
The Rationale, Science, Trials and Research behind NutriKane

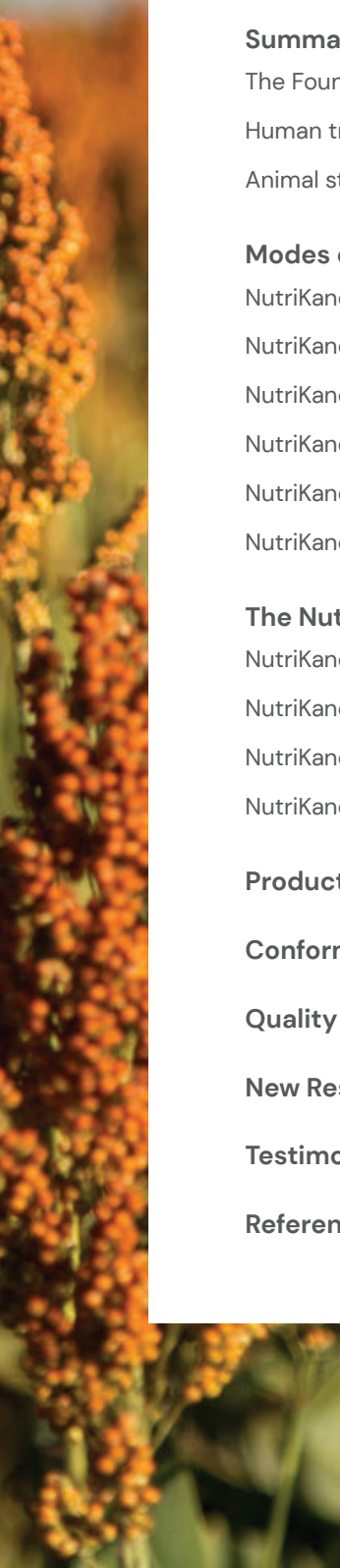
FEBRUARY 2023





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MediKane and the NutriKane Product Range

Behind the NutriKane brand is an innovative Australian Company

MediKane has reviewed the best scientific literature and performed its own scientific trials to ensure that the NutriKane range are effective Food-as-Medicine products.

It isn't just enough to review literature. We test each ingredient and form relationships with suppliers to ensure we only use ingredients with the best consistent quality that deliver the published science behind them and then do our own research and conduct clinical trials on the final product and effective dosage..

MediKane commenced the NutriKane journey in 2010 when we discovered how our unique ingredients had a positive impact on people with health issues. Since then, we continue to expand our ingredient list to help with more and more conditions.

MediKane is now proactively using upcycled ingredients wherever possible and focused on contributing to a sustainable environment. MediKane now uses the only upcycled dietary fibre produced in Australia and the work continues.

Why MediKane created the NutriKane range

We don't just believe that food has the power to heal, we know it. Over the past 13 years we researched a range of natural foods that have proven to have medicinal and protective qualities for those who regularly consume them. Our research made it clear that there was a real benefit to consuming certain foods to prevent, alleviate or help a range of health issues, such as managing blood sugar levels, improving digestive regularity, and reducing pain and inflammation. Armed with this knowledge, our team began formulating different combinations of natural ingredients to create the NutriKane range of "Farmerceuticals".

MediKane's Food-as-Medicine approach

We have all heard the saying "You are what you eat". In terms of overall health this is now a proven scientific fact. Research shows that dietary habits directly affect not only disease risk, but day to day management. While certain foods may increase the risk of chronic health conditions, others have been shown to prevent or reduce symptoms which in turn allows people more control in returning to normalcy. Put simply, when your body is provided with the range of nutrition needed to be healthy, it can repair itself far more effectively than originally thought. The role of Food-as-Medicine is to specifically identify those nutrients and then provide the fuel that your body needs in a convenient way. Food as Medicine is core to preventative health.

Gut health and Food-as-Medicine

It has been known for a long time that gut microbiome health directly affects intestinal health and overall bodily health. However, in recent years our understanding of the scope of the role that the microbiome plays in all aspects of human health has increased dramatically. We have learnt how important managing systemic inflammation can be to overall health, and what role diet plays. Your body does its best to be healthy and has an amazing capacity to repair itself when provided with the correct nutrients.



Often with the modern diet our bodies don't get the micronutrients they need to manage repairs, or the presence of constant inflammation does damage faster than our bodies can heal. If something is acutely damaged or infected in our bodies, we will still need pharmaceutical medication. However, with many lifestyle diseases, our bodies are rarely acutely damaged, just out of tune. Even if something is seriously out of tune, effective dietary management can also reduce the symptoms of chronic diseases in many cases.

Why we need Food-as-Medicine today

For most of us, our modern world makes it hard to consistently consume a healthy diet. Distribution delays reduce the nutrient value of many fruits and vegetables, and food processing often destroys the nutrient value of the original ingredients. In the history of the human gut, it has only been in the last 100 years that we have moved from "farmers' markets" to mass food production. This means that it is not just our bodies, but also our microbiome that is not being fed properly. NutriKane Food-as-Medicine products are designed to fill the gap by feeding the microbiome as well as our bodies.

What makes NutriKane Food-as-Medicine?

A single serve of a NutriKane product provides essential fibres, nutrients, trace elements and minerals clinically proven to improve gut and microbiome health. A healthy gut is key in supporting all bodily functions, including resisting and fighting infection, supporting glucose homeostasis, and removal of various toxins our bodies encounter. In addition, each NutriKane product has been scientifically developed to target modern health problems through careful ingredient selection and therapeutically analysed serving sizes.

