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**nuzest®**  
nutrition for life

# KIDS GOOD STUFF

## TECHNICAL BULLETIN

### COMPLETE NUTRITIONAL SUPPORT FOR GROWING CHILDREN AND PEACE OF MIND FOR PARENTS

*A multi-nutrient blend of vegetable protein, superfood greens, berries, vegetables, herbs and added vitamins and minerals in their optimum forms*

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# INTRODUCTION & PRODUCT JUSTIFICATION

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## THE EARLY YEARS ARE A TIME OF RAPID GROWTH AND DEVELOPMENT AND KIDS NEED TO BE SUPPORTED WITH GREAT NUTRITION.

Many people do not consume an optimal diet, and a staggering 90% of kids between the ages of 4 and 8 fail to consume the recommended number of serves of vegetables. A further 25% don't manage to eat the recommended serves of fruit.<sup>1</sup>

Kids Good Stuff is a multi-nutrient blend of vegetable (European Golden Pea) protein, superfood greens, berries, vegetables, herbs and added vitamins and minerals in their optimum forms - providing comprehensive nutritional support for children aged 4 years and older - and peace of mind for parents! It is intended to be consumed as a smoothie. Kids Good Stuff provides over 100% of the RDI of a wide range of vitamins and minerals for children from the age of 4 upwards – plus much more. With natural mint choc flavouring, it also tastes delicious and each serve contains less than one gram of sugars.

Create smoothie by stirring, blending or shaking 2 scoops (15g) of Kids Good Stuff in around 250 ml of water, almond milk, coconut milk or other preferred liquid. Best consumed with or immediately after main meals. Consume one serve daily.

### SYNERGY

There has been considerable controversy about what constitutes optimal nutrition for children. It stands to reason that people have very defined views on what's best for their kids, because we all want to ensure that they are getting the nutrients they need to grow and develop into the best they can be.

As a company, NuZest believes firmly that 'food comes first' and yet it recognises that many children are not always getting an optimum range of nutrients from diet alone consistently through their development.

There is a large and growing body of evidence showing that a diverse intake of fresh produce (vegetables and fruits) are associated with improved health outcomes later in life. As the latest Australian Bureau of Statistics data reveal, most parents struggle to get nearly enough vegetables and even fruit into their children.<sup>1</sup>

As children get older, the intake figures for vegetables and fruit deteriorate even further and these poor dietary habits can be maintained into adulthood, contributing to unnecessary and preventable chronic disease in later life.<sup>2</sup>

It is clear that dietary trends associated with the globalisation of the food supply and increased processing, including increased consumption of sugars, refined carbohydrates, trans fats and processed meats has been detrimental to health and has encouraged increased rates of obesity, type 2 diabetes and other metabolic disorders.<sup>3</sup>

Since WWII, food fortification and supplementation has generally involved the provision of isolated, often synthetic nutrients. Increasingly, it is recognised that it is the synergy of the constituents in diverse diets that is of paramount importance to health and wellbeing.<sup>4,5</sup>

In order to encourage such synergy, NuZest supplemented foods, such as Kids Good Stuff, represent an innovative approach to supplementation by incorporating the optimal, generally natural, full spectrum forms of nutrients in a food matrix base, without any fillers, preservatives or artificial flavours or sweeteners. By taking Kids Good Stuff with or immediately after meals, the synergy with nutrients in the diet is further optimised.

