Australia, the leaves have a subtle licorice flavour with a green tea backnote.

**What's in it?** Both hydrophilic and lipophilic antioxidants, trans-anethole, lutein, vitamin E, vitamin C, folate

One key ingredient in anise myrtle is trans-anethole which has been tested in clinical trials for its action on the learning centre of the brain and potential benefits for treating or protecting against diseases of ageing. As we grow older, the replacement of brain (glial) cells slows or may stop and antioxidants have been shown to switch on production of these essential cells resulting in a boost to our cognitive powers even into old age. Other functional effects of anethole are similar to the phytoestrogenic activity and immune boosting power found in green tea.



### **Forestberry herb\***

**What is it?** A small tree found in temperate and sub-tropical regions, forestberry herb typifies the culinary herbs in Australia in being a tree leaf rather than that of a forb or small perennial plant.

**What's in it?** Both hydrophilic and lipophilic antioxidants, cinnamates

Cinnamates in the diet could reduce risk factors associated with diabetes and cardiovascular disease.

Studies have been conducted that support the hypothesis that the inclusion of cinnamates in the diet of people who are overweight or obese would reduce oxidative stress and impaired fasting glycemia which are risk factors associated with diabetes and cardiovascular disease.

The mechanisms underlying the beneficial effects may be related to the insulin potentiating and antioxidant effects of the cinnamate polyphenols resulting in decreased free radical production.

## **Other (global) superfoods in Kalari Crush™**



### **Acai**

Acai is a natural and powerful antioxidant. Acai (pronounced 'ah-SIGHee') is a type of palm tree that grows in tropical and central South America. These trees produce fruit twice a year in the form of berries that are small and round, black-purple in colour and are similar in size to grapes. They are used as an important food source by native South Americans.

The high content of anthocyanins in Acai gives the berry its dark and vibrant colour and is the main reason for its antioxidant activity in the body. Acai has been shown to have up to six times the antioxidant capacity of blueberries and approximately 30 times the amount of anthocyanins in red wine.

Acai berries are also full of amino acids and essential fatty acids. Acai also contains phytosterols, which reduce blood plasma cholesterol. Acai also has high levels of calcium, vitamin E, phosphorous, iron and fibre.

Acai has:

- more protein than eggs, gram for gram.
- over 16 phytonutrients and antioxidants
- 10 times as many antioxidants as grapes and twice as many as blueberries
- 30 times more anthocyanins than red wine
- 44.2 grams of dietary fibre per 100 grams
- a low glycaemic index
- a high amount of vitamins and minerals
- vital fatty acids similar to those in olive oil
- a very high ORAC level

In addition to its antioxidant properties, acai is antibacterial and anti-inflammatory. It is beneficial for the eyes, blood vessels, connective tissue, and the nervous system. It helps to restore other antioxidants in the body such as vitamin C, vitamin E, and glutathione. Flavenoids in the acai also help to protect the body against disease.

The acai berry also contains enzymes and co-factors such as coenzyme Q10. These help the body digest food and assist with vital chemical interactions in the body.

In scientific, in vitro tests, acai has been shown to stimulate the activity of macrophages. Macrophages are white blood cells that are an important part of the body's immune system — they actually 'swallow' and destroy foreign objects and pathogens that attack the body.

Acai extract was found to inhibit the inflammatory action certain types of bacteria in the body and the more acai that was used, the greater the effect.

Further research has shown acai extract could reduce the growth of certain leukaemia cells in vitro. The researchers concluded that the acai extract activated an enzyme that plays an important role in the cell death or apoptosis of the cancerous leukaemia cells.



### **Barley Grass**

Barley is a staple food in many cultures. Records show that barley was cultivated by humans as early as 7,000 BC. Roman gladiators reportedly ate barley for strength and stamina and there are records back to the first Olympics of long jump distances of 55 feet (nearly 17m) whereas today's records stand at just under 29.6ft (10m).

Barley grass contains many vitamins, minerals, and proteins as well as chlorophyll. It is full of potassium, calcium, magnesium, iron, copper, phosphorus, manganese, zinc, beta carotene, B1, B2, B6, C, folic acid, and pantothenic acid.