MediKane has conducted extensive medical and scientific evaluations of Australian products with similar base ingredients, and NutriKane outperformed all competitors on direct comparative efficacy trials.





Summary of Evidence/Research

MediKane was founded when Dr Malcolm Ball (a biochemist by training and pharmaceutical designer at the time) was approached by his Co-founder Rod Lewis (a biochemist by training and a senior food executive with over 100 food products under his belt) to confirm some rather extraordinary results regarding a dietary fibre product he had helped create. Initial analysis had shown that the fibre not only improved regularity more effectively than other fibre sources, it also reduced the Glycaemic Load of consumed meals more effectively than psyllium husk or wheat dextrin. In 2010 work commenced to obtain scientific evidence and an understanding of what this product might be capable of in terms of improving health.

The composition of the dietary fibre, its effects on the microbiome and the biochemical pathways that were influenced were determined through 3 PhD projects that were funded by The Australian Research Council as part of the Industrial Transformation Training Centre (ITTC) program. This work identified multiple Modes of Action in detail and led the way for product improvements through the addition of other ingredients. These trials also showed that NutriKane had benefits for reducing inflammation, improving cellular health, reducing the incidence of liver disease and improving overall gut health. This analysis was performed primarily at Macquarie University, Sydney Australia.

To confirm the clinical efficacy of NutriKane, the core ingredients were analysed by Animal Models at the Kolling Institute – Sydney University, Sydney. These trials identified that NutriKane had benefits to blood sugar regulation, pancreatic health and insulin requirements. Results are presented in the next section.

Three separate clinical trials were independently conducted at the Royal Melbourne Hospital over 4 years. Summaries of these trials are presented in the next section.

Additional trials were conducted at the Advocate Group Hospitals in Libertyville, Illinois, USA by Dr William Watson. These trials observed significant benefits to intestinal health, blood sugar management, weight loss, Quality of Life, and recovery time in people living with diabetes, Spina Bifida, and recovery post-surgery. Results also showed significant improvements in intestinal function from those using Opioid Analgesics.

These clinical trials have been followed up by private practitioners in NSW, Queensland, South Australia and Victoria through case studies, additional hospital-based product trials and patient trials performed in collaboration with MediKane technical staff. In all trials, NutriKane was shown to have a significant improvement over normal standard of care.

The Foundation of NutriKane

NutriKane is a mixture of natural food ingredients that have been selected and tested to ensure they provide measurable health benefits. NutriKane is a mixture of soluble and insoluble fibres and resistant starch. Importantly though, these fibres are not heavily processed, which means the associated nutrients and waxes that are naturally occurring in the plants are still present in NutriKane. This mixture of fibres is consistent with many natural vegetable sources (approximately 3:1 Insoluble: Soluble dietary fibre). Most importantly, NutriKane is a complex food not just an artificial fibre boost like many of today's supplements. Complex foods are very important to our health. The highly processed foods common in today's society typically have very low nutrition compared to natural complex foods.

NutriKane generates a complex combination of effects that produce the overall health outcomes.

There are three basic classes of Modes of Action:

- Physical/chemical interactions with the gut
- Direct absorption of biochemically active micronutrients
- Prebiotic effect on intestinal flora

There are multiple agents underpinning these three interactions. The combination of effects is the key.

Human trials

NutriKane or NutriKane Specific Ingredients				
Trial	#subjects	Trial Type	End Point	Result
Alleviation of Hospital induced Constipation by NutriKane[1]	100	Randomised open label patient matched	<ul style="list-style-type: none"> Constipation relief Faecal incontinence relief 	<ul style="list-style-type: none"> 89% improvement over current methods Included pharmaceutical laxatives in control group
Improvement to intestinal health of people Spina Bifida intestinal health[2]	54	Randomised blinded placebo controlled multi centre	<ul style="list-style-type: none"> Constipation relief Faecal incontinence relief Improved quality of life 	<ul style="list-style-type: none"> Participants saw improvement in all intestinal health and cognitive markers
Diabetes[3]	56	Randomised blinded placebo controlled	<ul style="list-style-type: none"> Intestinal health improvement Blood glucose management improvement QoL 19 total clinical markers 	<ul style="list-style-type: none"> Improvement in all 19 markers over normal standard of care
Post surgery recovery – trauma [in-house trial]	66	Randomised open label patient matched	<ul style="list-style-type: none"> Constipation relief Recurrent surgery requirement Hospital stay length 	<ul style="list-style-type: none"> Improvement on all 3 End Points over normal standard of care
Post surgery recovery – elective [in-house trial]	31	Randomised blinded placebo controlled	<ul style="list-style-type: none"> Constipation relief Faecal incontinence relief Improved quality of life 	<ul style="list-style-type: none"> All participants saw improvement in intestinal health and cognitive markers
Weight loss [in-house trial]	100	Randomised blinded placebo controlled	<ul style="list-style-type: none"> Absolute weight lost Diet management 	<ul style="list-style-type: none"> 1.8x weight loss with NutriKane (2 serves a day) 20% more adherence to diet (6 days rather than 5)
Reflux/ Heartburn[4]	43	Randomised blinded placebo controlled	<ul style="list-style-type: none"> Quality of life Number reflux events Reflux type and severity 	<ul style="list-style-type: none"> Significant reduction in events and severity compared to placebo
Reduction of Glycaemic Index of various meals with co-consumption of NutriKane [in house analysis]	10x4 (6 food types)	Blinded Pre-Post	<ul style="list-style-type: none"> Numerical Value for Glycaemic index vs control food 	<ul style="list-style-type: none"> GI of meal lowered with co-consumption of NutriKane regardless of meal type of starting Glycaemic Index Average of 26 point reduction in Glycaemic Index when NutriKane consumed with a meal