# NUTRIENTS TO SUPPORT GROWING CHILDREN

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FRUITS • VEGGIES • BERRIES • VITAMINS • MINERALS • PROTEIN • PROBIOTICS • ENZYMES • ANTIOXIDANTS

## GROWTH & DEVELOPMENT

Pea Protein Isolate	6400mg
Sunflower Lecithin	250mg

## GREENS, FRUITS & VEG

Cacao	3750mg
Red Marine Algae (Calcium)	425mg
Organic Spirulina	200mg
Apple Powder	200mg
Grapeseed extract*	200mg
Blackcurrant extract*	200mg
Beetroot	150mg
Carrot Root	150mg
Organic Barley Leaf	150mg
Organic Wheatgrass	150mg
Acerola Fruit extract*	125mg
Bilberry extract*	100mg
Papaya Juice	100mg
Broccoli Sprout	100mg

Spinach	100mg
Camu Camu extract*	100mg
Pineapple Juice extract*	75mg
Kelp (whole plant) extract*	35mg
Goji (Wolfberry) extract*	20mg

## VITAMINS & MINERALS

Potassium Phosphate	668mg
Ascorbic Acid (Vit C)	200mg
Magnesium Glycinate	154mg
Magnesium Citrate	100mg
Mixed Tocopherols	63mg
Zinc Gluconate	46mg
Inositol Hexanicotinate (B3)	11mg
d-Alpha Tocopherol (Vit E)	6.2mg
Orthosilicic Acid (Silica)	6.0mg
Calcium D-Pantothenate (B5)	5.5mg
L-Selenomethionine	5.0mg
Manganese Gluconate	4.2mg

Lichen Vit D3 (400IU)	4.0mg
Riboflavin (Vit B2)	3.0mg
Pyridoxine HCl (Vit B6)	3.6mg
Retinyl Palmitate (Vit A)	2.7mg
Thiamin (Vit B1)	2.2mg
Copper Gluconate	1.5mg
Mixed Carotenoids	1.3mg
L-5MTHF (Folate)	200mcg
Chromium Picolinate	165mcg
Menaquinone-7 (Vit K2)	70mcg
Biotin (Vit B7)	40mcg
Methylcobalamin (Vit B12)	10mcg

## IMMUNE SUPPORT

Bioflavonoids	150mg
Citric Acid	150mg
R,S -Alpha Lipoic Acid	30mg
Cacao Polyphenol extract	30mg
Beta Glucans (70%)	11mg

## DIGESTIVE SUPPORT

Psyllium Husk (Fibre)	100mg
Ginger	50mg
Bromelain (Enzymes)	30mg
Dandelion*	15mg

## PRE & PROBIOTICS

Apple Pectin (Prebiotic)	200mg
B. bifidum	1.0B CFU
L. acidophilus	1.0B CFU

## FLAVOURS

Vanilla	
Chocolate	
Peppermint	
Katemfe Fruit extract (Thaumatococcus)	
Stevia	

\*Extract equivalent amount

## PLANT FOODS

Each 15g serve of Kids Green Stuff delivers 6.5 g of over 20 concentrated plant foods, plant extracts and other phytonutrients. These phytonutrients contain a broad range of beneficial compounds, such as flavonoids, anthocyanins and other polyphenols known to be associated with reducing oxidative stress in the body, resulting in the protection of DNA, proteins and lipids from oxidative damage.<sup>10</sup>

Among the greens, other vegetable and fruit phytonutrient sources included are: pure, raw cacao with an accompanying cacao polyphenol extract (but no sugar) that acts as a powerful free radical scavenger<sup>11</sup>; organic spirulina to support detoxification<sup>12</sup>; bilberry extract for eye health<sup>13</sup>; and grapeseed extract, blackcurrant extract and broccoli sprouts, known for their potent antioxidant and chemopreventive roles.<sup>14,15</sup>

## PROTEIN

Protein intake is particularly important for children given its key role in growth, building new tissue and muscle, repair, brain function and the regulation of a wide range of metabolic processes. Protein is also an important factor in satiation.<sup>6</sup>

Children should consume 0.8 - 1.0 g per kg body weight. That equates to 24 to 30 g of protein

for a 30 kg child. Kids Good Stuff provides 6.4 g of 98% digestible European Pea (*Pisum sativum*) protein (Pisane®). This represents around 25% of the protein requirement for a 30 kg child. The pea protein isolate is derived using a cold temperature extraction method free from solvents and therefore is entirely undenatured, in contrast to most animal or vegetable proteins that have been subjected to high temperature cooking.