Green barley juice contains:

- 11 times more calcium than cow's milk
- 5 times more iron than spinach
- 7 times the vitamin C in oranges
- Around 80 mg of vitamin B12 per hundred grams

Barley also contains alpha-glucan, which is a fibre also found in oat bran and is reported to reduce cholesterol levels. The barley root contains the alkaloid hordenine, which stimulates peripheral blood circulation and has been used as a bronchodilator for bronchitis.

Barley grass also acts as a free radical scavenger and it has been shown to reduce inflammation and pain.



### **Blueberries**

Blueberries are native to North America but they are now grown commercially in Australia and New Zealand.

One cup (145 g) of blueberries provides 31 per cent of the daily dietary requirements of vitamin C, 16 per cent of the daily dietary fibre intake, 20 of the body's daily for manganese requirements and seven per cent of the daily vitamin E requirements.

Blueberries contain a high amount of anthocyanins, other antioxidant pigments and various substances that reduce the risks of some diseases, including cancers. Research has shown that blueberry anthocyanins, proanthocyanidins, flavonols and tannins inhibit the development of cancer cells in vitro. Other research findings suggest that blueberries may reduce the progression of Alzheimer's disease and other age related disorders.

Blueberries fed to animals lowered the incidence of damage from strokes. Other animal studies found that blueberries lowered cholesterol and acted on the mechanism that lowers blood pressure.

UK researchers have found that blueberries could strengthen blood vessels against oxidative stress that may lead to heart disease.

Research on rodents has also found that an increased intake of blueberries may prevent the weakening of bones that occurs after menopause. And blueberries may also help prevent urinary tract infections.

In great news for people who struggle to lose weight, rodents fed blueberry extract gained up to 10 per cent less body weight than rodents not consuming blueberry. Those same rodents on the blueberry extract also ate around eight per cent less food.

Another study on rodents showed that an extract of berry anthocyanins decreased obesity in mice whereas the whole fruit did not have the same effects. Mice consuming a high-fat diet supplemented with the purified anthocyanin extracts from blueberries and strawberries gained significantly less body weight and body fat than a control group of mice on the high fat diet with no berry supplements.

Further studies on the actions of blueberry antioxidants and the brain revealed that a diet enriched with blueberries prevented an increase in a damaging protein that is associated with aging. The result is a decrease in the oxidative damage to the brain that naturally occurs with aging.



### **Cherries**

Cherries are a very popular fruit that belong to the same family as almonds, peaches, plums and apricots. However, while we know they taste great, they are also great for us, as recent research is showing.

Cherries contain vitamin C, vitamin A, bioflavonoids, ellagic acid, perillyl, anthocyanins and melatonin. The red colour of cherries comes from the anthocyanins, which are strong antioxidants that have been shown to reduce pain and inflammation.

In terms of other medical benefits, the antioxidants in cherries:

- help fight cancer
- aid in the prevention of heart disease
- relieve the pain of arthritis, gout, headaches
- can lower blood sugar in diabetics
- ease the symptoms associated with Fibromyalgia Syndrome
- provide a healthy and safe way to produce melatonin
- improve physiological and mental functions

A recent study in animals by University of Michigan researchers found that diets enriched with cherries significantly lowered insulin and fasting glucose levels, which are involved with the development of type 2 diabetes. Adding cherries to the diet also lowered total cholesterol levels and triglycerides after 90 days.

Other research showed that drinking cherry juice before and after exercise may reduce muscle pain and damage.

Cherries can also help with weight loss. Cherries are low in calories, low in fat and they contain a high percentage of water. Like most fruit, cherries are also high in potassium and low in sodium, which helps control water retention by improving water balance — a diet low in sodium results in the loss of excess water weight.



### **Flaxseed**

Flax or linseed is a plant that has been cultivated by humans for its fibres, which have been used for making cloth, paper and even fishing nets. The oil of the flax seeds has been used as a food and for preserving wood.

Flaxseeds have attracted a lot of attention for their nutritional benefits. They contain high levels of lignans and Omega-3 fatty acids. Lignans are phytoestrogens, or estrogen-like chemicals that also act as antioxidants.