Ingredient related external studies				
Trial	#subjects	Trial Type	End Point	Result
Bile Acid production and Stool consistency with SCF consumption[5]	19	Blinded Pre-Post crossover trial	<ul style="list-style-type: none"> • Stool weight • Stool fat content • Bile secretion 	<ul style="list-style-type: none"> • 26% reduction in blood glucose • 53% reduction in insulin levels
Reduction of glycaemic index with addition of SCF [6]	10x4	Blinded Pre-post	<ul style="list-style-type: none"> • Numerical Value for Glycaemic index vs control food 	<ul style="list-style-type: none"> • 37% reduction in glycaemic index
Chronic obstructive pulmonary disease symptom alleviation[7]	196	Multi-centre, randomised blinded placebo controlled	<ul style="list-style-type: none"> • Pulmonary symptom scores • St George's Respiratory Questionnaire 	<ul style="list-style-type: none"> • Significant improvement in SGRQ when SCF added to diet
Reduction of postprandial blood glucose levels with sorghum consumption[8]	10x3	Blinded Pre-post crossover	<ul style="list-style-type: none"> • Numerical Value for AUC of postprandial glucose and insulin levels vs control food 	<ul style="list-style-type: none"> • 26% reduction in blood glucose • 53% reduction in insulin
Reduction of postprandial blood glucose levels with sorghum consumption in healthy men[9]	10x3	Blinded Pre-post crossover	<ul style="list-style-type: none"> • Numerical Value for AUC of postprandial glucose and insulin levels vs control food 	<ul style="list-style-type: none"> • 35% reduction in blood glucose AUC with sorghum foods • 56% reduction in insulin AUC with sorghum foods
Comparison of the Glycaemic Index and Glycaemic Load of sorghum based products to wheat and rice equivalents[10]	10x3 (6 separate products tested)	Blinded Pre-post	<ul style="list-style-type: none"> • Numerical Value for AUC of postprandial glucose and insulin levels vs control food • Comparison of baked goods made with either wheat, rice or sorghum 	<ul style="list-style-type: none"> • All foods tested (flakes, course semolina, fine semolina, roti, biscuits, and pasta) had a significantly lower Glycaemic Load than their wheat/rice equivalents (average 17 points) • Four of the foods tested (flakes, course semolina, fine semolina, and pasta) had a significantly lower Glycaemic Index than their wheat/rice equivalents (average 17 points) • Biscuits were slightly lower and roti was slightly higher in GI – neither was significant • Average drop in GI of sorghum foods was 12 points

Ingredient related external studies				
Trial	#subjects	Trial Type	End Point	Result
Postprandial metabolic function with sorghum function[11]	40 (20)	Randomised crossover	<ul style="list-style-type: none"> AUC blood postprandial blood glucose. GIP, GLP-1, insulin, PYY, ghrelin levels post consumption. Subjective measures of satiety 	<ul style="list-style-type: none"> Lower satiety when consuming wheat products compared to sorghum GLP-1, GIP, and PYY significantly higher when sorghum consumed
Systematic review of benefits of sorghum consumption to the treatment of chronic disease and general health[12]	N/A	N/A	<ul style="list-style-type: none"> Diabetes management Gut health Longevity Immune response 	<ul style="list-style-type: none"> Improved glucose response Lower oxidative stress Improved outcomes when used as an adjunct for HIV therapy General trend towards better health in sorghum consuming communities

Animal studies

NutriKane or NutriKane Specific Ingredients				
Trial	#subjects	Trial Type	End Point	Result
Mouse – Type 1 diabetes model [in house analysis]	45	Randomised controlled STZ destruction of pancreas	<ul style="list-style-type: none"> Pancreas islet cell loss Insulin requirements Kidney function 	<ul style="list-style-type: none"> Halted degradation Significantly lower insulin requirements Kidney protection demonstrated that was not dependent on blood glucose levels
Mouse – Type 2 diabetes model [13, 14]	60	Randomised controlled high fat diet	<ul style="list-style-type: none"> Blood glucose levels Liver function Weight gain Microbiome modification 	<ul style="list-style-type: none"> Reduced chance of liver disease Reduced weight gain Blood glucose stabilised Microbiome positively impacted
Mouse IBD with probiotic and SCF intervention[15]	50	Randomised controlled supplemented diet probiotic use with colitis induction	<ul style="list-style-type: none"> Inflammation levels SCFA production Intestinal wall damage 	<ul style="list-style-type: none"> Inflammation significantly reduced SCFA production increased Cellular damage in the intestine reduced Symbiotic effect with probiotics
Mouse IBD with probiotic and SCF intervention[16]	32	Randomised controlled supplemented diet probiotic use with genetically deficient mice	<ul style="list-style-type: none"> Inflammation levels SCFA production Intestinal wall damage 	<ul style="list-style-type: none"> Inflammation significantly reduced SCFA production increased Cellular damage in the intestine reduced Symbiotic effect with probiotics