The protein is a rich source of all 9 essential amino acids and, unlike meat and dairy proteins, is alkaline (pH 7.8). The pea protein isolate is also entirely free from lectins, natural compounds found in leguminous vegetables (peas, beans, etc) that act as anti-nutritional factors and can only be broken down by extended cooking.

## PHOSPHOLIPIDS

Each serve of Kids Good Stuff contains 250 mg of sunflower (not soya) lecithin. Sunflower lecithin is a phospholipid source rich in phosphatidylcholine and essential fatty acids.<sup>8</sup> Phosphatidylcholine plays a vital role in cellular signaling and synaptic function, especially important for optimal brain function and cognitive support.<sup>9</sup> Sunflower lecithin also contains phosphatidyl inositol, phosphatidyl ethanolamine and a diverse range of essential fatty acids.

# NUTRIENTS TO SUPPORT GROWING CHILDREN

## VITAMINS & MINERALS

Kids Good Stuff contains a full complement of vitamins and minerals, in their optimum forms. These are shown in Table 1.

**Table 1.** Bioavailable vitamins and minerals, amounts and Recommended Dietary Intakes (RDIs) in Kids Good Stuff (per single, 15 g serving)

### BIOAVAILABLE VITAMINS Forms, amounts and RDIs

Vitamin A (retinyl palmitate & mixed carotenoids)	300 µg RE (40% RDI)
Vitamin D3 (from lichen)	10 µg (100% RDI)
Vitamin E (d-alpha & mixed tocopherols)	7 mg α-TE (70% RDI)
Vitamin K2 (menaquinone-7)	70 µg (94% RDI)
Vitamin C (ascorbic acid and acerola cherry)	200 mg (500% RDI)
Vitamin B1 (thiamine HCl)	2 mg (182% RDI)
Vitamin B2 (riboflavin)	3 mg (176% RDI)
Vitamin B3 (inositol hexanicotinate)	10 mg NE (100% RDI)
Pantothenate (pantothenic acid)	10 mg (187% RDI)
Vitamin B6 (pyridoxine HCl)	3 mg (187% RDI)
Folate (calcium methylfolate)	200 µg (100% RDI)
Vitamin B12 (methylcobalamin)	10 µg (500% RDI)
Biotin (d-biotin)	40 µg (133% RDI)

### BIOAVAILABLE MINERALS Forms, amounts and RDIs

Potassium (phosphate)	300 mg (RDI not set)
Calcium (from red marine algae)	140 mg (18% RDI)
Chromium (as picolinate)	20 µg (10% RDI)
Magnesium (citrate & glycinate)	54 mg (17% RDI)
Zinc (gluconate)	6 mg (50% RDI)
Manganese (gluconate)	500 µg (10% RDI)
Selenium (L-selenomethionine)	25 µg (36% RDI)
Iodine (kelp & marine algae)	75 µg (50% RDI)

**THE VITAMIN FORMS IN KGS HAVE BEEN SELECTED CAREFULLY TO DELIVER THE MOST BIOAVAILABLE AND FUNCTIONAL FORMS, TYPICAL OF A FOOD MATRIX. ADDITIONAL DETAIL IS PROVIDED BELOW FOR SPECIFIC FORMS PRESENT IN KIDS GOOD STUFF.**

## VITAMIN A

Vitamin A, which is a fat-soluble essential vitamin that has a wide range of functions in the body, including providing support for the immune system, mucous membranes, skin, vision, iron metabolism and cell specialisation.<sup>16</sup>