Lignans in flaxseed possess anti-cancer properties and studies performed on mice found that flaxseed extract reduced growth of specific types of tumours. Other studies suggest that flaxseed may benefit individuals with certain types of breast and prostate cancers.

Omega-3 fatty acids are essential fatty acids because they are essential to human health but cannot be manufactured by the body — they must be obtained from food.

There are three types of omega-3 fatty acids: alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). The body can convert ALA to EPA and DHA, which are the two types of omega-3 fatty acids more readily used by the body and these two types of omega-3 fatty acids are also found in high concentrations in fish oils. Flaxseed contains alpha linolenic acid (ALA).

Clinical studies show that omega-3 fatty acids are helpful in treating a variety of health conditions including high cholesterol, high blood pressure, heart disease, diabetes, arthritis, osteoporosis, and by controlling sugar levels and blood cholesterol. They are also beneficial in promoting weight loss and for maintaining healthy skin.



In addition to the high concentration of omega-3 fatty acids, flaxseed contains an important lignan called secoisolariciresinol diglucoside (SDG), which is converted into enterodiol and enterolactone in the colon. There is evidence that enterolactone, may have a beneficial effect on bone health, breast health, heart health, hair loss, acne, inflammation, prostate and menopause health and as an antioxidant.

Flaxseed lignans have also been linked to reducing the risk of breast cancer for pre-menopausal women by 78 per cent. In addition, daily consumption of flaxseed may stop the growth of prostate cancer tumours, according to a study in the USA.

Dietary supplement of flaxseed could also prove to reduce inflammation and oxidative stress in the lungs, as it has shown these benefits in animal tests.

Another area where flaxseed is showing promising is hair loss. An trial that supplemented the diets of male subjects with 250 mg of an extract of flaxseed oil reported that 90 per cent of the volunteers showed improvements in their hair loss problem, and 50 per cent reported a decrease in oil secretion in the scalp.



### **Green Tea**

An ancient Chinese proverb says: “It is better to be starved of food for three days, than tea for one.”

Tea comes from *Camellia sinensis* plant. The basic types of tea due to different methods of processing of the tea leaves are: black tea, green tea and oolong tea (red).

Of the three types of tea, green tea undergoes the least processing and it retains more unoxidised polyphenols. The polyphenols in tea act as antioxidants. Tea polyphenols consist mostly of catechins, the most powerful of which is epigallocatechin gallate (EGCG), which is found only in green tea.

EGCG has been shown to kill cancer cells without harming healthy tissue. It has also been effective in lowering LDL cholesterol levels, and inhibiting the abnormal formation of blood clots. Thrombosis (which is the formation of abnormal blood clots) is the leading cause of heart attacks and stroke.

In traditional Chinese and Indian medicine, green tea has been used as a stimulant, a diuretic, an astringent (to control bleeding and help heal wounds), and for heart health. Other traditional uses of green tea include regulating body temperature and blood sugar, promoting digestion and improving mental functioning —Chinese students are known to consume green tea to keep them alert during study and exams.

Large scale studies indicate that the antioxidant properties of green tea may help prevent atherosclerosis, or heart disease, particularly coronary artery disease.

In 1994 the Journal of the National Cancer Institute published the results of a study that showed drinking green tea reduced the risk of esophageal cancer in Chinese men and women by nearly sixty percent.

In one study that compared people with and without bladder cancer, researchers found that women who drank black tea and powdered green tea were less likely to develop bladder cancer. A follow-up study by the same group of researchers revealed that bladder cancer

patients (particularly men) who drank green tea had a substantially better five-year survival rate than those who did not.

Other research suggests that green tea inhibits the growth of breast cancer cells. In one study of 472 women with various stages of breast cancer, researchers found that women who consumed the most green tea experienced the least spread of cancer. The researchers also found that women with early stages of breast cancer who drank at least five cups of tea every day before being diagnosed with cancer were less likely to suffer recurrences of the disease after the completion of cancer treatment.

In another study on ovarian cancer patients in China, researchers found that women who drank at least one cup of green tea per day survived longer with the disease than those who didn't drink green tea.

Further studies on laboratory animals found that green tea polyphenols inhibit the growth of cancer cells of the esophagus, which is the muscular tube that connects the throat to the stomach.