Ingredient related external studies				
Trial	#subjects	Trial Type	End Point	Result
Feline hairball[17]	36	Randomised controlled Kibble with and without sugar cane fibre	<ul style="list-style-type: none"> • Number of hairballs • Total hairball mass 	<ul style="list-style-type: none"> • Reduction in total and mass of hairballs with sugar cane fibre addition to kibble
Feline blood glucose levels[18]	24	Randomised blinded, controlled	<ul style="list-style-type: none"> • Digestibility • Fermentation end products • Postprandial blood glucose levels 	<ul style="list-style-type: none"> • Sugarcane fibre was found to have least digestibility resulting in lower total calorie intake (implies satiety as more food was not consumed to account for calorie deficiency). • Postprandial blood glucose response was lower in SF containing diets
Feline reduced feed intake[19]	79	Sequential pre-post crossover	<ul style="list-style-type: none"> • Palatability • Voluntary feed intake 	<ul style="list-style-type: none"> • No reduction in palatability • Amount of food consumed per sitting and number of feeding events reduced when sugarcane fibre added to food
Canine blood glucose management using grain sorghum[20]	10	Sequential pre-post crossover	<ul style="list-style-type: none"> • AUC postprandial blood glucose. • Fasting, mean, minimum and maximum glycaemia and serum fructosamine 	<ul style="list-style-type: none"> • Lower fasting glucose in sorghum diet • Lower AUC postprandial glucose levels with sorghum diet • Lower maximum blood glucose with sorghum diet
Mouse hepatic signalling[21]	36	Randomised controlled High fat diet	<ul style="list-style-type: none"> • Lipid levels • Insulin sensitivity • Cholesterol • AMPK sensitivity 	<ul style="list-style-type: none"> • Lower triglycerides and cholesterol • Increased insulin and AMPK sensitivity • Lowered FGF21 production
Mouse weight loss and ghrelin signalling from SCF intake[22]	36	Randomised controlled High fat diet	<ul style="list-style-type: none"> • Body weight • Plasma insulin • Leptin levels • Blood glucose • GLP-1 	<ul style="list-style-type: none"> • Lower body weight than controls • Lower fat mass than controls • Lower fasting blood sugar than control or cellulose • Lower blood insulin levels than control or cellulose • Lower leptin levels than control or cellulose • Higher GLP-1 levels than control or cellulose
Rat Bile Acid production from SCF intake[23]	48	Randomised controlled fibre containing and fibre free diet	<ul style="list-style-type: none"> • Bile acid production • Serum cholesterol levels • Faeces bulk 	<ul style="list-style-type: none"> • SCF produced higher bile levels • Fibre increased faeces bulk • No change in food consumption • No change in serum cholesterol levels

Ingredient related external studies

Trial	#subjects	Trial Type	End Point	Result
Rat Lipid metabolism and hormone concentration from sorghum resistant starch intake[24]	72	Randomised controlled, ordinary diet	<ul style="list-style-type: none"> • Equol production • Lipid metabolism • HDL/LDL concentrations • Liver enzyme production • Body weight • Abdominal fat 	<ul style="list-style-type: none"> • Equol production increased with sorghum resistant starch intake. • Body weight, abdominal fat and liver size reduced with RS injection. • LDL reduced with RS consumption
Cholesterol production and absorption with the addition of sorghum lipids to diet[25]	28	Randomised controlled	<ul style="list-style-type: none"> • HDL cholesterol • LDL cholesterol • Liver function 	<ul style="list-style-type: none"> • HDL cholesterol increased or was not reduced with soghum; lipid consumption • LDL was significantly reduced with sorghum lipid consumption • Healthy liver function significantly increased with sorghum lipid consumption

In-vitro and mechanistic data

Trial	#subjects	Trial Type	End Point	Result
Canine microbiome[26]	N/A	In vitro canine microbiota model	<ul style="list-style-type: none"> • Short chain fatty acid production • Insoluble/soluble mix 	<ul style="list-style-type: none"> • SCFA production significant • Large percentage insoluble for bowel function
Effect on inflammatory pathways[27]	N/A	Cell line challenged with inflammatory bacteria and tested with and without NutriKane	<ul style="list-style-type: none"> • Pathway regulation changes • Anti-inflammatory effect • Comparison to resveratrol 	<ul style="list-style-type: none"> • NK has 5 x the antioxidant capacity of raisings and cranberry • NK has 3 x the free radical scavenge of Raisins and Cranberry • NK acts through TLR2 and 4 • NK and Res have different and complementary pathways
Microbiome changes[28]	N/A	Invitro analysis of gut microbiome with comparing NutriKane to other fibres	<ul style="list-style-type: none"> • Diversity of microbiome • Changes in individual genus • SCFA production 	<ul style="list-style-type: none"> • Maintained diversity compared to other fibres • Reduced inflammatory bacteria • Increased probiotic bacteria • Increased SCFA production