Kids Good Stuff includes both preformed vitamin A as retinyl palmitate and pro-vitamin A in the forms of natural, mixed carotenoids. Preformed vitamin A is present in large amounts in animal foods such as liver, or small amounts in dairy products, while the mixed carotenoid blend includes a full spectrum of carotenes as found in red, orange and yellow pigmented fruits and vegetables. Provitamin carotenoids are precursors to vitamin A, so the body has to convert them into usable vitamin A (retinol). However, there is evidence of considerable genetic variation in conversion rates and absorption<sup>16</sup> with conversion losses of beta-carotene exceeding 20-fold loss from food sources in some.<sup>17</sup> The presence of naturally-sourced carotenoids has been shown to be particularly important for long-term health.<sup>16</sup> High doses of synthetic beta-carotene, which is specifically not included in Kids Good Stuff, have been shown in some studies to pose increased cancer risk to some susceptible groups such as smokers, former smokers or those who have been exposed to asbestos.<sup>18</sup>

Kids Good Stuff also contains sunflower lecithin which provides a source of fat (phospholipids and fatty acids) to aid absorption of fat-soluble vitamins such as vitamins A, E and K2.

## VITAMIN E

Vitamin E is a fat-soluble vitamin found, amongst other foods, in plant/seed oils, wheat germ, green leafy vegetables and meats. It helps to protect cells, DNA, proteins and lipids from oxidative stress. It occurs naturally in foods in eight different isomers (alpha-, beta-, gamma-, delta-tocopherol, and alpha-, beta-, gamma-, delta- tocotrienol). Alpha-tocopherol is the predominant form in animal tissues and was for many years regarded as the only form required in supplements owing to its high biological activity, itself based on foetal resorption assays in rodents.<sup>19</sup> Gamma-tocopherol is the most abundant form in plant foods and in the diet and has a wide range of beneficial effects that have not been attributed to alpha-tocopherol.<sup>20</sup> Excessive intakes of the alpha-tocopherol form can actually inhibit uptake of the gamma-tocopherol form<sup>21</sup> and an increasing body of research suggests that all forms of vitamin E should be provided to derive maximum benefits.<sup>22</sup> Accordingly, Kids Good Stuff contains moderate amounts of alpha-tocopherol succinate, a form found in foods, as well as mixed tocopherols from rice bran, especially rich in gamma-tocopherol.

Absorption of the vitamin E, along with other fat soluble vitamins such as vitamin D3, is enhanced by inclusion of sunflower lecithin.



## FOLATE

Folate is a water-soluble B vitamin that is found naturally in a relatively narrow range of foods including leafy, dark green vegetables, legumes, oranges, organ meat, egg yolks and whole grains. Folic acid is the synthetic, stable and oxidised form of this vitamin.

Folate is essential for a wide range of functions including cell division, maternal tissue growth during pregnancy, amino acid synthesis, blood formation, homocysteine metabolism, psychological function, immune function and reduction of tiredness and fatigue.<sup>24</sup> Deficiency may cause a number of serious issues including anaemia, neural tube defects, cognitive and cardiovascular problems, increased cancer risk and fatigue. Low levels of the bioactive form, L-5'-methyltetrahydrofolate (5MTHF), may also contribute to compromised methylation or detoxification capacity.<sup>23</sup> Methylation is a vital process in the body, needed to detoxify and eliminate heavy metals, breakdown used hormones and brain chemicals, and to create and use antioxidants efficiently. The methylation cycle is dependent on folate as well as vitamin B12 as cofactors. Activated folate feeds straight into the methylation cycle.

Folic acid, as used in most supplements and fortified foods, by contrast, has to go through a number of different reducing, enzyme-dependent steps in order to be converted to active folate. There is considerable genetic variation in how well these different steps work<sup>24,25</sup>, so for some people (up to 50% of some populations) conversion is slow or incomplete.<sup>26</sup> Among the most well studied genetic polymorphisms affecting metabolism of folic acid are those affecting reduced folate carrier 1 (RFC1) gene (A80G), methylenetetrahydrofolate reductase (MTHFR) (C677T, A1298C), methionine synthase reductase (MTRR) (A66G) and dihydrofolate reductase (DHFR) (C-1610G/T, C-680A, and A-317G).<sup>27,28,29,30</sup>