Researchers also compared green tea drinkers with non-drinkers and found that those who drank the most tea were significantly less likely to develop pancreatic cancer.

Green tea has traditionally been used to control and regulate blood sugar in the body. Animal studies suggest that green tea may help prevent the development of Type 1 diabetes and slow the progression of the disease once it has developed. People with Type 1 diabetes produce little or no insulin, which is a hormone that regulates the uptake of sugars into cells and also influences fat storage.

Large-scale studies have shown that men who drink more than 10 cups of green tea per day are less likely to develop disorders of the liver. Green tea also seems to protect the liver from the damaging effects of toxic substances such as alcohol. Animal studies have shown that green tea helps protect against the development of liver tumors.

There is also research indicating that drinking green tea lowers total cholesterol levels, as well as improving the ratio of good (HDL) cholesterol to bad (LDL) cholesterol. One study found that men who drink green tea are more likely to have lower total cholesterol than those who do not drink green tea. Results from an animal study indicated that polyphenols in green tea could block the absorption of cholesterol through the intestines and promote its excretion from the body. In another study of male smokers, green tea significantly reduced blood levels of harmful LDL cholesterol.

Green tea is also rich in fluoride, which is good for the teeth by preventing cavities. In addition, green tea kills bacteria that cause dental plaques and bad breath.

Green tea extract also has fat-burning properties, which promote weight loss. One study confirmed that green tea and caffeine improved weight loss in humans. Some researchers suggested that green tea polyphenols, specifically the catechins, are responsible for the 'fat-burning' effect.



### **Goji**

Goji berries are the fruits of a plant in the Solanaceae family that includes the potato, tomato, eggplant, chili pepper and tobacco plants. Also called wolfberry, goji's natural habitat is south east Europe to southwest Asia, although China is where the vast majority of cultivation of goji berries has taken place for over 600 years.

Goji berries are highly nutritious. They contain:

- 18 amino acids, including the eight essential amino acids.
- Vitamins B1, B2, B6, C and E and up to 21 trace minerals including zinc, calcium, iron, selenium, phosphorous and germanium
- Dietary fibre
- Essential fatty acids and they are 15 percent protein
- They are rich in antioxidants and have more beta carotene than



### **Mangosteen**

Mangosteen is a tropical evergreen tree and while most people know about the edible white flesh it is the crimson pith that is the source of antioxidants in mangosteen.

A number of laboratory and animal studies show that mangosteen has significant anti-inflammatory effects. It is very high in vitamin C and beta-carotene.

In recent years, mangosteen has attracted special attention for its xanthone extracts — garcinol and mangostin. These are anti-inflammatory agents with preliminary evidence for inhibiting cancer-causing cyclo-oxygenase (COX) enzymes and other carcinogens. Other research indicates that garcinol may also be an appetite suppressant and could be useful in weight control.



### **Pomegranate**

On the outside it looks like a little like a red-orange apple, inside the pomegranate is full of seeds, which are covered in the flesh of the fruit. There are approximately 600 seeds in each pomegranate.

This fruit, which is classed as a berry, has been used as a food for many thousands of years. Pomegranate juice is a popular drink in many parts of the world, including the Middle East and Turkey.

However, there are many more benefits associated with pomegranate aside from being a popular food.

Pomegranate juice provides about 16 per cent of an adult's daily vitamin C requirement per 100 ml serving, and is a good source of vitamin B5, potassium and antioxidant polyphenols.

The most abundant polyphenols in pomegranate juice are the tannins, which have free-radical scavenging properties.

Pomegranate juice has been found to be effective in reducing heart disease risk factors, including oxidation of LDL cholesterol and oxidative damage to macrophages, which are linked to cardiovascular disease.

Pomegranate has also been shown to reduce blood pressure by inhibiting a certain enzyme which influences blood pressure.

In addition, pomegranate seed oil has been shown to be effective against the growth and spread of breast cancer cells in vitro. And pomegranate juice may also have antiviral and antibacterial effects and guard against dental caries.

Studies have shown that pomegranate juice, taken daily, prevented the thickening of arteries and slowed down cholesterol oxidation by almost half in some patients.