In-vitro and mechanistic data

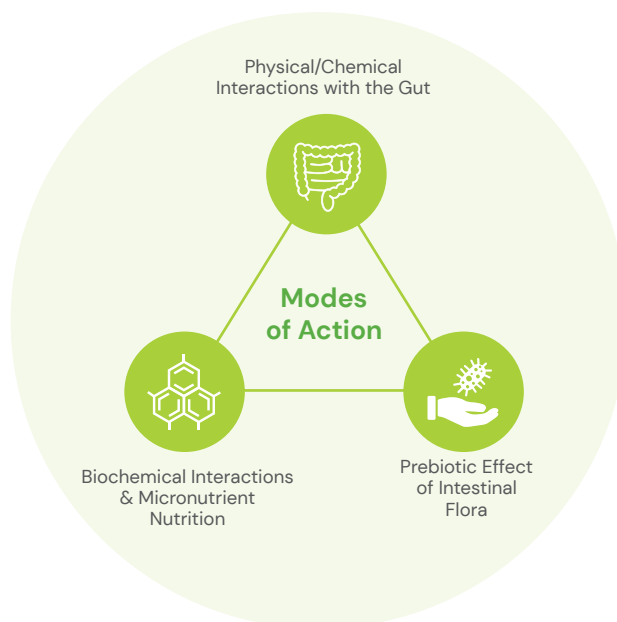
Trial	#subjects	Trial Type	End Point	Result
Microbiome changes[29]	N/A	In vitro analysis of human gut healthy and obese microbiome incubated with sorghum polyphenols	<ul style="list-style-type: none"> Diversity of microbiome Changes in individual genus SCFA production 	<ul style="list-style-type: none"> Increased populations of <i>Bifidobacterium</i>, <i>Lactobacillus</i>, <i>Roseburia</i>, and <i>Prevotella</i>. Inhibited <i>Dorea</i> Increased SCFA production Synergy observed with sorghum and other fibre sources
Pharmacologically active compounds from sorghum for use with T2DM[30]	N/A	In vitro analysis of potential medically active compounds from grain sorghum	<ul style="list-style-type: none"> Analysis of number of molecules isolated from grain sorghum that confirm to Lipinski's rule of pharmacokinetics 	<ul style="list-style-type: none"> 20 compounds identified which were accepted by the Lipinski's rule A total number of 16 compounds-related to T2DM were identified Compounds were associated with 12 signaling pathways Key mechanism might be to control blood glucose level by activating PPAR signaling pathway
Sorghum polyphenol anti-inflammatory activity[31]	N/A	Proteomic analysis of Nf-kB pathway with LPS induction and sorghum polyphenol addition	<ul style="list-style-type: none"> Pathway inhibition by polyphenol extracts in combination with single flavonoid therapy (apigenin and quercetin) 	<ul style="list-style-type: none"> Addition of sorghum extract increased pathway inhibition by 14x compared to flavonoid therapy alone
Inhibition of glycation with sorghum polyphenol extract[32]	N/A	Inhibition of BSA glycation using a fluorescent assay	<ul style="list-style-type: none"> Level of reduction of protein glycation 	<ul style="list-style-type: none"> Sorghum extract effectively reduced glycation of proteins by 60% in in vitro assays This benefit was not observed with wheat, oats or rice extracts
Inhibition of sucrase activity by sugarcane[33]	N/A	<p>Sucrase inhibition in vitro assay</p> <p>Measurement of sugar transfer across animal intestinal wall</p>	<ul style="list-style-type: none"> Binding capacity of sucin to sucrase 	<ul style="list-style-type: none"> Peptides found in sugarcane were shown to inhibit sucrase activity and subsequently reduce the energy utilisation of animals from sugar sources
Sugarcane polyphenol extract inhibition of glucose uptake[34]	N/A	<p>Caco-2 cellular assay</p> <p>Syrian Hamster beta cell (HIT-T15) assay</p>	<ul style="list-style-type: none"> Glucose and fructose uptake Insulin secretion 	<ul style="list-style-type: none"> Extract significantly reduced sugar uptake when incubated with Caco-2 cells Sugarcane extract restored insulin secretion function in compromised beta cells

Modes of Action

The specific ways that foods and medicines work in the body's biochemistry are referred to by medical scientists as "Modes of Action". This relates specifically to how the product interacts with the body's biochemistry.

Unlike pharmaceutical drugs that typically have a single Mode of Action, medical nutrition products such as NutriKane work on several aspects at the same time. The benefits of NutriKane cannot be assigned to any one Mode of Action as the importance of each Mode of Action will vary for each person, depending on diet, general health, infection levels, exercise, age, genetics and a whole raft of other things. The power of nutritional products is that they help the body to rebalance and work as it should, so that it can repair itself.

Food-as-Medicine and "traditional" pharmaceuticals work together to achieve total health when diet control alone is not enough. Pharmaceuticals still need the body to be working as well as possible to achieve their goals. NutriKane is therefore an essential part of a patient's regime as prescribed via a Healthcare Professional.



The Modes of Action that have so far been identified for NutriKane are as follows:

NutriKane is a Broad Spectrum Prebiotic – It feeds all of your microbiome.

The "microbiome" is the common term for the trillions of bacteria that live on and inside our bodies. The gut microbiome inhabits our gastrointestinal tract, from the mouth to the anus. more than 1200 species have been identified so far and they live in different parts of the gastrointestinal tract. Both beneficial and detrimental bacteria live in our gut and many species can be either depending on the circumstance. A prebiotic is a food that feeds the bacteria but not our bodies directly. University studies showed that NutriKane is a 'broad spectrum' prebiotic, meaning it feeds many different types of bacteria, unlike simple fibres such as psyllium husk that only feed one group. We have also shown it specifically feeds the healthy (probiotic) bacteria and reduces the number of unhealthy (pro-inflammatory) bacteria in the gut. It is known that if one group of bacteria (even so called healthy bacteria) gets out of balance it can lead to health problems (such as SIBO). All data to date has shown that to be healthy, a person needs a diverse range of bacteria in their gut, that maintains an overall balance. By using complex prebiotic foods rather than simple fibre supplements, NutriKane helps maintain a healthy balance which in turn results in a healthy gut.

Bacteria in the gut reproduce in a short period of time (minutes to hours) so they need to be constantly fed and nourished to maintain the health of the microbiome. The short life cycle of the bacteria coupled with the importance of everything they do for us is why we can see dramatic changes to health, wellbeing and mental state in such a short period of time after a healthy change in diet, or a deterioration if eating an unhealthy diet.

A healthy microbiome is essential to the body's ability to maintain correct blood sugar levels (called glucose homeostasis). Many essential nutrients that the body needs for metabolism, to recover from injury and resist infection are not found in plants or animals. They are only produced by the bacteria in our gut, so it is essential the bacteria are themselves healthy and well nourished.

NutriKane provides bio-available nutrients

The human body can be viewed as a massively complex chemistry set. Literally billions of chemical reactions continuously occur in our bodies from the time we are conceived until just after we die. So far science has managed to identify nearly 10,000 different types of reactions that occur in about 900 distinct pathways, and many more are yet to be discovered.