Added to which, unmetabolised synthetic folic acid from supplements and fortified foods can

accumulate in the bloodstream in its oxidised form. Unmetabolised folic acid (UMFA) has been found in 40% of Americans over the age of 60; this may be the mechanism that has contributed to some of the negative long-term health effects associated with long-term high folic acid intakes in some studies, such as cancer.<sup>31</sup>

Folic acid is not included in the Kids Good Stuff formulation. Instead folate is included in its reduced, stabilised form bound to calcium, as the calcium salt of L-5'-methyl-tetrahydrofolate, also referred to as calcium methylfolate.

## VITAMIN B12

To further enhance methylation in the body and to enhance the synergy with the methylated form of folate, Kids Good Stuff includes only methylcobalamin<sup>32</sup> as its source of vitamin B12.

## OTHER VITAMINS

Two vitamin C forms are included, L-ascorbic acid acerola cherry (360 mg total per 10 g serving), which are in turn activated further, along with any vitamin C in foods consumed concomitantly, by the inclusion of citrus bioflavonoids (500 mg per 10 g serving). The vitamin K form is the heavily researched vitamin K2 form, menaquinone-7, which is very well absorbed and strongly associated with supporting bone health.<sup>33</sup>



## MINERAL FORMS

Key to the selection of mineral forms in the Kids Good Stuff formulation is the water solubility and bioavailability. The former is important to ensure that significant minerals are not left behind in the mixing vessel used to prepare the product. The latter is important to ensure the mineral is absorbed optimally, rather than being excreted. This accounts for the presence of gluconate and glycinate forms.

For a multi-nutrient formulation, the inclusion level of magnesium is high (54 mg per 15 g serving) to help compensate for common inadequacies in Western diets.<sup>34</sup> Additionally, it complements the additional marine alga-sourced calcium, silica and iodine from Lithothamnium calcareum, vitamin D3 (lichen sourced), vitamin K2 to help support bone health.<sup>35</sup>

Potassium is added in larger quantities than in most multi-nutrient formulas, to help offset sodium, excessive levels of which eventually lead to hypertension and other cardiovascular health issues in adults.<sup>36</sup>

## IMMUNE SUPPORT

Citrus bioflavonoids, that act synergistically with vitamin C both in Kids Good Stuff as well as in foods,<sup>37</sup> R,S-alpha lipoid acid,<sup>38</sup> cocoa polyphenols<sup>39</sup> and 1,3/1,6-beta glucans<sup>40</sup> function to help support the immune system.

## DIGESTIVE SUPPORT

Psyllium is a soluble fibre from the plant *Plantago ovata*. Soluble fibres help to support healthy bacterial balance of the gut, which helps to support immune and overall health. Systematic reviews of the evidence suggest that psyllium fibre is also effective for aiding glucose control<sup>41</sup> regularity and bowel health and reducing constipation.<sup>42</sup>

Ginger root is added for its well researched and long standing use as a soothing agent on the gut and its role to support indigestion.<sup>43</sup>

Pineapple juice extract, papaya juice in addition to 30 mg of bromelain (from papaya) is provided as sources of bromelain, an enzyme known to help manage pain and inflammation.<sup>44</sup>

## PRE- AND PRO-BIOTICS

Prebiotics, such as apple pectin, provide important substrates for the healthy development of the gut microbiota.<sup>45</sup> Probiotics like acidophilus and bifidobacteria are beneficial bacteria that help to protect the gut from harmful bacteria and yeasts. Probiotics are useful to help the population of the gut with helpful bacteria, whilst crowding out the harmful. Antibiotics can disturb the balance of bacteria and probiotics may help to redress this imbalance. Probiotic supplements appear to reduce severity and duration of antibiotic related, infectious, and persistent diarrhoea in children<sup>46</sup> and may help to prevent upper respiratory tract infections.<sup>47</sup>

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