Recent scientific reports have even indicated that pomegranate fruit extracts have been shown to block enzymes that contribute to the breakdown of cartilage in people with arthritis. Combined with glucosamine, pomegranate extract could hold the key to a natural treatment for this painful condition.

Great news for pregnant mums to be is that drinking pomegranate juice during pregnancy may reduce hypoxia ischemia-related brain injuries in babies. Hypoxia ischemia is a condition brought about by decreased blood flow and oxygen to the baby's brain and it is linked to premature birth and other complications during pregnancy. This condition unfortunately causes brain injury in two out of every 1,000 full-term human births, and in a high percentage of premature babies born before 34 weeks.

Giving hope to breast cancer survivors, pomegranate seed oil has been shown to activate the process of apoptosis or the death of breast cancer cells. In addition, pomegranate juice can be toxic to some breast cancer cells, while leaving normal breast cells unaffected.



### **Grape skin and seeds**

Kalari Crush™ includes two grape products (we leave out the sugary juice which is high GI and unhealthy) made from the dried skin and seeds as these are rich sources of the antioxidant resveratrol. Initially this antioxidant was thought to be most important in cardiovascular health and terms such as the French paradox (high saturated fat diets yet low incidence of cardiovascular disease). More

recently, research is showing that resveratrol is increasingly being found to play a role in kidney, liver and brain health.



### **Cocoa Bean**

This is the newest addition to Kalari Crush™ and has been added because it is one of the richest sources of antioxidants amongst conventional foods. Cocoa was a wild food of the Aztecs and Toltecs and an Aztec King named Montezuma reportedly consumed vast quantities of a cocoa bean drink which he called the 'Food of the Gods' recognizing that it "builds resistance and fights fatigue". It was also believed to enhance sexual prowess, impart wisdom and provide great energy.

The translation of the phrase food of the Gods lends itself to the Genus for the plant and the active principle in cocoa, theobromine. However, recent research reveals a multitude of beneficial compounds in cocoa bean extract, including the catechin and epicatechin polyphenolics, methylxanthines such as theobromine and a host of bioactive peptides and amino acids which are reported to possess antihypertensive, antithrombotic, hypocholesterolemic, hypotriglyceridemic and anti-obesity effects.

Cocoa bean extract is also a rich source of magnesium.

## Our next new ingredient to be added in 2013

### Acacia Extract\*

An Australian species of wattle (Acacia) donated as part of a collection of arid zone plants to the University of Arizona by Vic Cherikoff in the 1980s has been found to contain families of compounds called avrins and avrinicins. These are powerful antioxidants in reducing oxidative and nitrosative stress and may suppress the development of human skin cancer and other epithelial malignancies.

Other work including some conducted by Vic Cherikoff and researchers at the University of Sydney has focused on extractive technologies and testing of Acacia extract on cancer cells in tissue culture. There is a natural shelf life, as it were, for cells called apoptosis and this differs for different cells.

To over-simplify the explanation, cancer cells lack an 'off switch' and so over time they proliferate.

Avrins are able to stimulate apoptosis, triggering the switch in cancer cells turning on their use-by date.



Apoptotic cell death plays a critical role in normal cell development, tissue homeostasis and the regulation of the immune system and compromised apoptosis is an integral part of cancer cell growth and development.



Avrins appear to be able to stimulate apoptosis in a wide range of cancer cells and the avrins in the Australian Acacia extract to be added to Kalari Crush™ have been shown to have a negligible to zero effect on normal cells.

This will add and enhance the existing action of ellagic and gallic acids from Kalari plum, anthocyanins from wild rosella and other phytonutrients which have also been reported as switching on apoptosis in cancer cells.

*\*Note: Due to Europe's anti-competitive legislation and Novel Foods Act, some of the traditional foods used by Australian Aborigines for over 60,000 years are unable to be included in the European formulation of Kalari Crush®. These are marked with an \* and please know that we are working with the Australian Government to circumvent this Draconian law to bring our unique whole food mix to anyone wishing to enhance their nutrition and boost their health.*

*However, even without the "novel" Australian ingredients as restricted in the EU, Kalari Crush™ is still the best nutritional product available as can be gleaned from the above.*

Note: The main purpose of the above is to provide information and is not intended to be substituted for medical advice.