To simplify things a little the vast array of nutrients our bodies need have been divided into 2 broad groups – Macronutrients (protein, fat, carbohydrate, dietary fibre) which are mainly used as building blocks and energy and are needed in relatively large quantities every day, and Micronutrients (everything else) that are essential to make all of the chemical reactions in our bodies work but are needed in relatively small amounts compared to the macronutrients. The human body needs both macro and micronutrients to grow and remain healthy. Vitamins and minerals are commonly known examples of micronutrients. While many micronutrients are common in nature (iron for example) it is important to understand that when they are used in biochemistry, they must have very specific forms, and often require other molecules to be present to function. It is not enough to lick a nail to get iron into our system, the iron must already have been modified by a plant or animal into its biochemically active form for us to then change it again into the specific form we need to use ourselves. This is why iron from meat is considered better than iron from plant sources, because it is more “bio-available” (meaning easier for us to absorb and use).

Many supplements contain the micronutrients we need but in forms that are not easy to absorb. In addition, our bodies are not designed to absorb large doses of single nutrients on their own. There are no foods that are just B and C vitamins for example. Our bodies absorb all of the nutrients in a complex food at once. Nutrients that are required in groups are called co-factors. If the body does not have enough co-factors in the food then it will use up some of its own to try and absorb the vitamins more efficiently. This means that taking large doses of vitamins can actually deplete your body’s micronutrients rather than increase them.

There is also a misconception of what bioavailable means that is a holdover from the pharmaceutical industry. When a pharmaceutical is not found in nature it is important to get it into the blood system so the body can use it. When any supplements say “bio-available” they mean the active ingredient has entered the bloodstream. Just because a molecule is in the blood doesn’t mean the body can make use of it however. In order to really get the proper nutrition our nutrients must come from foods, which is why NutriKane uses foods for all of its primary active ingredients, only supplementing the foods with vitamins that have been shown to be effective.

NutriKane improves the health of the gastrointestinal tract

Quite apart from benefits to the gut microbiome NutriKane also interacts directly with the intestines themselves. Counterintuitively our bodies are not designed to eat food that is easy to absorb, making all those Smoothie drinks actually worse for us rather than better. One of the problems with highly processed foods (apart from the fact that they are generally low in nutrition) is that the simplicity of the ingredients tends to mean that they are absorbed in the first 25% of the gut. This causes a major imbalance in the body’s biochemistry as many of the hormones used to regulate blood glucose levels are only produced in the last 25% of the gut in response to stimuli from digestion. NutriKane contains high fibre, complex foods which means that they are slowly digested over the entire length of the gut providing both nutrition and physical stimulation to keep the lining of the gut fresh and thick.

NutriKane improves absorption of nutrients from foods

The villi are the tiny filaments in our intestines through which nutrients are absorbed from our food. Intestinal health is reliant on the health of villi. In a healthy person these tiny filaments stand up and protrude into the small intestine and come into contact with the food as it passes through the gastrointestinal tract. Nutrients are absorbed into our bloodstream through these villi (which greatly increase the surface area of the small intestine to maximise its ability to absorb nutrients). The villi can be damaged by many things, including malnutrition and certain chemicals. Many gastrointestinal tract issues are also caused by inflammation of the villi. NutriKane helps maintain the health of the villi by reducing inflammation and providing essential stimulation and nutrients to the intestinal wall.

NutriKane lowers the Glycaemic Index (GI) of food

The Glycaemic Index (GI) is a relative ranking of carbohydrate in foods according to how quickly they are absorbed into the bloodstream and converted to glucose. The lower the GI of a food, the slower the carbohydrates are absorbed which in turn results in a slower rise in the blood sugar level. This is particularly important for people living with impaired control of their BSLs and people trying to manage hunger cravings. It slows the absorption of energy and provides a sustained boost during and/or after exercise.

It has also been shown in a large European study that a lower GI diet not only increases weight loss but that people who maintain a lower GI diet (without changing the actual calories consumed) are less likely to put weight back on. NutriKane lower the GI of foods when consumed with a meal and has been shown to help provide weight loss in multiple Australian clinical trials.

NutriKane reduces systemic inflammation

Inflammation plays an important role in disease progression and is a major component of most non-communicable diseases. Inflammation is the biological response of tissues to dangerous elements like pathogens or damaged cells. The presence of the detrimental stimuli spur the immune system into action, and, as a protective measure, an immune response is emitted that results in inflammation. Inflammation is just a part of life, the inevitable cost of having a powerful immune system, as evolution had to juggle the pros and cons of a potent defence mechanism. There's always some inflammation going on somewhere in the body of most people, and it even fluctuates in natural daily rhythms. Normally inflammation is switched off as soon as it isn't needed. If inflammation levels do not return to normal after it is no longer useful then chronic inflammation occurs (sore joints in arthritis is an example). If chronic inflammation migrates from a specific place to the whole body, then Systemic Inflammation occurs. Chronic and systemic Inflammation are problems because they can damage healthy tissue. Certain diets contribute to inflammation. For example, a diet high in simple carbohydrates and low in micronutrients allows bacteria that switch on inflammation to control the microbiome, while reducing the body's ability to switch off the inflammatory response. Stress can also cause inflammation. Early intervention and treatment are key to keeping Systemic Inflammation under control. NutriKane has been shown in multiple trials to reduce Systemic Inflammation and as such, can help people regardless of age, fitness and diet. People who stress their bodies emotionally or physically appear to be the most at risk and therefore have the most to gain from regular use of NutriKane.

Insulin insensitivity and systemic inflammation has also been shown to negatively impact many chronic conditions such as arthritis, IBS and IBD and Type 1 and Type 2 diabetes.



The NutriKane Product Range

The NutriKane product range started with a product designed to relieve the symptoms of constipation. The original formulation for NutriKane (which has evolved into NutriKane R) was shown in small scale trials to be very effective in managing constipation and restoring intestinal health. An interesting result of the trials was that in people living with Type 2 diabetes it was also observed that blood sugar levels were more controlled as well. Trials were expanded for constipation relief and the product was reformulated to optimise blood sugar management for a new round of trials. During this period, it was also undertaken to elucidate the underlying biochemical mechanisms and modes of action. The new formulation was named NutriKane D and launched in 2015 for blood sugar level control, after we had determined the best serve size and timing to achieve best results. The scientific work we performed confirmed feedback from individuals that NutriKane's core ingredients were also having a benefit in reducing inflammation and improving repair and recovery. Based on this feedback we decided to focus on providing targeted products for certain health conditions. We have expanded our proven ingredients in a serving size that we have shown works via the process that pharmaceutical drugs use – 'Dose response curves'. This way we maximised product effectiveness and made the NutriKane range relevant to more people.

To that end our original constipation product has been improved to NutriKane R, a specific joint health product, NutriKane J, has been developed and a product designed to improve overall inflammation – NutriKane I.

We continue to improve the effectiveness and consumer acceptability of our products based on customer feedback. During 2023 we will see ongoing improvements and expansion of our range, as new research and ingredients become available.

See Table of Evidence in the Product Matrix and a full image of the product descriptors.



NutriKane D

Target: To Lower & Control Blood Sugar levels, assist in weight loss (as part of a calorie-controlled diet), lower the GI of foods, promote SCFA production.

Ingredients: Sugarcane Fibre (sugar removed), Red Sorghum, Natural Orange Flavour, Whole Apple Powder, Whole Pear Powder, Whole Orange Powder, Natural Orange Colour, Xanthan Gum, Guar Gum, Citric Acid, Ascorbic Acid, Monk Fruit Powder.

Serving size: 8.9g | Serves in a tub: 28

Notes: Our original product continues to be improved. It has a success rate of over 85% in helping people with BSL issues.

NutriKane R

Target: For Optimal Regularity, helps minimise bloating and indigestion, stimulates the intestinal tract, supports microbiome function.

Ingredients: Sugarcane Fibre (sugar removed), Pectin, Apple Powder, Natural Lemon/Lime Flavour, Potassium Bicarbonate, Citric Acid, Green Colour, Lime Powder, Lemon Powder, Xanthan Gum, Guar Gum, Monk Fruit Powder.

Serving size: 6.7g | Serves in a tub: 30

Notes: In clinical trials NutriKane R was shown to provide relief in 80% of patients that had not seen improvement with the use of fibre supplements and/or chemical laxatives. This product is not a laxative or bawking product. Helps normalize the gut.



NutriKane I

Target: Reduce Inflammation, reduces inflammatory bacteria in the gut, reduces long-term inflammation, supports healthy immune function.

Ingredients: Evaporated Cane Juice, Sugarcane Fibre (sugar removed), Red Sorghum, Red Grape Marc, Whole Beetroot Powder, Natural Raspberry Flavour, Citric Acid, Potassium Bicarbonate, Australian Grey Sea Salt, Vegetable Gums, Queen Garnet Plum Powder, Ascorbic Acid, Cholecalciferol.

Serving size: 16g | Serves in a tub: 30

Notes: This formulation expands the range of ingredients to provide broad spectrum anti-inflammatory benefits. Has also been shown in small scale trials to reduce acute inflammation from exercise. The complexity of NutriKane I is the secret to supporting Immunity and reducing systemic inflammation.



NutriKane J

Target: Improve Joint Health, rejuvenates connective tissue, reduces joint pain, helps maintain healthy skin

Ingredients: Collagen Peptides, Sugarcane Fibre (sugar removed), Red Sorghum, Turmeric, Maltodextrin, Natural flavour, Vegetable Gums, Queen Garnet Plum Powder, Ascorbic Acid, Whole Kakadu Plum Powder, Whole Finger Lime Powder, Curcumin, Black Pepper, Monk Fruit Powder.

Serving size: 14g | Serves in a tub: 30

Notes: The collagen peptides used in NutriKane J have been shown in clinical trials to repair skin condition and restore skin flexibility in the serve size. Each NutriKane J serve contains a substantial dose (14g per serve) of quality ingredients including a blend of Collagen, Turmeric and Curcumin not available together in any other product.

Product Matrix

Health conditions	Comment	NutriKane D	NutriKane R	NutriKane I	NutriKane J
Blood Sugar control		✓✓✓✓✓	✓✓	✓✓	✓✓
Gestational Diabetes		✓✓✓✓✓	✓✓	✓✓	✓✓
Type 2 Diabetes		✓✓✓✓✓	✓✓	✓✓	✓✓
Weight loss		✓✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓
General Gut health		✓✓✓	✓✓✓✓✓	✓✓	✓✓
Regularity		✓✓✓	✓✓✓✓✓	✓✓	✓✓
Constipation		✓✓✓	✓✓✓✓✓	✓✓	✓✓
Bloating		✓✓✓	✓✓✓✓✓	✓✓	✓✓
Indigestion		✓✓✓	✓✓✓✓✓	✓✓	✓✓
Weight loss	2 doses per day	✓✓✓✓✓	✓✓✓✓✓	✓✓✓	✓✓✓
Reduces Inflammation		✓✓✓	✓✓	✓✓✓✓✓	✓✓✓
Healthy Immune function		✓✓✓	✓✓	✓✓✓✓✓	✓✓✓
Healthy microbiome/gut		✓✓✓	✓✓	✓✓✓✓✓	✓✓✓
Reduces joint pain		✓✓	✓✓	✓✓	✓✓✓✓✓
Reduces joint pain		✓✓	✓✓	✓✓	✓✓✓✓✓
Rejuvenates connective tissue		✓✓	✓✓	✓✓	✓✓✓✓✓
Helps maintain healthy skin		✓✓	✓✓	✓✓	✓✓✓✓✓



Conformance and Approval by FSANZ

NutriKane has been assessed by the TGA and Food Standards Australia New Zealand and has been classified as a non-novel food that can be used to supplement a normal diet.

The claims that have so far been approved for NutriKane products include:

- 1 Contributes to healthy bowel function
- 2 Supports gut microbiota / microbiome in healthy adults
- 3 Contributes to the nourishment of good bacteria
- 4 Contributes to the maintenance of intestinal health
- 5 Contributes to the natural cleansing processes of the digestive system & gut
- 6 Contributes to normal stool frequency & regular laxation in healthy adults
- 7 Contributes to digestive health & wellness
- 8 Contributes to the maintenance of blood sugar levels
- 9 Contributes to the enhancement of satiety / feelings of fullness / reduced feelings of hunger
- 10 Contributes to the maintenance of dietetic health & wellness
- 11 Suitable for Low FODMAP diets with uniform fermentation rate of prebiotic fibre
- 12 Contributes to the normalisation of dietary caused bloating via uniform fermentation & gas production compared to rapid gas forming prebiotics in healthy adults.
- 13 Contributes to the normalisation of aspects of dietary caused indigestion & gas compared to rapid gas forming prebiotics in healthy adults.
- 14 Promotes the growth of non-inflammatory fibre digesting bacteria & synthesis of Short Chain Fatty Acids (SCFAs).

We will be broadening our claims based on the scientific evidence around the new ingredients of all NutriKane products during 2023.



Quality Control

MediKane has partnered with a unique Australian Packaging company, run by a Compounding Pharmacists with 30 years of experience. The facility includes TGA approved manufacturing and food grade packaging and all products are packaged to the highest standards.

As part of our ongoing commitment to quality, ingredients are constantly tested for safety and efficacy and in house trials are constantly performed to ensure the products perform as required.

New Research/Research Planned

MediKane is committed to increasing our understanding of our product benefits and Food-as-Medicine as a whole. To that end we have a number of new trials in the pipeline.

- We are conducting R&D into the higher health benefits that can be delivered from upcycled Extracta dietary fibre. This work will be extended to dietary fibres from upcycled Australian apples and oranges.
- We have commenced a trial program to show benefits of NutriKane products to companion animals for joint pain and intestinal health.
- We are expanding our understanding of blood sugar management with a trial using NutriKane D with people who have continuous glucose monitors to get a better picture of the minute by minute interactions.
- Previous trials have shown that NutriKane products have a benefit to Quality of Life and cognitive function as a secondary end point. Two new trials specifically aimed at improving cognitive function and feelings of anxiety are planned with Ashton University in the United Kingdom.
- Animal models have shown that NutriKane may have a benefit to liver function and a small scale human trial is planned with Macquarie University.
- The benefits of NutriKane to exercise recovery is planned with College Grid Iron players in South Carolina.

Testimonials



I've been recommending the product for the past 8 years in my Health & Lifestyle consulting practice, with excellent results across a varied range of health issues.

I have clients who have sought help with elevated blood glucose levels; chronic gut issues; arthritic joint problems; weight loss; post exercise recovery; and poor sleep patterns and brain fog after Covid, and in every case they have found enough relief to continue using the product on a regular basis, and incorporating it into their daily regime.

It is one of the base products I use for every client, because of such reliable results and I would highly recommend any practitioner consider using it in their practice.

Patricia Reed RN

Total Health Options



We have recently become a supplier of NutriKane D in a small rural town in WA out of a health food retail shop. As of the time of writing this, we have not been able to keep up with supply to our small number of constituents who are currently using the product. Word of mouth is growing for 2 main reasons:

- 1. The product works! It does what it claims it does.**
- 2. It is affordable.**

We have one customer who has bought this product for her sister who has diabetes and has always had difficulties keeping it manageable. Almost immediately she saw the change and felt the benefits. Her sister has told me she cannot be without NutriKane D. Her sister was so impressed with the results she has been taking NutriKane D for her own health and has noticed a positive difference to her overall health.

Another customer of ours has reported to me that she has been on an 800 calorie diet for years and has been unable to lose the excess weight she's been carrying around. After just 2 weeks of taking the NutriKane D she noticed a change. Her continued use of the product in a very short time had her showing very proudly to me that her clothes are becoming a little loose on her already. She is not only thrilled about the weight loss; she is also thrilled about becoming healthier the longer she is using the product. Her words of advice to me are that every customer should know that it is better to use cold water from the fridge to mix up the powder. This somehow reduces the chalky taste in your mouth and is a lot more pleasant to swallow.

We will be continuing to supply NutriKane D to our current customers, and as word of mouth spreads, are prepared to supply to what will be an undoubtedly growing demand and market for this product.

As a supplier the company has been wonderful to deal with from the very first contact. Price, postage and communication have been of a very high standard. If you are considering stocking this product, I can recommend the company as they will be professional and proficient to you and your customers will love the benefits from NutriKane D.

Karen

*On behalf of Faye McBeath (Proprietor/Manager)
Goodlife Narrogin*



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